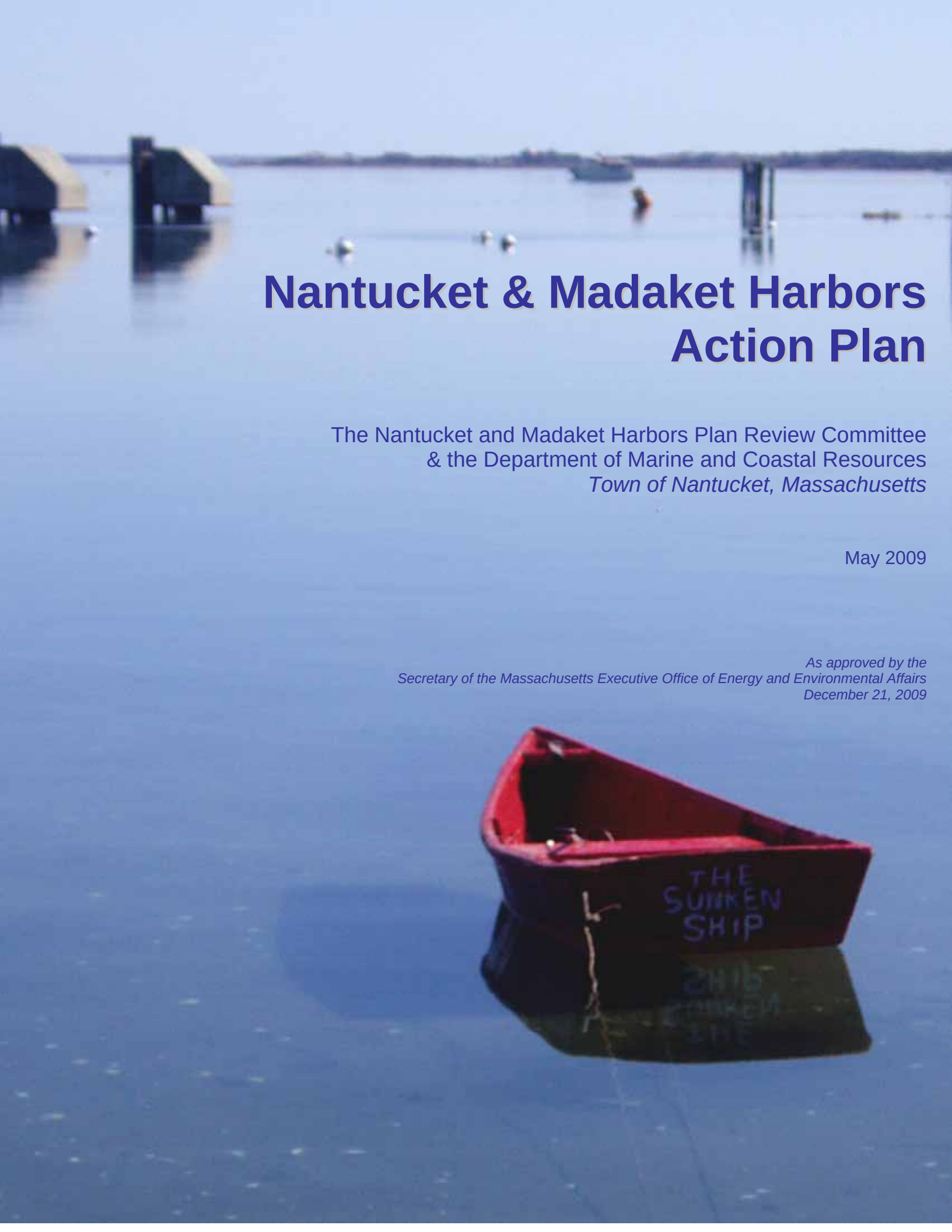
Nantucket & Madaket Harbors Action Plan

The Nantucket and Madaket Harbors Plan Review Committee
& the Department of Marine and Coastal Resources
Town of Nantucket, Massachusetts

May 2009

As approved by the
Secretary of the Massachusetts Executive Office of Energy and Environmental Affairs
December 21, 2009



DECISION ON THE TOWN OF NANTUCKET'S REQUEST FOR APPROVAL OF THE NANTUCKET AND MADAKET MUNICIPAL HARBOR PLAN PURSUANT TO 301 CMR 23.00

December 21, 2009

Commonwealth of Massachusetts

Executive Office of Energy and Environmental Affairs

Ian A. Bowles, Secretary

I. INTRODUCTION

Today, as Secretary of the Massachusetts Executive Office of Energy and Environmental Affairs (EEA), I am approving, the Nantucket and Madaket Harbors Action Plan ("Plan") dated May 2009. This Decision presents a synopsis of Plan content and my determinations on how the Plan complies with the standards for approval set forth in the Municipal Harbor Planning regulations at 301 CMR 23.00 et seq.

Pursuant to the review procedures contained therein, the Town of Nantucket ("Town") submitted the Plan in June 2009. Following a review for completeness, a notice of public hearing and 30-day opportunity to comment was published in the *Environmental Monitor* dated June 11, 2009. Oral testimony was accepted during a public hearing held in the Town of Nantucket on June 22, 2009, and two written comment letters were received prior to the close of the public comment period on July 10, 2009. The review process led on my behalf by the Massachusetts Office of Coastal Zone Management (CZM), included consultation between staff of CZM, the Waterways Regulation Program of the Department of Environmental Protection (DEP), and the Steamship Authority (SSA). The SSA is a "state agency" as the term is defined in 301 CMR 23.03 and owns and operates the Nantucket ferry terminal on real property located within the harbor planning area. The Plan review followed the administrative procedures set forth at 301 CMR 23.04 and in accordance with the standards in 301 CMR 23.05. In reaching my approval decision, I have carefully considered the oral and written testimony submitted by the public during these respective comment periods.

As shown in Figures 1 and 2, the geographic area covered by the Plan includes all of the land and water areas of Nantucket and Madaket Harbors, and also extends to the west of Madaket Harbor to include the Tuckernuck and Muskeget islands. The planning area is extensive and includes a wide variety of natural resources along with areas of densely developed commercial and residential waterfront.

The Plan reflects significant effort on the part of the Town and many members of the public who participated in the public process. I would like to commend the efforts of the members of the Nantucket and Madaket Harbors Plan Review Committee, elected officials, community residents, and all others who volunteered their time and effort over the course of many meetings.

Figure 1. Nantucket Harbor Planning Area

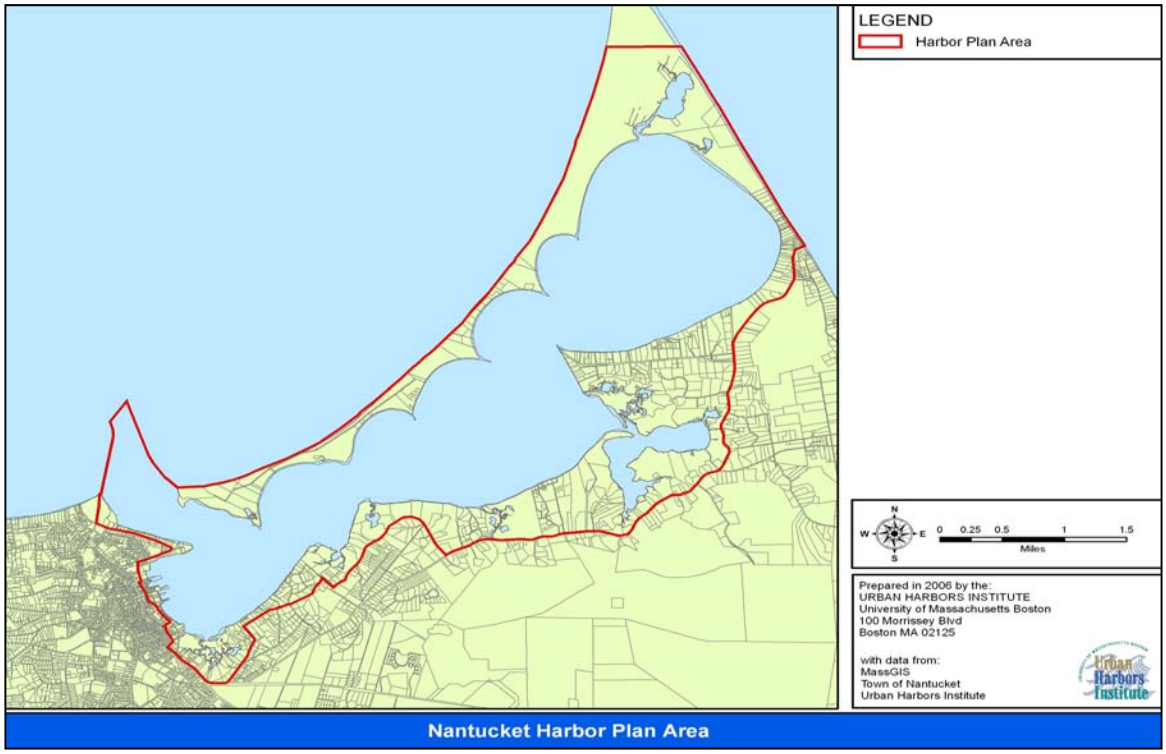
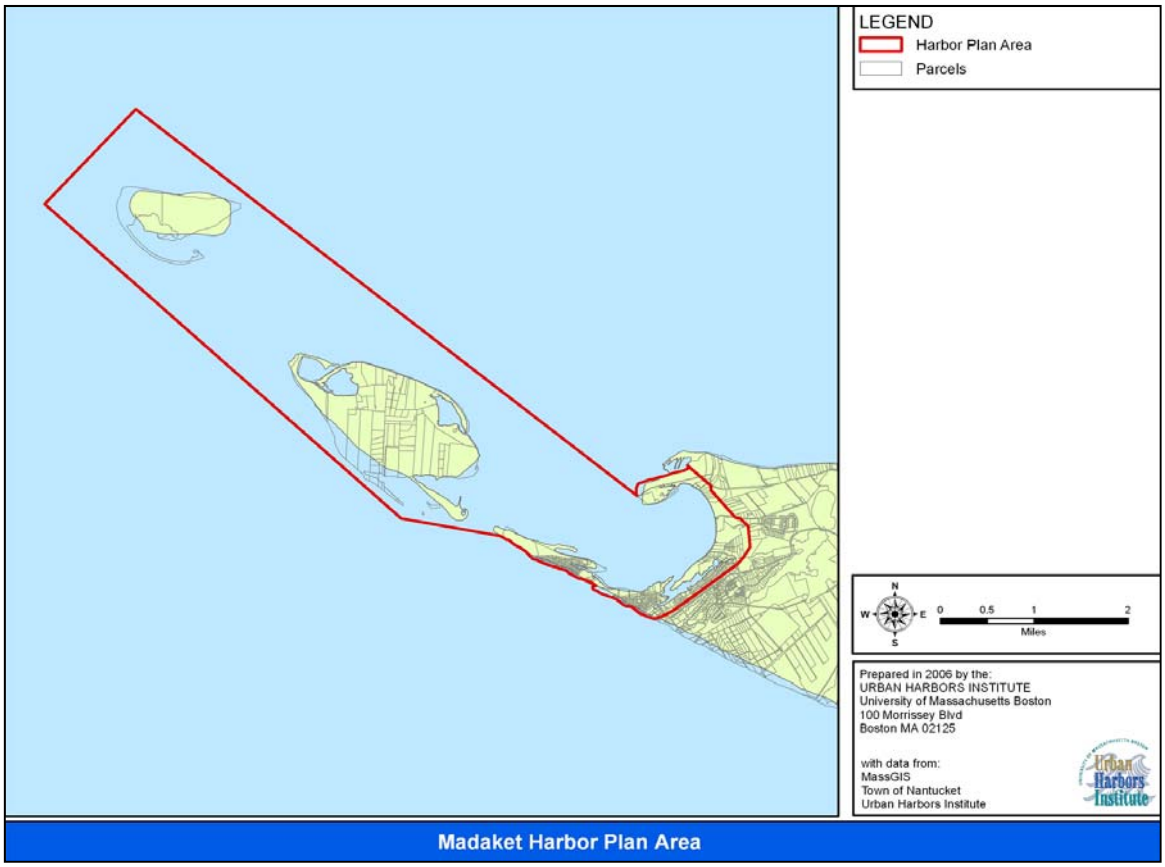


Figure 2. Madaket Harbor Planning Area



II. PLAN CONTENT

The Municipal Harbor Planning Regulations (301 CMR 23.00 et seq.) establish a voluntary process under which cities and towns may develop and submit Municipal Harbor Plans to the EEA Secretary for approval. These plans serve to promote and implement a community's planning vision for their waterfront and to inform and guide state agency decisions necessary to implement such a vision. Specifically, approved Municipal Harbor Plans provide licensing guidance to DEP in making decisions pursuant to MGL Chapter 91 (c. 91) and the Waterways Regulations (310 CMR 9.00 et seq.). Approved harbor plans may establish alternative numerical and dimensional requirements (e.g., substitute provisions) to the requirements specified by the Waterways Regulations as well as specify provisions that amplify any of the discretionary requirements of these regulations.

On April 16, 2006, the Nantucket Board of Selectmen voted to prepare the Nantucket and Madaket Harbors Action Plan in accordance with procedures and requirements for approval of a municipal harbor plan as established in 301 CMR 23.00 et seq. The stated focus of the Plan was to identify the community's goals, objectives and recommendations for guiding public and private use of the land and water of its harbor areas and to establish an implementation program to achieve these objectives. The Plan was prepared under the auspices of the Nantucket Board of Selectmen and guided by the Nantucket and Madaket Harbors Plan Review Committee.

The Plan builds upon the first Harbors Action Plan, which was prepared in 1993 but was not submitted for review as a state approved Municipal Harbor Plan. The planning process began with a review of the 1993 Harbors Action Plan and an assessment of what had been accomplished in the succeeding years. Many of the goals and action items were successfully implemented, while others are ongoing and some were never implemented. The 2009 Nantucket and Madaket Harbors Action Plan carries forward a number of recommendations from the 1993 Harbors Action Plan that remain important and identifies new recommendations that have arisen in the intervening years.

The Plan focuses on the improvement of public access, maintaining and improving appropriate water-dependent uses within the harbors, and protection of natural resources and water quality as it relates to commercial and recreational shellfishing. The Plan includes a comprehensive inventory and analysis of harbor resources and uses, and identifies specific goals, objectives and recommendations for these three focus areas.

III. STANDARDS FOR APPROVAL

The Plan contains the Town's planning vision and other specifics to provide guidance on use and development within the harbor planning area. It should be noted, however, that while these elements are commendable and important to the planning area, my approval today is bounded by the authority and standards as contained in 301 CMR 23.00 et seq. (Review and Approval of Municipal Harbor Plans) and is applicable only to those discretionary elements of the Chapter 91 Waterways regulations that are specifically noted in this Decision. This Decision does not supersede separate regulatory review requirements for any activity.

A. Consistency with CZM Program Policies and Management Principles

The federally-approved CZM Program Plan establishes 20 enforceable program policies and 9 management principles which embody coastal policy for the Commonwealth of Massachusetts. The following is a brief summary of the Policies and Management Principles applicable to the Plan:

- Water Quality Policy #1: Ensure that point-source discharges in or affecting the coastal zone are consistent with federally approved state effluent limitations and water quality standards.

- Water Quality Policy #2: Ensure that non-point pollution controls promote the attainment of state surface water quality standards in the coastal zone.

- Habitat Policy #2: Restore degraded or former wetland resources in coastal areas and ensure that activities in coastal areas do not further wetland degradation but instead take advantage of opportunities to engage in wetland restoration.

- Protected Areas Policy #3 – Ensure that proposed developments in or near designated or registered historic districts or sites respect the preservation intent of the designation and that potential adverse effects are minimized.

- Coastal Hazards Policy #1 – Preserve, protect, restore, and enhance the beneficial functions of storm damage prevention and flood control provided by natural coastal landforms, such as dunes, beaches, barrier beaches, coastal banks, land subject to coastal storm flowage, salt marshes, and land under the ocean.

- Coastal Hazards Policy #2 – Ensure construction in water bodies and contiguous land area will minimize interference with water circulation and sediment transport. Approve permits for flood or erosion control projects only when it has been determined that there will be no significant adverse effects on the project site or adjacent or downcoast areas.

- Ports Management Principle #1 – Encourage, through technical and financial assistance, expansion of water dependent uses in designated ports and developed harbors, re-development of urban waterfronts, and expansion of visual access.

- Public Access Policy #1 – Ensure that developments proposed near existing public recreation sites minimize their adverse effects.

- Public Access Management Principal #1 – Improve public access to coastal recreation facilities and alleviate auto traffic and parking problems through improvements in public transportation. Link existing coastal recreation sites to each other or to nearby coastal inland facilities via trails for bicyclists, hikers, and equestrians, and via rivers for boaters.

- Public Access Management Principal #2 – Increase capacity of existing recreation areas by facilitating multiple use and by improving management, maintenance, and public support facilities. Resolve conflicting uses whenever possible through improved management rather than through exclusion of uses.

- Public Access Management Principal #3 – Provide technical assistance to developers of private recreational facilities and sites that increase public access to the shoreline.

- Public Access Management Principal #4 – Expand existing recreation facilities and acquire and develop new public areas for coastal recreational activities. Give highest priority to expansions or new acquisitions in regions of high need or limited site availability. Assure that both transportation access and the recreational facilities are compatible with social and environmental characteristics of surrounding communities.

- Energy Management Principle #1 – Encourage energy conservation and the use of alternative sources such as solar and wind power in order to assist in meeting the energy needs of the Commonwealth.

The aforementioned policies are relevant to the major issues identified in the Plan: maintenance and improvement of water dependent uses; public access; and protection of natural resources and water quality. Based on review of the documentation provided by the Town, and affirmation by CZM of the Plan's consistency with the relevant policies, and as required by 301 CMR 23.05(1), I find the Plan has met this standard.

B. Consistency with Tidelands Policy Objectives

As required by 301 CMR 23.05(2), I must also find that the Plan is consistent with state tidelands policy objectives and associated regulatory principles set forth in the state Chapter 91 Waterways regulations of DEP (310 CMR 9.00 et seq.). As promulgated, the Waterways regulations provide a uniform statewide framework for regulating tidelands projects. Municipal Harbor Plans and associated amendments present communities with an opportunity to integrate their local planning goals into state c.91 licensing decisions by proposing modifications to these uniform standards through the amplification of the discretionary requirements of the Waterways regulations or through the adoption of provisions that, if approved, are intended to substitute for the minimum use limitations or numerical standards of 310 CMR 9.00. The approved substitute provisions of

Municipal Harbor Plans, in effect, allow DEP to waive specific use limitations and numerical standards affecting projects in tidelands in favor of the modified provisions specified in an approved Municipal Harbor Plan.

The Plan contains clear guidance that will have a direct bearing on DEP licensing decisions within the harbor planning area. Included in this guidance are:

- Provisions that amplify upon certain discretionary requirements of the Waterways regulations.

These provisions are each subject to the approval criteria under 301.CMR 23.05(2)(b)-(e), and as explained below, I find that all such criteria have been met.

Evaluation of Proposed Amplification Provisions

The Municipal Harbor Plan regulations at 301 CMR 23.05(2) (b) require me to find that any provision that amplifies a discretionary requirement of the Waterways regulations will complement the effect of the regulatory principle(s) underlying that requirement. Upon such a finding, DEP is committed to "adhere to the greatest reasonable extent" to the applicable guidance specified in such provisions, pursuant to 310 CMR 9.34(2)(b)(2). The Plan contains three provisions that will have significance to the Chapter 91 licensing process as an amplification, pursuant to 301 CMR 23.05(2)(b). My determination of the relationship of these proposed local amplification provisions to c.91 standards in accordance with the MHP regulatory guidance is discussed below. A summary of the proposed amplification provisions for the 2009 Plan is provided below in Table 1.

Harbor Overlay District

The c.91 standard at 310 CMR 9.51 states that "…a nonwater-dependent use project on any tidelands shall not unreasonably diminish the capacity of such lands to accommodate water-dependent use"**.** The Plan proposes an amplification to this c.91 standard through the implementation of the standards and regulations set forth in Chapter 139-12 of the Nantucket Zoning Bylaw for the Harbor Overlay District. This District includes the downtown commercial waterfront area of Nantucket Harbor and was created to protect existing water-dependent uses and to ensure that these uses are not displaced by new nonwater-dependent uses. This zoning district was adopted by the town on April 8, 2008. Zoning regulations for the Harbor Overlay District require that any new non-water dependent use or extension of an existing non-water dependent use shall not: displace or significantly disrupt an existing water dependent use; unreasonably disrupt an

existing water-dependent use; unreasonably diminish the capacity of the site to accommodate future water-dependent uses; and impede or infringe upon existing public access. Additionally, Chapter 139-12,(i),(3) of the Nantucket Zoning Bylaw specifies commercial uses that are allowed within the Harbor Overlay District.

The proposed amplification will provide guidance to DEP when licensing projects in the Harbor Overlay District by ensuring that any licensed use is compatible with, supports, or otherwise does not interfere with the water-dependent uses on a site. I find the proposed amplification achieves local goals while complementing the underlying principles of the applicable c.91 regulatory standards.

Water-Dependent Uses not Consistent with Plan

The c. 91 standards at 310 CMR 9.35(2) and 9.51(1) - (2) collectively and generally protect the navigational rights of the public and conserve areas for water-dependent uses. The Plan proposes an amplification to these c.91 standards through the implementation of the standards and regulations set forth in Ch 139-12,(i),(5) of the Nantucket Zoning Bylaw. In an effort to preserve and protect the island's traditional water-dependent commercial uses located within the Harbor Overlay District this zoning regulation includes a list of water-dependent uses that are not consistent with these traditional water based uses, and that have been prohibited. The uses were determined to conflict with the traditional and historic use and character of the Harbor Overlay District. This list of prohibited uses includes:

- Cruise ship terminals or support services;
- Personal watercraft rental; and
- New facilities of private tenancy.

These provisions reflect the Town's goals for the future development of the commercial waterfront within Nantucket Harbor and represent a long-term, comprehensive "vision" for protection of the historic character of this planning area**.** The proposed amplification will provide guidance to DEP when licensing projects by prohibiting specific uses, and I find that this provision complements the underlying principles of the applicable c.91 regulatory standards.

Private Dock Prohibition

The c.91 standards at 310 CMR 9.35 (2) - (3) generally hold that potential projects must not obstruct or interfere with the public's fishing, fowling, or navigation rights, and contain provisions to protect traditional locations used extensively by the public. The Plan proposes an amplification

to these c.91 standards through the implementation of the standards and regulations set forth in Chapter 139-22 of the Nantucket Zoning Bylaw. This local bylaw contains a prohibition on all new private docks and piers but exempts certain public or commercial water-dependent dock and pier projects within the Harbor Overlay District. This prohibition serves to protect and enhance the ability of the public to access shellfishing areas along the shoreline, to navigate along the shoreline, to protect water-quality and natural resources, and to preserve the traditional community character. Shellfishing is an integral part of the Nantucket community, and its importance is reflected throughout many sections of the Plan. Commercial shellfishing is an important industry on the island with significant annual revenue. Recreational shellfishing is an historic pastime enjoyed by large numbers of families. The prohibition of private docks was developed out of concern that the construction of these docks would interfere with and negatively impact commercial and residential shellfishing activities. Most shellfishing occurs in shallow waters adjacent to the shoreline. A proliferation of private docks would make it difficult for shell fisherman to fish in and around these structures, and activities from the construction, footprint, and use of these structures has potential to impact the natural habitat and water quality in the area.

The town recognizes the importance of water access to private waterfront property owners, and while prohibiting private docks and piers, gives each property owner the right to two moorings for private recreational boat use. Moorings are the traditional vessel berthing arrangement on Nantucket and do not pose the same conflicts with shellfishing and shoreline access that docks and piers create. The town also recognizes the importance of docks and piers as integral part of commercial water-dependent activities and clearly distinguishes commercial dock and piers that support water-dependent uses from those that serve private recreational uses. The prohibition of private docks includes an exemption for the expansion of existing commercial docks and piers and those for governmental and public entity use located within the Harbor Overlay District. Additionally, multiple public boat ramps and landings are located within Nantucket and Madaket Harbors, and these facilities serve to ensure that public boating access is protected throughout the harbor planning area.

The Plan clearly stresses the importance of preserving these significant local water-dependent uses. The proposed amplification will provide guidance to DEP when licensing projects by prohibiting private docks or piers that may interfere with local shellfishing activities or navigation,

and I find that this provision adequately complements the underlying principle of the applicable c.91 regulatory standards.

Table 2 — Summary of Amplifications

Regulatory Provision	Chapter 91 Standard	Amplification
310 CMR 9.51(1)-(2)	A nonwater-dependent use project on any tidelands shall not unreasonably diminish the capacity of such lands to accommodate water-dependent use. Facilities of Private Tenancy must be developed in a manner that prevents significant conflicts in operation with water-dependent uses that can reasonably be expected to locate on or near the water.	The amplification of these requirements prohibits any new non-water dependent use, or extension of an existing non-water dependent use, that would: 1. displace or significantly disrupt an existing water dependent use; 2. unreasonably disrupt an existing water-dependent use; 3. unreasonably diminish the capacity of the site to accommodate future water-dependent uses; and 4. impede or infringe upon existing public access.
310 CMR 9.51(1)-(2); and 310 CMR 9.35(2)(a)	A nonwater-dependent use project on any tidelands shall not unreasonably diminish the capacity of such lands to accommodate water-dependent use. Facilities of Private Tenancy must be developed in a manner that prevents significant conflicts in operation with water-dependent uses that can reasonably be expected to locate on or near the water. The project shall not significantly interfere with public rights of navigation.	The amplification of these requirements prohibits certain water-dependent uses determined in the Plan to conflict with the traditional and historic use and character of the Harbor Overlay District, including: • Cruise ship terminals or support services; • Personal watercraft rental; and • New facilities of private tenancy.
310 CMR 9.35(3)(a)1 and 2 310 CMR 9.35(2)(a)	The project shall not: 1. pose a substantial obstacle to the public's ability to fish or fowl in waterway areas adjacent to the project site; 2. result in the elimination of a traditional fishing or fowling location used extensively by the public; or 3. interfere with public rights of navigation	The amplification of these requirements prohibits the construction of new private docks or piers but exempts certain public or commercial water-dependent dock and pier projects within the Harbor Overlay District.

C. Implementation Strategies

Pursuant to 301 CMR 23.05(4), the Plan must include enforceable implementation commitments to ensure that, among other things, all measures will be taken in a timely and coordinated manner to offset the effect of any plan requirement less restrictive than that contained in 310 CMR 9.00. The plan contains provisions that will be implemented through the recently adopted amendments to the underlying zoning. Based on the information provided in the Plan and as discussed above, I believe that no further implementation commitments on the part of the Town are necessary, and I find that this approval standard has been met.

IV. EFFECTIVE DATE AND TERM OF APPROVAL

This Decision shall take effect immediately upon issuance on December 21, 2009. As requested by the Town of Nantucket, the Decision shall expire 10 years from this effective date unless a renewal request is filed prior to that date in accordance with the procedural provisions of 301 CMR 23.06. No later than 6 months prior to such expiration date, in addition to the notice from the Secretary to the City required under 301 CMR 23.06(2)(b), the Town shall notify the Secretary in writing of its intent to request a renewal and shall submit therewith a review of implementation experience relative to the promotion of state tidelands policy objectives.

V. STATEMENT OF APPROVAL

Based on the planning information and public comment submitted to me pursuant to 301 CMR 23.04 and evaluated herein pursuant to the standards set forth in 301 CMR 23.05, I hereby approve the 2009 Nantucket & Madaket Harbor Action Plan as the Municipal Harbor Plan for the Town of Nantucket, subject to the following conditions:

1. In accordance with Chapter 139-12(3) of the Nantucket Zoning Bylaw, DEP shall not issue a license allowing a conversion of any currently licensed (as of the date of this decision) commercial water-dependent use to a new or expanded nonwater-dependent use in the Town's Harbor Overlay District.
2. In accordance with Chapter 139-22 of the Nantucket Zoning Bylaw, DEP shall not issue a license for a private dock or pier, except for those allowed under the exemptions specified for projects located within the Harbor Overlay District.
3. In accordance with Chapter 139-12, (i), (5) of the Nantucket Zoning Bylaw, DEP shall not issue a license for the following uses: cruise ship terminals or support services, personal

watercraft rental, and new facilities of private tenancy in the Town's Harbor Overlay District.

4. The City shall prepare a final, approved Nantucket Harbor Plan ("Approved Plan") to include:
    a. The Plan dated June 2009 as amended during the consultation period; and
    b. This Approval Decision.

Copies of the final, approved plan shall be provided to CZM and DEP's Waterways Program, kept on file at the Nantucket Town Clerk's office and Harbormaster Office, and made available to the public through the Town's website and copies at the public library. For Waterways licensing purposes, the Approved Plan shall not be construed to include any of the following:

1. Any subsequent addition, deletion, or other revision to the final Approved Plan, except as may be authorized in writing by the Secretary as a modification unrelated to the approval standards of 301 CMR 23.05 or as a plan amendment in accordance with 301 CMR 23.06(1); and

2. Any provision which, as applied to the project-specific circumstances of an individual license application, is determined by DEP to be inconsistent with the waterways regulations at 310 CMR 9.00 or with any qualification, limitation, or condition stated in this Approval Decision.

In a letter from the Waterways Program Chief dated December 10, 2009, DEP has expressed support for approval of the renewal Plan and stated that the Plan will become operational for waterways licensing for all applications upon the effective date of Plan approval and in accordance with the conditions above. Subsequent to Plan approval, a determination of conformance with the Plan will be required for all proposed projects in accordance with 310 CMR 9.34(2).

Philip Lipsitt

for Ian A. Bowles
Secretary of Energy and Environmental Affairs

December 21, 2009
Date

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1 PURPOSE, SCOPE AND AUTHORITY OF THE NANTUCKET AND MADAKET HARBORS ACTION PLAN AND THE PLANNING PROCESS

1.1 PURPOSE, SCOPE AND AUTHORITY OF THE NANTUCKET AND MADAKET HARBORS ACTION PLAN

The Nantucket and Madaket Harbors Action Plan presents the community's goals, objectives and recommendations for guiding public and private use of the land and water of its harbor areas and establishes an implementation program to achieve the desired outcomes. The plan was prepared under the auspices of the Nantucket Board of Selectmen and guided by the Nantucket and Madaket Harbors Plan Review Committee.

The 2007 plan is an update of the first action plan, which was prepared in 1993, and as such is meant to complement the original plan. The 1993 plan contained extensive background material, much of which is as relevant today as it was when written. The background material in the 2007 plan was prepared with the intent to build upon the original plan rather than to reproduce it.

The 1993 plan also included a number of goals and action items that aimed to address the issues at that time. Many of these items were successfully implemented, while some are on-going and others were never implemented. The 2007 plan includes a number of recommendations from the 1993 plan that remain important. In addition, the 2007 plan includes new recommendations that address issues that have arisen in the intervening years.

The 1993 plan remains available on the Department of Marine and Coastal Resources' website (http://www.nantucket-ma.gov/departments/marine/marine.html) and in the Athenaeum. Appendix 1 provides additional detail about the status of the 1993 recommendations.

1.2 THE PLANNING AREA

This plan was prepared for the areas of Nantucket and Madaket Harbors depicted on Figures 1.1 and 1.2. These planning boundaries encompass all of the land and water area relevant to the issues to be addressed by the harbor plan; the boundaries are largely the same as those used for the 1993 plan. Figures 1.3 and 1.4 show the planning area on NOAA charts. The Madaket figure is focused on Madaket Harbor itself.

The boundary around Nantucket Harbor remains unchanged from 1993. While the main focus of the plan at the west end of the island has been on Madaket Harbor, it was decided to extend the planning area to included both Tuckernuck and Muskeget Islands. The planning areas are described below.

> ***Nantucket Harbor*** *- Boundaries encompass the surface waters from the northern end of the jetties in the main channel, up harbor to the eastern end of Wauwinet. Surface waters also include Polpis Harbor, Coskata Pond, fringing salt marshes, and other coastal and inland wetlands within the landside harbor boundaries. Landside boundaries are from the tip of the west jetty running south on Jetties Road, east on Hulbert Avenue, west on Easton Street, southeast on South Beach Street, South Water Street and Washington Street, west on Francis Street, southeast on Union Street and Orange Street to the rotary, east on Milestone Road, northeast on Monomoy Road, northwest on Boston Avenue, northeast on DeWolf Avenue, on the 25 foot contour and on South Valley Road, southeast on Gardner Road, northeast turning southeast on Shimmo Road, northeast on Polpis Road, north on Wauwinet Road to the Wauwinet Gatehouse, north on the eastern most shoreline of Wauwinet to the point just south of the Galls and tracking a line west to the northwest shoreline of Coatue, following the northern shoreline of Coatue to the north tip of the East Jetties.*
>
> ***Madaket Harbor*** *- The landside boundaries include Eel Point to Eel Point Road south to Nantucket Conservation Foundation's east boundary (map/parcel #38-12) through the northwestern section (map/parcel #59, 4-10) to Washington Street southwest to the end of Madaket Road, and north to include all of Smith Point and Esther Island. The boundaries also*

encompass the surface waters and the islands of Tuckernuck and Muskeget from the northwest tip of Eel Point to the northwest tip of Esther's Island, including creeks, salt marshes and other coastal wetlands within the landside harbor boundaries.

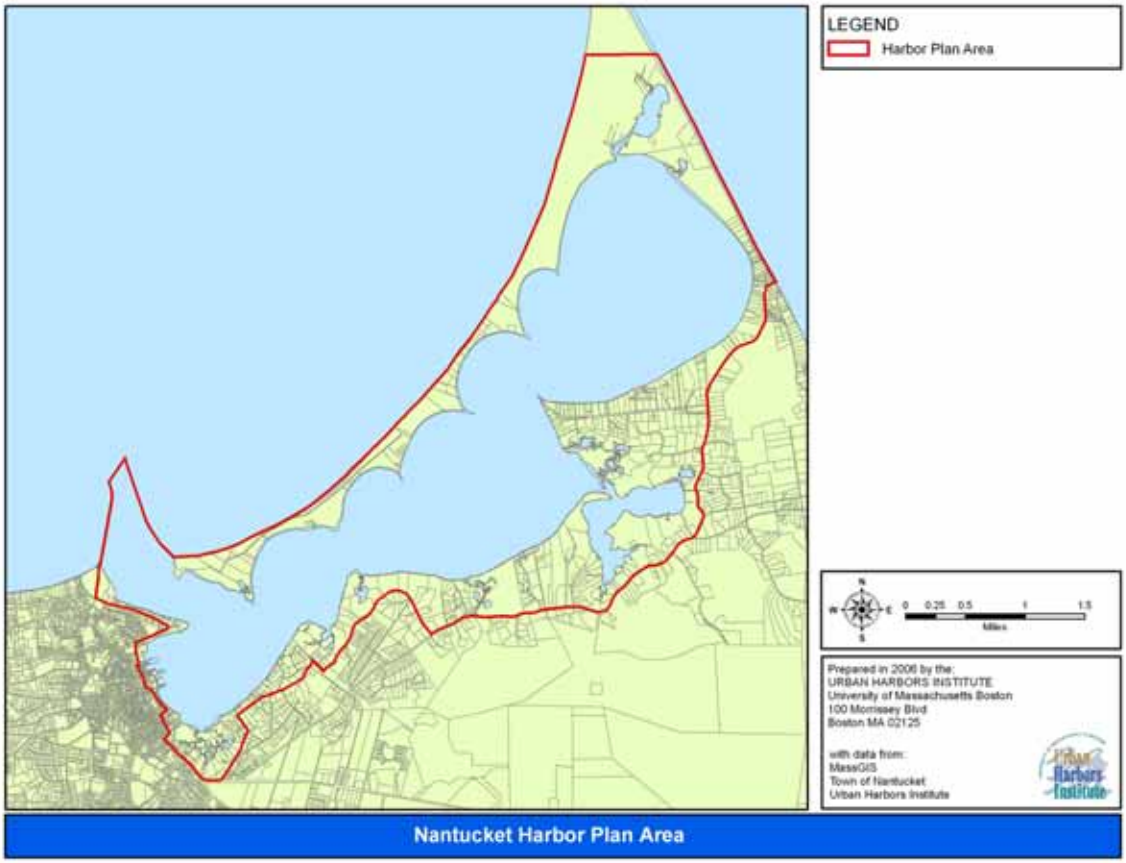


Figure 1.1 The Nantucket Harbor Planning Area.

1.3 PLANNING PROCESS

In early 2005, the Board of Selectmen identified updating the 1993 Harbors Action Plan as one of its objectives for improving and protecting the island's waters. The town secured funding from the Massachusetts Seaport Advisory Council, issued a Request for Proposals and, following a selection process, contracted for the assistance of the Urban Harbors Institute of the University of Massachusetts Boston. Work began in August 2005.

The process began with a review of the 1993 Harbors Action Plan and an assessment of what had been accomplished in the succeeding years. Concurrently, the planning team began updating information and data for the plan.

Throughout the early stages of plan preparation, the topic of state approval versus local approval was regularly discussed. On April 19, 2006, the Board of Selectmen voted to prepare the Nantucket and Madaket Harbors Action Plan in accordance with procedures and requirements for approval of a municipal harbor plan established by the Secretary of Environmental Affairs (301 CMR 23.00). In May 2006, the Town Administrator submitted to the Massachusetts Office of Coastal Zone Management (MCZM) a Request for Notice to Proceed (RNTP) with a state-approved municipal harbor plan for Nantucket and Madaket Harbors. A scoping meeting was held with MCZM in mid-August, as required by the regulations. The town then submitted information to supplement the RNTP in December. Notice of the Town of Nantucket's request was published in the Environmental Monitor on January 23, 2007, starting a 30-day public comment period that ended on February 22, 2007. MCZM issued its Notice to Proceed on April 6, 2007.

The significance of obtaining state approval of the harbor plan is that an approved plan serves to guide the decisions and actions of the agencies of the State's Executive Office of Environmental Affairs, including the regulatory decisions of the Massachusetts Department of Environmental Protection (DEP) under M.G.L. Chapter 91, the Public Waterfront Act. When an approved harbor plan exists, any project seeking a Chapter 91 license from DEP must be in conformance with the plan. Put another way, a municipality with a state-approved harbor plan utilizes the state regulatory authorities to help implement its own objectives.

State approval of the plan is for a period of five years. After three years, the board responsible for overseeing its implementation shall determine which of the plan's recommendations remain to be done and determine a strategy for accomplishing those items. A state-approved harbor plan can be amended by the municipality at any time by submitting the proposed change(s) together with supporting information to the Massachusetts Office of Coastal Zone Management acting on behalf of the Secretary of Environmental Affairs. The procedures for amendment are the same as for initial plan approval: MCZM reviews and determines the compliance of the proposed amendments with the standards for approval in the municipal harbor planning regulations at 301 CMR 23.05; consults with other relevant agencies; holds a public hearing; and, following a public comment period, the Secretary of Environmental Affairs issues a decision on the amendment.

It is important to note this plan references a number of previously commissioned studies and reports; however, it only reflects such documents as they existed at the time that this plan was approved by the Board of Selectmen. This plan does not necessarily support any subsequent updates, amendments or revisions to such documents.

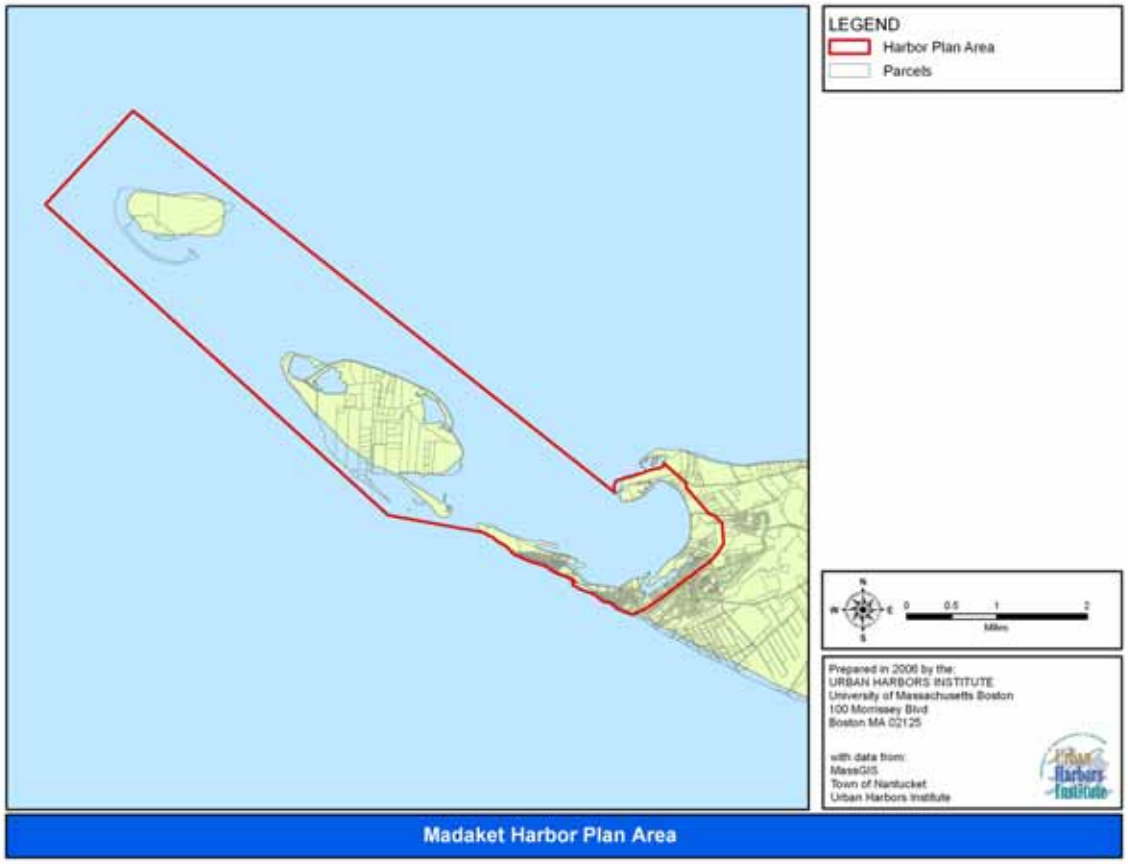


Figure 1.2 The Madaket Harbor Planning Area.

1.3.1 Public Participation

The public participation process began in late August 2005 with a series of six public meetings to obtain the input and the perspectives of island residents. These meeting were held in various locations and were organized around specific issues. Meetings were also held with town officials and other organizations having an interest in or influence over harbor resources and uses. A harbor plan website was created and linked to the official Town of Nantucket website. The website was routinely updated with minutes of all meetings, drafts of material prepared for the plan, and answers to frequently asked questions. The website also provided a means for the public to submit comments on, or questions about, the plan.

1.3.2 Nantucket and Madaket Harbors Plan Review Committee

The Board of Selectmen voted on June 14, 2006 to establish a Nantucket and Madaket Harbors Plan Review Committee with membership from the Harbor and Shellfish Advisory Board, Nantucket Marine Trades Association, Nantucket Planning & Economic Development Commission, Conservation Commission, Department of Marine & Coastal Resources, and two public-at-large members. Following a public hearing process to review nominees, the Board of Selectmen appointed the committee on July 26, 2006.

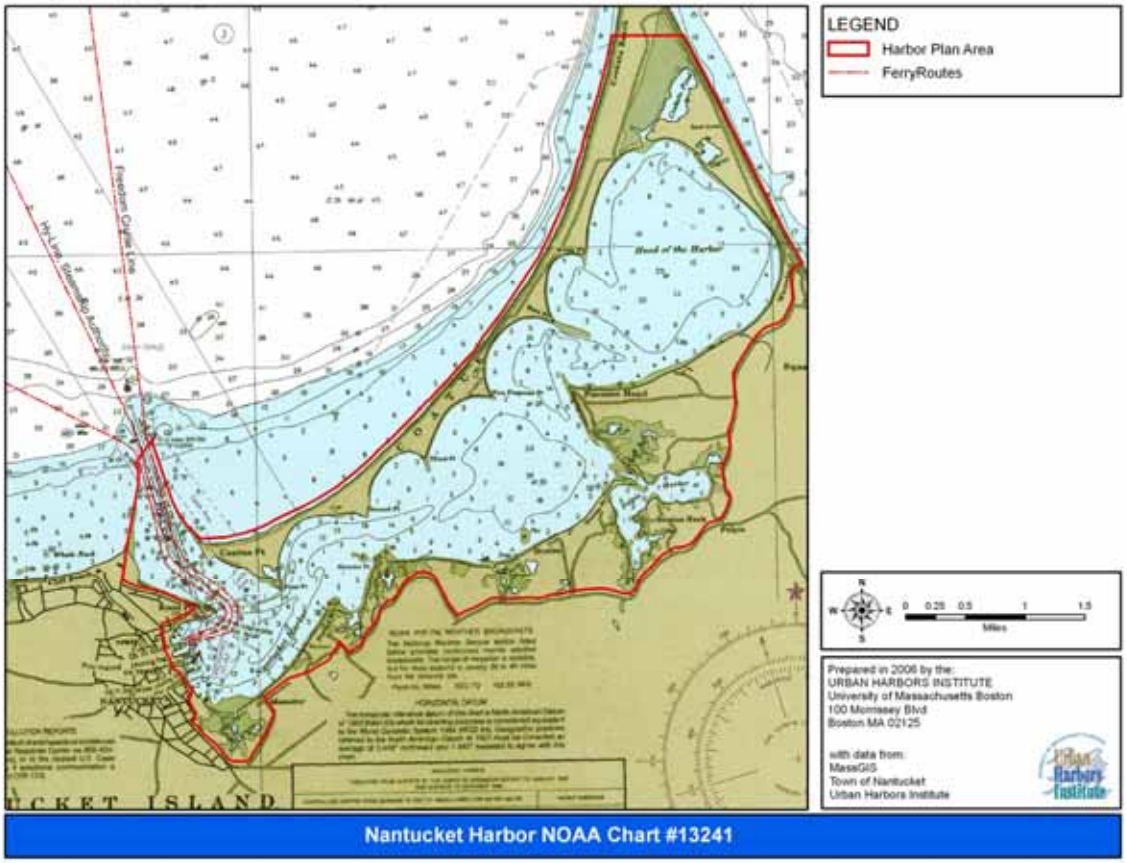


Figure 1.3 Nantucket Harbor Planning Area Shown on NOAA Chart.

The committee's mission statement:

> *"The mission of the Nantucket and Madaket Harbors Plan Review Committee is to ensure the public's input and focus on: improvement and retention of public access, maintaining appropriate water-dependent uses within the harbors and protection of natural resources/water quality as it relates to commercial and recreational shellfishing as adopted by the Board of Selectmen."*

The committee met fourteen times between August 17, 2006 and April 26, 2007 to review and provide guidance on issues, analyses, goals, objectives, recommendations and implementation mechanisms. Based on this input, a complete draft was compiled for the committee's review. That draft was presented to the Board of Selectmen on November 8, 2006. The final plan was completed in May, 2007. See the complete list of public meeting and presentation dates in Appendix 8.

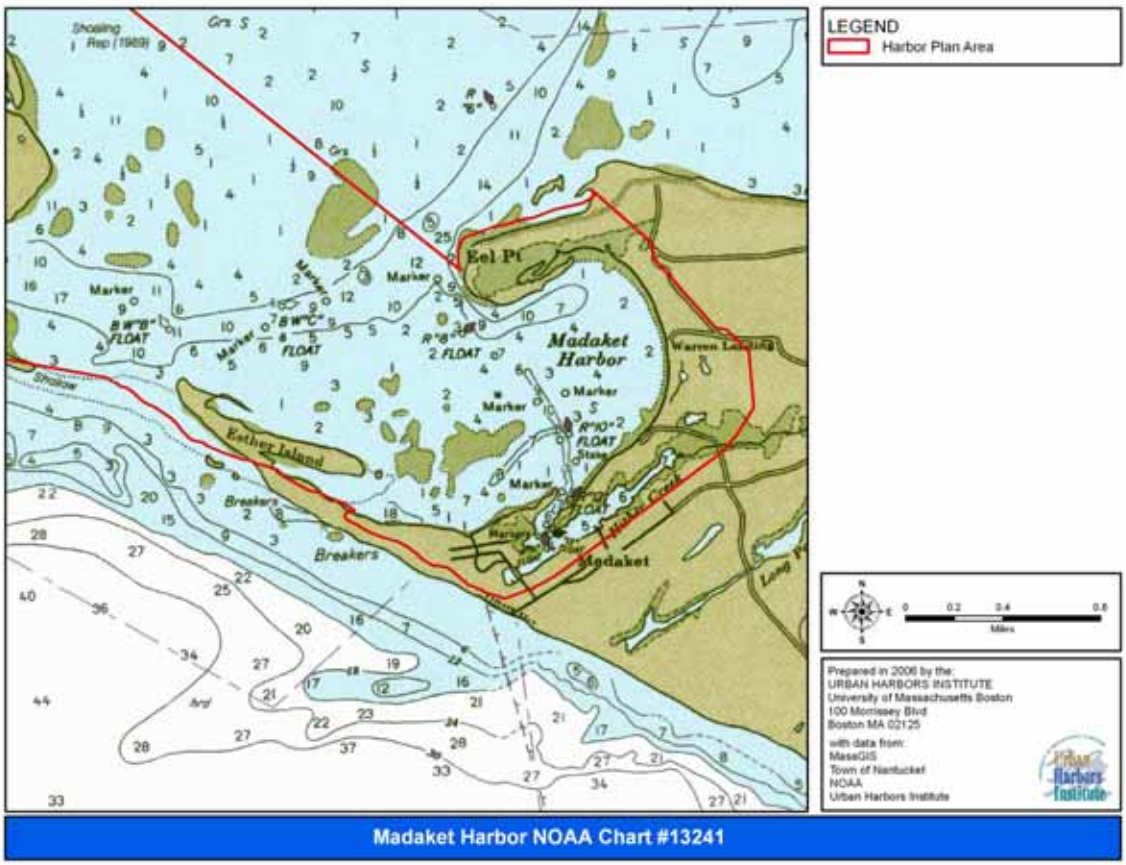


Figure 1.4 Madaket Harbor Planning Area Shown on NOAA Chart.

2. INVENTORY AND ANALYSIS OF HARBOR RESOURCES AND USES

2.1 NATURAL RESOURCES

2.1.1 Eelgrass Beds

Eelgrass is a type of seagrass that grows in the shallow coastal waters with low nutrient inputs. In Nantucket Harbor, eelgrass is able to grow in water as deep as 8 feet, except at the Head of the Harbor where reduced water quality only allows eelgrass to grow to a depth of about 6 feet (Curley 2002). The seagrass, both alive and dead, is an important and valuable part of the coastal ecosystem. As a live plant, eelgrass provides a sheltered habitat for many organisms, including the bay scallop which attaches itself to the eelgrass leaves. Eelgrass also stabilizes sediment in the harbor and helps to improve water clarity. When eelgrass dies, it washes to shore and accumulates along the tide line. Here, the mass of dead eelgrass provides a nursery for the seeds of beach plants that will eventually help to form new dunes and stabilize existing ones. Shorebirds will also feed on insects and small crustaceans that are found in the mass of dead eelgrass (Nantucket Conservation Foundation, Inc. 2005 - Coatue).

Eelgrass is also an indicator of water quality. Eelgrass is able to store nitrogen in its leaves and stems. This allows the plant to grow well in areas with low nutrients. However, when nutrient concentrations increase, algae are able to grow more successfully. Ultimately, the algae out-compete eelgrass by blocking sunlight penetration. The loss that Nantucket Harbor has seen in its eelgrass beds over the last decade is likely due to this nutrient loading or eutrophication process (Curley 2002); however, since eelgrass is still present in the harbor, nutrient loading into the harbor is only moderately high (Curley as cited in Valiela *et al.* 2002). Figures 2.1 and 2.2 compare estimated eelgrass beds from 1995 and 2001.

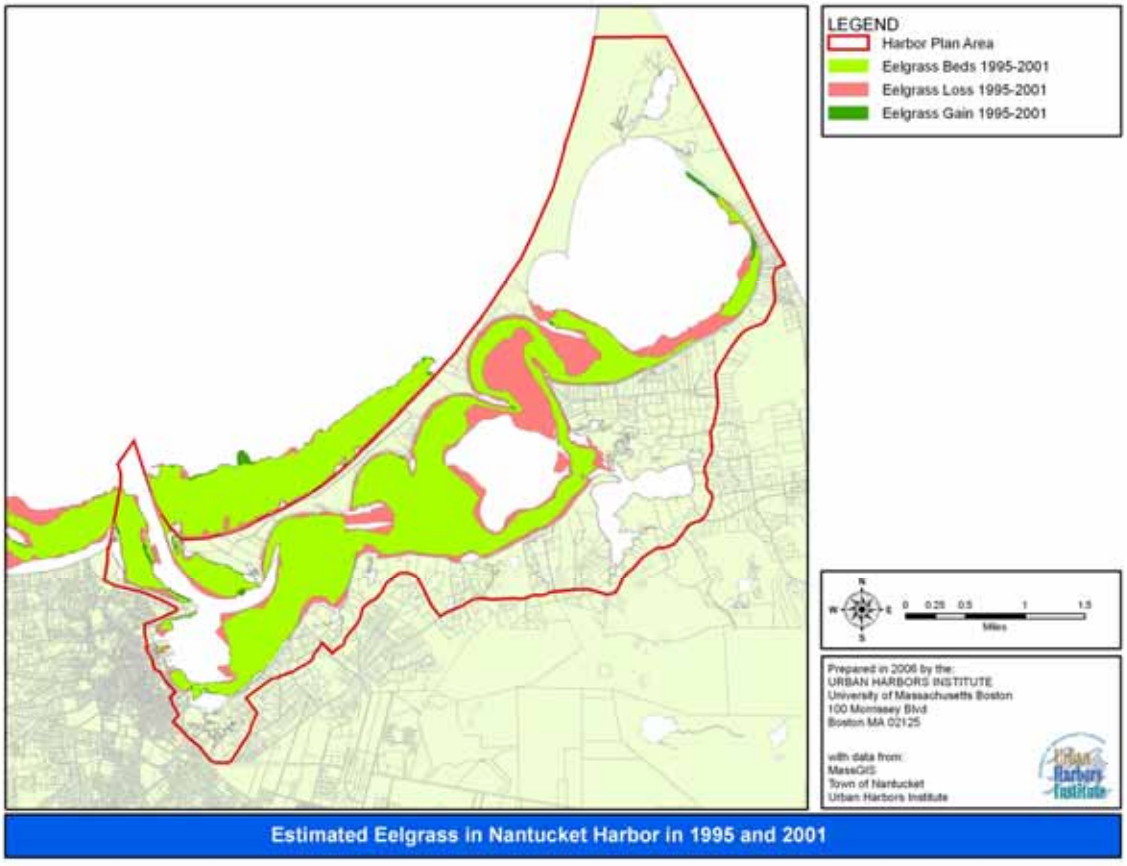


Figure 2.1 Estimated Eelgrass Coverage in 1995 and 2001. Data from the Massachusetts Department of Environmental Protection.

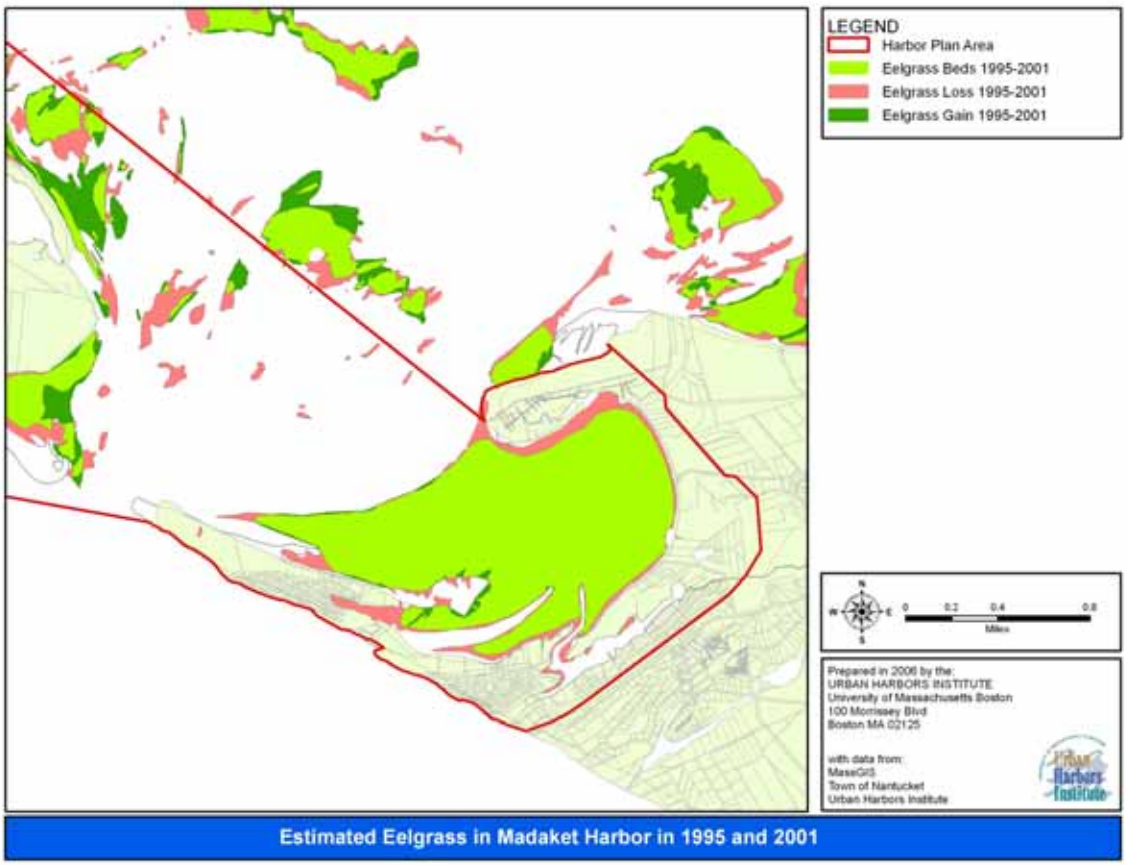


Figure 2.2 Estimated Eelgrass Coverage in 1995 and 2001. Data from the Massachusetts Department of Environmental Protection.

2.1.2 Salt Marshes

A salt marsh is *"a coastal wetland that extends landward up to the highest high tide line…and is characterized by plants that are well adapted to or prefer living in, saline soils…. A salt marsh may contain tidal creeks, ditches and pools"* (310 CMR 10.32.2). Salt marshes are important spawning and nursery habitats, providing shelter and food resources necessary to support many different species ranging from finfish to migrating birds. American oystercatchers, great egrets, snowy egrets, greater yellowlegs and lesser yellowlegs all feed on small fish, snails and shellfish found in the salt marsh habitat (Nantucket Conservation Foundation, Inc. 2006). The network of roots and rhizomes underlying the marsh vegetation also binds sediment together. This binding creates a layer of peat that can absorb floodwaters, prevent erosion, and remove pollutants from the water. See Figures 2.3 and 2.4.

In Nantucket Harbor, well-developed salt marshes include those found at First Point, Second Point, Third Point, Five-fingered Point, Coskata, Haulover Pond, Quaise, Pimneys Point, the Creeks, and in Polpis Harbor. In the Madaket planning area, salt marshes can be found at Eel Point, Jackson Point, Warren's Landing, and Hither Creek (Nantucket Conservation Foundation, Inc. 2006). Many of these represent areas of special ecological importance.

2.1.3 Coastal Beaches and Tidal Flats

The Massachusetts Wetland Protection Act regulations define *coastal beach* as, *"unconsolidated sediment subject to wave, tidal and coastal storm action which forms the gently sloping shore of a body of salt water and includes tidal flats. Coastal beaches extend from the mean low water line landward to the dune line, coastal bank line or the seaward edge of existing man-made structures, when these structures replace one of the above lines, whichever is closest to the ocean"* (CMR 310 10.27(2)). The Massachusetts Wetland Protection Act regulations also provide a definition for *tidal flats*, stating, *"Tidal*

Flat means any nearly level part of a coastal beach which usually extends from the mean low water line landward to the more steeply sloping face of the coastal beach or which may be separated from the beach by land under the ocean" (CMR 310 10.27(2)).

The tidal flats provide habitat and food for many different species, including the sandpipers which stop in Nantucket to rest and feed as they migrate in the spring and fall (Nantucket Conservation Foundation, Inc. 2006). Coastal beaches and tidal flats also provide flood protection and help to dissipate wave energy. Exposed to tidal, wind, and wave action, as well as human forces, coastal beaches and tidal flats are dynamic resources, supplying sediment in some cases, and accumulating sediment in others. In addition, the island's coastal beaches and tidal flats are important recreational resources. Nantucket is fortunate to have many coastal beaches and tidal flats including those at Brant Point, Children's Beach, and Francis Street Beach. See Figures 2.3 and 2.4.

2.1.4 Barrier Beaches

Coastal Regulations of the Massachusetts Wetlands Protection Act, describe barrier beaches as: *"A narrow low-lying strip of land generally consisting of coastal beaches and coastal dunes extending roughly parallel to the trend of the coast. It is separated from the mainland by a narrow body of fresh, brackish, or saline water or marsh system. A barrier beach may be joined to the mainland at one or both ends"* (310 CMR 10.29(2)).

Barrier beaches provide several different services, including acting as storm buffers by deflecting onshore waves and absorbing wave energy, providing and protecting habitat located on the beach, in the dune system, and in the water body between the beach and the mainland, and serving as a recreational and/or aesthetic resource. Surrounded by water on at least three sides, barrier beaches are highly influenced by wind and water which can alter their form, location, and volume. See Figures 2.3 and 2.4.

Based upon the definition of a barrier beach provided above and outlined in Massachusetts Executive Order 181, the Office of Coastal Zone Management inventoried the state's barrier beaches and identified 58 Barrier Beaches on Nantucket, including Jetties Beach, Coatue Point, The Creeks, Eel Point, and Jackson Point (Massachusetts Barrier Beach Task Force 1994, 159-161).

In addition to being numerous on Nantucket, barrier beaches also define the sheltered nature of both Nantucket and Madaket Harbors. In Nantucket Harbor, the Coatue and Wauwinet barrier beaches help protect the harbor and its resources from the force of the open ocean. In Madaket Harbor, Eel Point and Smith Point serve to buffer the harbor from the forces of the Atlantic Ocean. Fortification and development of barrier beaches may jeopardize their ability to provide beneficial services.

2.1.5 Rare and Endangered Species

The Town of Nantucket is home to many rare and endangered species. The Massachusetts Division of Fish and Wildlife lists over 80 species. Nantucket also has its own Endangered Species Program (ESP). This program began in 1994, managing one site, Smith's Point. Now, the town's ESP also covers Low Beach and Jetties Beach. All three sites provide habitat that supports endangered species. *"The goal of the Town of Nantucket's Endangered Species Program (ESP) is to protect piping plovers, least terns, American oyster catchers, and other endangered, threatened, or protected species while allowing reasonable vehicle access and other appropriate uses and activities to occur on town-managed beachfront properties"* (Nantucket Beach Management Plan 2005).

Nantucket also has local authority to protect these species through their Wetlands Bylaw (Chapter 136 of the Nantucket Code) and their Beach Rules and Regulations (Chapter 56 of the Nantucket Code) (Nantucket Beach Management Plan 2005). The Nantucket Wetland Protection Bylaws provide protection of habitat for rare and significant species through Chapter 136-1.02 (definition of habitat under protection), 136-2.11, and 136-3.05.

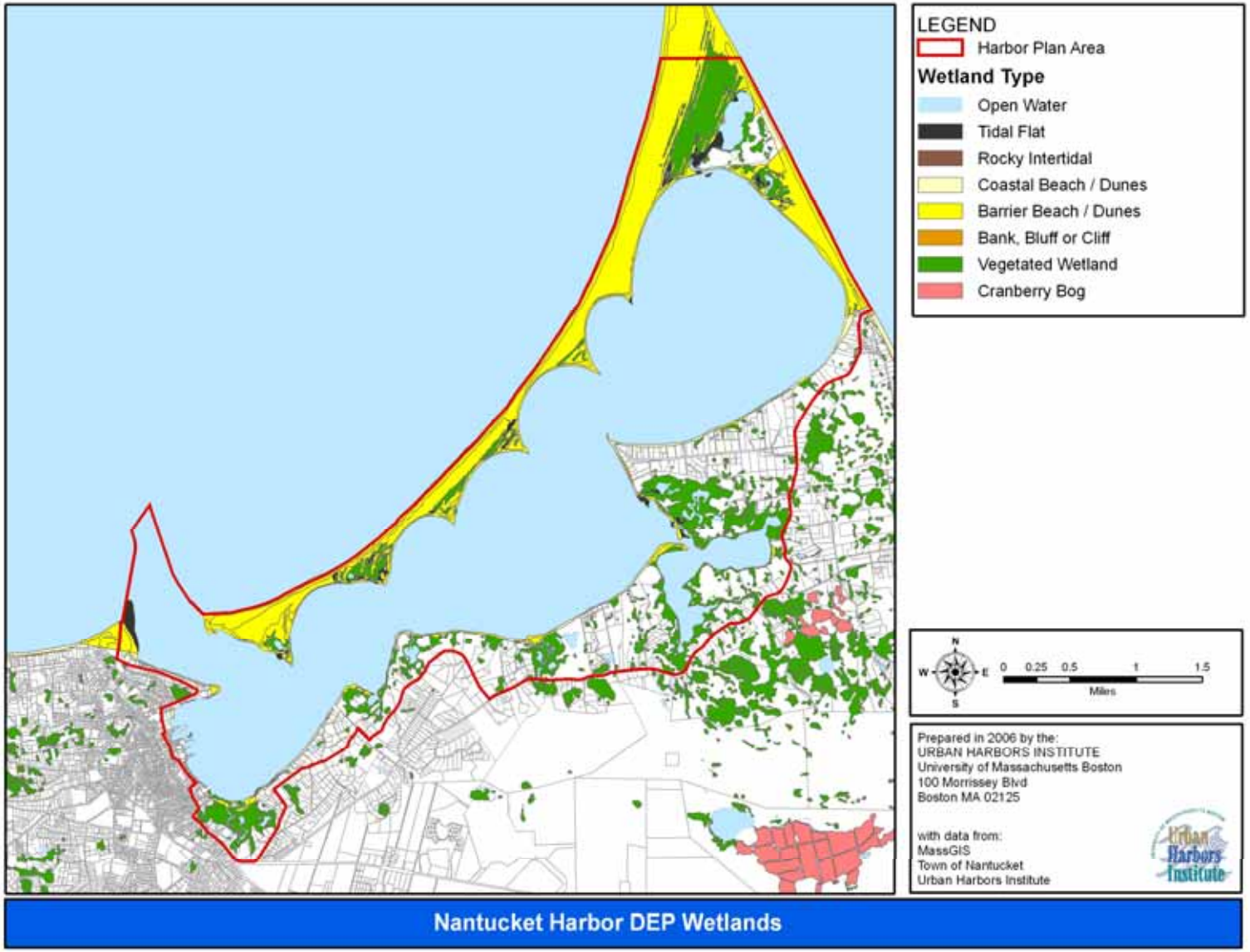


Figure 2.3 Wetlands around Nantucket Harbor.

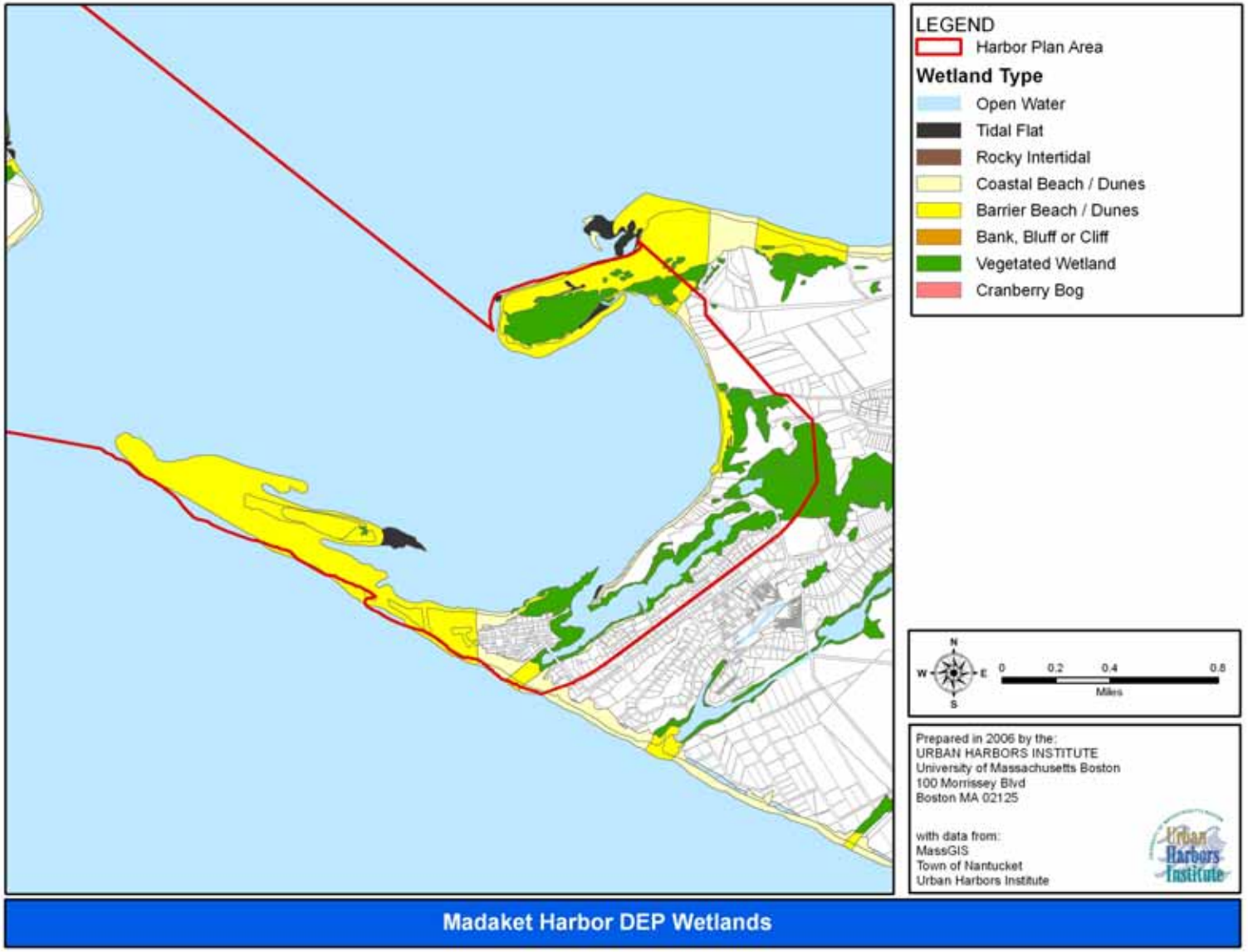


Figure 2.4 Wetlands around Madaket Harbor.

The island's Nantucket Biodiversity Initiative (NBI) group is also involved in identifying rare and endangered species. The NBI has designated 21, ten-hectare research plots around the island, each representing unique habitats from sandplain grasslands to coastal marshes. Each year, regional and local scientists conduct biodiversity inventories of the species of plants, fungi, invertebrates, vertebrates, and other organisms found in each research plot. This effort helps to identify rare and endangered species as well as document invasive introductions. In addition, this mapping and inventory will establish a database of natural resources.

Figures 2.5 and 2.6 show the Natural Heritage and Endangered Species Program (NHESP) Priority Habitats of Rare Species Habitat and Endangered Habitats of Rare Wildlife.

Among the list of rare and endangered species are least terns and piping plovers. While on the island's beaches, colonies of least terns breed, raise chicks, and prepare for the annual winter migration to the east coast of South America. Piping Plovers arrive on Nantucket in mid-March to establish their nests, seek mates, and lay eggs. In late August, the piping plovers migrate to the southern coast of the United States for the winter months. Between 1992 and 2000, there was almost a 3 percent decrease in the number of pairs throughout the entire state of Massachusetts (Mosellot and Melvin 2001). In Nantucket, the mean number of chicks per pair has also decreased, but was among the highest in the state in 2000. However, along the entire Atlantic coastline, productivity is variable between years (Mosellot and Melvin 2001).

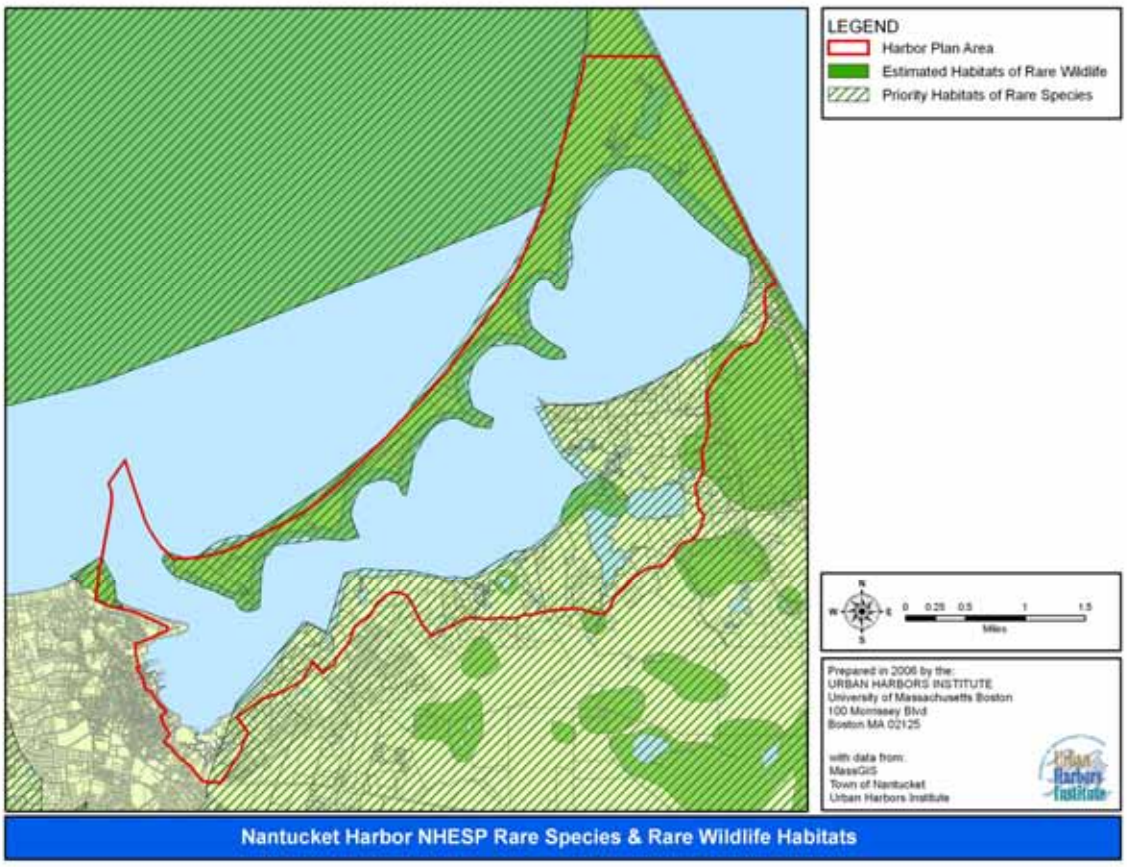


Figure 2.5 NHESP Priority Habitats of Rare Species and Endangered Habitats of Rare Wildlife.

2.1.6 Invasive Species

Similar to many other places in the United States, Nantucket is dealing with the issue of invasive species competing with local species. *Phragmities australis,* and green and asian crabs and are of particular concern on Nantucket.

Phragmites australis is especially common and likely to spread in areas disturbed by *"pollution, alteration of the natural hydrologic regime, dredging, and increased sedimentation"* (Roman *et al.* 1984). Cutting, burning, pesticide applications, and water management strategies are all possible means to control the spread of these highly invasive plants.

Green and asian crabs are also of concern. In November 2005, Keith L. Conant produced a report for the Nantucket Marine and Coastal Resources Department entitled "Predator Investigation" (Conant, 2005). In that report, Conant notes that the green crabs likely arrived in the United States in ballast water from Europe in the late 1800s. In the 1980s, the asian crab also came to the United States in ballast water. While the exact year in which these invasive crabs came to Nantucket is unknown, they seem to be increasing in numbers. Fortunately, the limited availability of rocky habitat and the harsh winter conditions in the harbor suggests that perhaps their numbers will remain small. Nevertheless, the green crab is a common predator of scallops, thus the island is very interested in continuing a culling program to protect the scallop population.

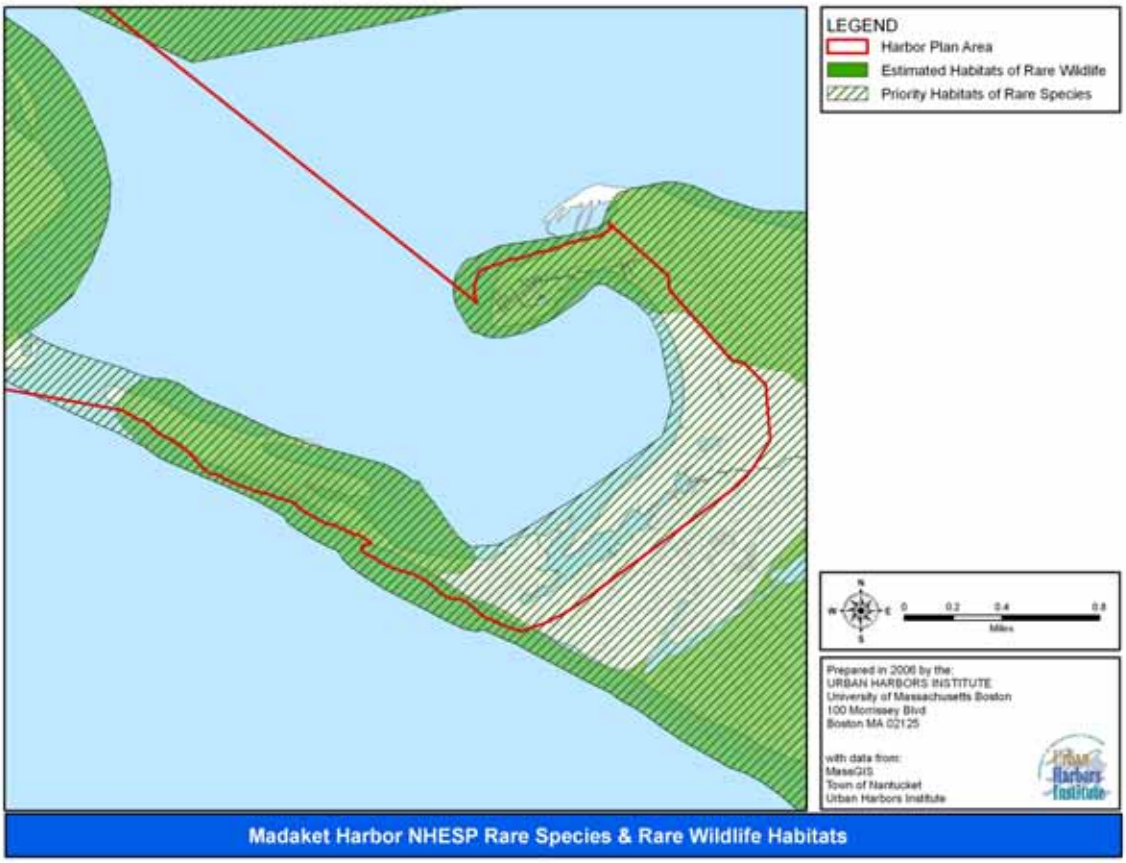


Figure 2.6 NHESP Priority Habitats of Rare Species and Endangered Habitats of Rare Wildlife.

The Nantucket Biodiversity Initiative has formed a sub-committee to address invasive species issues on island, focusing primarily on terrestrial plants (Nantucket Conservation Foundation, Inc. 2006). The group conducts invasive species removal events yearly, works with the Town of Nantucket on invasive species disposal methods, produced a brochure and Powerpoint presentation on Nantucket's Top Ten most "dangerous' invasive plants, initiated an IPANE study, and is currently working on a large vegetation remediation project in the mid-island district. The Nantucket Conservation Foundation, the Nantucket Land Bank, Mass Audubon, the Nantucket Land Council, and the University of Massachusetts Boston Nantucket Field Station are conducting research to examine methods for removal of invasive plants (such as Japanese Knotweed, *P. australis,* and purple loosestrife) as well as methods for restoration of salt marshes and pond vegetation. Researchers from the University of Massachusetts Boston, with support

from the Maria Mitchell Association, have created an Electronic Field Guide website designed to allow laypeople and researchers to identify invasive species in the field.

2.1.7 Birds

Nantucket is on the north/south flyway, making the island a crucial resting place for migrating birds. Ducks, gulls, hawks, and cormorants are some of the types of birds commonly spotted. The areas surrounding Muskeget Island are home to the largest concentration of oldsquaws (*Clangula hyemalis*) in the western Atlantic (US Fish and Wildlife Service 2006). Nantucket also provides habitat for some endangered species including the piping plover, American oyster catcher, northern harrier, and least tern.

While the birds on Nantucket provide recreational opportunities for birders and are important to the biodiversity of the island, some waterways have been impaired due to bird droppings.

2.1.8 Mammals

Nantucket is home to many different types of mammals, including a variety of rabbits, rats, voles, and seals (MassWildlife 1999). Muskeget Island is the only known habitat for the Muskeget vole. Muskeget Island also serves as one of the few locations where the gray seal breeds (US Fish and Wildlife Service 2006). Because of the presences of the Muskeget Vole and the breeding opportunities afforded to the gray seal, Muskeget Island is designated a National Natural Landmark.

The local North Atlantic gray seal (*Halichoerus grypus*) population has been rapidly recovering since the 1960's, when bounties on gray seals were still in effect. Gray seals are now a State protected species, and receive additional protection from the Marine Mammal Act. Pup counts on Muskeget were 5 in 1988; 1,023 in 2002 (NOAA 2005b); and 1,982 in 2005. (Woods 2005).

Although gray seals' diets do include some cod, flounder, and other commercially desirable fish, they primarily feed on sand lance, hake, conger eels, and skates. From 2002-2206, scientists have been inspecting fecal samples and stomach contents from local populations of gray seals. According to Ampela and Ferland (2006*), "Juvenile hake (Urophycis sp.) accounted for 53.7 percent of the [gray seal] diet by weight. Skate and squid contributed to an additional 21.6 percent of the diet, and cod (Gadus morhua) accounted for less than 6 percent. We found no evidence of bluefish (Pomatomus saltatrix), American lobster (Homarus americanus), or striped bass (Morone saxatilis). Our sampling indicates that these seals have a minimal impact on economically important fish species in US waters."*

2.1.9 Vegetation

Nantucket Vegetation Community Types

Aerial photo-interpretation was carried out by J. Stone between 1998-99 to characterize the vegetative cover of Nantucket. GIS versions of this data were provided by the Nature Conservancy (Lundgren *et. al.* 2000) This information was used to produce Figures 2.7 and 2.8 that show the vegetation cover in the harbor plan areas. The original data included a much more detailed classification system than is depicted in these figures. The full classification system is below:

COASTAL TYPES

- COASTAL BEACH STRAND (CBS)-sparse vegetation on the portions of beaches subject to irregular tidal flooding (from the wrack line to foot of dune). This type will be included in the Sand classification if less than approximately 50 feet wide and several hundred feet long. Large recent overwashes identifiable on the photography will also be delineated as CBS.
- SAND (S)-open sand, usually beach or bluff, with less than 10 percent vegetation.
- COASTAL DUNE COMMUNITY (CDC)-usually dominated by *Ammophila breviligulata* (dense to open cover). Beyond tidal influence. May also include scattered forbs, shrubs (*Hudsonia spp., Myrica pensylvanica, Rosa spp.*) and lichen. Also includes the community found on Coatue, dominated by *Festuca*, with *Chrysopsis* and *Lechea*.
- COASTAL INTERDUNAL SWALE (CIS)-seasonally flooded wetlands within low swales of dunes. Herbaceous and/or cranberry vegetation.

- COASTAL SALT POND (CSP)-breached by occasional storms, creating brackish conditions. Includes the narrow fringe of marsh or shrub along the CSP shoreline as well.
- MARITIME FOREST ON DUNES (MFD)-deciduous "tall shrubland" to stunted trees growing on dunes and directly affected by wind and salt spray.

    MARITIME RED CEDAR WOODLAND (MRC)-dominated by stunted *Juniperus virginiana*, with a variable understory of shrubs (*M. pensylvanica*, *Gaylussacia* spp., *Vaccinium corymbosum*) or grasses and herbs. Includes dense to scattered cover of red cedar.
- MARITIME SHRUBLAND ON DUNES (MSD)-mixed shrubs on dunes, including *M. pensylvanica*, *Gaylussacia*, *Rosa* spp., *Viburnum recognitum*, *Toxicodendron radicans* and *Baccharis halimifolia*.

    MARITIME RED CEDAR SHRUBLAND ON DUNES (MRCS)-windswept *Juniperus virginiana* that has a low, spreading growth form and is lightly scattered across the dunes. Associated vegetation includes coastal dune community grasses, and forbs.

SANDPLAIN TYPES

- SANDPLAIN GRASSLAND (GR)-Dominated by *Schizachyrium scoparium*, *Carex pensylvanica*, and other grasses, with <50 percent *Arctostaphylos uva-ursi, Gaylussacia*, and other heathland shrubs.
- MOWED GRASSLAND (GRM)-grasslands that are predominately *Schizachyrium scoparium,* and show evidence of mowing. May contain scattered trees or shrubs (<30 percent). Usually located near developed areas.
- SANDPLAIN HEATHLAND (HE)-dwarf shrubland dominated by *Arctostaphylos*, *Hudsonia*, *Corema conradii* or *Gaylussacia*, with lesser amounts of *Myrica, Viburnum* and *Quercus ilicifolia*. Often contains a matrix of grassland.
- PITCH PINE-SCRUB OAK WOODLAND (PPSO)-dense to open canopy of *Pinus rigida* with understory of predominately *Q. ilicifolia*.

    PITCH PINE-MIXED SHRUB WOODLAND (PPSOM) Scattered pitch pine (occasionally including black pine or red cedar) with an understory of predominately *Gaylussacia, Viburnum, Arctostaphylos*, or *Myrica* and sometimes grassy openings. Usually found near developed or disturbed areas.
- SCRUB OAK SHRUBLAND-Thickets of *Quercus ilicifolia*.

    OPEN SCRUB OAK (OSO)- approximately 30-75 percent total cover, of which at least 50 percent is scrub oak, with *Arctostaphylos*, *Gaylussacia* or herbaceous understory.

    CLOSED SCRUB OAK (CSO)->75 percent cover of scrub oak.

OTHER SHRUB & FOREST TYPES

- MARITIME FOREST ON UPLAND (MFU)-deciduous trees stunted or flat topped from salt spray and wind pruning. Uncommon.
- BLACK PINE/PITCH PINE WOODLAND (BPP)-may be either a stand of *Pinus thunbergii* or *Pinus rigida* (unable to differentiate on aerial photo).
- BLACK PINE WOODLAND (BP)-stands of *Pinus thunbergii* with 30 percent or greater canopy cover.
- MIXED PLANTED EVERGREENS (MPE)-plantation of evergreen trees, usually *Pinus strobus*.
- RED CEDAR WOODLAND (RCW)-30 percent or greater overstory of *Juniperus virginiana,* with a variety of understories including *Gaylussacia*, *Arctostaphylos*, or herbaceous vegetation.
- MIXED DECIDUOUS FOREST (MDF)-forest dominated by *Quercus* spp., *Sassafras albidum*, *Nyssa sylvatica, Acer rubrum* or other deciduous trees.

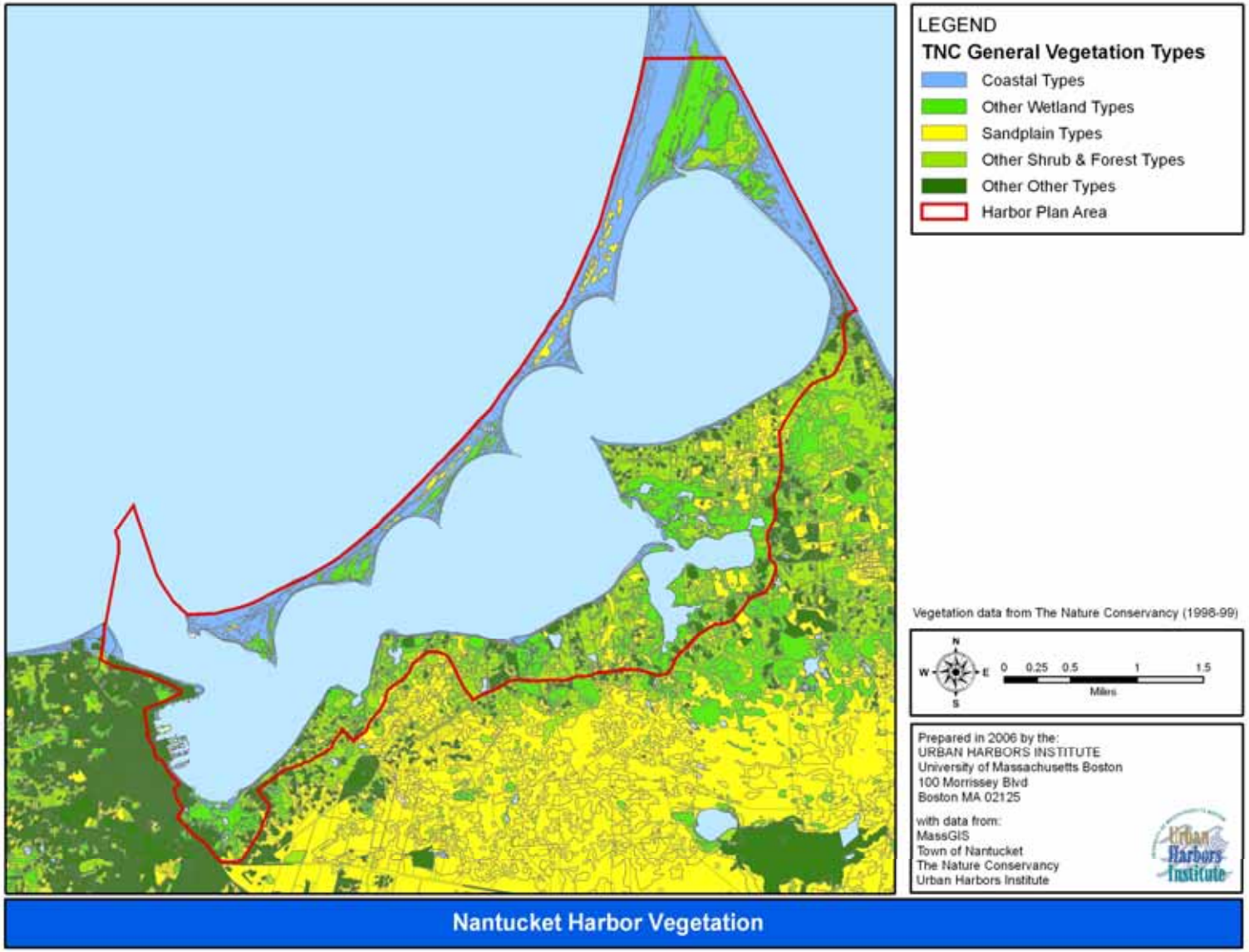


Figure 2.7 Generalized Vegetation Types based on Data from The Nature Conservancy.

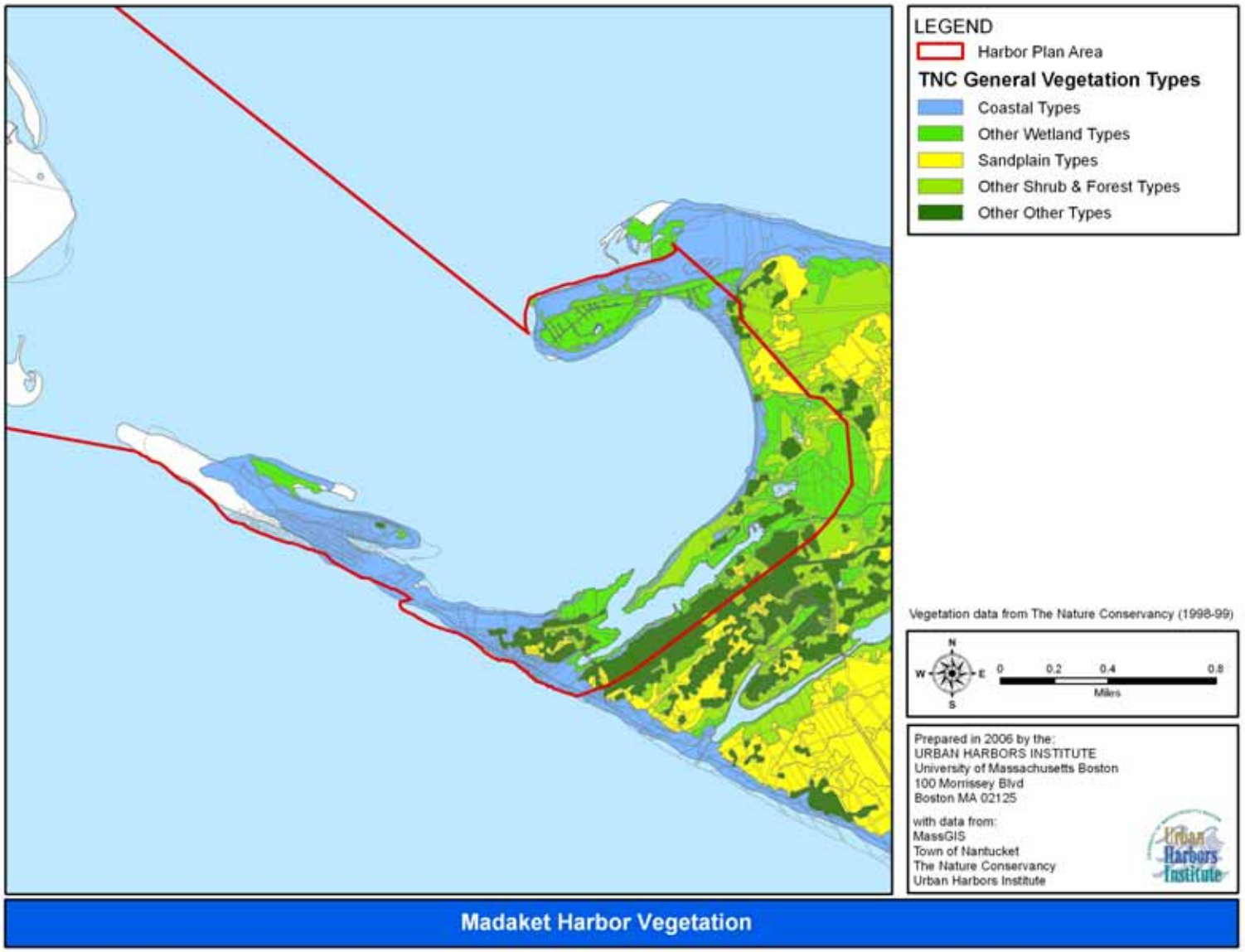


Figure 2.8 Generalized Vegetation Types based on Data from The Nature Conservancy.

- COASTAL SHRUBLAND (CSH)-Tall (>.5m), usually dense, shrubland on upland. Common species include *Viburnum*, *Gaylussacia, Prunus maritima, Amelanchier* spp., *Myrica, Rosa* spp., *Vaccinium* spp., and *T. radicans.* This type is widely scattered across the island and will vary in composition and location. Locations include the top of non-active dunes, large areas of the interior of the island, and "mesic" shrublands in lowlands, usually dominated by *Vaccinium corymbosum*, or *Clethra*, with *Ilex glabra, Viburnum, Amelanchier, Prunus* common. Also includes shrublands in developed areas that are a mix of plants, often exotics and invasives, including *Lonicera, Rosa multiflora, Ligustrum*, and *Celastrus.*

OTHER WETLAND TYPES

- SALT MARSH (SM)-*Spartina* spp., *Distichlis spicata*, *Iva frutescens* and other tidal marsh plants.
- TIDAL FLAT (TF)-regularly flooded and exposed tidal flat.
- SHRUB SWAMP (SS)-Variable mix of azalea, blueberry, *Clethr*a and winterberry, usually in a basin.
- MARSH (M)-herbaceous freshwater wetland.

  TYPHA MARSH (TY)-dominated by cattails (usually *Typha angustifolia*).
- DEEP MARSH (DM)-deeper water freshwater wetland dominated by herbaceous vegetation, but may have some shrubs, including *Decodon verticillatus*.
- WATER (OW)-marine, estuarine and fresh waterbodies.
- SHRUB BOG (BG)-dominant vegetation is broad leaved evergreen shrubs such as *Chamaedaphne calyculata*, native cranberry and sphagnum. May contain some deciduous shrubs, especially around the edges. Usually includes a moat.
- WOODED SWAMP (WS1)-deciduous forested wetland, usually in a basin, and dominated by *Acer rubrum* or *Nyssa sylvatica.*
- POTENTIAL VERNAL POOL (PVP)-basins under ¼ acre in size that appear to have the hydrologic and vegetative characteristics common to vernal pools. NOTE: these are only a subset of the potential vernal pools on the island. Larger wetlands are delineated and classified as shrub swamp, marsh etc.

OTHER TYPES

- OLD FIELD (OF)-*Juniperus virginiana* as shrub or tree overstory (30 percent or less), usually with a grass and forb understory, sometimes with shrubs. May also contain scattered *Pinus rigida* or *thunbergii*. In its earlier stages, this type is an overgrown field, without cedar or other trees.
- DEVELOPED LAND (DL)-Includes residential, commercial, industrial and recreational land uses. Also includes large mowed lawns often found in residential and developed areas, sand and gravel pits, and recently bulldozed or excavated areas that appear to be undergoing development.
- AGRICULTURAL LAND (AL)-Includes tilled fields, nurseries, orchards and pastures. These areas do not support native grasses and plants, but rather are planted and managed for agricultural or commercial purposes.
- CRANBERRY BOG (CB)-Actively managed cranberry bog. Easily distinguished from the native cranberry wetlands by their shape and cleared borders.

2.1.10 Fish and Shellfish

The sheltered environments and natural resources of Nantucket and Madaket Harbors provide important habitat for many different fish and shellfish species including bay scallops, soft-shell clams, quahogs, the American lobster, striped bass, scup, bonito, flounder, fluke, false albacore, eels, blue crabs, and bluefish. Recognizing the region's importance in this regard, the National Marine Fisheries Service has designated areas in and around both Nantucket and Madaket Harbors as essential fish habitat (EFH) for federally managed species.

The Magnuson-Stevens Fisheries Management and Conservation Act (MSFMCA) defines essential fish habitat to include *"those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity"* (16 U.S.C. 1801 2(a)104-297(10)). Within these EFHs, the New England Regional Fishery Management Council is required to minimize, to the extent practicable, adverse effects caused by fishing, and to identify actions that will encourage the conservation and enhancement of the habitat. In addition to the intrinsic value of the fish and shellfish in Nantucket and Madaket Harbors, many of these species have economic value as well (Table 2.1). Recreational fisheries rely heavily on the area's stripped bass, bluefish, and bay scallop populations, while the commercial fishery relies most heavily on the bay scallop.

Figures 2.9 and 2.10 show shellfish suitability areas. These *"delineate areas that are believed to be suitable for shellfish based on the expertise of the Massachusetts Division of Marine Fisheries (DMF), the opinion of local Massachusetts Shellfish Constables, and information contained in maps and studies of shellfish in Massachusetts. The areas covered include sites where shellfish have historically been sighted, but may not currently support any shellfish. The shellfish suitability areas were not verified in the field and the boundaries were not surveyed. For these reasons, the areas should be used only as guides to the approximate locations of potential habitats"* (MassGIS website).

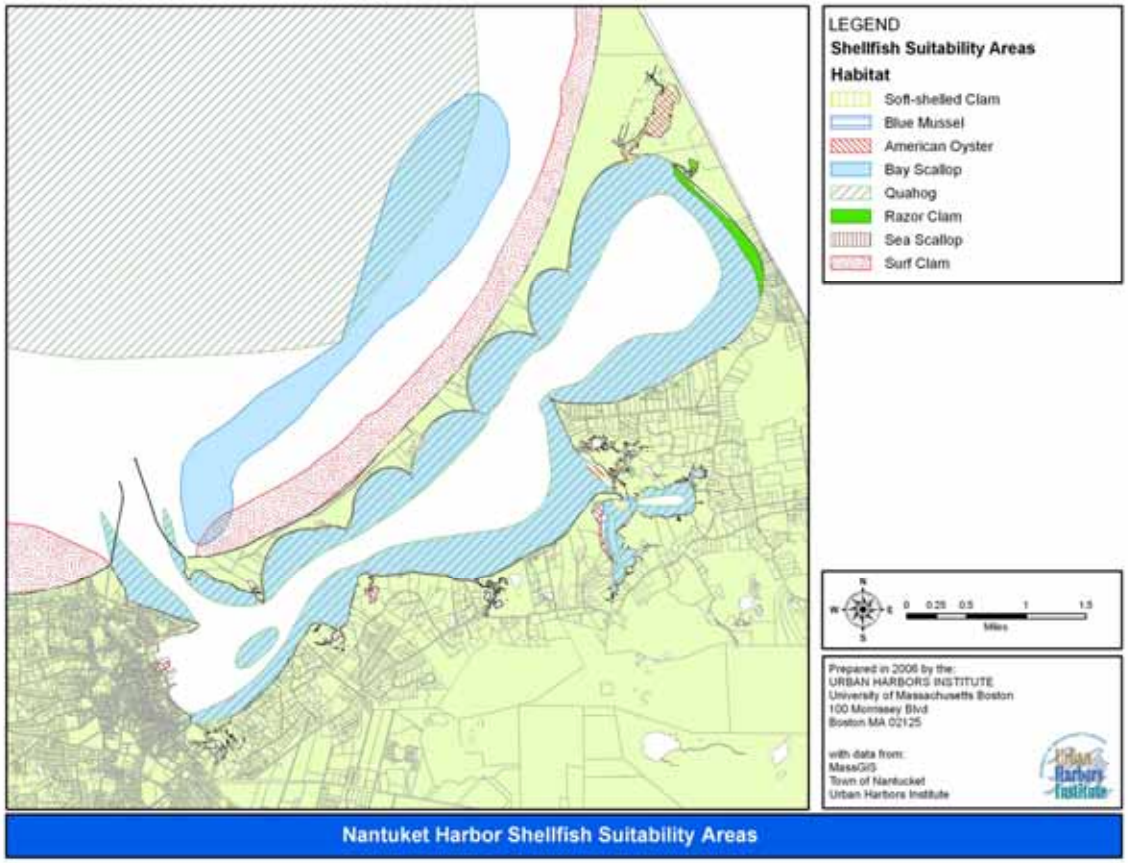


Figure 2.9 Shellfish Suitability Areas.

2.2 WATER QUALITY

Water quality in Nantucket and Madaket Harbors is affected by multiple input pathways or sources and by various stressors. These can include stormwater runoff, infiltration, transport of groundwater containing excess nutrients, rainfall, pollutant plumes from underwater storage tanks or the landfill, changes in land use which may accelerate stormwater runoff, etc. Some pollutants, such as atmospheric levels of lead and small particulates, have decreased in New England as a result of the federal regulations such as the Clean Air Act and Clean Water Acts, and local and state regulations (NOAA 2006).

Table 2.1 Summary of Essential Fish Habitat (EFH) Designations in and around the Harbors.

Boundary	North	East	South	West
EFH around Nantucket Harbor	41º 30.0' N	70º 00.0' W	41º 10.0' N	70º 10.0' W
EFH around Madaket Harbor	41º 20.0' N	70º 10.0' W	41º 10.0' N	70º 20.0' W

Species	Eggs	Larvae	Juveniles	Adults
Atlantic cod *(Gadus morhua)*	M	M	M	N,M
haddock *(Melanogrammus aeglefinus)*				N,M
whiting *(Merluccius bilinearis)*				M
red hake *(Urophycis chuss)*	M	M	M	
winter flounder *(Pleuronectes americanus)*	N,M	N,M	N,M	N,M
yellowtail flounder *(Pleuronectes ferruginea)*	M		M	M
windowpane flounder *(Scopthalmus aquosus)*	M	M	N,M	N,M
ocean pout *(Macrozoarces americanus)*	M	M		M
Atlantic sea herring *(Clupea harengus)*		M	N,M	M
long finned squid *(Loligo pealei)*			N,M	N,M
short finned squid *(Illex illecebrosus)*			N,M	N,M
Atlantic butterfish *(Peprilus triacanthus)*	N,M	N,M	N,M	N,M
Atlantic mackerel *(Scomber scombrus)*	N,M	N,M	N,M	N,M
summer flounder *(Paralicthys dentatus)*	N,M	N,M	N,M	N,M
scup *(Stenotomus chrysops)*			N,M	N,M
black sea bass *(Centropristus striata)*		N,M	N,M	N,M
surf clam *(Spisula solidissima)*			N,M	N,M
ocean quahog *(Artica islandica)*			M	M
spiny dogfish *(Squalus acanthias)*			M	M
king mackerel *(Scomberomorus cavalla)*	N,M	N,M	N,M	N,M
Spanish mackerel *(Scomberomorus maculatus)*	N,M	N,M	N,M	N,M
cobia *(Rachycentron canadum)*	N,M	N,M	N,M	N,M
common thresher shark *(Alopias vulpinus)*		M	M	M
blue shark (*Prionace glauca)*				N,M
dusky shark *(Charcharinus obscurus)*			M	
shortfin mako shark *(Isurus oxyrhyncus)*			M	
sandbar shark *(Charcharinus plumbeus)*			M	N,M
bluefin tuna *(Thunnus thynnus)*			N,M	N,M

(*** Note: M = Madaket Harbor, N= Nantucket Harbor. Source: NOAA 2005)

The management and fate of both stormwater and wastewater on the island greatly affect water quality by contributing contaminants and nutrients to the harbors. The main water quality concern for many areas on Cape Cod and the islands is excessive nutrient concentrations, which can lead to algae blooms, reduction in photic depth, influx of invasive aquatic plant species, and a reduction in eelgrass coverage. Despite extensive efforts to slow the eutrophication process, *"water quality results, [specifically in Nantucket Harbor,] indicate that nutrients are increasing; and being recycled at the Head of the Harbor and Quaise Basin"* (Conant 2006 "Nantucket Harbor"). In addition, certain areas such as "the Creeks", Folger's Marsh,

Medouie Marsh, Hither Creek, Polpis Harbor, and Coskata Pond are especially susceptible to environmental impacts due to their natural resource value and fragility.

Many growth related changes on Nantucket can contribute to a declining water quality: Increased development and the subsequent additional septic systems, significantly more moorings, increased use of fertilizers from lawns, and more vehicles and boats all provide both point and non-point pollution inputs. Nantucket has implemented many water protection measures, but more can be done. New issues have arisen, and ongoing research has revealed new issues during the past thirteen years.

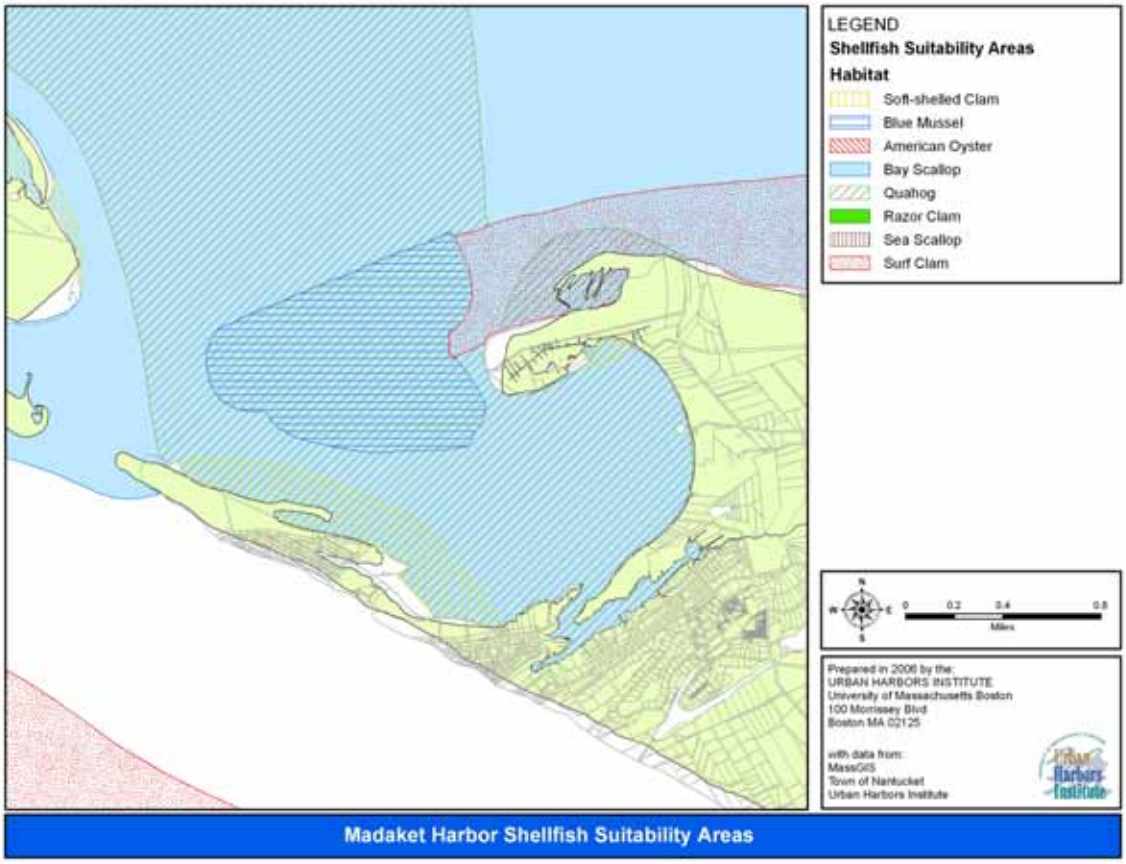


Figure 2.10 Shellfish Suitability Areas.

2.2.1 Evolution of Water Quality Conditions and Research from 1993 to the Present

Nantucket Harbor's water was designated as SA or "excellent" in 1993 according to CMR 314-4.00. SA-classified waters are suitable for any high quality water use, including bathing, swimming, and shellfishing. This designation, based on dissolved oxygen and fecal coliform concentrations, was made according to the Surface Water Classifications of the Commonwealth of Massachusetts for Coastal and Marine Water (314 CRM 4.03).

The "Massachusetts Surface Water Quality Standards" (314 CMR 4.00) establish quantitative and qualitative standards for the protection of surface waters in both inland waters and coastal marine systems (Tables 2.2 and 2.3). Although there are several quantitative criteria provided in the standards, no specific thresholds or criteria are provided for nitrogen as it relates to eutrophication and its associated ecological impact on the health of Massachusetts coastal embayments (Howes *et al.* 2003).

The other two categories are SB and SC, listed in order of degree of impairment. All three of these categories have both quantitative and qualitative components. The Massachusetts Estuaries Project is recommending that these designations be replaced with 6 classifications from "excellent" to "severely degraded". Earlier embayment health monitoring focused on coliforms and other measurements which

directly impact humans while ignoring some of the factors more closely related to habitat health, such as photic depth or chlorophyll-a concentration. The latter may indicate excess nutrients and excess algae growth.

Despite this "excellent" designation, there were still water quality concerns. The 1993 Nantucket and Madaket Harbors Action Plan identified three potential pollution problems: pathogen contamination, excessive nutrient enrichment, and toxic contamination.

In addition, the CMR 314 regulations apply additional **minimum** criteria to all surface waters.

Table 2.2 The Massachusetts Water Quality Standards for SA-Classified Waters.

Parameter	Standard
Dissolved Oxygen	Not less than 6.0 mg/L unless background conditions are lower; natural seasonal and daily variations above this level shall be maintained; levels shall not be lowered below 75% of saturation due to a discharge.
Temperature	Shall not exceed 85°F nor a maximum daily mean of 80°F.
pH	Shall be in the range of 6.5 through 8.5 standard units and not more than 0.2 units outside the normally occurring range.
Fecal Coliform	a. Waters approved for shellfishing shall not exceed a geometric mean (Most Probable Number or MPN) of 14 colonies/100 mL, nor shall more than 10% of the samples exceed an MPN of 43 colonies/100 mL. b. Waters not designated for shellfishing shall not exceed a geometric mean MPN of 200 colonies/100mL, nor shall more than 10% of the samples exceed an MPN of 400 colonies/100 mL.
Solids	Shall be free from floating, suspended and settleable solids in concentrations of combinations that would impair any use assigned to this class, that would cause any objectionable conditions or that impair the benthic biota or degrade the chemical composition of the bottom.
Color and Turbidity	Shall be free from color and turbidity in concentrations or combinations that are aesthetically objectionable or would impair any use assigned to this class.
Oil and Grease	Shall be free from oil and grease and petrochemicals.
Taste and Odor	None other than that of natural origin.

Pathogen contamination refers to fecal coliform contamination. As a consequence of this contamination, beaches along Nantucket Harbor were repeatedly closed to swimming. In addition, concentrations of fecal coliform were steadily increasing towards levels unsafe for summer shellfishing in portions of the harbor. The method used by the town's Board of Health to measure fecal coliform concentrations produced lower results than the state's method. Therefore, relative to state standards, the water quality appeared better than it actually was ("Nantucket and Madaket Harbors Action Plan" 1993).

The Nantucket and Madaket Harbors Action Plan (1993) identifies several apparent sources of pathogen contamination. Storm drains, sewage discharge from boats, old septic systems that do not meet Title V regulations and excretion from birds are all recognized in the list of probable sources. In addition, the strength of most sources is noted to increase during the summer sampling seasons ("Nantucket and Madaket Harbors Action Plan" 1993).

Nutrient enrichment was not identified as a current problem in the 1993 Action Plan. However, the Action Plan did note that the island's 1993 residential population was forecasted to increase. The resulting increase in development and associated increases in fertilizer and septic leachate was presented as a potential cause of future nutrient enrichment ("Nantucket and Madaket Harbors Action Plan" 1993).

Toxic contamination was a concern in Nantucket Harbor during 1993. Numerous and varied sources contributed to the contamination. The primary sources included paints, anti-fouling chemicals such as tributyltin, pesticides/herbicides/fungicides, oil seepage from boats, impervious surfaces and ultimately

storm drains, corroded storage tanks and occasional oil spills ("Nantucket and Madaket Harbors Action Plan" 1993).

Table 2.3 Minimum Criteria Applicable to All Surface Waters in Massachusetts.

Parameter	Standard
Aesthetics	All surface waters shall be free from pollutants in concentrations or combinations that settle to form objectionable deposits; float as debris scum or other matter to form nuisances; turbidity; or produce undesirable or nuisance species of aquatic life.
Bottom Pollutants or Alterations	All surface waters shall be free from pollutants in concentrations or combinations or from alterations that adversely affect the physical or produce objectionable odor, color, taste or chemical nature of the bottom, interfere with the propagation of fish or shellfish, or adversely affect populations of non-mobile or sessile benthic organisms.
Nutrients	Shall not exceed the site-specific limits necessary to control accelerated or cultural eutrophication.
Radioactivity	All surface waters shall be free from radioactive substances in concentrations or combinations that would be harmful to human, animal, or aquatic life or the most sensitive designated use.
Toxic Pollutants	All surface waters shall be free from toxic substances in concentrations or combinations that would be harmful to human, animal or aquatic life or wildlife. This includes consideration of site-specific limits, human health risk levels and accumulation of pollutants (bioaccumulation).

2.2.2 Nantucket Harbor Watershed Work Group

A Nantucket Harbor Watershed Work Group was formed in 1997 by the Nantucket Planning and Economic Development Commission (NP&EDC) for the purpose of developing strategies to address water quality issues in Nantucket Harbor (Report of the Nantucket Harbor Watershed Work Group, 2003). They released the final version of the study endorsed by the entire group on June 1, 2003. The impetus for the creation of the Watershed Work Group as cited in their report was to address issues raised in the upcoming Nantucket Harbor Study published by Brian Howes at WHOI in 1997 (details below).

"Recommendations of the Work Group in a report dated December 1, 1997:

- *a Town Meeting appropriation to fund the engineering, modeling, and dredging of a channel in the harbor to enhance circulation in the harbor;*
- *an appropriation for the design of sanitary sewers for the Monomoy and Shimmo portions of the watershed;*
- *an appropriation for the design, engineering, and environmental assessment of improvements to existing storm drainage systems within the watershed;*
- *the formation of a harbor watershed district encompassing Nantucket Harbor;*
- *adoption of elements of an open space work group report associated with the development of the Comprehensive Plan related to open space initiatives in the watershed;*
- *encouragement of open space acquisition preference to Nantucket Islands Land Bank and non-profit entities; and,*
- *a public education component that focused on educating the public on prudent application of fertilizers within the watershed.*

Of the initiatives requiring Town Meeting action, the following actions took place:

- *the appropriation of $50,000 for the study of the circulation patterns in Nantucket Harbor;*

- *the appropriation of approximately $700,000 for the construction of sewers in Monomoy, recently completed;*
- *the inclusion in the Department of Public Works Enterprise fund an appropriation to inventory drainage systems in the watershed;*
- *the adoption of a harbor watershed district as a general bylaw in 1999.*

Of the initiatives not requiring Town Meeting action, the following publicly sponsored actions were initiated:

- *the design and construction of a stormwater mitigation area for a stormwater discharge on Washington Street extension;*
- *the acquisition by the town, the county, the Land Bank, and environmental organizations of the fee interest conservation restrictions in over 60 acres of land situated in the harbor watershed;*
- *the production of a poster highlighting water quality issues and best management practices, with the funding assistance of the Massachusetts Executive Office of Environmental Affairs."*

In addition, the Work Group formed a subcommittee which issued a critique of the 1997 WHOI Nantucket Harbor Study that stated: *"it failed to include atmospheric deposition sources; it used a disproportionately high and non-scientifically based fertilizer leaching rate percent; it failed to use Nantucket-based onsite septic system and sewer information; it used surface water sampling data (except for Millbrook) of questionable scientific validity; and, it failed to highlight the role of education / community participation in addressing harbor needs and in promoting harbor health."*

2.2.3 Applied Science Associates: Harbor Circulation Models

The Watershed Nutrient Model and a Harbor Nutrient Model were funded by Article 28, at the Annual Town Meeting (ATM) in 1998. The Marine and Coastal Resources Department commenced these studies in late 1999, retaining Applied Science Associates (ASA), who subcontracted with the Boston University Marine Program (BUMP), Applied Marine Ecology Lab, and Nucci Vine Associates as consultants to design the computer based simulation models. The model and report were released in 2000 and an on-island training session in the use of the computer simulation model was provided. These models are frequently used in oceanographic scenarios to predict changes in a watershed based on changing input factors. Ideally, these models should be 3-dimensional, but that adds another layer of difficulty including much more data acquisition for both atmospheric and sediment boundary inputs that was likely not within the bounds of the contract. The Department of Marine and Coastal Resources currently has this model and has purchased a newer computer dedicated to run the simulations, which may sometimes take a day or longer on older computers. The Estuaries Project released their final draft results for Nantucket Harbor and Sesachacha Pond in February of 2007. Their report presents a linked watershed-embayment model to determine critical nitrogen loading thresholds for Nantucket Harbor and Sesachacha Pond (see Section 2.2.8).

The results from the Nantucket Harbor Study indicated that water quality was degrading in parts of the harbors (e.g., Head of the Harbor, Polpis Harbor). The Harbor Study and the BUMP study both cite fertilizers, septic systems, and stormwater runoff from impervious systems as the primary non-atmospheric nitrogen sources to the watershed (see "Sources of Water Quality Degradation" below).

2.2.4 Mass DEP Islands Watershed 2000 Water Quality Assessment Report

Water quality as it relates to aquatic habitats is a primary concern, according to the Mass DEP Islands Watershed 2000 Water Quality Assessment Report, a comprehensive report on the quality of Nantucket and Madaket Harbors and their associated embayments released in 2003 (http://www.mass.gov/dep/brp/wm/wqassess.htm):

> *"The Aquatic Life Use is supported when suitable habitat (including water quality) is available for sustaining a native, naturally diverse, community of aquatic flora and fauna. Impairment of the Aquatic Life Use may result from anthropogenic stressors that include point and/or nonpoint sources of pollution and hydrologic modification. Twelve percent of the island's watershed salt*

pond/coastal embayment segments reviewed in this report were assessed (support or impaired) for Aquatic Life Use. One coastal embayment (Madaket Harbor, Nantucket, 1.4 square miles) was supported for this use. The remaining 1.7 square miles (Polpis Harbor, Hither Creek and Long Pond) were impaired for the Aquatic Life Use for known and/or suspected causes, including loss of eelgrass bed habitat, excess total nitrogen, tidal restriction, dissolved oxygen and anthropogenic activities that result in poor water quality. Suspected sources of impairment include: recreational activities (boat traffic), stormwater, onsite septic systems, and poor tidal circulation."

This same report showed that Long Pond is unsuitable for Primary Recreational Contact (i.e. wading swimming, diving, surfing) and that only Secondary Recreational Contact (involving limited contact with the water such as boating) should be allowed due to elevated bacterial counts and poor water clarity. Although not directly related to the harbor plan planning area, this same report states that the Massachusetts Department of Public Health (MDPH) has issued fish consumption advisories for Miacomet Pond (MA97055), Gibbs Pond (MA97028) and Tom Nevers Pond (MA97097) due to high levels of mercury.

In addition, the Massachusetts 303(d) list of impaired waters from 1998 includes Nantucket Harbor, with the cause of impairment as nutrients, pathogens, and noxious aquatic plants. Sesachacha was listed as impaired for pathogens (MA9702). The "Islands Watershed 2000 Water Quality Assessment" also gives specific values and recommendations for Polpis Harbor (Impaired, loss of eelgrass and partial loss of shellfish habitat); Sesachacha Pond (Impaired for shellfish harvest, on Alert status for fish kills), Coskata Pond (suitable for all activities), Madaket Harbor (not approved for summer shellfishing due to fecal coliforms) and Hither Creek (Impaired).

2.2.5 Recent Data and Research

In order to evaluate the current water quality a number of variables including temperature, salinity, dissolved oxygen, secchi depth, nitrogen and phosphorous as well as fecal coliform levels are monitored regularly by the town Biologist in the harbor planning area. In addition, several other ongoing water quality studies are conducted by various groups and agencies, including the Massachusetts Estuaries Project.

Temperature and salinity conditions have remained relatively predictable over the years. Overall, since Nantucket Harbor is well mixed, both parameters show steady measurements from the surface layer to the bottom layer. However, localized departures from this generalization do occur (Curley August 2002). Madaket Harbor is also well mixed and has relatively normal temperature conditions (Conant 2006). Conversely, in Hither Creek, which is a shallow water body with little circulation and more common stratification of both temperature and salinity, temperatures were higher than Madaket Harbor (Conant 2006).

Dissolved oxygen levels were generally "good" for Nantucket Harbor in 2004. However, mid-summer, low dissolved oxygen levels were observed in the bottom water of certain Nantucket Harbor sections (Curley 2004). Madaket Harbor, which has good circulation since it is open to Nantucket Sound and the Atlantic Ocean, has relatively normal dissolved oxygen concentrations (Conant 2006). However, Hither Creek, due in large part to the temperature and salinity stratification, can have very low dissolved oxygen and occasionally reach a state of hypoxia or anoxia (Conant 2006).

Secchi depth, which indicates water clarity, appears to alternate between "good" and "poor" throughout the year in Nantucket Harbor. "Good" and "poor" water clarity can indicate low and high estimates of phytoplankton population density, respectively (Curley 2004). Water clarity is good in most of Madaket Harbor, with the exception of Hither Creek, which has the least amount of light penetration (Conant 2006). The Creek's silty bottom, boat traffic from a connected boat yard and mooring field, and high nutrient concentrations all contribute to the relatively degraded water clarity (Conant 2006). Nitrogen concentrations in the water column also indicate how fast the phytoplankton populations will grow (Curley 2002).

While average total nitrogen concentrations for Nantucket Harbor ranked in the "excellent" range between 2002 and 2004, nitrate concentrations increased to the "moderate" impairment range at some locations in

2004. The 2002 Nantucket Harbor Water Quality Annual Report did note that, *"Nantucket Harbor contains more nitrogen than it should."* Due to the shape of Nantucket Harbor and its circulation patterns, nitrogen concentrations are typically much higher in Polpis Harbor and the harbor's three major basins (Conant 2006 "Nantucket Harbor"). Conversely, nitrogen concentrations are not increasing in Madaket Harbor (Conant 2006). This is due, primarily, to the harbor's shape and high rate of circulation (Conant 2006). Hither Creek is not sampled as regularly, but is known to have high nitrogen and phosphorous concentrations (Conant 2006).

Total phosphorous concentrations do appear to be increasing over time in Nantucket Harbor (Curley 2002). Just like nitrogen, the highest concentrations are frequently detected in Polpis Harbor. Usually, phosphorous concentrations increase at the same time of year that fertilizers are applied on land (Curley 2004). Another major source of phosphorus is Nantucket Harbor's Mooring Field (Curley 2004). In 2004, concentrations of total phosphorous in Nantucket Harbor exceeded safe water quality standards on multiple occasions (Curley 2004). However, phosphorous concentrations in Madaket Harbor are relatively low and represent good water quality (Conant 2006).

High fecal coliform concentrations are a recurring problem along the shoreline of Polpis Harbor as well as the Downtown and Monomoy areas of the watershed. In addition, Madaket Harbor is closed to the taking of shellfish for six months of the year, due to both high fecal coliform counts and the occurrence of a boatyard nearby. Hither Creek is permanently closed to shellfishing (Conant 2006 "Madaket Harbor"). Faulty and inadequate wastewater disposal systems are blamed for the high concentrations in the Downtown and Monomoy area shorelines.

Along the shoreline in Polpis Harbor, it is hypothesized that the inadequate tidal flushing is to blame for the high fecal coliform concentrations ("Comprehensive Wastewater Phase I" 2001). Polpis Harbor's water quality is also highly influenced by onsite wastewater disposal systems. Due to this relationship with onsite wastewater disposal systems, Polpis Harbor is "unsustainable" ("Comprehensive Wastewater Management Plan Phase III" 2004).

Criteria for evaluating estuary health as specified in the MEP (Massachusetts Estuaries Project) and currently used by the EPA include the monitoring of biological habitat quality indicators. As a basis for preliminary nutrient (nitrogen) threshold determination, focus is placed on two major biological habitat quality indicators (Howes *et al.* 2003):

- Eelgrass vs. macroalgal distribution
- Benthic animal communities (presence and diversity)

The DEP identified the presence of eelgrass in Nantucket Harbor from historic 1951 black and white aerial photography (Costello 2003). DEP mapped Nantucket Harbor in 1994 from field verified 1993 aerial photography. Total coverage of Nantucket Harbor from the 1993/1994 surveys was almost 50 percent of the harbor. DEP field verified 1999 aerial photography and identified marginal loss of eelgrass along the margins of the beds along entire shoreline as well as in the central part of the harbor as compared to the 1993 survey. The DEP did not issue an assessment of Aquatic Life Capability for Nantucket's Harbors because of a lack of data. DEP identified the presence of eelgrass in Polpis Harbor from historic 1951 black and white aerial photography (Costello 2003). Field surveys conducted by DEP in 1998 and 2000 found no eelgrass in Polpis Harbor. Because of the total loss of eelgrass bed habitat the Aquatic Life Use is assessed as impaired for Polpis Harbor. Suspected causes of this loss are tidal restriction and/or anthropogenic activities that result in reduced water clarity.

Within the past few years, eelgrass coverage has experienced a 10.7 percent reduction in Nantucket Harbor according to the DEP (Figure 2.1).

The Estuaries Project is examining benthic communities to determine adverse effects from oxygen depletion, nutrient concentrations, and competition between species, in addition to the buildup of excess organic carbon in deeper sections of the harbor. Also, a recent Massachusetts-wide EPA project (Coastal 2000) is identifying benthic diversity and its relationship to water quality parameters. The Town of Nantucket's Biologist also performs routine benthic organism evaluations. These multiple efforts should be maximized, collated and recorded.

2.2.6 Ferry Sensor System on the SSA Eagle

Woods Hole Oceanographic Institution (WHOI) scientists, led by Scott Gallager, have been measuring water quality (specifically temperature, salinity, oxygen, chlorophyll, and water clarity) and photographing plankton using sensors attached to the *Katama*, a 235-foot freight ferry that passes through the western side of Nantucket Sound several times a day.

The WHOI scientists will be setting up a similar sensor system on the Steamship Authority's ferry *Eagle*. The *Eagle* runs on the eastern side of Nantucket Sound between Hyannis and Nantucket. The purpose of the WHOI team's work is to develop a *"detailed, continuous portrait of changing water conditions and plankton communities in Nantucket Sound over long time scales"* (WHOI News Release, August 29, 2006). This may help pinpoint Nantucket Sound water quality inputs into Nantucket Harbor.

2.2.7 Sources of Water Quality Degradation

Stormwater

Stormwater runoff is the largest component of non-point source pollution in our nation's watersheds. Stormwater is discharged into the harbor from a variety of sources, including groundwater, stormwater outfall pipes, as well as stormwater runoff (sheetflow). According to the "Report of the Nantucket Harbor Watershed Workgroup" (June 2003), major sources for contaminants in the stormwater are from:

1. Impermeable surfaces
2. Development activities
3. Landscape activities
4. The atmosphere
5. Automobiles
6. Fertilizers
7. Animal waste
8. Winter road applications

Often the contaminants are filtered out through natural vegetated systems; however, the western portion of Nantucket Harbor's watershed, the downtown area, is almost entirely covered by impermeable surfaces. While manmade infrastructure helps to manage stormwater, discharges from outfall pipes, for example, can also act as the transport vehicle for sediment originating from development activities and dump it directly into the harbor ("Report of the Nantucket Harbor Watershed Workgroup" 2003). Outfall pipes are often too small to accommodate current flow rates, and some are poorly located with regards to current land and water uses ("Drainage Outfall" 2005).

Throughout the summer months, the Nantucket Board of Health monitors the public beaches for total and fecal coliform. The town has completed some preliminary work to identify sources, using DNA evidence to separate mammalian (dogs and humans) from avian fecal matter sources; however, new studies and protocols are surfacing throughout the nation and should be investigated. Specific tactics for identifying sources of fecal and bacterial inputs into the harbors involve several different sampling protocols such as rain event sampling, DNA typing, antibiotic resistance testing, and avian waste surveys (recording the number of bird droppings along beach transects) to pin-point the source(s) of bacterial pollution for each beach. Successful monitoring studies to identify bacterial sources in coastal areas have been conducted in Wisconsin and other states. Some of these monitoring studies have been partially funded through the EPA BEACH's Act (NOAA 2005.)

Stormwater Bylaws

Many communities in Massachusetts lack the local regulatory standards needed to regulate stormwater runoff outside of the state's wetland jurisdiction. In an effort to address this problem, three South Shore communities, partially funded by the Coastal NPS Grant Program, jointly developed a Model Stormwater Bylaw to improve their ability to manage stormwater. Their Model Stormwater Bylaw provides a comprehensive approach to stormwater management, encourages Low Impact Development (LID), allows for a possible stormwater utility fee, and exceeds the state's Stormwater Policy and Standards.

The Model Stormwater Bylaw also seeks to fulfill EPA Phase II requirements pertaining to post-construction stormwater management.

According to NOAA's Ocean and Coastal Resource Management website*, "Some of the ways the bylaw surpasses statewide stormwater requirements include: (1) proposing a more stringent criteria for channel protection (attenuating the 24-hr extended detention storage of post-development runoff from a 1-yr, 24-hr storm event vs. controlling the peak discharge rate from a 2-yr storm event to the pre-development rate as required by the MA Stormwater Management Policy); (2) proposing more stringent criteria for extreme flooding protection (attenuating the peak discharge rate from the 100-yr, 24-hr storm event to the pre-development rate vs. evaluating the 100-yr, 24-hr storm event to demonstrate no increased off-site flooding impacts will occur); and (3) proposing more stringent criteria for structural practices to improve water quality (in addition to requiring control structures be designed to remove 80 percent of the average total suspended solids from post-development runoff, the practices must also be designed to remove 40 percent of the total phosphorous and 30 percent of the total nitrogen)"* (NOAA 2006).

Nantucket has a Stormwater Management Plan as well as several different bylaws pertaining to stormwater management and mitigation of artificial recharge, which can be found in Chapter 139 of the Town Code. Nantucket also has local wetland protection bylaws, but no specific Stormwater Bylaw.

Wastewater

Up until about 2001, Nantucket's wastewater was treated in one of two ways. The first option was the island's Surfside and Siasconset wastewater treatment facilities and the second option was privately owned onsite treatment and disposal systems. The Surfside facility, historically, has only utilized primary treatment, which does not remove dissolved constituents such as ammonium or most biological species such as fecal coliform. In 2005, the Surfside facility treated about 524 million gallons of wastewater.

At the Siasconset facility, wastewater was discharged onto infiltration beds where the soil was meant to remove the contaminants ("Comprehensive Wastewater" 2001). However, untreated wastewater was still discharged directly to the soil ("Comprehensive Wastewater" 2003). Onsite treatment and disposal systems also leaked untreated or poorly treated wastewater into the soil ("Comprehensive Wastewater" 2001).

Although there are two public facilities, the majority of the island uses private onsite septic systems ("Comprehensive Wastewater" 2001). In 2005, 167 permits were issued for the installation of septic systems. However, 79 of these permits were issued for either the repair of failed systems or upgrades to non-compliant systems (Town of Nantucket 2005).

Often the island's soil does not adequately filter wastewater, even if it has already been treated. Due to the soil's porosity, the water moves through too quickly for constituents to be absorbed by the soil particles. The inadequately filtered wastewater ends up mixing with the groundwater, ultimately discharging into the harbor ("Comprehensive Wastewater" 2001).

Aquaculture Enterprises

Nantucket has few aquaculture activities and has granted only 4 permits for operators in the harbor. All of these are focused on shellfish. The potential environmental impacts posed by aquaculture vary significantly depending on the type of operations and which animals or plants are being raised. Shellfish aquaculture is thought to have relatively low environmental impacts, and some argue that such activities may even improve water quality. However, it is important that all aquaculture activities be monitored to ensure that they do not lead to a degradation of water quality. If types of aquaculture that are known to have greater environmental impacts are permitted in the future, more stringent monitoring protocols should be stipulated.

Groundwater

Groundwater inputs are a significant contributor of nitrogen to Nantucket, Madaket, and Polpis Harbors (Curley, 2002; Howes *et al.* 1997, Valiela *et al.* 2000). Most of the groundwater's nitrogen comes from onsite wastewater treatment systems ("Report to Nantucket" 2003). Even properties which meet the DEP's Title V regulation for onsite wastewater treatment and disposal systems*, "do not adequately*

remove nutrients from wastewater before it enters the leaching fields" ("Phase III" 2004). Compared to wastewater treatment facilities, onsite Title 5 systems only remove a nominal amount of nitrogen before discharge ("Phase III" 2004).

Agriculture and golf courses can also contribute excess nutrients to the harbor. As can be seen below, input from these sources can be relatively significant (Gardner 2003). Consistent groundwater monitoring in conjunction with the Nantucket Land Council, the University of Massachusetts Boston Nantucket Field Station, the Wannacomet Water Company, and the USGS should be done to track these inputs.

Groundwater Monitoring

The Department of Public Works has a contract with Camp Dresser & McKee Inc. (CDM) to collect water and complete thorough testing of samples taken from a series of monitoring wells placed around the island'slandfill. CDM tests for close to 200 constituents, including everything from conventional parameters such as pH and alkalinity to metals and volatile organic compounds (VOCs). The environmental sampling is done in accordance with the approved Environmental Monitoring Plan, prepared by Secor International, Inc. in July 1999, and is in conformance with the Solid Waste Management Regulations (310 CMR 19.132). This sampling regime is scheduled to be conducted semi-annually. The landfill is also closely monitored for potential aerial hazards and incidents that could cause atmospheric deposition of harmful chemicals.

In addition, nearby surface waters and landfill gases are also measured. At the January 4, 2006 Board of Selectmen meeting, the DPW Director reported *that "nothing exceeding statutory limits has been detected"*. A brief review of tables and reports from the April 2004 CDM "Summary of Groundwater, Surface Water and Gas Sampling Results" shows that almost all potential pollutants, from heavy and light organics, to metals and carcinogens, fall below groundwater regulation limits and are often in the ND (non-detect) range. For groundwater samples, the only parameters exceeded were manganese, iron, and Total Dissolved Solids (TDS). For surface water samples, zinc concentrations (115 µg/l) slightly exceeded the Ambient Water Quality Criteria of 100 µg/l. No gas measurements exceeded regulatory levels.

Boat Sewage

Another more direct source of wastewater to the harbors is through boat sewage. Over 130,000 gallons of sewage was pumped from boats visiting Nantucket Harbor in 2005. Nantucket Harbor is a federally designated No Discharge Zone (NDZ). This means that it is illegal for boaters to discharge either treated or untreated sewage within the NDZ. In recent years, the demand for pumpout services in the harbors has increased. Currently, dye tests are conducted twice a year and the Nantucket Harbormaster proactively patrols the mooring fields in order to pump out boat waste holding tanks (see section below).

Harmful Algal Blooms (HABs)

Many algal species form blooms, commonly referred to as "red tides," each with different impacts. Most of these blooms are harmless, but a few species of phytoplankton cause red tides that are poisonous to marine animals and to humans. Because of this, scientists prefer the term "harmful algal bloom" (or HAB). Of the more than 60 different species of phytoplankton that cause red tides, only four or five have been identified as toxic.

The organism that causes toxic red tide, or HAB, in New England is a microscopic one-celled alga called *Alexandrium tamarense*. *Alexandrium* propels itself through the water using two tiny whip-like extensions called flagella. Its life cycle includes a dormant cyst stage that can survive cold winters in bottom sediments. The cysts, which also contain toxin, are the seeds for future blooms. These cysts facilitate the spread of toxic red tides into new areas since they are easily transported by tidal currents, dredge material disposal, and transplanted shellfish.

Alexandrium toxin (saxitoxin) becomes concentrated in shellfish—clams, quahogs, mussels, scallops, oysters, and other bivalves. These shellfish are "filter feeders" that obtain nourishment by siphoning in water and filtering out the phytoplankton, which are their food. During a red tide bloom, a single shellfish could accumulate billions of *Alexandrium* organisms in just 24 hours. The shellfish themselves are not affected by the toxin. In New England, the Spring of 2005 brought the worst "bloom" of the toxic alga *Alexandrium* since the massive outbreak of 1972. The conditions needed for such a massive bloom to

occur are quite rare. The New England spring weather of 2005 produced higher than usual amounts of rain and snowmelt in addition to two nor'easters in May. These conditions, coupled with constant northerly and easterly wind patterns, may have pushed the abundance of *Alexandrium* cells south into Massachusetts Bay and Cape Cod Bay, eventually reaching Nantucket. There was also an intense bloom off western Maine in autumn 2004 that may have provided a larger source of cells at the beginning of the season. (Ely and Ross. 2006, Rhode Island Seagrant)

Phosphates

Phosphates are measured in both harbors as well as in Hummock Pond, Long Pond, Miacomet Pond, Hither Creek and other critical surface water systems on Nantucket. Phosphate species (typically orthophosphate that is a bioavailable form of phosphorus or total phosphorus) are routinely measured in groundwater sampling wells, local ponds, and by the Estuaries Project, the Department of Marine and Coastal Resources, Nantucket Land Council, WHOI, and others. Phosphate can come from septic systems, goose droppings, fertilizers, and detergents. The town should explore the possibility of passing a bylaw restricting all detergents on Island to low phosphate detergents. Unfortunately, many low-phosphate detergents contain a greater amount of surfactants, which can equally harm the harbors if allowed to reach significantly high concentrations. This can adversely affect fish breeding ability and the formation of gill mucus linings. Additional possible mitigation methods include using phosphate free or low phosphate (less than 1 percent) automatic dishwashing detergents (Organization for the Assabet River 2006), supporting the Conservation Commission to require both nitrate removal and phosphate removal in new onsite waste systems, and supporting the Marine and Coastal Resources Department's efforts to prevent boats from releasing phosphates in the harbors.

Pesticides

Pesticides are substances or a mixture of substances that prevent, destroy, repel, or mitigate pests, or that defoliate, desiccate or regulate plants. Pests for example can be insects, fungi, weeds, snails and slugs, mold and mildew. So insecticides, fungicides and herbicides and even common disinfectants are pesticides. The suffix -"cide" derives from the Latin meaning to cut down or kill. Schools and municipalities must have Integrated Pest Management plans, but pesticides cannot be regulated in other ways by municipalities on private properties. Any utility, municipality or private entity that intends to apply pesticides must adhere to strict protocols as defined by Chapter 132B and Chapter 85 of the Acts of 2000 (see below).

Federal Law: The Federal Government regulates pesticides through the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). FIFRA gives the federal Environmental Protection Agency (EPA) the power to register pesticides and to regulate the use, storage and disposal of containers and manufacturing wastes. FIFRA also allows states to have primary enforcement responsibility.

State Law: Massachusetts regulates pesticides under the authority of the Massachusetts Pesticide Control Act (MPCA, Chapter 132B of the Massachusetts General Laws). This law, enacted in 1978, places the power of pesticide regulation with the Massachusetts Department of Food and Agriculture. The regulations are Chapter 333 of the Code of Massachusetts Regulations (333 CMR). The Pesticide Bureau in the Department of Food and Agriculture carries out these regulatory responsibilities.

According to Section 6E. *"On or before November 1, 2001, each school, day care center and school age child care program in the commonwealth shall adopt and implement, in accordance with any regulations promulgated by the department pursuant to this chapter, an integrated pest management plan. The plan shall cover both indoor and outdoor areas. The department shall produce a generic integrated pest management plan that may be adopted by any school, day care center or school age child care program. One copy of the plan adopted by the school, day care center or school age child care program shall be filed with the department, and at least one additional copy shall be kept on site and made available to the public upon request pursuant to section 10 of chapter 66. Every agency of the commonwealth shall develop and implement integrated pest management plans and procedures for all buildings and grounds owned or managed by the commonwealth."*

"Integrated pest management" is a comprehensive strategy of pest control whose major objective is to achieve desired levels of pest control in an environmentally responsible manner by combining multiple

pest control measures to reduce the need for reliance on chemical pesticides; more specifically, a combination of pest controls which addresses conditions that support pests. It may include, but is not limited to, the use of monitoring techniques to determine immediate and ongoing need for pest control, increased sanitation, physical barrier methods, the use of natural pest enemies and a judicious use of lowest risk pesticides when necessary.

Other Marina and Boat Associated Impacts

Chapter 4 of the Commonwealth of Massachusetts Coastal Zone Management Clean Marina Guide addresses Best Management Practices for the reduction of pollution sources at marinas. Marinas are required under federal and Massachusetts' laws and regulations to take actions to control pollution from normal operations and to prevent accidents. Some regulations, such as the National Pollutant Discharge Elimination System (NPDES), require that they take specific actions. Other laws, particularly the Coastal Zone Act Reauthorization Amendments of 1990, leave it up to the regulated party (e.g. marina owners) to decide which practices to implement. Activities that can contribute to water quality degradation in the harbors include:

- Hull Maintenance and Cleaning
- Boat Cleaning
- Engine Maintenance
- Bilge Water Handling
- Fueling
- Spill Response
- Boat Sewage and Wastewater Management
- Shoreside Facilities and Pet Waste Management
- Solid Waste Management
- Hazardous Materials and Hazardous Waste Management
- Fish Waste Management
- Stormwater Management
- Boat Operations

Several of these items are addressed in various sections of this harbor plan. Reduction of pollutants from marine traffic in the harbors should include education of boaters, enforcement of town bylaws, and adoption of Best Management Practices (BMPs) from CZM. BMPs help solve the environmental pollution problems that result from marina activities, such as boat cleaning, fueling, and waste disposal. BMPs use one or more basic methods to control this pollution, such as preventing accidental spills or leaks, capturing pollutants as they are produced, containing the spread of spills or debris, reducing the use of a potentially harmful material, and filtering or trapping out pollutants. They may include structural changes to a marina, acquisition and use of environmentally preferable products and equipment, and educational efforts aimed at helping boaters understand how to prevent pollution. It is almost always less costly to prevent pollution from occurring than it is to clean it up later. Consider pollution prevention BMPs when prioritizing BMP implementation (CZM 2001).

2.2.8 Action Items from 1993 Plan and Associated Actions

Actions Taken Since 1993

Woods Hole Oceanographic Institute Report

As mentioned above, a quantitative assessment of Nantucket Harbor's environmental health was published by Woods Hole Oceanographic Institute (Howes *et al.*) in 1997. The report concluded that nutrient levels did exceed those observed in Nantucket Sound. It was suggested that drainage from Nantucket Harbor's basin as well as sediments were the source of nutrients (Howes *et al.* 1997).

The monitoring data indicate four general concerns. First, nitrate loading is occurring from Nantucket Sound into the harbor and the nitrate concentration in stream discharge increases abruptly at the end of winter and remains high through spring. Second, total kjeldahl nitrogen, which constitutes a measure of total organic nitrogen, is thought to originate at the Head of the Harbor. Third, phosphorous concentrations are increasing at the Head of the Harbor, at the Mooring Field and in surface runoff into the harbor. Finally, *"there could be a trend of increasing nutrients in the harbor that will cause continued declines in water clarity as well as other eutrophication problems"* (Howes *et al.* 1997).

Comprehensive Wastewater Management Plan (CWMP)

A CWMP was developed to improve Nantucket's wastewater treatment and disposal. The purpose of the CWMP plan is to *"identify areas within the island with sub-surface wastewater disposal problems and to develop a plan that will mitigate or eliminate the problems"* ("Comprehensive Wastewater" 2001).

The plan consisted of three phases. Phase I analyzed wastewater needs on the island by determining areas incapable of sustaining long-term, onsite wastewater disposal systems and screened the alternative management actions. Phase II investigated sites for wastewater treatment facilities and effluent disposal fields and in addition, proposed draft recommendations regarding wastewater disposal on Nantucket. Lastly, Phase III of the plan provided final recommendations and environmental impacts.

Septic Management Plan

The July 18, 2005 Septic Management Plan was developed as a recommendation from the Comprehensive Waste Water Management Plan. A joint endeavor between the Department of Public Health, DPW, and the Water Company, the plan was endorsed by the Board of Selectmen (acting as the Board of Health) on November 9, 2005 (Town of Nantucket Board of Selectmen 2005). The CWMP-Phase 1 recommended that a Septage Management Plan be developed with the local Board of Health, and implemented for the areas of town not included in the sewer service area. The purpose of a Septage Management Plan is to maintain the operation of septic systems in a manner that will protect the groundwater and reduce the need of the system. This type of plan should include such items as recommended septage pumpout frequencies and maintenance of onsite wastewater disposal systems. Public education concerning the importance of proper maintenance of onsite wastewater disposal systems is an important means of prolonging the life of these systems. The Septage Management Plan takes into account the various issues with groundwater and septic systems around the island, such as distance to groundwater, horizontal distance to surface water bodies, and type of soil. The Town of Nantucket's Health Department has been proactive in developing regulations and alternative solutions for the island's septic needs.

The Director of the Town of Nantucket's Health Department has provided literature, given forums, spoken at BOS meetings and conducted several public outreach sessions. Information is also available on the Department of Public Health's website.

Drainage Outfall Evaluation

The Town of Nantucket devised a series of objectives to be addressed by the Drainage Outfall Evaluation prepared by Earth Tech, Inc. for the Town of Nantucket and released in January 2005. These objectives included:

- Improve water quality by decreasing sediments in Nantucket Harbor;
- Mitigate on-going flooding due to undersized outfall pipes;
- Modification to deficiencies in the upstream systems.

Earth Tech's evaluation identified existing wastewater infrastructure in need of rehabilitation for one of two main reasons. First, rehabilitation may be necessary to eliminate excessive infiltration and inflow from the system. Second, street flooding and pollution discharging into the harbor may need to be eliminated. This evaluation focused on mitigating stormwater problems in the downtown portion of Nantucket's watershed ("Drainage Outfall" 2005) for 16 primary outfall pipes (out of a total of 52 pipes discharging into the harbors). The work recommended was to be accomplished in three phases. Phase I improvements would include areas with extreme problems and the 16 major outfall structures. Phase II recommendations would concentrate on upstream catch basins and drain lines. Phase III improvements were recommended to include rehabilitation or replacement to the entire tributary areas of each outfall.

Specifically, the report addressed individual outfall pipes and recommended mitigation methods for the reduction of stormwater inputs into the harbor, the treatment of water flowing through these pipes and the installation of larger pipes. Whenever possible, each solution was based on Best Management Practices (BMPs). Evaluated outfall pipe locations included Brant Point and Children's Beach outfalls, New Whale Street, "The Creek", Cambridge Street, Easy Street, Steamboat Wharf, Commercial Wharf, Consue Springs, Marine and Coastal Resources Department, Washington Street extension, Washington Street Middle, North and South outfalls.

The Department of Public Works began an infiltration/inflow reduction project in 2005. The first part of this project includes rehabilitating defective sewer pipes in Brant Point (Town of Nantucket 2005). The project will remove more than 200,000 gallons of inflow from the sewer system, and will reclaim lost pipe capacity (Town of Nantucket 2005).

Capital Improvement Program

This program was motivated by the town's efforts to complete recommendations from the Comprehensive Wastewater Management Plan, Septic Management Plan and Drainage Outfall Evaluation. The program will however, include other town department budget expenditures as well. *"This proactive agenda will allow the town to act fiscally responsible and ensure the long-term sustainability of the island while protecting the environment and sole source aquifer at the same time, both of which are direct goals of the State's Watershed Initiative"* (Phase III, 2004).

The Estuaries Project: Nantucket

As part of the Federal Clean Water Act, states are required to develop Total Maximum Daily Loads (TMDLs) for lakes, rivers, and coastal waters not meeting the State's surface water quality standards as indicated by the State's 303(d) List of Waters. TMDLs can be set for pathogens, nutrients, or any other constituent found to be impairing a body of water. A TMDL is the greatest amount of a pollutant that a waterbody can accept and still meet standards. Further information on the 303(d) list and the TMDL program are available on the DEP website.

The DEP will need to produce TMDLs for various causes of impairment (e.g., nutrients and pathogens). Both state and federal regulations require that communities address the water quality impairments caused by nitrogen loading ("The Massachusetts Estuaries" 2003). The Massachusetts Estuary Project (MEP) is an effort that began in 2001 to address this problem and to restore the health of estuaries. The project's *"overall deliverable is to determine the watershed nitrogen loading targets for guiding nitrogen reductions (or limits) within contributing watersheds to the estuaries of the various towns"* ("The Estuaries Project" 2005).

In order to meet the project's goal, The School of Marine Science and Technology at the University of Massachusetts Dartmouth has collaborated with the DEP. Estuaries included in the MEP are located south of Duxbury, including Cape Cod, Buzzard's Bay, Mt. Hope Bay and the islands. There are a total of 89 estuaries included in the six year project. Nantucket Harbor, Sesachacha Pond, Long Pond, Madaket Harbor, and Hummock Pond are all included in the program. Work in the first two estuaries begin in 2002 as Phase I high priority sites ("The Estuaries Project" 2005). Work on Madaket Harbor and Long Pond began in 2003.

Ultimately, the Massachusetts State Water Quality Standards, as well as requirements of the federal government's Clean Water Act, must be addressed by the MEP ("The Massachusetts Estuaries" 2003). According to the Clean Water Act, states are required to develop a Total Maximum Daily Load (TMDL) for each waterbody that does not meet the State Water Quality Standards. The TMDL designates a specific nitrogen load to the estuary that needs to be achieved in order to meet the state standards ("Total Maximum Daily Loads" 2004).

Data collection and subsequent development of mathematical models and technical reports are the first steps toward designating the TMDLs. The data and models will determine sources and loads of nitrogen to the estuary as well as the highest nitrogen load that the estuary can tolerate before its health begins to degrade ("About Estuaries" 2004). In addition*, "the models can be used to illustrate how changes in land use will affect the nutrient load and water quality in estuaries"* ("Total Maximum Daily Loads" 2004). A technical report for each estuary, based on collected data and model results, will identify*, "the most promising nitrogen reduction approaches for each estuary"* ("The Massachusetts Estuaries" 2003).

Once the TMDLs are developed, communities can start to develop a restoration and protection strategy for their estuary (Howes 2003). Strategies may include improved tidal flushing, upgraded stormwater control and treatment, attenuation through the use of wetlands, improved wastewater treatment, nutrient trading and better land use planning ("The Massachusetts Estuaries" 2003). In the end, the participating communities will have a healthier estuary and as a result, will see a decrease in human health risks and an increase in ecosystem services.

The Estuaries Project released their final draft results for Nantucket Harbor and Sesachacha Pond in February of 2007. Their report presents a linked watershed-embayment model to determine critical nitrogen loading thresholds for Nantucket Harbor and Sesachacha Pond. The model is essentially a three dimensional one that includes atmospherics inputs, land use estimates of inputs, and circulation information. Non-point source inputs are also included (sheet flow, storm water runoff, etc.). Additional needs for modeling inputs will depend on inputs into the harbors from Nantucket Sound and attenuation underground of nutrients such as nitrate which would require integration of groundwater well analysis into modeling efforts. The reports also present the first set of TMDL's for these two watersheds. (Howes, et. al, 2006 a, b).

Increased Boat Sewage Pumpout Capacity

In 2005, a new pump-out station increased Nantucket's capacity for boat sewage by 575 gallons. For the eighth year running, the town received a $50,000 grant to apply towards boat sewage pumpout services (Town of Nantucket 2005). Currently, boat pumpout services are offered at no cost to boats moored in Nantucket and Madaket Harbors. In 2005, 120,000 gallons were pumped out of boat holding tanks.

Nantucket and Madaket Harbors Watershed Protection District

Nantucket adopted the Nantucket and Madaket Harbors Watershed Protection District as a general bylaw at the 1999 Annual Town Meeting. The files can be found at on the Town of Nantucket's website.

The area constituting the watershed for Nantucket Harbor, as described in a technical report entitled "Nantucket Water Resource Management Plan," 1990, by Horsley, Whitten, & Hegemenn, Inc., and as delineated on a map entitled "Nantucket Harbor Watershed," Nantucket GIS, dated January, 1999. Local regulation 68.00 in the Town of Nantucket Health Regulations pertain to the Watershed Protection District.

Land Use and the Effect on Nitrate Concentrations

A graduate student from Tufts University undertook research focused on the relationship between land use and groundwater nitrate concentration on Nantucket, and found:

> *"Both historic nitrate concentrations and nitrate concentrations in 57 residential and 12 monitoring wells in Nantucket Island, Massachusetts, monitored in August 2001, were analyzed to assess the effects of land use on groundwater quality. Maximum likelihood Tobit and logistic regression analysis of explanatory variables that characterize the type of land use within a 1000-foot radius of each of the wells were used to develop predictive equations for nitrate occurrence in groundwater. Historic nitrate concentrations down-gradient from land used for agriculture were significantly higher than concentrations collected elsewhere on island. Monitoring wells down-gradient from a golf course opened in 1998 on pristine land have shown an increase in groundwater nitrate concentrations over time. Tobit regression results demonstrate that the number of septic tanks and the percentages of high-density residential, undeveloped and forestland within a 1000-foot radius of a well are reliable predictors of nitrate concentration in groundwater. Logistic regression revealed that the percentages of forest, undeveloped and low-density residential land are the best indication of groundwater nitrate concentration greater than 2 mg/L. The strength of the correlations supports the premise that land use affects the quality of water in aquifers overlain by highly permeable material because land use determines the types and amounts of chemicals introduced at the land surface. When coupled with GIS technology and accurate, detailed land use and water quality information, the methods and results of this study can be useful to local planning boards in evaluating potential effects of development on groundwater quality. A residential survey sent to Nantucket homeowners indicated the need for public education in two main areas: lawn care and septic tank maintenance. The percentage of survey respondents who fertilize their lawn is 49.8, while those who fail to pump their septic system within 2 to 5 years, as advised by the*

Massachusetts Department of Environmental Protection is 35.9 percent. The combined results of historic groundwater nitrate data analysis, regression analyses, and the residential survey of Nantucket homeowners have implications for three policy goals that minimize nitrogen loading to Nantucket groundwater: (1) reduce fertilizer pollution (2) reduce pollution from septic systems and (3) increase open space. Regulatory and non-regulatory land management techniques to achieve these three policy goals are recommended". (Gardner, 2003).

2.3 HARBOR FACILITIES AND USES

2.3.1 Boat Berthing, Mooring and Anchorage

Docks and Slips

Slips rentals in Nantucket Harbor are available at the Town Pier and the Nantucket Boat Basin. Slips are also available to members of the Nantucket Yacht Club. In Madaket Harbor, slip rentals are available at Madaket Marine.

The Boat Basin has 240 slips. To dock at this marina, a vessel must be at least 30 feet in length; and may be as long as 230 feet. The Boat Basin also offers fuel sales and vessel pumpout. The Town Pier has 20 slips for boats up to 40 feet long, 55 slips for boats up to 30 feet long, and 25 additional slips that can accommodate boats of various sizes between 13 feet and 30 feet. Slips at the Town Pier are allocated based on a lottery system tied to a boat's registration number. Recreational slips at the Town Pier are only allocated for one-year terms. Each year, the town allocates slips to approximately 100 people, and places 40 people on the waiting list in the event that someone does not take his/her slip.

In order to provide some stability for businesses, commercial slip permits at the Town Pier are issued on either a one-year, three-year, or five-year basis. When the term of their permits are up, commercial enterprises must once again enter the lottery.

Moorings

According to Section 137-4.B of the Nantucket Town Code, all moorings must be registered by the Department of Marine and Coastal Resources. Registered moorings may be located within one of Nantucket's nine mooring fields: Hulbert Avenue; Children's Beach; Easy Street; Swain's Wharf; South of Town Pier; Monomoy; Between the Piers; the General Anchorage Mooring Field, and Warren's Landing. In addition to those mooring fields, additional registered moorings are located throughout the harbors. In Madaket, those additional moorings are located on both sides of the channel in Hither Creek. In Nantucket Harbor, additional moorings are located primarily in Shimmo Pond, Quaise Basin, and Wauwinet.

Vessels of 27 feet or more are moored in the General Anchorage mooring area. Boats of 23 feet or less make up the vast majority of moored boats (approximately 1360 boats, or over 80 percent) and are accommodated in the other mooring fields. Generally, boats are placed within the mooring fields by size and type, with smaller vessels closer to shore (Figures 2.11 to 2.13; Table 2.4). In order to receive a mooring permit, the applicant must own or have a signed purchase and sale agreement for a vessel at the time the mooring permit is issued. Once a permit is issued, it can be renewed annually. If the individual holding a mooring permit sells his/her boat, he/she has 12 months to place a new vessel on the mooring. If no vessel is placed on the mooring within the 12 months, the individual loses the mooring permit. Until August of 2006, mooring permits could transfer with the sale of a boat. However, Section 137-4.A of the Town Code now prevents the transfer of moorings to anyone other than an immediate family member of the permitee.

The Department of Marine and Coastal Resources currently maintains two separate mooring waiting lists based upon vessel size. As of October 2006 the waiting list for boats 26 feet in length or less had 624 people, while the waiting list for boats 27 feet in length or longer had 202 people. Each year approximately 30 to 40 people are taken off the wait list for smaller vessels, while only one to two people are taken off the waiting list for larger boats each year.

Approximately 1700 mooring permits have been issued within the town's designated mooring areas and off private waterfront residences for the 2007 boating season. This number is down from the over 1,800

mooring permits issued in 2006 (see Carrying Capacity Section 2.3.4).

The town recognizes that some people may only need a mooring for part of the boating season; therefore, it allows for the time-sharing of moorings. In order to be eligible to participate in a time share, boat owners have to employ a professional company to handle their mooring. In a time share situation, the company handling the moorings will deploy different ground tackle for each vessel. Currently, professional companies handle over 63 percent of moorings.

Waterfront homeowners may apply for permits for private moorings to be located off shore from their residence. Currently there is no official limit on the number of permits that a homeowner may apply for but, in reality, the maximum that has been requested is two. The 2007 plan recommends that this be codified by the town. Waterfront homeowners are not required to be on a waiting list. This benefits both the waterfront homeowner and those on the waiting list. There are approximately 216 permitted, private moorings in front of waterfront homes.

Table 2.4 Approximate Number of Moorings within the Mooring Fields and Anchorage in Nantucket in 2006.

Mooring Location	Number of Boats	Size of Boats
General Anchorgae	126	27 feet and over
Rentals in General Anchorage	125	27 feet and over
Children's Beach	230	26 feet and less
Easy Street	31	26 feet and less
Swain's Wharf	46	26 feet and less
South of Town Pier	185	26 feet and less
Hulburt Avenue	204	26 feet and less
Polpis Harbor	244	26 feet and less
Madaket Harbor	258	26 feet and less
Monomoy, Shimmo, Quaise, and Wawinet	392	26 feet and less
Total	**1,841**	

(Data: Nantucket Department of Marine and Coastal Resources, 2006)

Boat Ramps

Given the long waiting lists for moorings and boat slips, many boaters are only able to use their boats by launching them at one of the island's boat ramps. There are two ramps in Madaket Harbor, both funded by the Massachusetts Office of Fishing and Boating and managed by the Town of Nantucket. Those ramps are Walter Barrett Pier (in Hither Creek) and Jackson's Point. One ramp exists in Nantucket Harbor at Children's Beach. All three ramps are concrete, and are used by fishers as well as by recreational boaters. The ramp at Children's Beach is currently undergoing major renovations. There continues to be a demand for more ramps and opportunities should continue to be investigated.

Table 2.5 Details of Boat Ramps in Nantucket.

Boat Ramp	Number of Lanes	Maximum Draft	Parking Capacity
Children's Beach	2	4-6 feet	12
Walter Barrett Pier	1	Unknown	6
Jackson's Point	1	Unknown	6

(Data: Nantucket Department of Marine and Coastal Resources, 2006)

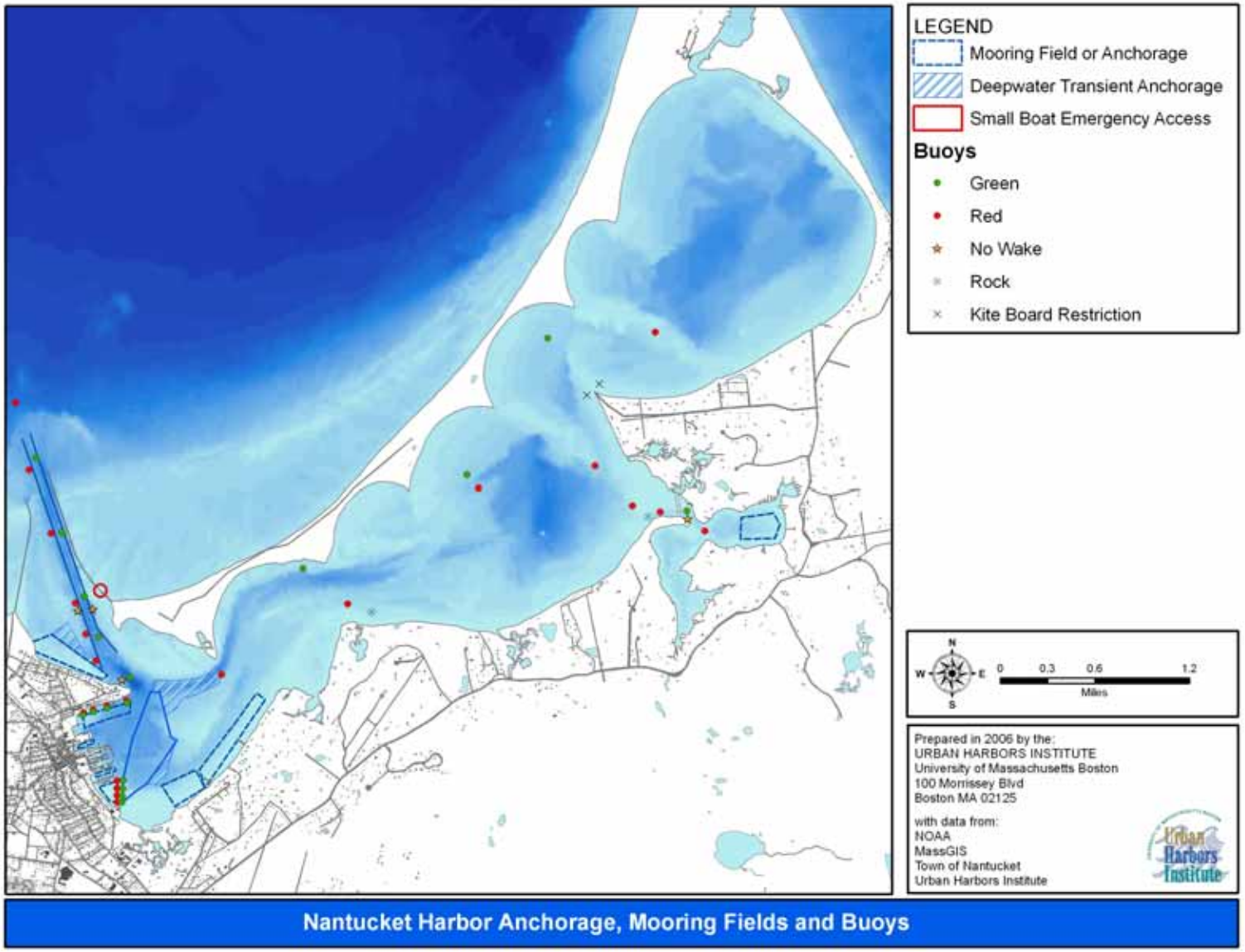


Figure 2.11 Mooring Fields, General Anchorage and Buoys in Nantucket Harbor.

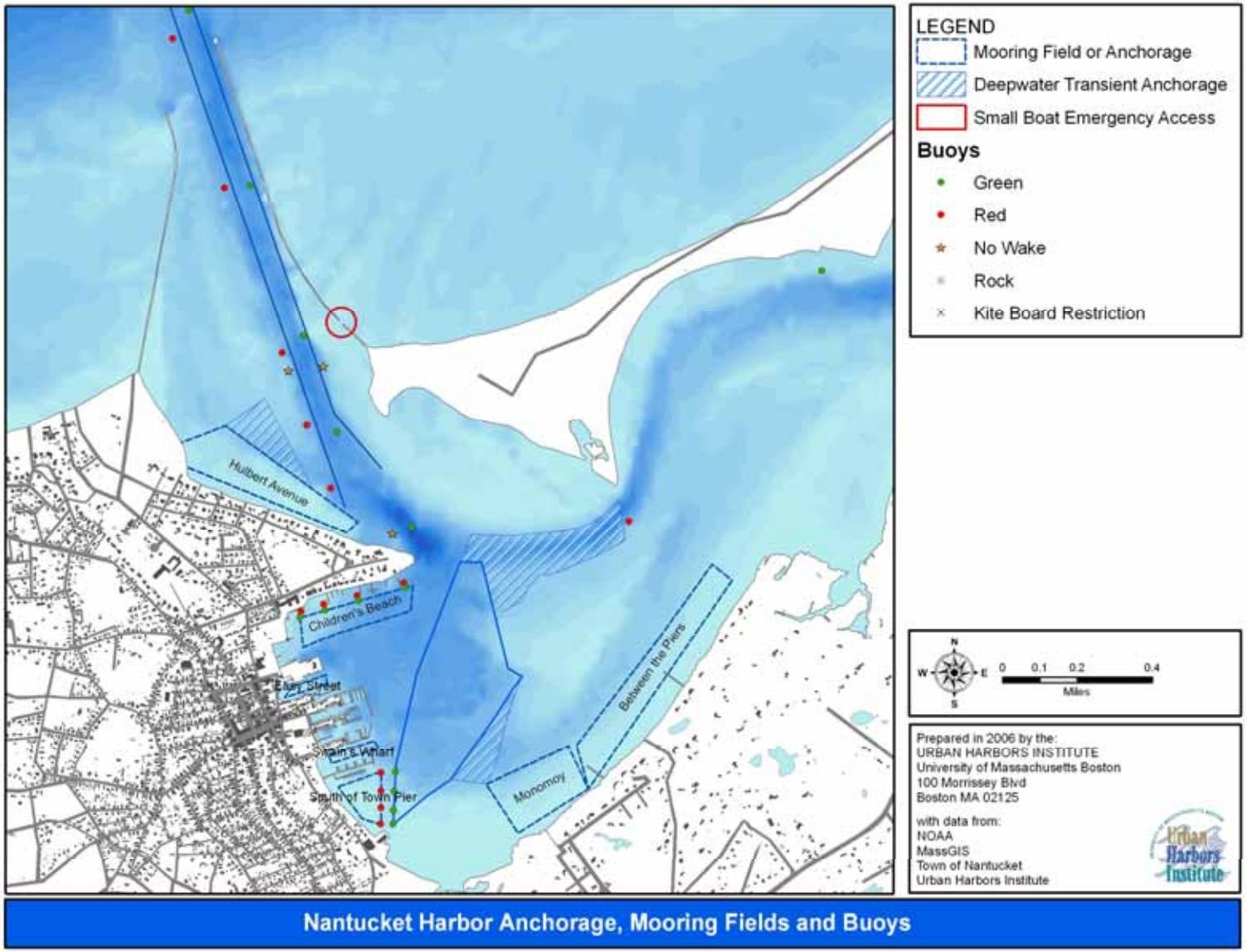


Figure 2.12 Details of Mooring Fields, General Anchorage and Buoys in Nantucket Harbor.

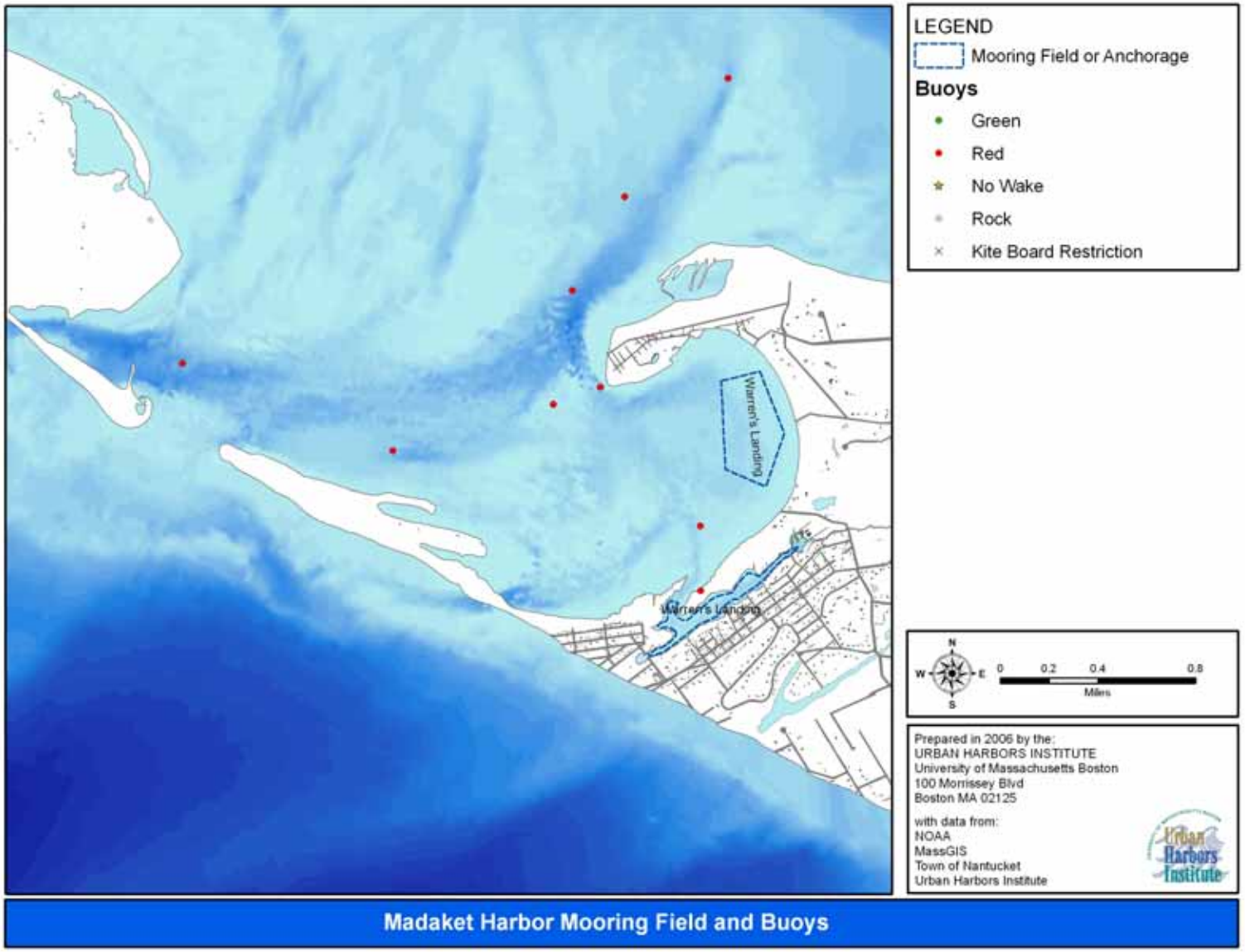


Figure 2.13 Mooring Field and Buoys in Madaket Harbor.

2.3.2 Commercial and Recreational Fishing

Nantucket's rich commercial fishing history continues today, though the once prosperous offshore finfishing industry has been dramatically reduced over the past several decades due in part to changing markets, the use of larger boats, and development of new technologies. For instance, of the total number of striped bass sold in Massachusetts during 2004, Nantucket's commercial fleet only contributed between 0.1-5.0 percent of the state's total catch (Nelson 2004).

Nantucket also supports a small commercial lobster fleet. In 2003, six fishers were issued lobster permits in Nantucket County. Those six fishers caught a total of 59,116 lbs. of lobster worth $257,746 (Dean *et al.* 2003). In 2006, there were two lobster fishers. Quahogs are also harvested commercially, but the commercial fleet for quahogs consisted of one fisher in the 2005-2006 season, and has been similarly small in size for several years.

The largest commercial fishery on Nantucket is that of the bay scallop. In addition to its historic and cultural value to the island, the commercial bay scallop fishery provides an important source of income for year-round residents living in a largely seasonal, tourism-based economy. Unfortunately, the harvestable scallop population in the area and the dollar value per pound are both inconsistent from year to year, resulting in boom and bust cycles. For example, the lucrative 2004-2005 bay scallop season landed 32,500 bushels for a total of $2,019,000. The 2005-2006 season, however, reached only 5,490 bushels. The Department of Marine and Coastal Resources currently issues commercial shellfishing permits ($250.00 for commercial scallop permits and $150.00 for all other species per year) and noncommercial permits ($25 for residents, $100 for non-residents).

The bay scallop's *(Argopecten irradians*) biology directly influences the commercial fishing industry – specifically in terms of its spawning cycle, life span, development of a growth ring, and population size. Adult bay scallops (those at least 12 months or older) typically spawn during the summer months when there is a rapid rise or fall in water temperature to around 20-22.2 ºC (Conant & Curley 2005, 2). Scallops from this summer spawn grow through the summer and fall months, reaching a shell length of between 31-51 mm in size before the water temperature drops and their shell growth slows. Over the winter months, a ridge develops at the shell's edge. This ridge is referred to as a "growth ring," and suggests that the animal has lived through a winter.

Bay scallops may also spawn in the fall, producing scallops that have a shortened growth period before the water temperature drops and shell cessation occurs. These scallops over-winter at 1-20 mm in size (Conant & Curley 2005, 2), and develop a growth ring between 1 and 20 mm from the hinge. These scallops are referred to as "nubs" or "ring at hinge" scallops. Typically, nub scallops do not spawn until they reach 21-22 months.

One of the problems facing the scallop industry on Nantucket is the fluctuation in scallop population. Given the short lifespan of these animals, the bay scallop population relies on the successful propagation of every year class. Though exact numbers are uncertain, the boom and bust cycle of the fishing industry shows that scallop populations are vulnerable to environmental changes, a lack of a fisheries management plan and the stress placed on the habitat due to increased use of the harbors.

Previous bylaws prohibited people from harvesting nub scallops with only one growth ring. This policy was developed to allow the nub scallops to live long enough to spawn. Debates about the life span of scallops, however, resulted in a new rule which allowed fishers to harvest nub scallops with only one growth ring. Specifically, scallop fishers argued that most scallops die at about 24 months, and those nubs not harvested during the second scallop season (which currently runs from November 1 to March 31) will perish before the next fishing season without ever spawning. Research, on the other hand, suggests that scallops may live up to 3 years, which would imply that, if left in the water through the first two harvesting seasons, the nubs would spawn and contribute to the overall scallop population. Furthermore, these nubs would be available for harvest during the third scalloping season. This matter of harvesting nub scallops remains an on-going debate among those involved in the scallop industry; nevertheless, the current bylaw allows the harvest of "adult" scallop, allowing any scallop with a growth ring to be harvested – including nub scallops.

The flowing figures show the scallop harvest in bushels, total number of licenses issued over the past 26 years, and average catch per license (Figures 2.14 to 2.16).

To combat the fluctuation resulting from declines in the scallop population, the town and private companies have made efforts to collect spat and grow scallops to increase the overall scallop population.

Given the large seasonal influx of tourists and the island's close proximity to productive fishing areas, it is not surprising that recreational fishing is also prevalent on the island. In addition to recreationally harvesting bay scallops, quahogs, clams, oysters, and lobster, fishing enthusiasts can surf cast or take local charter boat trips. Charter boats target a variety of species including bluefish, striped bass, bonita, shark, marlin, tuna, fluke, and cod, and many people fish for finfish recreationally in both harbors.

Currently non-commercial scallop and shellfishing licenses are issued annually and there is a strong island tradition of family scalloping. The island also has many boats that are moored within its harbors for recreational finfishing, a sport that is and has been part of the summer experience for generations of islanders.

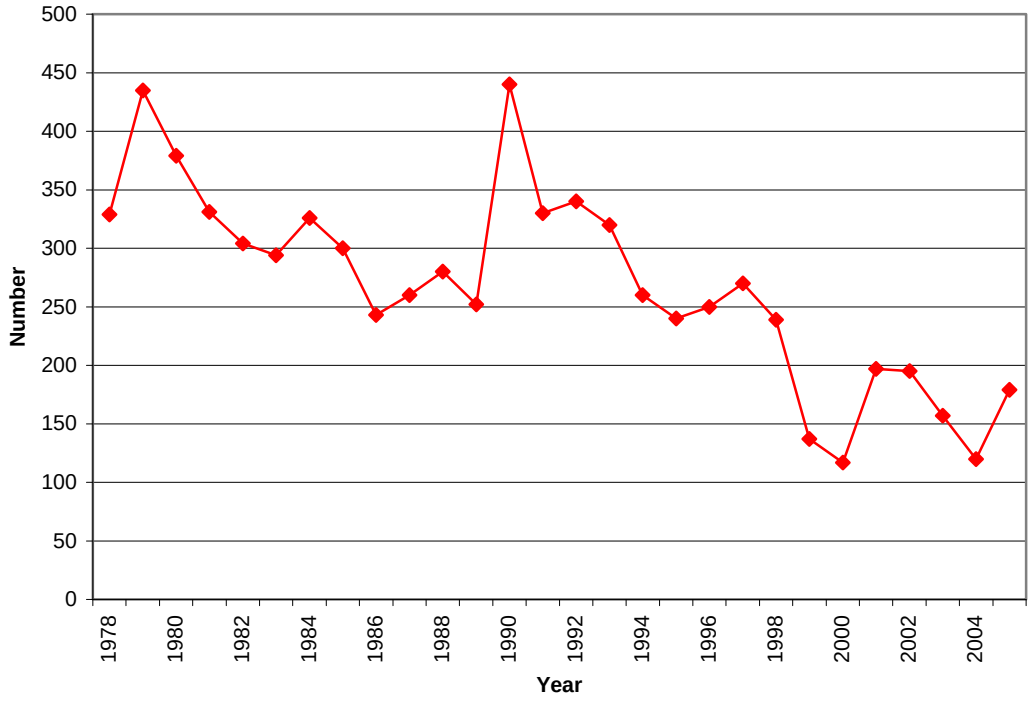


Figure 2.14 Number of Scallop Licenses Issued Between 1978 and 2004.

2.3.3 Boat Services and Haul-outs

There are six full-service facilities in Nantucket and Madaket Harbors providing boat repair and maintenance services (Table 2.6).

- Brant Point Marine: 32 Washington Street
- Glyn's Marine: 8 Arrowhead Drive
- Great Harbor Yacht Club (formerly Grey Lady Marine): 13 Arrowhead Drive
- Madaket Marine: 20 North Cambridge Street
- Nantucket Marine: 85 Pleasant Street (sales office); at 14 Sun Island Road (yard)
- Harbor Marine Repair: 12 30 Acres Road.

A number of facilities offer haul-out services, which becomes especially critical during storms, when boats need to be taken out of the water. Additionally there are a number of businesses with mobile operations

offering limited services. Many of these businesses are located inland because of the high cost of real estate along the harbors.

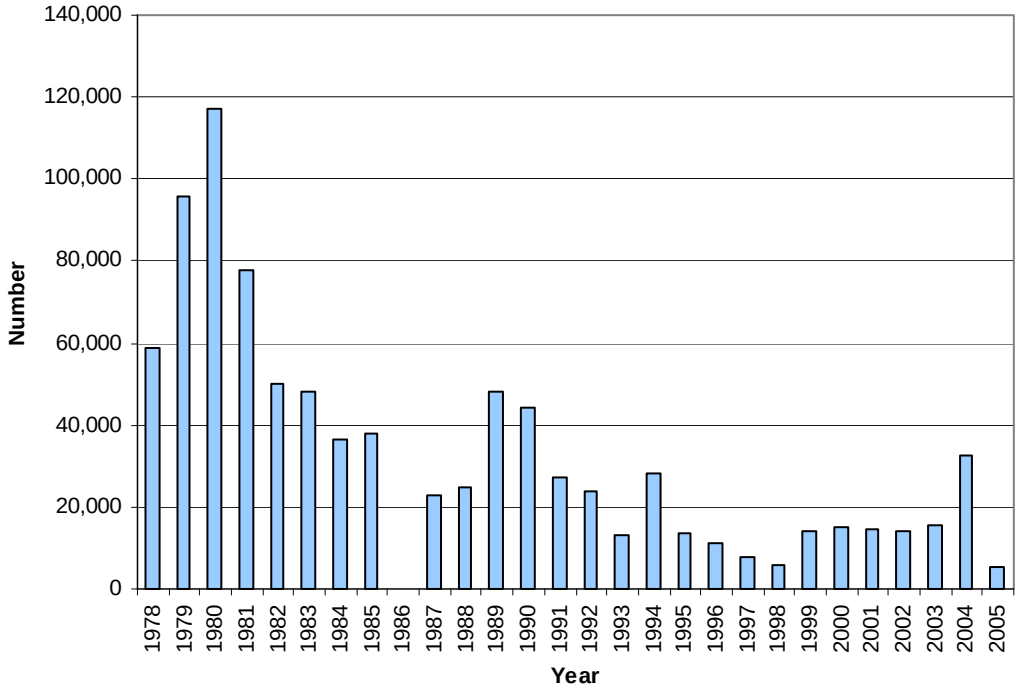


Figure 2.15 Number of Bushels of Scallops Harvested Between 1978 and 2005. No data for 1986. NOTE: In 1990, 1991 and 2003 a large number of scallops were lost due to severe storms.

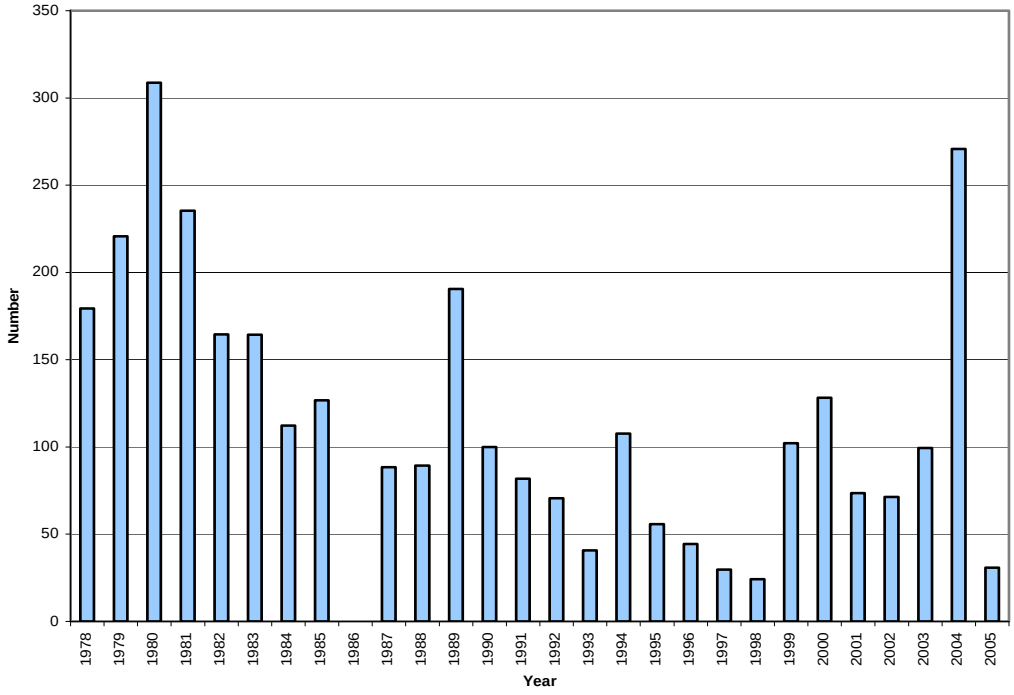


Figure 2.16 Average Number of Bushels Harvested per License between 1978 and 2005. No data for 1986. NOTE: In 1990, 1991 and 2003 a large number of scallops were lost due to severe storms.

While the current companies and services on Nantucket can adequately manage the number of boats presently in the harbors, many boat owners and service providers are concerned that the loss of a service will pose a serious threat to the island's ability to meet the needs of boaters. Of specific concern is that the loss of any of the island's haul-out infrastructure or services would compromise the island's ability to safely remove boats from the water in the event of a storm. It is therefore important that efforts are made to ensure that haul-out capabilities are maintained at a suitable level.

Table 2.6 Boat Service Facilities on Nantucket

Operator	Haul-Out Type	Dockage Capacity (# Boats)	Boat Storage Capacity (ft)	Fuel Sales	Pump-Out	Repair / Service	Launch Services	Boat Sales
Brant Point Marine	Trailer		Up to 30'	No	No	Yes	No	Yes
Glyn's Marine	Hydraulic trailer		Up to 30'	No	No	Yes	No	Yes
Great Harbor Yacht Club	Fork lift, travel lift		Unlimited	Yes	Yes	Yes	Yes	Yes
Madaket Marine	Fork lift, travel lift	100	Up to 40'	Yes	Yes	Yes	No	Yes
Nantucket Marine	Hydraulic trailer		Up to 30'	No	No	Yes	No	Yes
Harbor Marine Repair	Trailer		Up to 30'	No	No	Yes	No	Yes
Nantucket Yacht Club	Gantry system	40	Up to 26'	No	No	No	Yes	No
Town Pier	None	100	None	No	Yes	No	No	No
Boat Basin	None	240	None	Yes	Yes	No	Yes	No

(Data: Nantucket Department of Marine and Coastal Resources, 2006)

2.3.4 Carrying Capacity of the Harbors

In 2006, there were approximately 2100 boats on moorings in Nantucket and Madaket Harbors. While the harbors physically have space to accommodate more boats, the Department of Marine and Coastal Resources has placed a cap on the number of mooring permits that they issue. This is necessary to balance several different uses and factors that are influenced by the number of boats in the harbors. This current cap has been set in part to address water quality and eelgrass concerns. In addition, an increase in the number of boats would create new opportunities for user conflicts, and would overwhelm the companies that currently manage moorings and service and store boats. Finally, an increase in the number of boats in the harbors would require new sites for parking, as well as an increase in haul-out capacity in the event of a storm.

Although mooring numbers have been capped, the town has never officially defined a carrying capacity for either harbor. Generally, the carrying capacity refers to the number of boats that can be accommodated within a harbor. However, it may also need to reflect the size distribution of boats and, possibly, the ratio of sailboats to powered vessels.

There are at least three ways to determine a harbor's carrying capacity, and they often focus on maintaining desired conditions. *Physical carrying capacity* refers to the maximum number of vessels that can be accommodated in the harbor at one time without jeopardizing boating safety or efficiency. *Social carrying capacity* considers the impacts that different uses and intensities of uses have on recreational

and social experiences. *Ecological carrying capacity* refers to the *"maximum level of use, in terms of numbers and types of activities, before an unacceptable or irreversible decline in ecosystem value occurs"* (Gona, 2004). Public input during the harbor plan update process suggests that a carrying capacity for the harbors might include physical, ecological, *and* social considerations.

In Nantucket, the physical carrying capacity may largely be determined by the ability to haul vessels out of the water before a storm. It is felt that the existing infrastructure and resources are capable of handling the current number of vessels. However, this capability could be compromised if the number of boats were to increase significantly. The same might occur if the proportion of larger vessels or sailboats were to increase. The physical carrying capacity of Nantucket's harbors is also affected by the availability of boat services on the island. It is generally accepted that the existing vessel service facilities cannot accommodate additional boats and that startup costs prohibit new companies from establishing themselves on the island.

An additional physical limitation to the carrying capacity is the public access that exists. Increasing the number of boats would require additional public access sites with parking, dinghy storage etc.

There have also been some issues with conflicting uses within the harbor (e.g. sail boats capsizing and having to be towed out of the way of an incoming ferry). Some could argue that this suggests there are too many boats in the Nantucket Harbor.

The same argument could also be used when trying to determine the social carrying capacity. Any conflict of use within the harbor means that one side may feel there are too many boats in general, or too many of a certain type of boat. Determining what the optimum number of vessels or various types and sizes is a very subjective undertaking. Kayakers, wind surfers and kite boarders may not appreciate large numbers of sizeable vessels due to the wakes that they might produce. Not all power boaters appreciate sailboats due to their limited maneuverability. And some people do not like power boats due to the noise that they make. In many places the social carrying capacity for jet skis is zero and their use is prohibited or severely restricted. However, jet skiers themselves might argue more jet skis should be allowed. The social carrying capacity may also include the aesthetic value of boating in the harbors. At some point people may feel that there are too many boats. However, the level at which a person feels that there are too many boats will probably be significantly influenced by the type of boats. One large cruise ship may be too many for some people, whereas hundreds of small vessels might be acceptable.

The ecological carrying capacity is also difficult to determine and is, once again, very subjective. Nobody can deny that boats and boating have an impact on the environment. However, what is an acceptable level of impact is not so clear. Nantucket has made significant efforts to reduce the impact that boating has on the environment; but conflicting views remain. For example, the scouring of eelgrass that can be caused by moorings may be viewed as an acceptable level of impact by some boats but is of concern to other people, including scallopers.

As all these methods of determining carrying capacity are very subjective, such a determination can only be achieved by finding a compromise that all stakeholders can live with. This is what the Department of Marine and Coastal Resources has been striving to achieve with its current limit on the number of mooring permits.

In addition to the number of boats allowed in the harbors, the size of the boat also impacts natural resources, user conflicts, and the ability to safely manage activities in the harbor. Even a small number of large, commercial passenger vessels may exceed the carrying capacity of Nantucket Harbor. In 1998, in response to concerns of town officials and the business community, the Board of Selectmen issued a statement that large cruise ships have an unacceptable impact on Nantucket and should not be encouraged. Navigational safety concerns, the capacity of the current tourist infrastructure and transportation systems to handle large influxes of people arriving at once, and the importance of maintaining the quality of visitor experience, are the reasons cited for the town's policy to discourage large cruise ship visits.

2.3.5 Public Access

One of the qualities of Nantucket prized by tourists and residents alike is the fact that its location provides opportunities to enjoy the water, both physically and visually. While the town, various private land

protection organizations, and the State have been successful in acquiring and maintaining physical public access, there is still considerable interest in protecting visual access to the water, as well as increasing pedestrian access along the shoreline, and to the shoreline by foot, boat, and vehicle.

The Public Trust Doctrine provides for the public's right to access the intertidal area for the purposes of fishing, fowling, navigation, and their natural derivatives. Some Chapter 91 license conditions reinforce the Public Trust Doctrine, specifying any signage, stairs, overhead clearance, or other conditions to ensure this public right. Other Chapter 91 license conditions require an expansion of the Public Trust Doctrine, allowing for passage within the intertidal zone for *any* purpose. Some Chapter 91 license conditions even make additional requirements such as providing berthing space for a specific number of commercial fishing vessels. Over 50 Chapter 91 licenses within the planning area currently call for public access in one form or another (see Appendix 3 for details).

In addition to the public access opportunities created via Chapter 91, at least seven different groups (the Conservation Commission, the County of Nantucket, the MA Audubon Society, the Nantucket Conservation Foundation, the Nantucket Island Land Bank Commission, the Trustees of Reservations, and the Town of Nantucket) own public access sites. They each also have the ability to acquire more in the future (Figures 2.17 to 2.20).

While physical access to the shoreline is important, visual access also plays a large role in the public's ability to enjoy the water, and helps to define the character of Nantucket. For many who cannot or do not stroll the shoreline or get in the water, visual access allows them to enjoy the marine environment of Nantucket nonetheless.

Visual access and scenic views on Nantucket may be impaired by fences, buildings, and similar types of obstructions. The Conservation Commission has the authority to modify a proposed project that might impact a wetland scenic view (Nantucket Bylaws, Section 136-4. J). It also has the authority to enforce conditions it imposes on a project to protect scenic views. Similarly, the Planning Board, Zoning Board of Appeals and the Zoning Enforcement Officer in their reviews of site plans submitted for new development have the authority under the Zoning Bylaw to protect unique, natural, scenic, or historic features of the site, and minimize of the obstruction of scenic views (Section 139-23. I). The Nantucket Historic District Commission also plays a role in preserving historic elements that are part of the island's scenic views.

2.3.6 Docks and Piers

Nationwide, docks, wharves, and piers have been demonstrated to have a wide range of impacts; they may shade eelgrass and marsh grasses, impede longshore currents and sediment movement, obstruct navigation and mooring, block public access along the shore, or change the visual character of the shoreline. On the other hand, they are necessary for transportation of people, goods, and materials to an island and provide public access from the shore to the water. Nantucket is served by the Steamship Authority dock. However, the development of a commercial dock at an alternative location has been discussed. This could help alleviate truck traffic in the downtown area and could reduce the problems associated with the location of the existing dock and the need to access the main channel. An additional on-going discussion has been the relocation of the fuel off-loading facility and the tank farm away from the downtown area. The option to develop a fuel off-loading facility away from the downtown area may be challenging. The general feeling is that its physical and economic feasibility should be explored along with other alternatives to evaluate what measures reasonably can and should be taken to create a better situation than the existing one.

Historically, the voters of Nantucket have differentiated between public or commercial docks and private structures associated with residences. Presently the construction of new private docks, wharves or piers is prohibited through the town Zoning Bylaw on all of Nantucket, with the exception of the Residential Commercial District. In the latter district, a moratorium prohibiting new or expanded private docks was established through a Town Meeting vote. The moratorium was extended in April 2007 and is now scheduled to expire at the end of April 2008. In passing the zoning ordinance prohibiting these structures outside of the Residential Commercial District, the town indicated that it felt private use of the waters along the shore was detrimental to the wishes of its citizens.

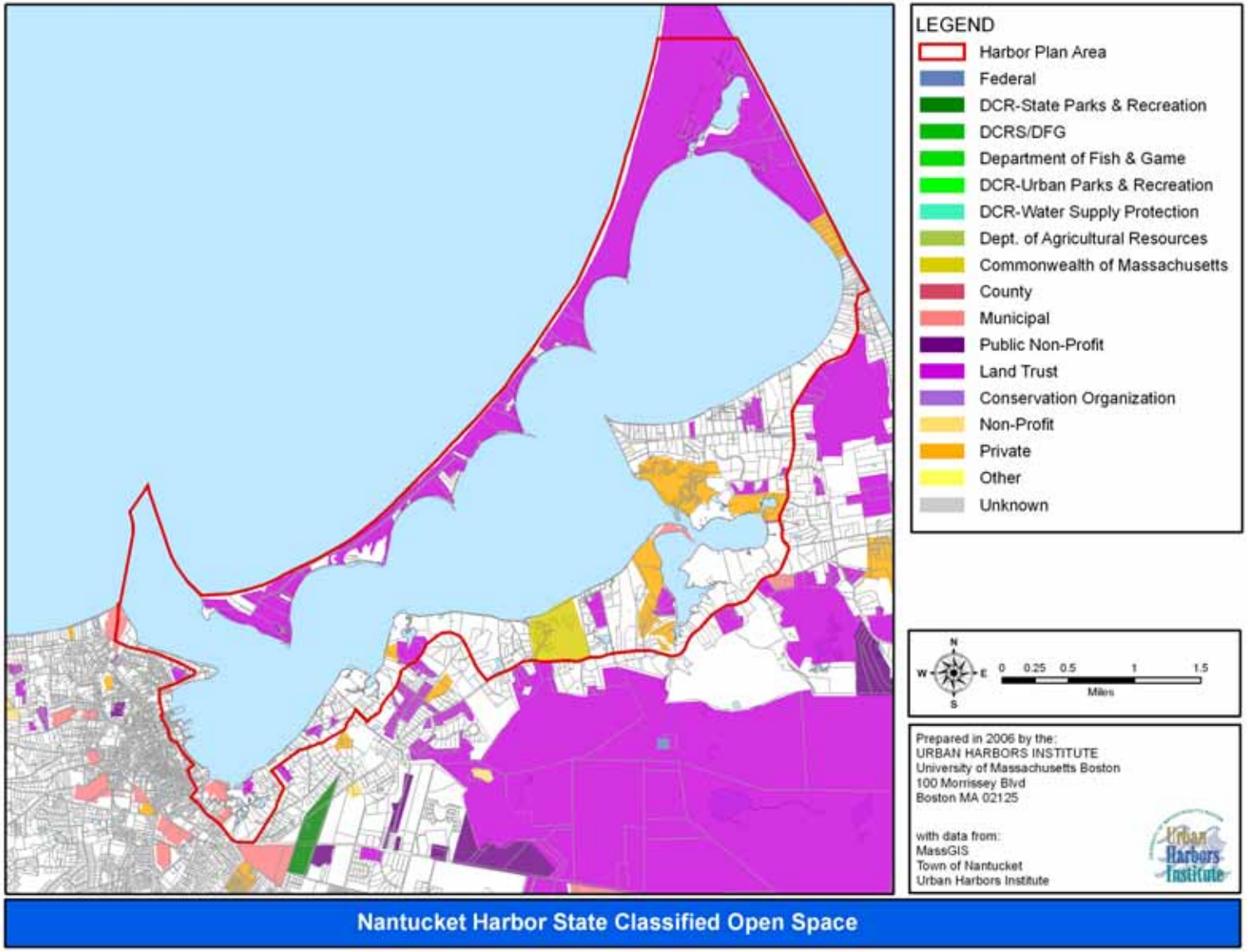


Figure 2.17 State Data showing Protected and Recreational Open Space around Nantucket Harbor.

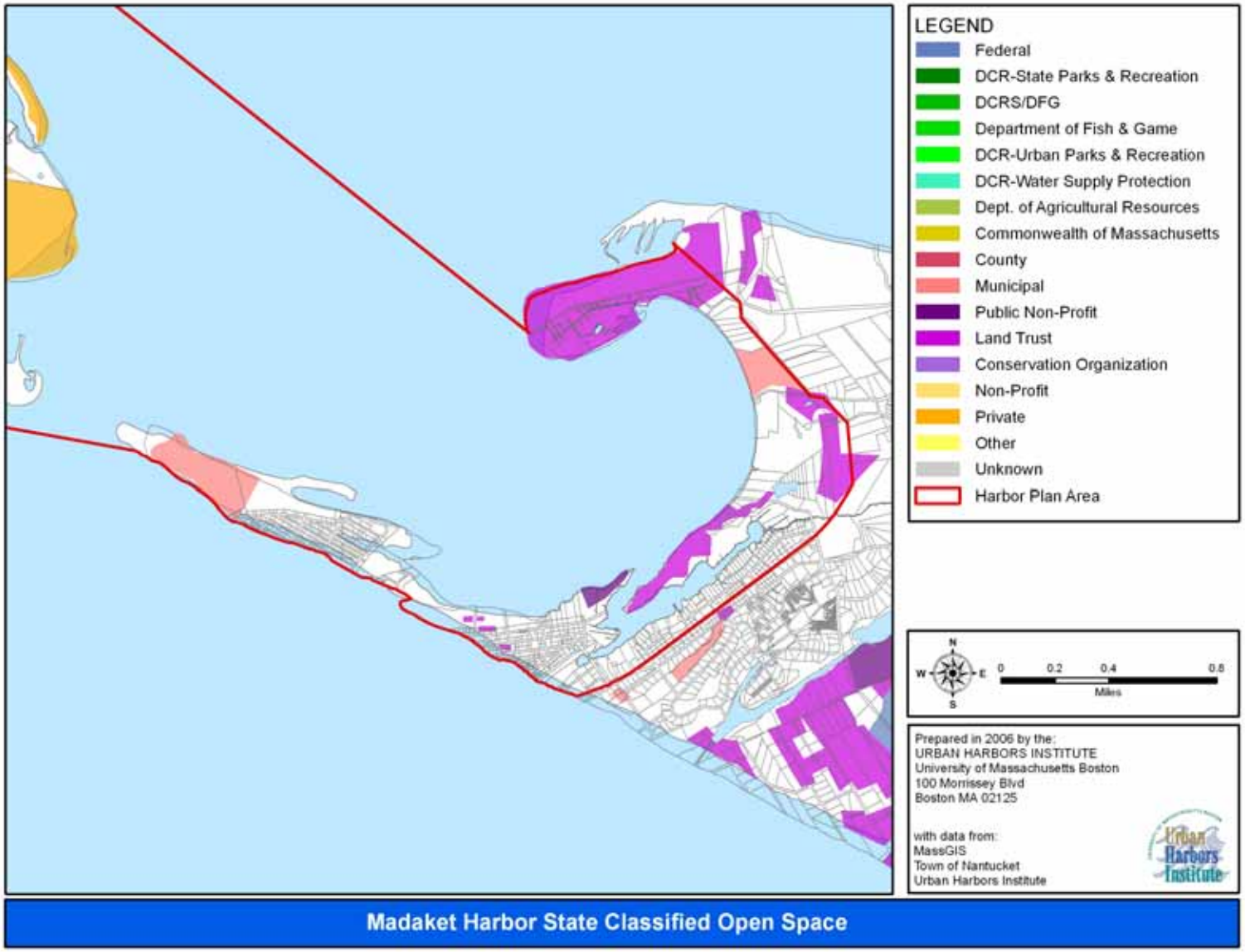


Figure 2.18 State Data showing Protected and Recreational Open Space around Madaket Harbor.

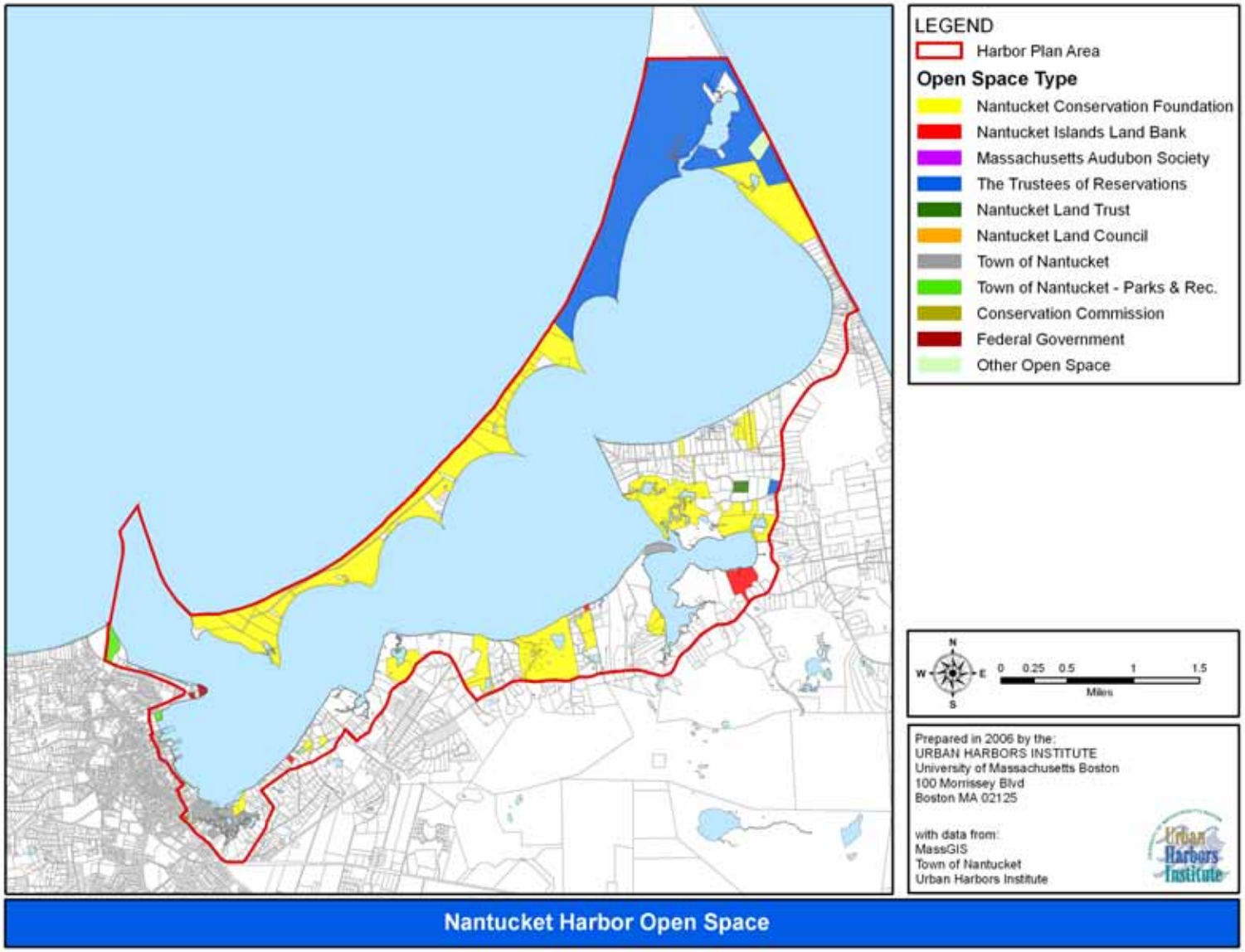


Figure 2.19 Open Space around Nantucket Harbor based on Parcel Ownership.

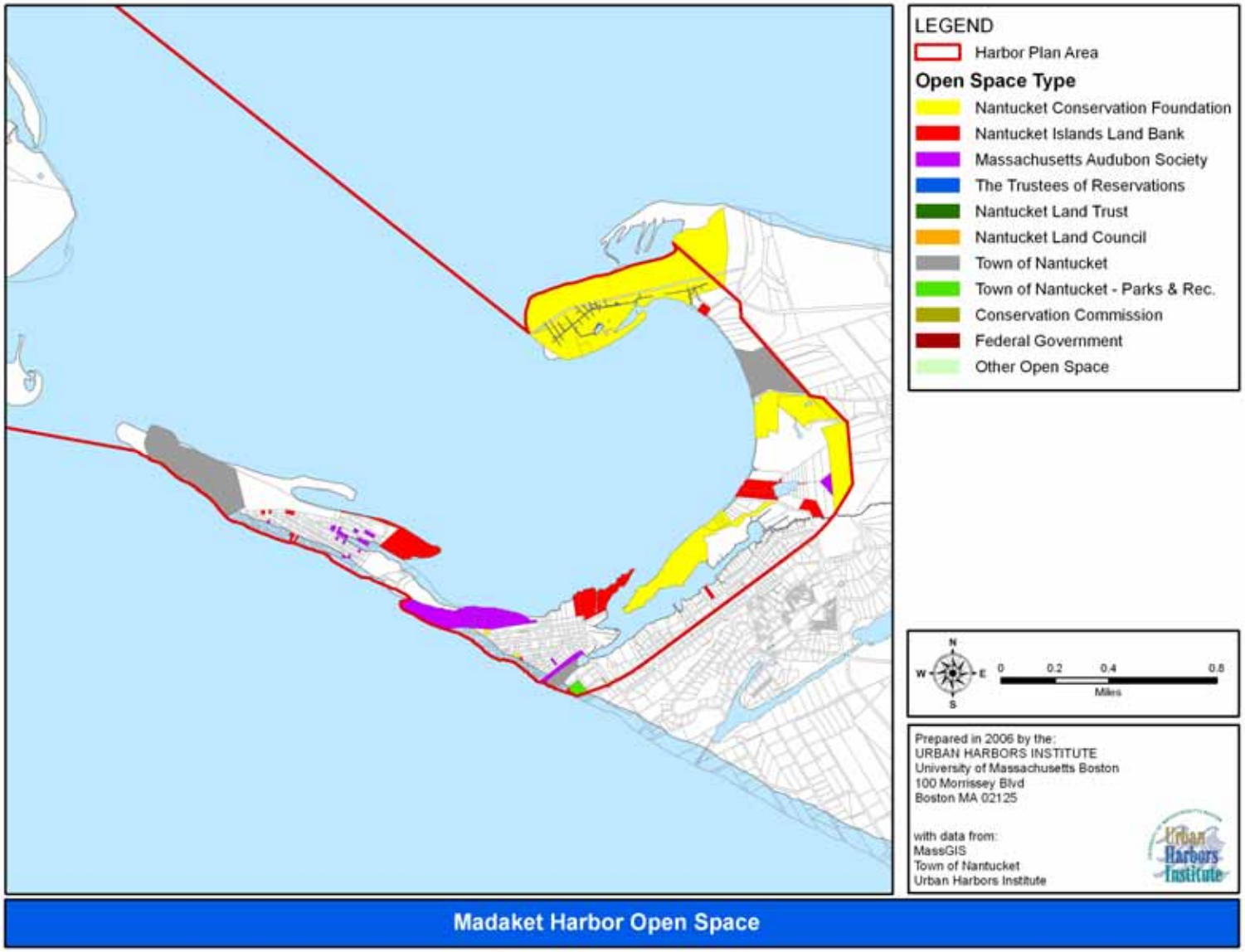


Figure 2.20 Open Space around Madaket Harbor based on Parcel Ownership.

2.3.7 Oil Spill Response

Both Nantucket and Madaket Harbors are rich in natural resources, i.e., eelgrass beds, beaches, and scallops, that are used both commercially and for recreation. A release of any petroleum-based product could have major impacts to both the natural systems of the harbors and human use of the resources.

Nantucket Harbor has several facilities that handle petroleum products at or near the shoreline, as well as thousands of vessels that use petroleum for fuel. Madaket Harbor has a smaller number of vessels and only one fueling station at the head of Hither Creek. However, because the Creek is so constricted, there is the potential for significant damage to marshes and shellfish in case of a spill there.

The current "Nantucket Coastal Oil Spill Response Plan" was written in 1991 and has not been updated since. The objectives of *"this local plan are to enable timely, efficient coordinated and effective action to minimize damage from oil spills through (1) the development and implementation of immediate oil containment or deflection practices, (2) the identification, ranking and mapping of Highly Vulnerable Areas (HVA's), (3) the listing of oil containment and removal resources, both governmental and private, available for local spill response activities."*

Much of the information in the plan is out of date. In lieu of an updated plan, an informal – but apparently quite effective – response process has evolved with coordination between the Nantucket Marine and Coastal Resources Department, the Nantucket Fire Department, and the U.S. Coast Guard Station at Brant Point. This seems to function based on personal interactions of individuals within those departments as opposed to any coordinated, pre-planned system. It is not clear how well the response actions would be coordinated and how effective they would be if these individuals were not available at the time of a spill.

The original plan was developed through the Nantucket Planning and Economic Development Commission with partial funding from CZM. It established an Oil Spill Response Planning Team that included members of several town departments, CZM, DEP, the US Coast Guard, and several citizens of the Town of Nantucket. This seems to be a reasonable model and could be used to update the plan.

The plan should include locations for the placement of suitable oil spill response equipment and would ensure that personnel with the relevant training are on hand. In addition, boats do not have to be fuelled at a fuel dock so it is important to ensure that simple clean-up materials are available such as absorbent pads or "Speedy Dry". Information should be made readily available so that boaters know where to dispose of contaminated materials.

A spill of fuel on land can quickly enter the harbors if the fuel enters a storm drain that feeds into the marine environment. Simple covers can prevent this and such covers can be deployed most effectively if those drains that feed into the harbors are clearly marked. There are additional concerns that other contaminants may enter the harbors through storm drains. These concerns are addressed in the Section 2.2.

2.3.8 Harbor Navigation and Recreation

Figures 2.11 to 2.13 provide information about Nantucket's anchorage, moorings, and location of buoys. The town is responsible for ensuring that all channels remain clear and navigable, and works to provide safe conditions for boaters.

Jetties at the entrance to the main, federal channel serve in part to guide people into and out of Nantucket Harbor. There is a small break in the east jetty that is only available for use by small boats for emergency access.

Vessel speed within most of Nantucket Harbor is limited to a speed in which vessels can maintain steerage while creating minimal wake, as regulated via Section 137-16 of the Nantucket Bylaws. Signs at the mouth of Nantucket Harbor and Polpis Harbor remind boaters that Nantucket Harbor is a no wake zone.

Sailing, one of the most popular recreational activities on Nantucket, takes place in and around Nantucket and Madaket Harbors. Small sailboat races are common between First and Second Points in Nantucket Harbor, while larger boats often race in Quaise Basin. In the sailboat racing run by Nantucket Yacht Club

on Saturday afternoons, more than 70 sailboats under 26 feet participate. Nantucket Community Sailing and Nantucket Yacht Club provide more than 1300 children and adults with on-the-water instruction each summer. Sailboats and kayaks are rented to the public from Jetties Beach by Community Sailing and kayaks are rented at the Frances Street Beach. The Nantucket High School Sailing team uses the Boat Basin for its spring training and regattas and the Nantucket Yacht Club in the fall. The instructional and sail training programs help manage the usage of the harbor and educate sailors on safe and healthy harbor practices. Recreational boating activities are important parts of summering on Nantucket for both year-round and seasonal residents, and also contribute significantly to the island economy.

Section 137-23 of the Town of Nantucket Bylaws requires that anyone wishing to rent out kiteboards as part of his/her business must first receive a permit from the Board of Selectmen. No companies hold such a permit; nevertheless, kiteboarding is a popular activity. To minimize user conflicts within the harbor, buoys are set at Pocomo Point to delineate the areas in which kiteboarding is allowed. The area off Pocomo Point is the only location within the planning area where kiteboarding is permitted.

Section 137-21 of the Town of Nantucket Bylaws states that "No person shall engage in the business of renting to the public, for public operation, any personal watercraft, jet ski, surf jet, wet bike or any motorboat…without first having obtained a license to do so from the Town of Nantucket Board of Selectmen in compliance with this section and in compliance with all federal, state or local laws pertaining to their use." To date, no companies hold such a license, and use of these watercrafts is restricted to headway speeds within the study area. In addition, waterskiing (Section 137-12 of the Town of Nantucket Bylaws) and parasailing are also prohibited within most of the study area.

2.3.9 Dredging for Navigation and Water Quality

Dredging has been conducted in Nantucket since the early 1800s when an effort was made to create a channel in Nantucket Harbor. Since the 1800s, several more dredging projects have been conducted within Nantucket, Polpis, and Madaket Harbors as outlined in Table 2.7.

Many of the dredging projects conducted to date were for the primary purpose of improving navigation. In Nantucket Harbor, however, some dredge projects were conducted in order to improve water quality by increasing water circulation.

It is important to be aware that dredging can sometimes adversely impact water quality through resuspension of contaminated sediments, release of organic matter, burial of bottom habitat, and increases in turbidity. Dredging operations in Nantucket Harbor and/or the main channel can also interfere with the activities of all harbor users, including the Steamship Authority, Hy-Line Cruises, private barge operators and the Coast Guard. While dredging may interfere with harbor operations, delays in dredging those areas could result in shoaling that similarly can impair their ability to provide necessary service. Therefore, it is critical to include the Steamship Authority, as well as other harbor users, in the preparation of any Dredge Management Plan for Nantucket Harbor and/or the main channel that may have an impact on their activities, and to include in any Dredge Management Plan the following items:

1. Criteria for determining when and if dredging is needed.
2. Specific protocols for establishing cost and benefits regarding improvement of navigation or water quality versus adverse environmental impacts.
3. Procedures for dredging operations including type and size of dredge equipment, time of day and time of year restrictions, disposal of dredge fill, and best management practices to minimize turbidity and adverse impacts. Healthy eelgrass beds should not be dredged unless absolutely necessary for emergency access of vessels such as Coast Guard cutters.
4. Procedure to determine the effectiveness of the dredging (recovery time of area, speed of silting, shoaling, or current diversion impacts to nearby areas, etc.
5. A list of priority projects and associated funding sources.
6. Accurate bathymetry charts updated yearly.

In addition, current flow and dissolved oxygen concentrations at depth should be monitored pre and post dredging to establish the efficacy of the dredging projects. A 1996 project to dredge to Head of the Harbor

and create three cuts in the mid harbor area to connect the deeper basins between Quaise, Polpis, and Head of the Harbor quickly infilled, illustrating the difficulty of establishing dredging protocols for water quality enhancement.

The town has identified the need for several new dredging projects, and has developed a timeline for these projects based on the expected volume of dredged materials and the ability to secure funding and all necessary permits. Dredging at the Easy Street Basin, the entrance to Polpis Harbor, the channel in Madaket Harbor, and from the Town Pier to Great Harbor Yacht Club are all part of the five-year dredging plan. Dredging to connect the Head of the Harbor and Quaise Basin is expected to be completed within the next ten years, along with maintenance dredging in the Federal Channel.

Dredging at the Easy Street Basin, in particular, needs to be reviewed and coordinated with the Steamship Authority to make certain that neither the dredging activities, including but not limited to the vessels and/or pipelines used, nor the boats for which the dredging is performed interfere with the unimpeded and safe navigation and berthing of the Steamship Authority's vessels.

There has been some discussion about dredging the shoaled area near the Creeks in order to re-establish habitat and increase water flow into the Creeks; however dredging in this area could be detrimental to the existing habitat and should be considered carefully. The Commonwealth of Massachusetts Department of Coastal Zone Management's Wetland Restoration Program can provide advisory and scientific assistance regarding evaluating dredging projects near fragile habitat.

Recent developments in the FY08 Federal Budget and additional funding in the Seaport Bond Bill have increased the potential for funding dredging projects in small harbors such as those within the study area of this plan. These changes increase the likelihood that the 5-year and 10-year dredging plans will be funded.

2.4 DEVELOPMENT TRENDS

2.4.1 Brief History of Nantucket Harbor Waterfront

The area of Nantucket Harbor that serves as the commercial waterfront has undergone significant physical modifications over the 300 years since Europeans first settled on the island. From the early 1700s to the late1800s, the waterfront grew out into the harbor through the building of solid wharves and filling of wetlands and intertidal area. Straight Wharf was the first wharf, built in 1723, extending into the harbor from the foot of Main Street.

Beginning in the early 1700s and continuing through the mid-1800s, whaling was the dominant industry on the island. Large whaling and trading vessels berthed at the perimeter of the five major wharves and a profusion of businesses associated with these activities crowded the wharves and adjacent land area. Cargo passed through multi-story warehouses built on the wharves, which also housed sail lofts, boat houses and spar shops. Other waterfront businesses included oil factories, ropewalks, barrel making shops, blacksmiths, and ship chandleries. In its peak whaling years, the 1820s and 30s, Nantucket was the leading whaling port in the country.

By the 1830s, the increasing scarcity of whales and the production of less expensive and more easily obtainable petroleum-based fuels (kerosene) were taking their toll on the whaling industry. Shoaling at the entry to the harbor, which had been a perennial problem, became an increasingly significant obstacle as ships got larger. On July 13 and 14, 1846, a great fire swept through the town and its waterfront destroying over 300 buildings and structures. By the 1870s, little of the former waterfront business remained and the population of the islands fell to just over 3,000, down from 10,000. Nantucket's recreational sailing tradition was well established at the turn of the century and has been part of summers on the Island for generations.

By the late 1800s the waterfront had been rebuilt and at the turn of the century, the waterfront was again an active place, with fishing vessels, cargo schooners, and catboats clustered about the wharves and moorings. Excursion vessels brought growing numbers of summer visitors from the mainland to Nantucket and several large hotels were built in town and along other parts of the shoreline. This was the beginning of the transitioning of the island's economy to one based on tourism.

Table 2.7 Dredging History in Nantucket

Year	Volume (cubic yards)	Purpose	Location
1829-1832	Dredging Attempted	Create Channel	Nantucket Harbor & Federal Channel
1905	7,039	Create Channel	Nantucket Harbor & Federal Channel
1906	187,024	Improvement	Nantucket Harbor & Federal Channel
1910	32,874	Improvement	Nantucket Harbor & Federal Channel
1911	110,841	Improvement	Nantucket Harbor & Federal Channel
1912	299,542	Improvement	Nantucket Harbor & Federal Channel
1914	162,026	Improvement	Nantucket Harbor & Federal Channel
1915	126,448	Improvement	Nantucket Harbor & Federal Channel
1925	22,000	Maintenance	Nantucket Harbor & Federal Channel
1929-1930	113,494	Maintenance	Nantucket Harbor & Federal Channel
1936	34,770	Maintenance	Nantucket Harbor & Federal Channel
1937	96,890	Maintenance	Nantucket Harbor & Federal Channel
1953	60,000	Maintenance & Create Anchor Basin	Nantucket Harbor & Federal Channel
1959	70,547	Maintenance	Nantucket Harbor & Federal Channel
1963	47,235	Maintenance	Nantucket Harbor & Federal Channel
1968	54,000	Maintenance	Nantucket Harbor & Federal Channel
1989	40,000	Maintenance	Nantucket Harbor & Federal Channel
1940	Unknown	Create Channel	Polpis Harbor Channel
1965	32,500	Maintenance	Polpis Harbor Channel
1992-1993	32,500	Maintenance	Polpis Harbor Channel
1965	30963	Create Channel and Mooring Basin	Madaket Harbor & Hither Creek
1970	43723	Maintenance	Madaket Harbor & Hither Creek
1985	34570	New Channel Location	Madaket Harbor & Hither Creek
2005	2000	Maintenance	White Elephant & Children's Beach turning basin
? - post-1993	Unknown	Maintenance	Old North Wharf

Until mid-century the waterfront was mainly occupied by fishers, shellfishers and marine-based businesses. Fishing boats and other types of vessels berthed alongside all of the wharves and scallop shanties lined Commercial Wharf, Straight Wharf, and Old South Wharf. Fishers lived in some of the small structures. All the wharves and the surrounding area supported warehouses, storage, and a mix of marine businesses. Fishers lived in some of the shanties and small cottages on the wharves.

In 1964 Sherburne Associates began a redevelopment of the waterfront. The traditional commercial and industrial operations on the harbor were replaced with a boat basin for recreational vessels surrounded by new shops and galleries (converted scallop shanties) and rental cottages on Straight and Commercial Wharfs. To create the boat basin, a wave barrier was built in the harbor waters extending from the end of Straight Wharf to the tip of Commercial Wharf with a single opening for recreational boats and for the fuel vessels going to the Island Service wharf. Berthing areas formerly used by commercial fishers and commercial vessels were rebuilt for recreational boats.

2.4.2 Land Use and Development Trends

Population

Nantucket's population is estimated to be 10,168 (US Census Bureau, 2005). This is a 6.8 percent increase over 2000 and a 40 percent increase since 1990. Statistics prepared for the Regional Transportation Plan projects the island's population to increase at a rate of 1.3 percent per year over the next two decades.

Dwelling Units

In 2004, there were 10,042 housing units on the island. Over 1,200 new dwelling units were authorized for construction in the five years between 1993 and 1997. According to the 1997 Build Out Analysis, the island has the 'potential,' under current [1998] zoning to accommodate more than 23,700 [total] dwelling units.

Land Use and Land Cover

Recent statistics prepared for the Regional Transportation Plan show that currently only 8.8 percent of the land on Nantucket is available for development in contrast with about 35 percent in this category in 1993. Sixty-one percent of the land on Nantucket is publicly owned, conservation or open space, and just over 30 percent is developed (Figure 2.21).

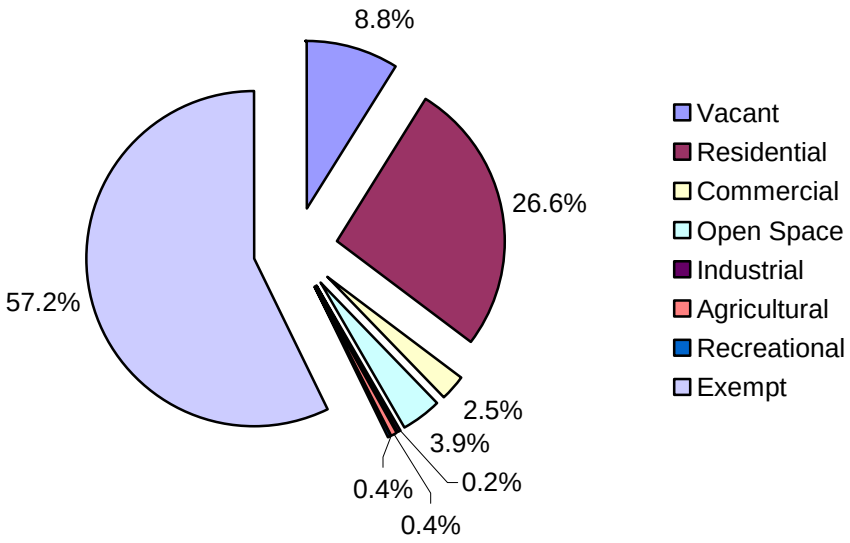


Figure 2.21 Land Use, 2005. (Regional Transportation Plan Update).

The data depicted in Figures 2.22 and 2.23 was prepared for the State by interpretation of aerial photographs. The most recent data available is from 1999. While the data is frequently described as

"land use" data, it is more accurate to think of it as the predominant land cover. Table 2.8 shows the same data for each of the two harbor planning areas. As can be seen clearly, the vast majority of the land in the harbor planning areas is undeveloped (open land, forest, wetlands). Residential is the next most prevalent land use. Commercial and industrial uses total just over one percent of the land in the Nantucket Harbor planning area.

2.4.3 Transportation

Persons traveling between Nantucket and the mainland have two commercial transportation options: ferries and aircraft. Beyond considerations of cost, availability and schedule, weather is often a determining factor in choice of transportation. If it is foggy, the boats will run, but not aircraft. If the seas are very choppy, the high speed boats do not run. Aircraft will fly, generally, if winds are under 30 knots. A combination of fog and high winds may mean no travel. If the harbor and sound freeze, aircraft is the only option.

Demographic and land use changes are also reflected in the transportation trends over the years. A strong national economy has fueled tremendous growth in the construction of expensive second homes on Nantucket over the past couple of decades. The market for rentals of vacation homes has increased while the number of lodging establishments has diminished. The introduction of the fast boat has increased the numbers of day visitors to the island, and their profile has changed. Air transportation has increase dramatically over the past two decades.

Table 2.8 Percent of Land Area within the Nantucket and Madaket Harbor Planning Areas by "Land Cover" Category (1999).

Land Use Type	Nantucket	Madaket	Both
Industrial	0.51	0.00	0.31
Transportation	0.09	0.00	0.05
Commercial	0.44	0.00	0.27
Residential (<1/4 acre lots)	0.33	0.57	0.42
Residential (1/4-1/2 acre lots)	0.22	1.95	0.90
Residential (>1/2 acre lots)	10.48	4.51	8.13
Urban Open	0.21	0.00	0.13
Participation Recreation	0.01	0.00	0.00
Water-Based Recreation	8.74	10.36	9.38
Pasture	0.01	0.00	0.01
Cropland	0.70	0.00	0.42
Open Land	50.86	50.63	50.77
Forest	10.46	12.64	11.32
Woody Perennial	0.05	0.00	0.03
Freshwater Wetland	0.79	0.00	0.48
Salt Wetland	16.03	8.99	13.26
No Data	0.06	10.35	4.11

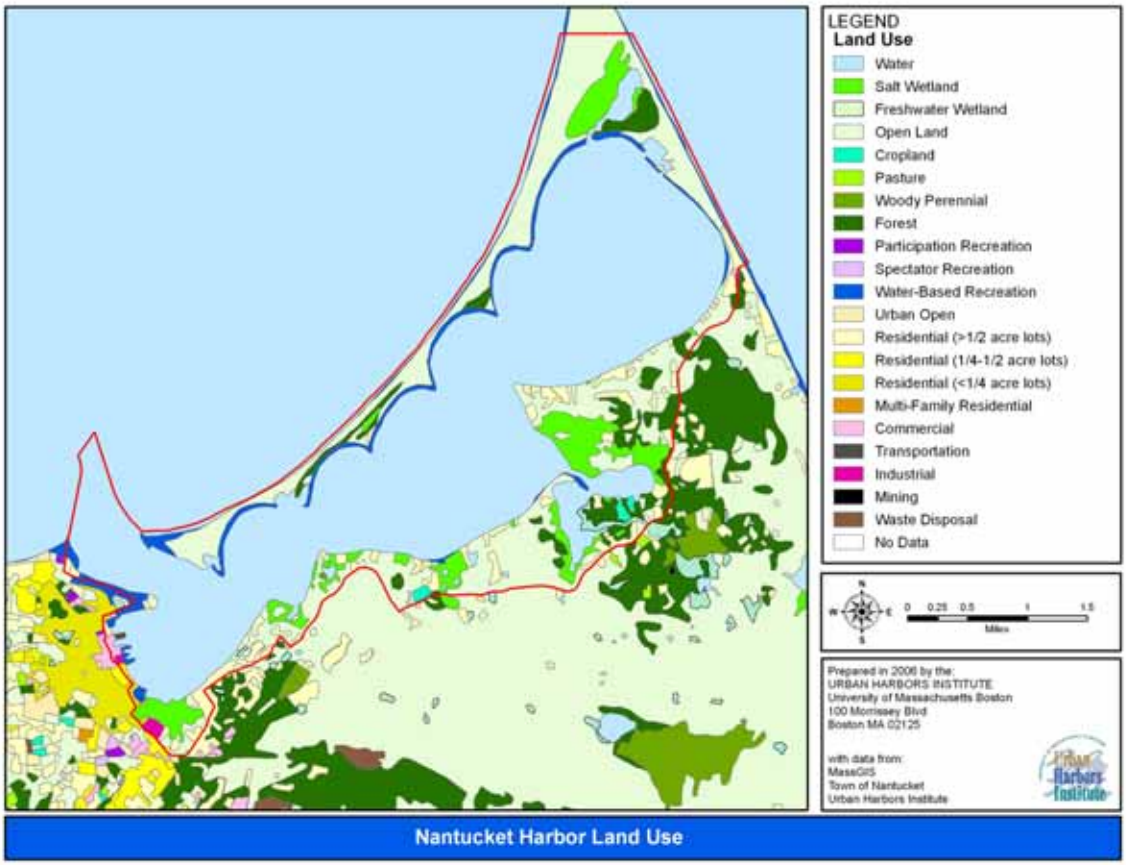


Figure 2.22 Land Use (or "Land Cover") around Nantucket Harbor.

Waterborne Passenger and Cargo Transportation

Three companies provide waterborne passenger transportation to and from Nantucket: the Steamship Authority; Hy-Line Cruises; and Freedom Cruises. Ridership includes year-round residents of Nantucket, a large seasonal population, tourists, and visitors.

The Steamship Authority provides services between its Pleasant Street terminal in Hyannis and the Steamboat Wharf in Nantucket. *"The Woods Hole, Martha's Vineyard and Nantucket Steamship Authority is a public instrumentality created by the Massachusetts legislature to provide for adequate transportation of persons and necessaries of life for the islands of Nantucket and Martha's Vineyard. The Authority's statutory mission is to serve as the 'Lifeline to the islands' and it is the only ferry service for the islands that carries both passengers and vehicles, including commercial freight trucks."* The enabling act also gives the Steamship Authority power to regulate the transport of freight by water by private operators between the Massachusetts mainland and the islands and to regulate vessels certified by the U.S. Coast Guard to carry in excess of forty passengers in their operation between the Massachusetts mainland and the Islands.

The Authority operates several vessels carrying passengers, automobiles and freight trucks between Hyannis and Nantucket (Table 2.9).

Hy-Line Cruises owns several boats serving Nantucket between its Ocean Street Dock in Hyannis and Straight Wharf in Nantucket.

Brant Point	seasonal (May through October)
Great Point	800 passengers
Grey Lady	year round, five (six in the summer) roundtrips per day

Hy-Line also operates an inter-island service between Nantucket and Martha's Vineyard.

Freedom Cruises operates a seasonal passenger ferry with up to three roundtrips per day between Saquatucket Harbor, Harwich Port and Straight Wharf on Nantucket.

In recent years, the total number of passengers traveling to and from Nantucket has been decreasing. Ridership during the summer season of June, July and August has followed this decreasing trend (Figures 2.24 and 2.25) but, since 2003, ridership has increased during the winter months of December, January and February (Figure 2.26). Note: All data acquired through the Nantucket Planning and Economic Development Commission.

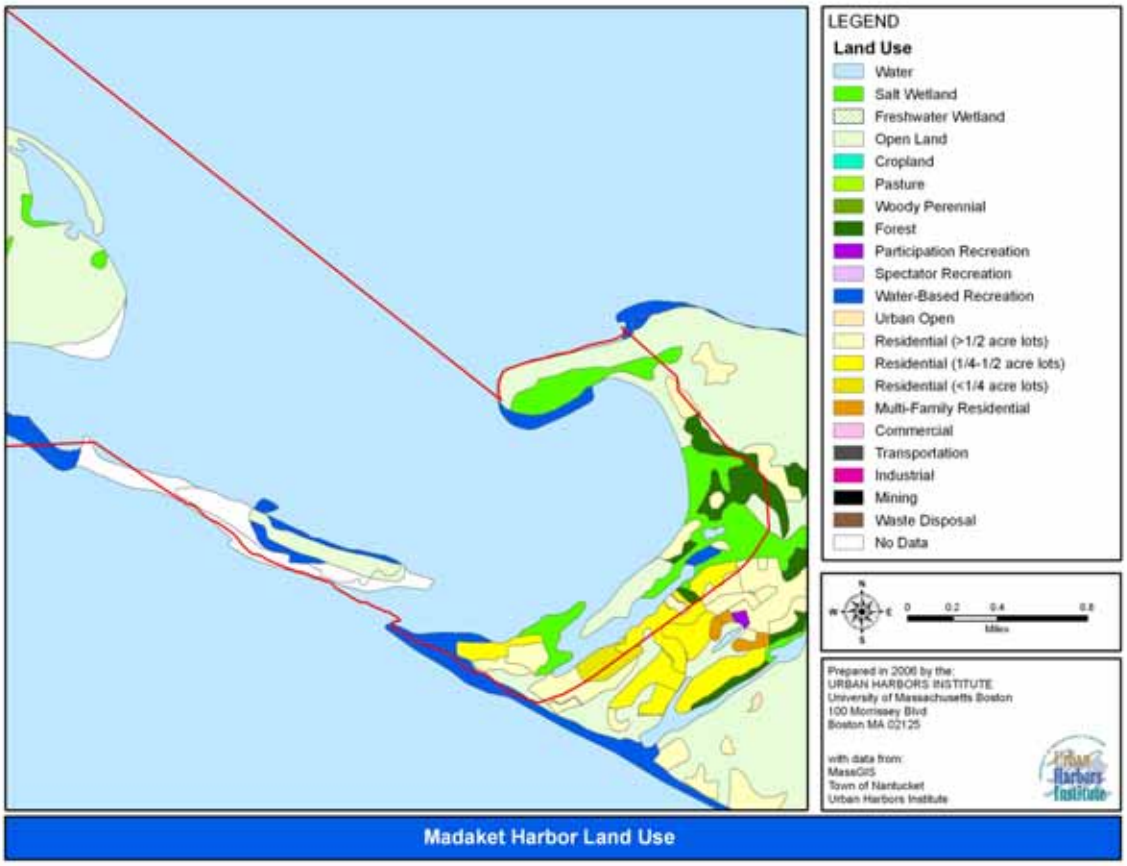


Figure 2.23 Land Use (or "Land Cover") around Madaket Harbor.

Table 2.9 Commercial Vessels Servicing Nantucket.

Vessel	LOA	Passengers / Freight	Journey Time
Iyanough	154'	393-passengers	high-speed catamaran; one hour
Eagle		freight, autos, and passengers	2 hours, 15 minutes
Nantucket	230'	freight	summers; 2 hours, 15 minutes
Gay Head	235'	freight and passengers	2 hours, 15 minutes
Sankaty	197'	freight and 300 passengers	2 hours, 15 minutes

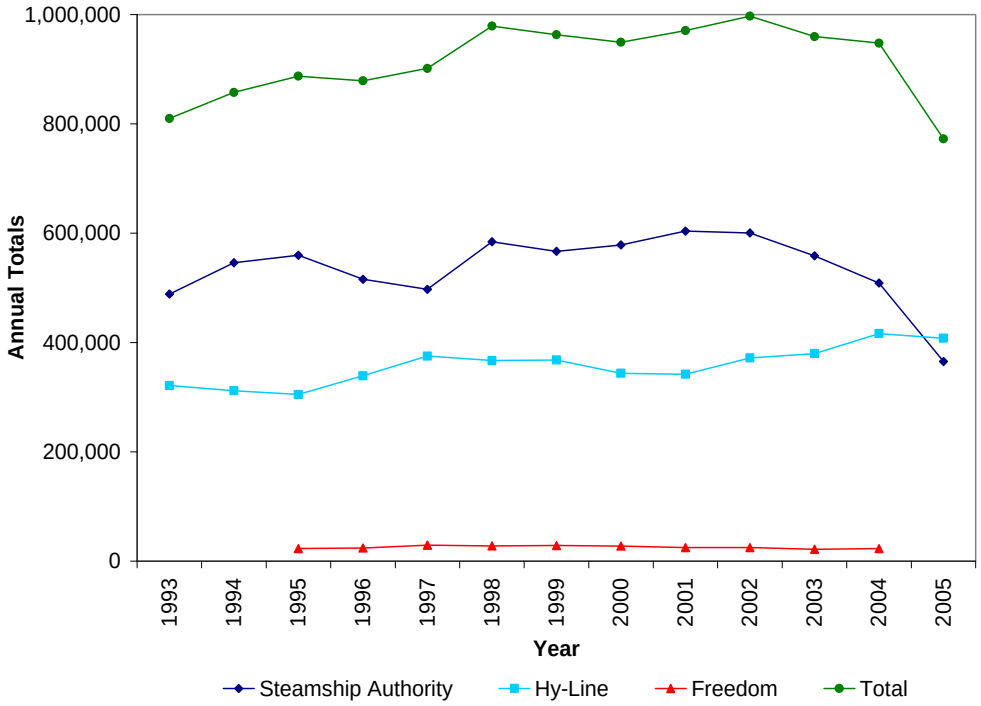


Figure 2.24 Total Passengers by Ferry Service to and from Nantucket, 1993-2005.

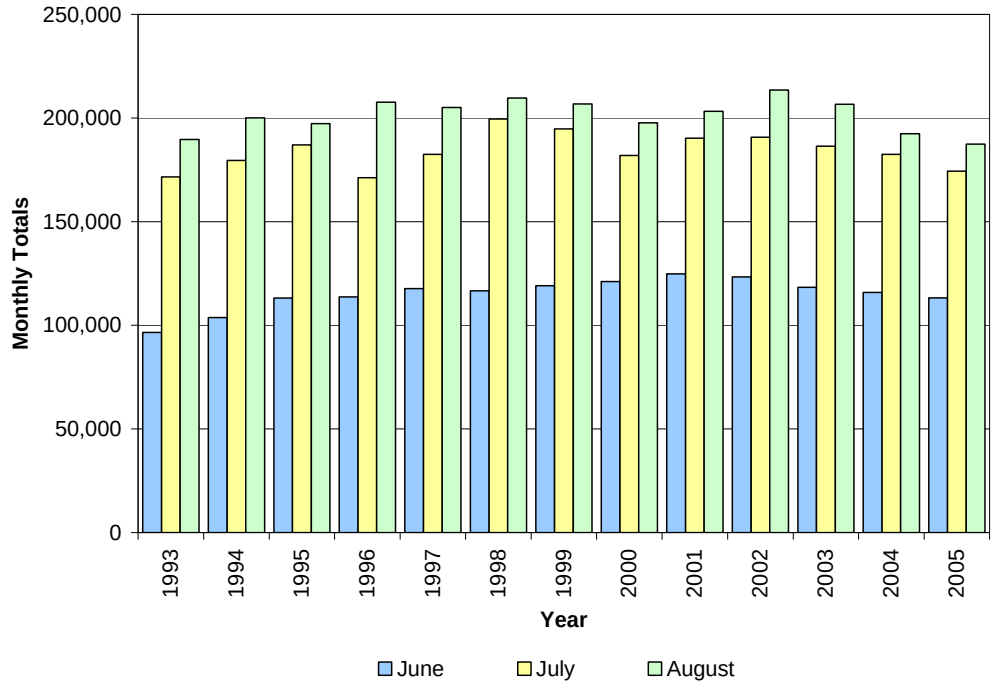


Figure 2.25 Total Passengers to and from Nantucket during the Summer Months, 1993-2005 (all ferry services).

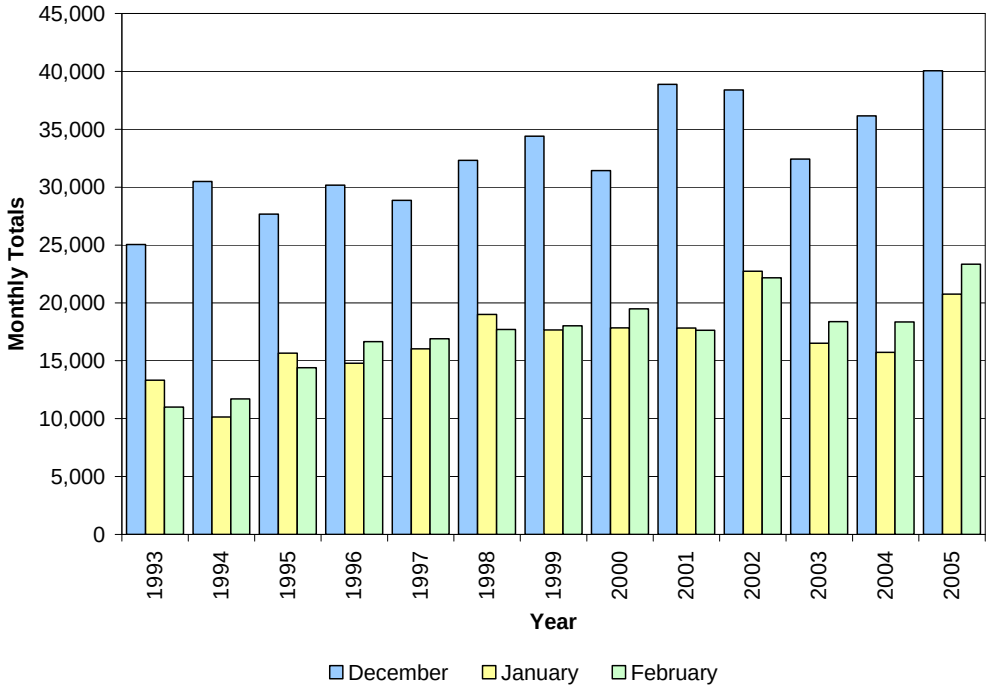


Figure 2.26 Total Passengers to and from Nantucket during the Winter Months, 1993-2005 (all ferry services).

The total number of cars transported to and from Nantucket each year has also decreased annually since 2002. Two reasons given for the drop in passenger/car traffic are the sluggish economy during this period and higher gasoline prices, which *"gives families less discretionary income to take trips to the Vineyard and Nantucket."* See Figure 2.27. However, another explanation for the apparent decrease is that it is becoming increasingly common for island residents to keep a car on the mainland, while seasonal residents keep a car on-island year-round.

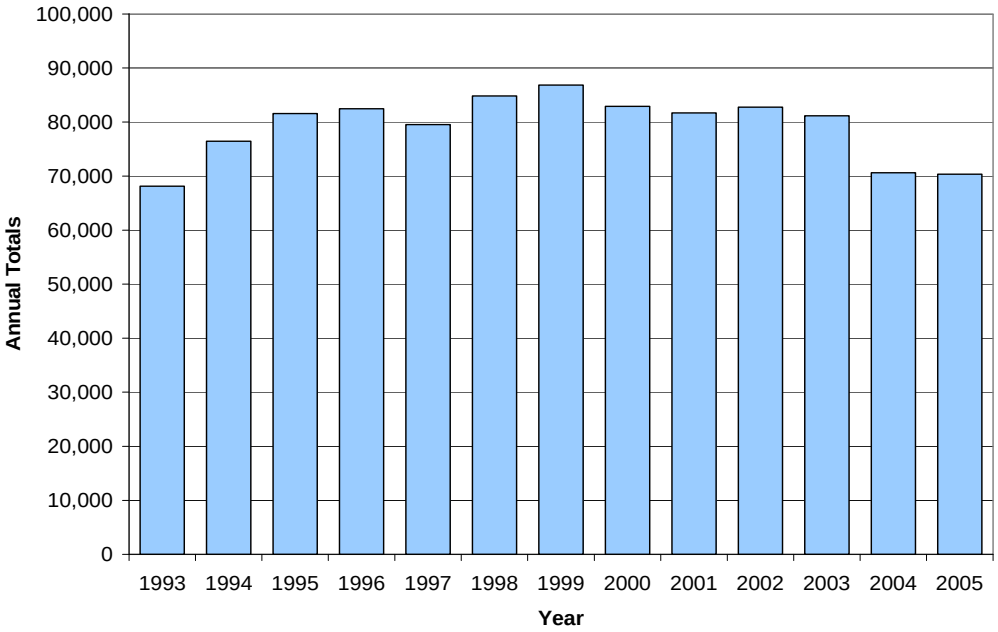


Figure 2.27 Total Cars to and from Nantucket by Year from 1993 to 2005.

The total number of trucks traveling to and from Nantucket each year has generally been increasing since 1993. Increased truck traffic is mainly from trucks less than 20 feet long. Although a slight decrease appears between 2000 and 2003, annual totals have increased sharply since then. The main reason given for the rise in truck traffic is the large number smaller trucks used by tradesmen traveling to the island (Figure 2.28).

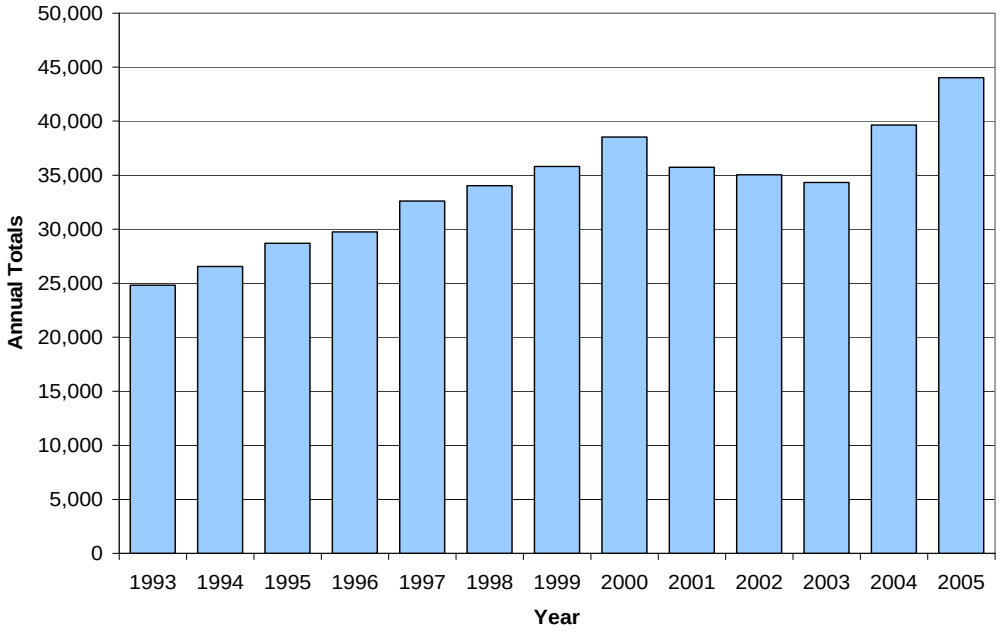


Figure 2.28 Total Trucks to and from Nantucket by Year from 1993 to 2005.

Air Transportation

Total airport operations, which refer to either takeoffs or landings peaked in 2000 and declined each year through 2004 as a result of the softening economy following 9/11. Operations increased in 2005, a trend that continued in 2006. Air taxi operations represent over three-quarters of the takeoffs and landings, followed by general aviation. Enplanements (number of revenue passengers departing Nantucket) also peaked in 2000 and declined annually through 2003. Beginning in 2004, enplanements have been increasing steadily, but are still well below the peak year (Figure 2.29 and 2.30).

2.5 MANAGEMENT AND REGULATORY AUTHORITIES

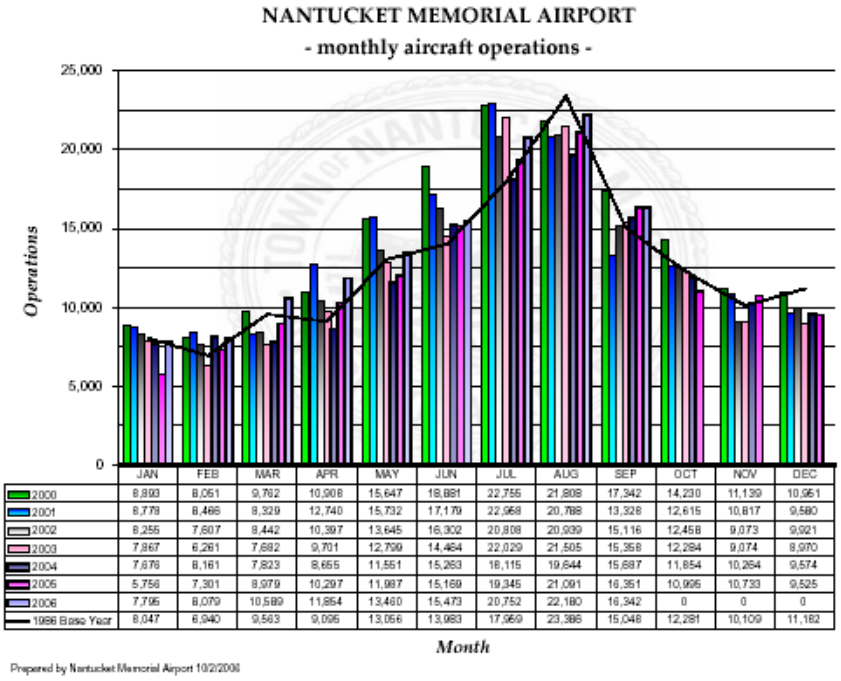
2.5.1 State and Municipal Marine Boundaries

Under the provisions of the Submerged Lands Act (SLA), the federal government conveyed to the states submerged lands three miles seaward of the coastline. Accordingly, the marine boundary of the Commonwealth of Massachusetts extends three nautical miles from the ordinary low water mark. Under Massachusetts law, *"[t]he seaward boundary of cities and towns bordering on the open sea shall coincide with the marine boundary of the Commonwealth."* Since Nantucket is not contiguous to another municipality the town's seaward boundary is coincidental with the marine boundary of the Commonwealth extending a full three miles seaward of the town's ordinary low water mark in almost every direction.

Property and Sovereignty Interests in State Offshore Areas

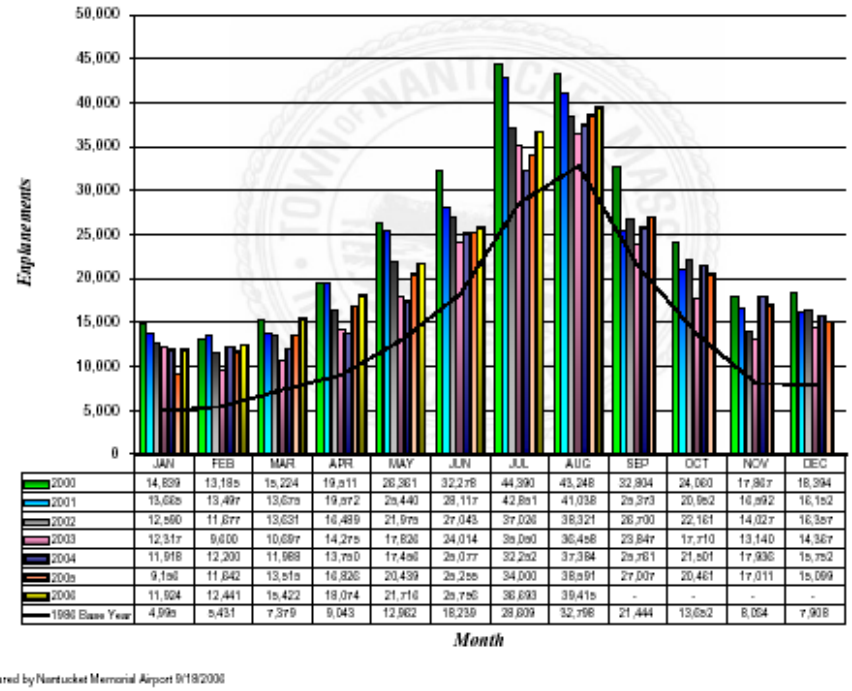
While the boundaries of Nantucket reach three nautical miles offshore, the submerged lands and natural resources within Nantucket's marine boundary, in general, belong to the Commonwealth pursuant to the terms of the Submerged Lands Act (see Submerged Lands Act, 43 U.S.C. §§ 1311, 1312.). The conveyance to the states under the SLA included the natural resources within the three mile limit, but did *"not include water power, or the use of water for the production of energy"* (see Submerged Lands Act, 43

U.S.C. §1301(e)). Further, the federal government reserved its authority to regulate navigation and other activities that are governed by the Commerce Clause of the US Constitution.



	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2000	8,893	8,061	9,762	10,908	15,647	18,881	22,755	21,808	17,342	14,230	11,139	10,951
2001	8,779	8,486	8,329	12,740	15,732	17,179	22,958	20,788	13,328	12,615	10,817	9,580
2002	8,255	7,607	8,442	10,397	13,645	16,302	20,808	20,939	15,116	12,458	9,073	9,921
2003	7,867	6,261	7,682	9,701	12,709	14,464	22,029	21,505	15,358	12,284	9,074	8,970
2004	7,678	8,161	7,823	8,655	11,551	15,263	18,115	19,644	15,687	11,854	10,264	9,574
2005	5,756	7,301	8,979	10,297	11,987	15,169	19,345	21,091	16,351	10,995	10,733	9,525
2006	7,795	8,079	10,589	11,854	13,460	15,473	20,752	22,180	16,342	0	0	0
1998 Base Year	8,047	6,940	9,563	9,095	13,056	13,983	17,969	23,386	15,048	12,281	10,109	11,182

Figure 2.29 Nantucket Memorial Airport, Monthly Aircraft Operations (numbers of takeoffs and landings).



	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2000	14,839	13,185	15,224	19,511	26,361	32,278	44,390	43,248	32,804	24,060	17,987	18,394
2001	13,685	13,497	13,673	19,972	25,440	28,117	42,891	41,038	25,373	20,962	16,992	16,152
2002	12,560	11,677	13,631	16,489	21,975	27,043	37,026	38,321	26,700	22,161	14,027	16,357
2003	12,311	9,600	10,697	14,275	17,826	24,014	35,050	36,458	23,847	17,710	13,140	14,367
2004	11,918	12,200	11,988	13,750	17,456	25,077	32,252	37,384	25,761	21,501	17,936	15,752
2005	9,150	11,642	13,515	16,826	20,439	25,255	34,000	38,591	27,007	20,461	17,011	15,099
2006	11,924	12,441	15,422	18,074	21,716	25,756	36,693	39,415	-	-	-	-
1998 Base Year	4,995	5,451	7,379	9,043	12,962	18,239	28,809	32,798	21,444	13,652	8,054	7,908

Figure 2.30 Nantucket Memorial Airport, Monthly Passenger Enplanements.

2.5.2 Regulatory Jurisdictions

Chapter 91 and the Massachusetts Waterways Regulations

Massachusetts' principal waterfront regulatory program in tidelands and other waterways is Massachusetts G.L. Chapter 91 (Public Waterways Act, 1866). Chapter 91 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 (DEP).

Chapter 91 applies in tidelands, great ponds, and along certain rivers and streams. Tidelands refer to all land presently or formerly beneath the waters of the ocean, including lands that are always submerged as well as those in the intertidal area, i.e., below the mean high water mark. This area is governed by a concept in property law known as 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 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 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, so that any filled areas, moving inland to the point of the historic high tide line, are subject to Chapter 91 jurisdiction. Figures 2.31 and 2.32 show the approximate historic high and low water lines for the downtown area and for Madaket. As these lines have not been verified, they should only be used for planning purposes.

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).

The benefits that the Chapter 91 program can afford a town are best captured in the five basic objectives of the program:

(1) ensure the waterfront is used primarily for water-dependent purposes;

(2) provide public access;

(3) facilitate other state programs related to shoreline use and conservation;

(4) strengthen local controls and encourage harbor planning; and

(5) ensure accountability to present and future public interests.

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. The Massachusetts Office of Coastal Zone Management (CZM) is completing a project to map the historic shoreline of the Commonwealth, including Nantucket Harbor. The historic high water lines on these maps may be used by DEP and waterfront property owners as presumptive lines of Chapter 91 jurisdiction. Ultimately, jurisdiction will be determined by DEP on a property-by-property basis at the time of licensing.

Special Acts of the Legislature

Prior to 1866 when Chapter 91 was first promulgated, the Massachusetts legislature issued Special Acts to transfer title of a property from the Commonwealth to a waterfront landowner and to enable particular types of development to take place on the property as specified in the Act. The rights granted within a Special Act are transferred to each successor at the time of sale, but they do not exempt a property owner from Chapter 91 review for a new or modified use of the property.

Municipal Harbor Plans

In September 1990 the Secretary of Environmental Affairs adopted regulations for "Review and Approval of Municipal Harbor Plans" (301 CMR 23.00). The regulations established a voluntary procedure by which municipalities could obtain state approval of a municipal harbor plan.

A municipal harbor plan is defined as a document setting forth the community's objectives, standards, and policies for guiding public and private use of the land and water areas of a harbor and an implementation program to achieve the desired plan.

A plan prepared and approved in accordance with these regulations serves to guide EOEA agency actions, including the regulatory decisions of the MA Department of Environmental Protection under M.G.L. Chapter 91. When an approved harbor plan exists, any project seeking a Chapter 91 permit from DEP must be in conformance with that plan. In essence, a municipality with an approved harbor plan utilizes the state regulatory authority to help implement its own objectives.

Through a locally-prepared harbor plan, a municipality has the ability to "substitute" local standards for certain state Chapter 91 requirements such as building height limits and to "amplify" certain discretionary state standards.

The standards that can be substituted by an approved harbor plan apply only to nonwater-dependent uses. Section 9.51(3) establishes minimum standards and limitations on building height, site coverage, waterfront setback, and encroachment into flowed tidelands. Section 9.53(2)(b)-(c) pertains to the provision of interior and exterior public space in a project. Section 9.52(1)(b)(1) is a requirement for a waterfront walkway with a minimum width of 10 feet to be included with any non water-dependent use. In those instances where non water-dependent uses are allowed, this public access requirement exists, as does the ability to modify it through a municipal harbor plan.

The provisions of a municipal harbor plan can also be effective in providing guidance for DEP in applying the numerous *discretionary* requirements of the Chapter 91 regulations to projects under review.

Nantucket Zoning Bylaw

Municipal Zoning Authority in Massachusetts

Massachusetts law (The Zoning Act, M.G.L. c.40A *et seq.*) allows cities and towns to zone via bylaws and ordinances to *"[r]egulate use of land, buildings, and structures to the full extent of the independent constitutional powers of cities and towns to protect the health, safety and general welfare of their present and future inhabitants."*

Under The Zoning Act, a municipality may restrict, prohibit, permit or regulate, among other things:

- uses of land, including wetlands and lands deemed subject to seasonal or periodic flooding;
- uses of bodies of water, including water courses;
- noxious uses;
- areas and dimensions of land and bodies of water to be occupied or unoccupied by uses and structures, courts, yards and open spaces;
- accessory facilities and uses, such as vehicle parking and loading, landscaping and open space; and
- the development of the natural, scenic and aesthetic qualities of the community.

Nantucket's Zoning Bylaw is Chapter 139 of the Code of the Town of Nantucket. The Bylaw establishes 15 Limited Use, Residential and Commercial districts, four Special districts, and eight Overlay districts covering all of the island. These districts are depicted on the Zoning Map of Nantucket. Regulations for each district govern three basic factors: the allowable uses of the land and any buildings on it; the allowable bulk (size and shape) of buildings; and the overall density of development, measured in square footage or housing units per unit of land area.

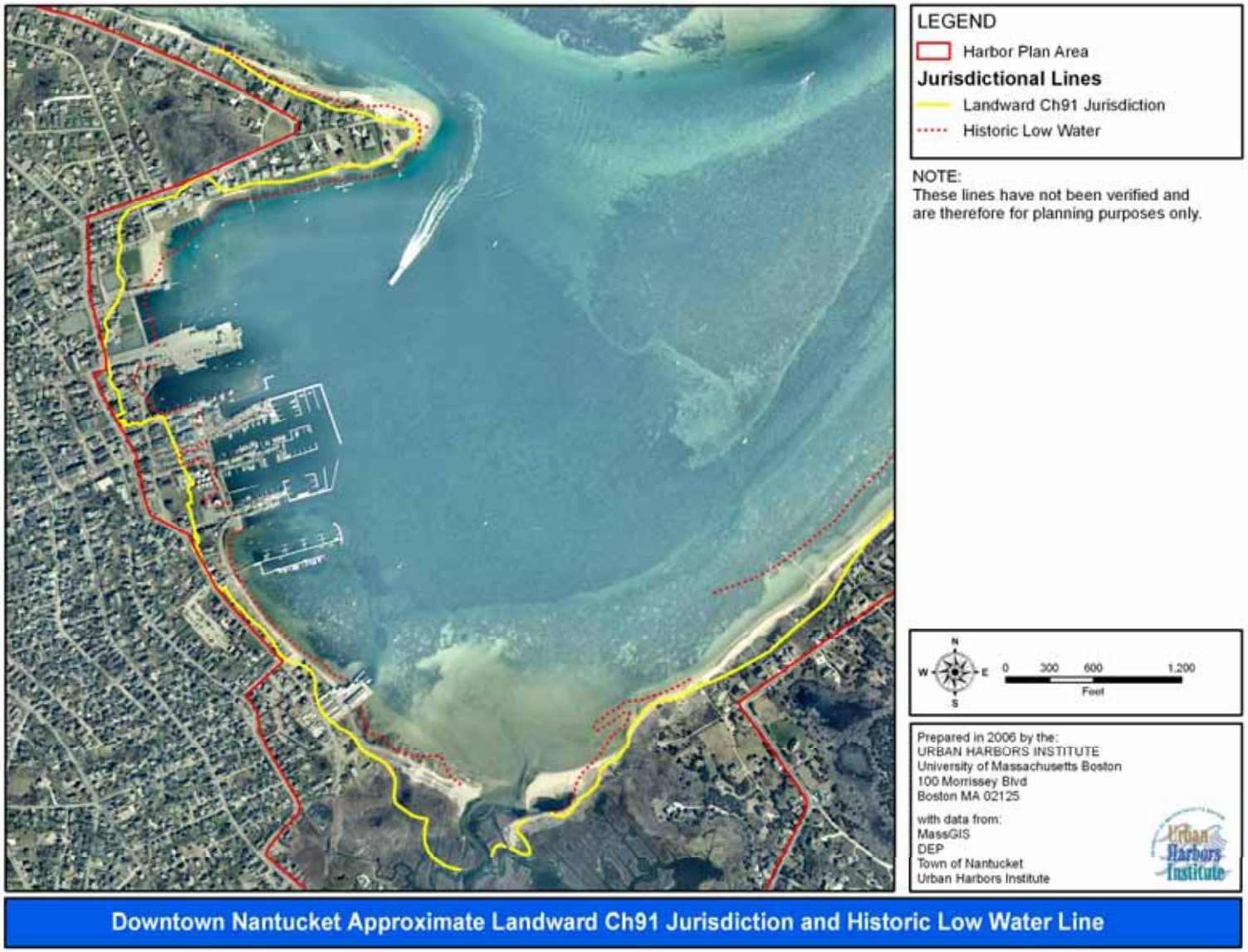


Figure 2.31 Approximate Historical High and Low Water Lines in Downtown Nantucket.

Figure 2.32 Approximate Historical High and Low Water Lines in Madaket.

The Nantucket and Madaket Harbors planning area includes six zoning districts: Limited Use General 1; Limited Use General 3; Residential 1; Residential Commercial, and small areas of Limited Commercial and Residential Commercial Downtown. The Madaket Harbor planning area includes: Residential 2; Limited Use General 2; Limited Use General 3; and Residential Commercial. Figures 2.33 to 2.35 illustrate the zoning pattern in Nantucket and Madaket Harbors.

The Residential Commercial (RC) district covers the commercial waterfronts of both Nantucket and Madaket Harbors. Uses allowed by right within this district are: residential (up to two units per parcel); transient residential; retail; offices; restaurants; personal services; theatres; boat building, maintenance, repair and servicing; maritime services, marinas, yachting; and sail clubs. There are also a variety of special permit uses including taverns, light manufacturing, warehousing, fabrication, petrochemical storage, and public utilities.

The commercial waterfronts of both harbors have experienced significant alteration over the course of Nantucket's long maritime history. The shoreline has been engineered, piers and wharves built, channels dredged and related infrastructure installed. These assets have been and will continue to be essential to the community's existence and economy. Given the constraints imposed by environmental and land use regulations, alteration of natural resources and the construction or expansion of docks and piers in areas beyond the existing commercial waterfront areas is unlikely. Consequently, the existing commercial waterfront should be protected and preserved to the extent possible for those activities that require direct access to the water.

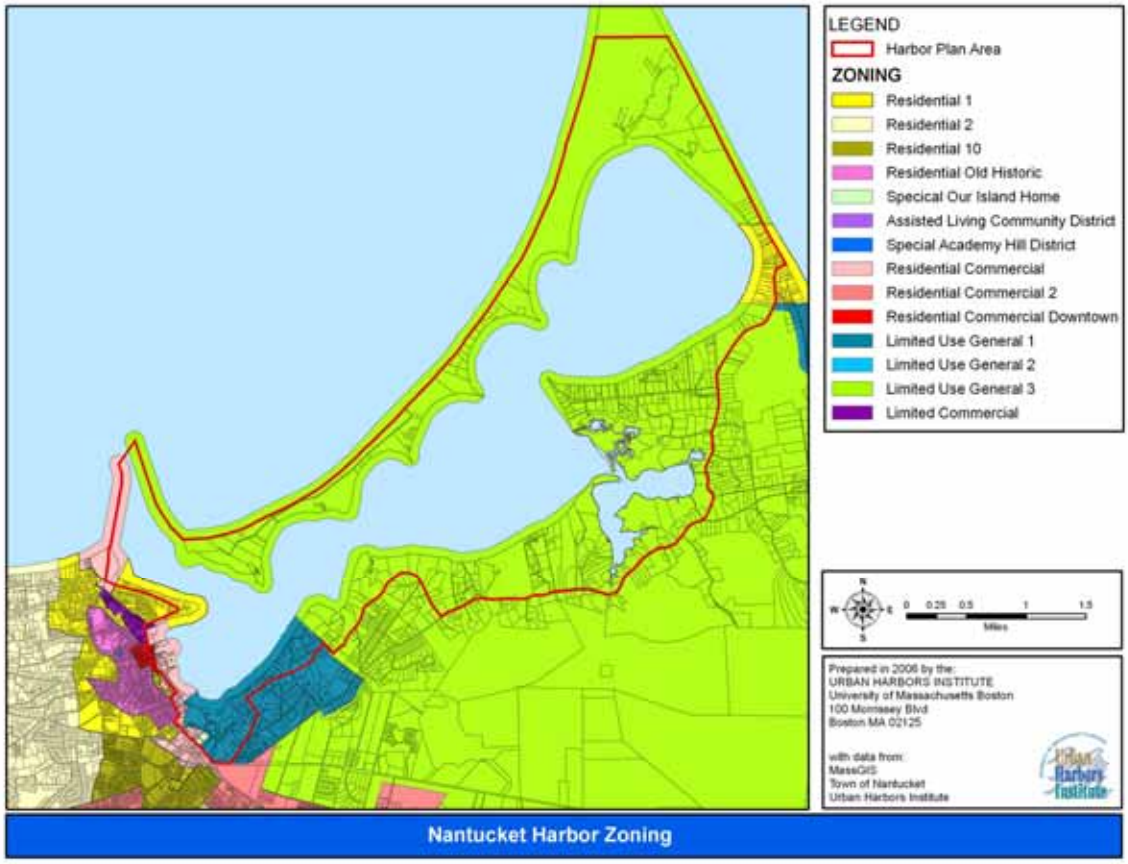


Figure 2.33 Zoning around Nantucket Harbor.

Nantucket Wetlands Bylaw

One of the primary responsibilities of the Nantucket Conservation Commission is the administration and enforcement of the Massachusetts Wetlands Protection Act (MGL Ch. 131, sec. 40) along with its

corresponding Wetlands Regulations (310 CMR 10.00). In addition, Nantucket has adopted under general Home Rule powers a municipal Wetlands Bylaw (Chapter 136).

Under the Wetlands Act and the Nantucket Wetland Protection Regulations, the Conservation Commission has authority over projects in or affecting any categories of wetland resource areas, including bank, beach, dune, flat, marsh, swamp, freshwater or coastal wetlands, which border on the ocean or any estuary, creek, river, stream, pond, or lake. The Commission also has jurisdiction for land under water bodies, land containing shellfish, land subject to coastal storm flowage, the banks along and land under fish runs, land subject to flooding, and estimated habitat for rare/significant wildlife, flora and fauna. Activities within these resource areas subject to jurisdiction include activities that would remove, fill, dredge, or alter the resource. The Commission also has the right of review for activities within a 100-foot buffer zone around wetlands bordering water bodies, banks, beaches, and dunes.

Provisions of the local regulations require that all nonwater-dependent structures maintain a 50-foot buffer from wetland resource areas. In areas where the shoreline is eroding, structures must maintain a distance from a coastal bank that is the lesser of 100 feet or 20 times the average annual erosion rate. Fill of any salt marsh on Nantucket is strictly prohibited; and building is not permitted within 75 feet of a vernal pond.

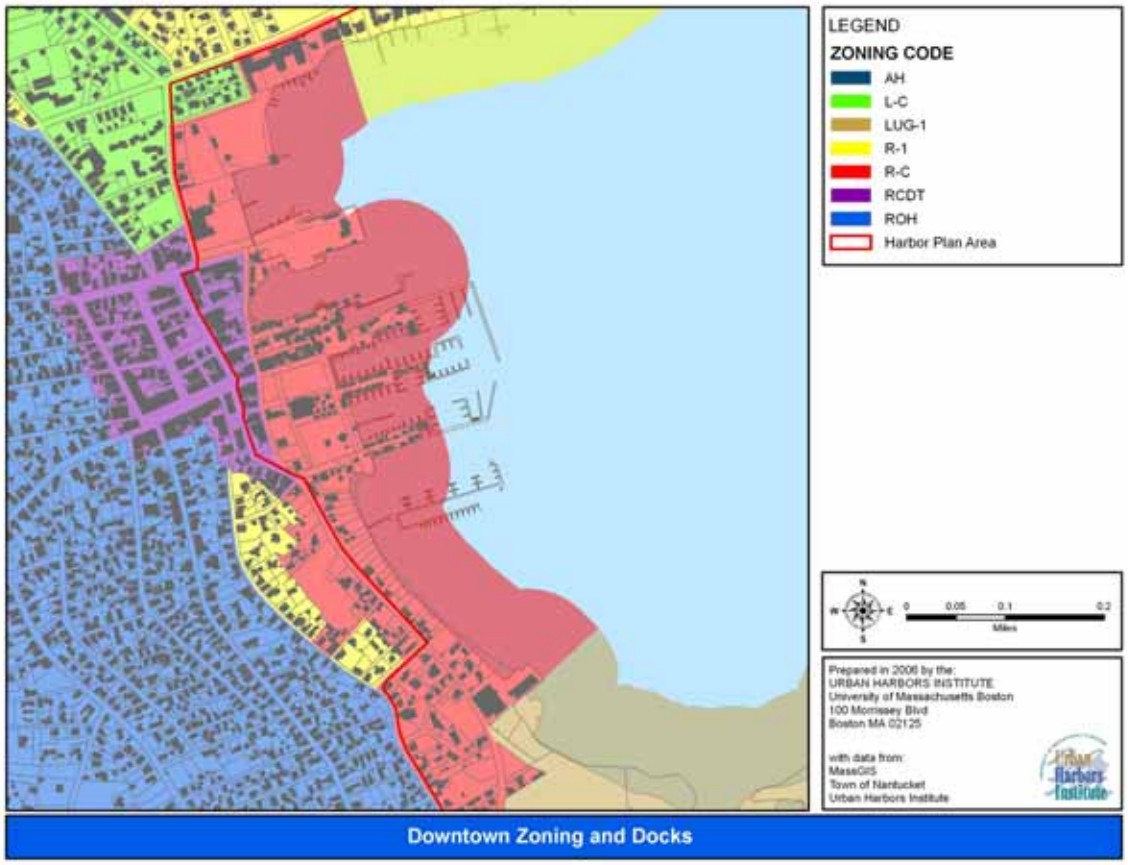


Figure 2.34 Downtown Zoning.

Nantucket Wharves and Waterways Regulations

Nantucket's Wharves and Waterways Regulations (Chapter 137) outline the procedures and rules regarding moorings, boat ramps, public landings, uses of the waterways, traffic, and safety.

No one can moor, anchor, or set any moored vessel or float in any harbor or waters within the Town of Nantucket without obtaining a 10A Mooring Permit from the Harbormaster. Permits are issued on a first come, first serve basis. The Harbormaster has the authority to reassign mooring locations of any permitted vessels at anytime. If there is no room for an applicant's vessel, the person's name will be put

on a waiting list that is maintained by the Harbormaster. No mooring is allowed in any navigational channel or where it might interfere with the public's rights of fishing, fowling and navigating on tidelands.

If an assigned mooring is determined to be abandoned within a boating season, it may be reassigned by the Harbormaster. No boat used as a residence can remain overnight unless equipped with sewage holding tanks. Vessels larger than 65 feet cannot be assigned a mooring without special Harbormaster approval. It is the responsibility of the permit holder to install and maintain appropriate mooring gear or tackle, according to vessel size. Mooring gear may be inspected by the Harbormaster at any time and removed or relocated as necessary.

Mooring fees are established annually by the Board of Selectman based on vessel length and permits may be revoked by the Harbormaster for good cause.

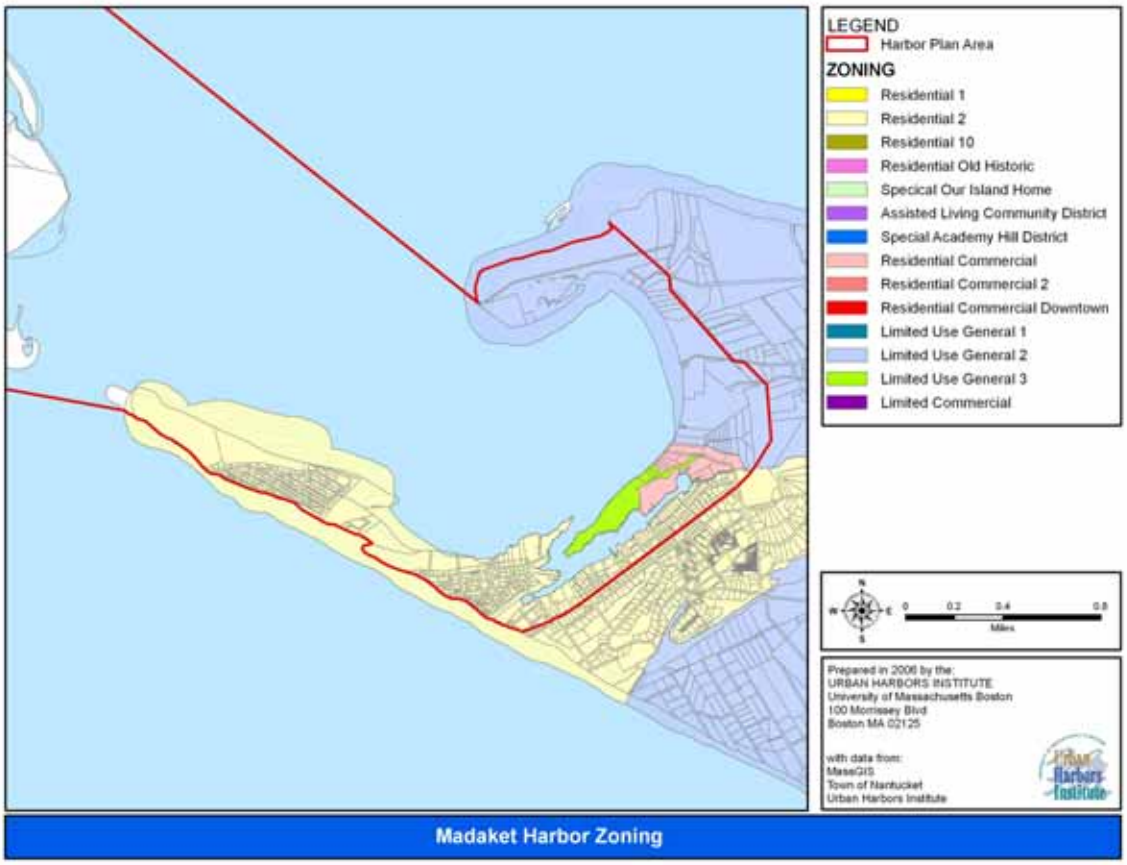


Figure 2.35 Zoning around Madaket Harbor.

Nantucket's Commercial Shellfish Regulations

Shellfishing in Nantucket is regulated under both Massachusetts General Law (Chapter 130) and the Code of the Town of Nantucket (Chapter 122). The regulation is designed to ensure the continuing health of harvested species. The Marine and Coastal Resources Department is authorized to issue permits for shellfishing that follow the specifics set out in the regulations.

Primary emphasis in the regulations is placed on setting limits for the taking of legal scallops (*Argopecten irradiens*) for commercial purposes. The scallop season runs from November 1st to March 31st, inclusive. During the season, individuals and boats are restricted to specific harvesting limits, and harvesting is prohibited in designated seed areas. In addition, only animals with well-defined raised growth lines can be legally harvested. Taken together, these measures strive to maintain a stable scallop breeding population.

Other species frequently harvested in Nantucket waters include soft shell clams (*Mya arenaria*), quahogs or hard shell clams (*Mercenaria mercenaria*), oysters (*Crassotrea virginica*), and blue mussels (*Mytelus edulis*). As with scallops, the first three of these species have minimum size limits to be considered legal catch.

The Marine and Coastal Resource Department offers educational materials to the public to help individuals comply with shellfishing regulations; with some species the department also provides specific information on returning animals to their habitat that may better ensure the survival of those caught below the size limit.

Harbor and Shellfish Advisory Board

The Harbor and Shellfish Advisory Board was established by the Massachusetts legislature in 1976.

The board consists of seven elected members with each member serving for three years. After each election, the members of the Board elect one of their members to act as chairman for the ensuing year.

The Board's mission statement is as follows:

- To ensure that Nantucket's harbors, bays and watersheds are protected from the harmful effects of human activity.
- To seek carefully planned use of the waterways and watersheds to allow the natural system to function normally and healthfully, both now and in the future.
- To keep Nantucket's harbors, bays and watersheds clean and free of contamination, sewage discharges, oil spills, stormwater runoff, hazardous wastes, and other toxic pollution.
- To restore and maintain the water quality of Nantucket's harbors and bays to a standard that shall support swimming, fishing, and shellfishing and the greatest bio-diversity of marine life.
- To educate the public to a sense of environmental stewardship and understanding of the lifestyle changes needed for healthy waterways.
- To encourage and help develop land use policy in balance with the needs of the ecosystems of Nantucket's harbors and bays.

Historic District Commission

The Historic Districts Commission (HDC) was established by the Massachusetts legislature in 1955 (§ A301-1. Chapter 601) with subsequent changes including the 1970 designation of the entire island as a historic district and a name change to Historic District Commission (§ A301-4). Section 2 of § A301-4 states that the purpose of creating the HDC is to *"promote the general welfare of the inhabitants of the Town of Nantucket through the preservation and protection of historic buildings, places and districts of historic interest through the development of an appropriate setting for these buildings, places and districts and through the benefits resulting to the economy of Nantucket in developing and maintaining its vacation-travel industry through the promotion of these historic associations."* The HDC reviews all applications regarding the alteration or construction of any exterior architectural feature. No building permit or occupancy permit may be issued until the HDC issues a Certificate of Appropriateness or a Certificate of Nonapplicability. The HDC also regulates all signs on Nantucket.

Federal Emergency Management Act Regulations

The FEMA Flood Zones Map (Figures 2.36 and 2.37) provides a plan for the various Flood Insurance Zones along the shoreline as established by the Flood Insurance Study of Nantucket (1992).

The majority of the planning area, including all properties along the water's edge, are in zones AE, X, and VE. The following provides a further description of the zone designations:

- Zone AE: Areas subject to 100-year flood with base flood elevation determined.
- Zone X: Areas outside the 500-year flood plain with less than 0.2 percent annual probability of flooding.

- Zone VE: Areas subject to 100-year flood and additional velocity hazard (wave action). Base flood elevation determined.

FEMA periodically updates flood hazard maps by conducting a detailed reevaluation of flood hazards, referred to as a flood study. However, flood studies are time consuming and expensive, so far fewer than needed are done. As an alternative, FEMA has established procedures by which a community may compile appropriate data and request a map revision. Further, if an individual homeowner has technical information to indicate that his or her home has been inadvertently shown within the Special Flood Hazard Area on a Flood Insurance Rate Map, the homeowner may submit that information to FEMA and request that FEMA remove the flood zone designation from the home by issuing a Letter of Map Amendment (LOMA) or a Letter of Map Revision Based on Fill (LOMR-F). Requests for LOMAs/LOMR-F must include the surveyed elevation of the lowest grade adjacent to the structure or the lowest enclosed level of the structure, along with certain other information.

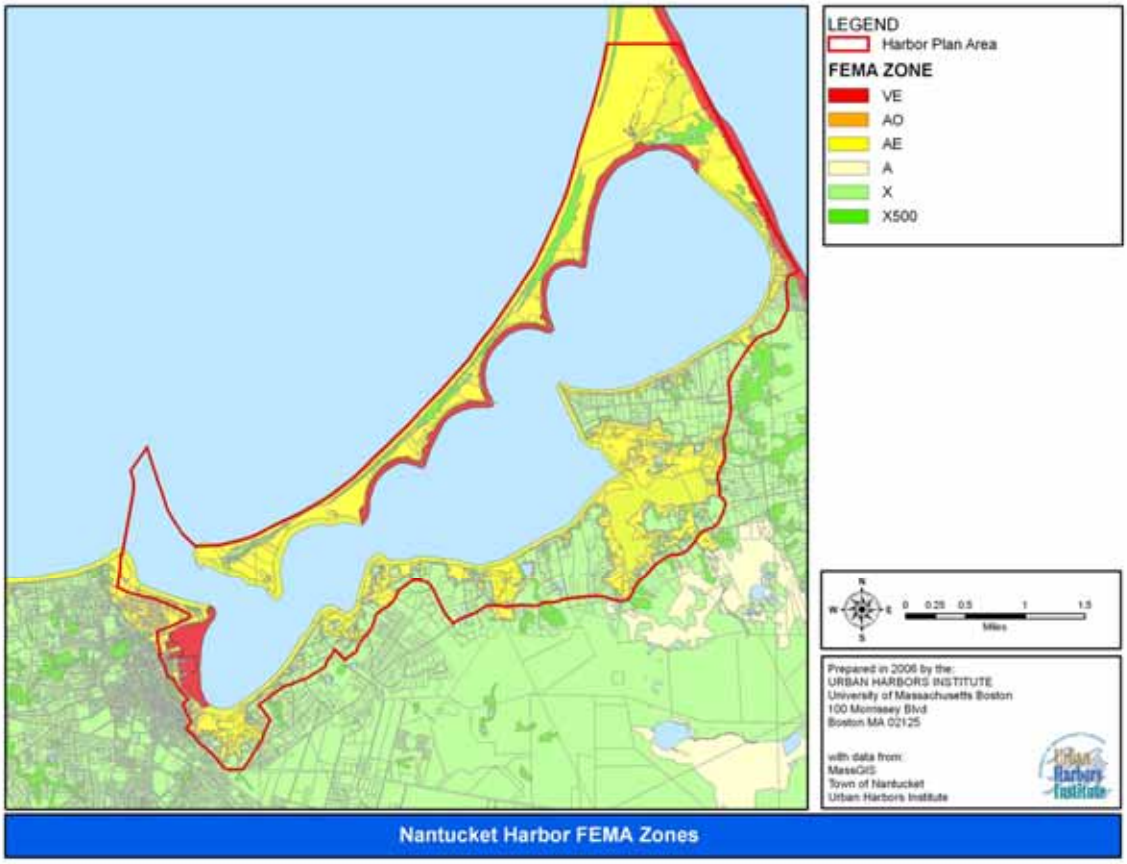


Figure 2.36 FEMA Zones around Nantucket Harbor.

US Army Corps of Engineers Regulations

Section 404 of the Clean Water Act authorizes the Corps to regulate the discharge of dredged or fill material into "waters of the United States" which are all navigable waters, tributaries to navigable waters, and wetlands adjacent to those waters. The limit of jurisdiction is the high tide line in tidal waters; where adjacent wetlands are present, it is the limit of the wetland. Regulated activities include the placement of fill for construction, site-development fill, riprap, seawalls, and beach nourishment.

Section 10 of the Rivers and Harbors Act of 1989 authorizes the US Army Corps of Engineers to regulate structures and work in navigable waters of the US. Jurisdiction extends shoreward to the mean high water line. Regulated activities include construction of piers and wharves, permanent mooring structures such as pilings, intake and outfall pipes, boat ramps, and dredging and disposal of dredged material, excavation, and filling.

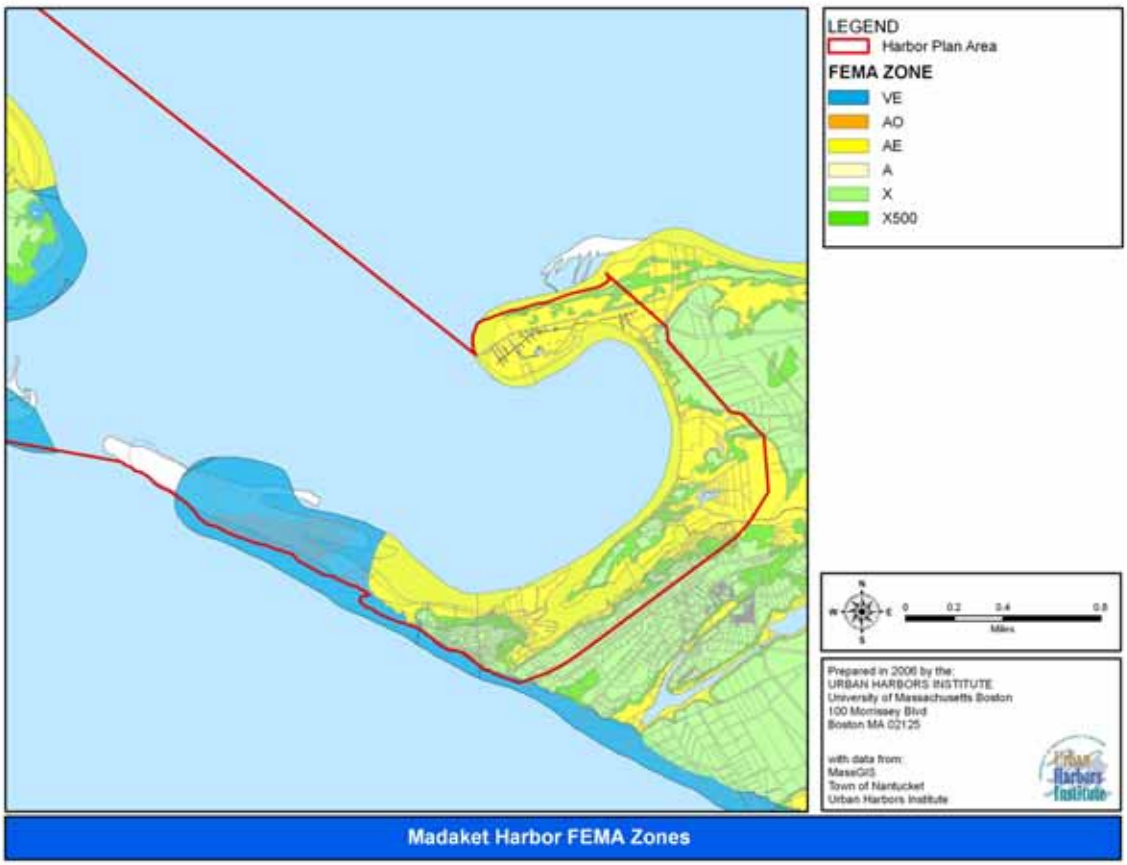


Figure 2.37 FEMA Zones around Madaket Harbor.

The Corps' other major responsibility is to plan and carry out water resources projects such as improvements to navigation. Since 1986, the cost for such projects is shared between the federal government and the nonfederal sponsors. An important consideration in the Corps' decision to undertake a project is that its benefits 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.

The Main Channel into Nantucket Harbor is a federally created and maintained navigation channel.

Water Quality Certification

Any activity that would result in a discharge of a pollutant, dredging, dredged material disposal of greater than 100 cubic yards, and that require a federal permit (such as a 404 permit from the Corps) must also obtain a Water Quality Certification (authority derives from Section 401 of the Clean Water Act). The DEP's Division of Wetlands and Waterways administers the program which seeks to ensure that a proposed project does not violate the Massachusetts Surface Water Quality Standards or the Massachusetts Wetlands Protection Act, and otherwise avoids or minimizes individual and cumulative impacts to Massachusetts waters and wetlands. If a project would result in minimal fill within wetlands, the Order of Conditions issued by the Conservation Commission can serve as the Section 401 Water Quality Certificate.

Massachusetts Ocean Sanctuary Program

In 1970, Massachusetts passed the Ocean Sanctuaries Act (Ch. 132A, Section 12A) which applies to the area between the mean low water line and three miles offshore, except for the area between Lynn and Marshfield. The Ocean Sanctuaries Act is designed to protect coastal waters by prohibiting activities that could be environmentally or aesthetically damaging. The Act prohibits exploitation or development that

would seriously alter or endanger the ecology or appearance of the ocean, seabed, or the subsoil. Some of these prohibited activities include building on the seabed, drilling, dumping wastes, and commercial advertising. However, fishing, sand extraction, and special projects are still allowed under the act. The Department of Conservation and Recreation (DCR) has jurisdiction over the ocean sanctuaries and DCR must approve all activities that occur on, or in, these areas.

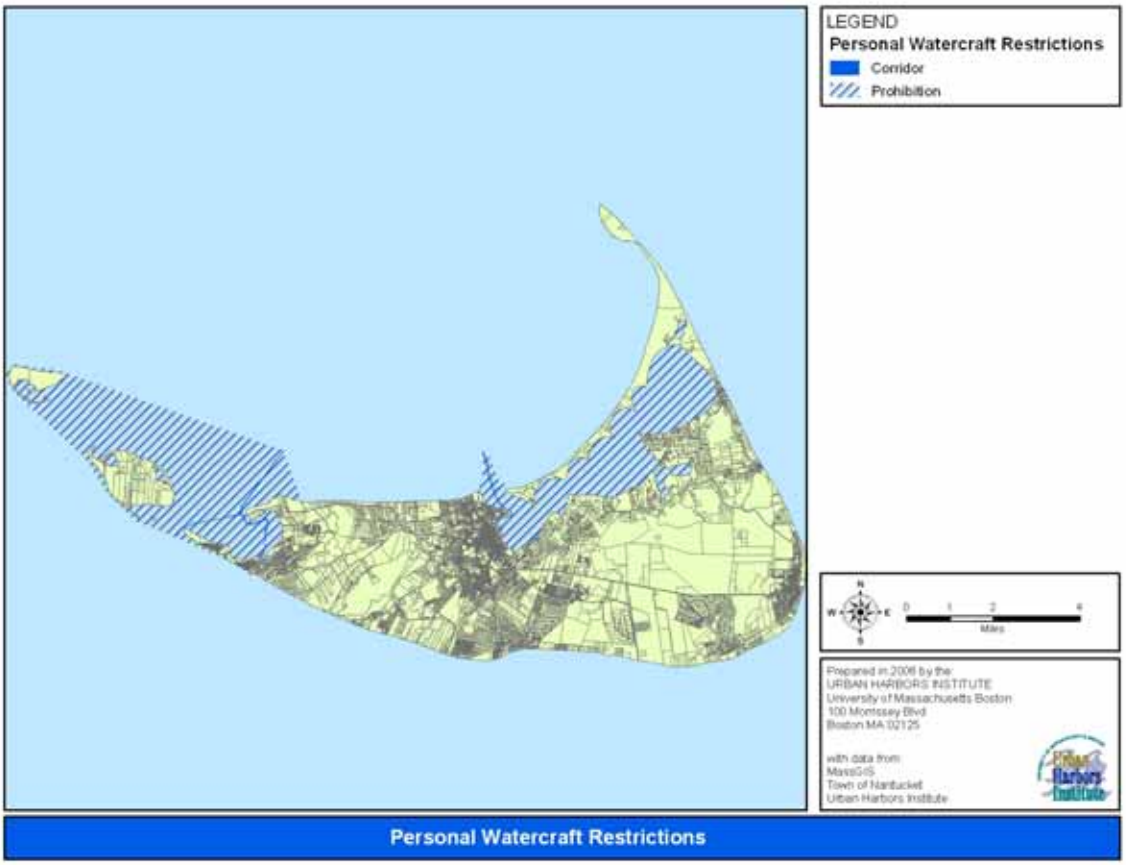


Figure 2.38 Personal Watercraft Restrictions around Nantucket.

3 ISSUES, GOALS, OBJECTIVES AND RECOMMENDATIONS / ACTIONS

3.1 ISSUE IDENTIFICATION PROCESS

The key issues covered in the Nantucket and Madaket Harbors Action Plan update were identified through two types of meetings.

Staff and consultants of the Urban Harbors Institute (UHI) of the University of Massachusetts Boston held several individual and small group meetings with town officials. In addition to identifying issues, these meetings also addressed current conditions and future plans on Nantucket.

UHI staff and consultants also facilitated six public meetings, offering residents the opportunity to voice their opinions about the 1993 plan as well as topics that the update should address. General meetings were held on 29 August, 2005, and 20 September, 2005, to discuss the harbor plan as a whole. The other four public meetings allowed the public to comment on specific topics identified in the 1993 plan, and to suggest new issues not previously addressed. The schedule for those meetings was as follows:

- 3 October, 2005 – Commercial and Recreational Fishing; Harbor Safety, Navigation, and Moorings
- 4 October, 2005 – Tourism and Recreation; Public Access
- 17 October, 2005 – Water Quality; Natural Resource Protection
- 18 October, 2005 – Harbor Waterfront Development

Meetings with town officials and the public identified many of the same issues. A list of all issues can be found in Sections 3.2 and 3.3.

3.2 POLICIES AND ISSUES FROM THE 1993 HARBORS ACTION PLAN

The following policies were developed as part of the 1993 planning process. These policies remain relevant and should be retained as the policies underpinning the revised plan.

- **Water Quality** – It shall be the policy of the town to safeguard and improve the water quality of the harbors to ensure the enhancement of natural resources and wetlands for safe public contact, recreation, recreational and commercial boating, and fishing activities.
- **Natural Resources** – It shall be the policy of the town to protect and preserve coastal habitats, wildlife corridors and all other environmentally sensitive resources to maintain Nantucket's quality of life.
- **Commercial and Recreational Boating** – In recognition of the importance of commercial and recreational fishing for the maintenance of the marine heritage of the town, it shall be the policy of the town to maintain fisheries as part of the balance of uses of Nantucket and Madaket Harbors.
- **Harbor Safety, Navigation and Moorings** – It shall be the policy of the town to regulate the use of all harbors, in a manner which provides for the safe, orderly and efficient use of the water and waterfront.
- **Public Access** – It shall be the policy of the town to pursue opportunities for improving existing and providing new areas for public access to the waters of both harbors consistent with a policy of wise stewardship.
- **Tourism and Recreation** – It shall be the policy of the town to encourage and provide for tourism and recreation.
- **Downtown Waterfront District** – It shall be the policy of the town to ensure basic public utilities can be provided on a continual basis for the citizens and visitors of Nantucket in a manner that is sensitive to the historic maritime character of the downtown waterfront area. It shall be the policy of the town to preserve and maintain commercial facilities as necessary to sustain the economic lifeline of the town.

The following issues were identified by the 1993 Harbors Action Plan. Appendix 1 shows the action items related to these topics, as well as the status of each of those action items. Additionally, it shows the action items from the 1993 plan that are still on-going. These on-going action items should remain a priority for the town. However, this plan will only address old action items in cases where new information requires a change to the recommendation.

- Water quality – biological contamination, toxic pollution, nutrient loading
- Natural resource protection – increased tourism, development, population, overcrowding in the harbors
- Commercial and recreational fishing – lack of shoreside facilities and access
- Harbor safety, navigation, and moorings – need comprehensive management strategy because of increased number of boats, overcrowded mooring areas, poor mooring tackle, derelict boats, unskilled boaters
- Public access – opportunities for access decrease with increased development, use conflicts, maintenance issues
- Tourism and recreation – need support facilities (showers, restrooms, etc.), dinghy docks, handicap facilities, waterfront parking, shoreside recreational areas
- Downtown waterfront district – conversion from water-dependant to non-water-dependant uses, displacement of traditional maritime uses, loss of architectural character, need commercial waterfront facility

3.3 SUMMARY OF ISSUES IDENTIFIED FOR THE 2007 HARBORS PLAN

The issues and recommendations that have resulted from the 2006-2007 planning process are discussed in this section. A list of responsible agencies/groups is suggested for each recommendation with the "lead" agency or group being denoted by an asterisk (*). A tabular summary can also be found in Appendix 1.

3.3.1 Key Issues

- Dock and pier moratorium in the Residential-Commercial (RC) zone –
  - Address the moratorium that was to expire at the end of April 2007 (this has now been extended to the end of April 2008)
  - Minimize visual impacts
  - Minimize environmental impacts (including impacts to shellfish, water quality, and eelgrass)
  - Minimize impacts to boating access (maintain access but prevent congestion)

- Water dependent structures and waterfront zoning –
  - Definition of "water dependent structure"
  - Explain the Chapter 91 regulations
  - Change the zoning district to exclude RC on top of commercial district
  - Evaluate the need for RC zoning in Madaket Harbor
  - Consider a waterfront overlay district to address fertilizer, lighting, etc.
  - Address the fact that the 30 year restrictions on increased development in subdivisions are about to expire for some developments
  - Evaluate all future development with regard to the character of the waterfront and the needs of the community.

- Public access to the water –
  - Improve and increase public access to the water
  - Retain existing points

- Consider a handicap-accessible waterfront
- Improve boating access for fishers, recreational boaters, researchers
- Develop a “Harbor Walk”
- Outline the role of Chapter 91 for public access requirements – existing and potential
- Coordinate among the various land-holding agencies
- Develop and distribute a public access guide
- Improve signage and conditions at some existing sites
- Map potential access areas

- Water quality – the town recognizes that there are serious water quality problems with broad impacts
  - Develop/refine monitoring strategies
  - Identify pollution sources - fertilizers, boats, septic, stormwater, etc.
  - Identify public responsibilities and opportunities for public education

- Fisheries – the town acknowledges that the bay scallop fishery is unstable
  - Develop a shellfish management plan
  - Create/define a designated shellfish area
  - Improve access for fishers
  - Improve shore-side infrastructure to support the fisheries
  - Explore the commercial fishing pier option
  - Re-establish a propagation facility
  - Conduct additional research about scallops, eel grass, and water quality

3.3.2 Other Issues Identified

- Navigation – Raise jetties in navigation channel; improve navigational aids
- Moorings – The Department of Marine and Coastal Resources is at capacity with their waitlists. What is the capacity of the harbors (total as well as ideal). Should there be a fee to stay on the waitlist? How are moorings transferred? Can public access be improved?; What would be the necessary changes related to mooring expansions (i.e. need more room for car parking, dinghy storage, etc.)?arbor – Maintain visual access to the harbors
- “Large” cruise ships – Prevent access to Nantucket Harbor
- Light pollution – Enforce existing regulations related to lighting; explore an overlay district to control light pollution
- Shore-side boating infrastructure – Address lack of boating mechanics, launch services, and marine supply shops along the waterfront
- Public bathrooms – Identify locations suitable for public bathrooms in Madaket Harbor
- Recreational uses of the harbor – Encourage and promote other recreational uses of the harbors such as kayaking
- Eelgrass conservation, including off-site mitigation and planting programs – especially as it relates to scallops, docks and piers, and moorings
- Erosion – Take action to prevent erosion
- Plan implementation – How will it be implemented?
- Invasive species – Take action to remove invasive *Phragmites* in Madaket Harbor
- Riparian property rights – Clarify rights of riparian property owners.
- Port Authority – Would a port authority help Nantucket receive more money from the Seaport Council and other sources?
- Competing recreational uses of the water

3.4 NANTUCKET AND MADAKET HARBORS ACTION PLAN IMPLEMENTATION

Background

Recognizing (1.) that the Board of Selectmen is ultimately responsible for the implementation of this Harbors Plan, and (2.) that monitoring the status of the recommendations will be a time-consuming activity, it makes sense to consider tasking a board with the responsibility of coordinating and monitoring the implementation of the many recommendations within this Harbors Plan. Using the matrix found in Appendix 1 as a guide, this board would create and maintain awareness of the recommendations among the responsible agencies and groups, monitor the progress on each recommendation, and provide the Board of Selectmen with regular updates on the status of each recommendation.

Qualifications for an effective Oversight Board:

- A commitment to perform the task
- The ability to meet regularly to perform coordination, communication, monitoring and reporting tasks
- An understanding that the Harbor Plan, as written and adopted by the BOS, will be implemented according to the recommendations therein and by the agencies that are identified in the plan's matrix

Some tasks to be performed by an oversight board include:

- Develop a coordination plan to ensure that all responsible agencies are aware of their tasks as outlined in the Plan
- Establish communication protocols between and among the various agencies and boards that will be doing the actual implementation of items in the matrix
- Establish a process for receiving reports from the above implementing agencies on a regular and timely basis
- Establish a process for coordinating the above reports to develop regular reports for the BOS on the progress of implementation

Objective: ***To ensure that a harbors action plan implementation strategy is designed and executed in an effective manner.***

Recommendation

1. *The Board of Selectmen should develop an implementation strategy for this harbors action plan. As part of its implementation strategy, the Board of Selectmen should consider charging a board with coordinating and overseeing the implementation of this plan.*

   List of responsible agencies/groups:

   - Board of Selectmen *

3.5 NATURAL RESOURCES

Goal: **To protect, and restore where appropriate, the valuable natural resources of Nantucket and Madaket Harbors.**

Much of the character of Nantucket is based on its coastal natural resources. The beauty of its beaches, dunes, and barrier beaches draws tourists from all over the world. Its clean waters host a wide array of pleasure vessels. Its eelgrass beds support a unique shellfish industry. It is critical to the economy and way of life of the island that these resources be maintained and, where possible, restoration efforts should be undertaken to ensure that critical ecosystems remain healthy and viable.

Objective I: Maintain existing systems for natural resource protection in the Nantucket and Madaket Harbors planning area.

Background

Presently, there is a system of local and state environmental protection for the natural resources of the island that functions quite well. The Massachusetts Wetlands Protection Act and its regulations and the Nantucket Wetlands Protection Bylaw and Regulations are administered by the Nantucket Conservation Commission and establish a procedure for review and conditioning of permit applications. Using these regulations and their associated procedures, the Commission has the ability to protect a series of specific wetlands values from degradation.

Many of the proposed projects bring with them subtle legal and scientific issues. It is important for the Commission to be suitably supported to be able to continue to make informed, accurate decisions.

Recommendations

1. *Continue to enforce existing town bylaws pertaining to natural resource conservation and protection (including Chapter 193 – Zoning; Chapter 136 – Wetlands; Chapter 99 – Nantucket and Madaket Harbor Watersheds; and Chapter 56 – Regulation of Motor Vehicles on Beaches). The Conservation Commission should develop more restrictive regulations if they feel that such moves can be scientifically justified.*

   Procedures are in place to enable the town to protect some of its wetland resources such as the wetlands themselves, vernal ponds, and buffer zones, but not the watershed itself. Town agencies need to continue to make informed decisions within the purview of the statutes, bylaws, and regulations they implement. There is also a need for the capability to adequately enforce these decisions over time as development projects are undertaken and used. It is important to maintain a strong enforcement capability to complement reasonable permitting decisions.

   As some violations of these statutes, bylaws and regulations are criminal actions, it is important to ensure that the Nantucket Police Department and Department of Marine and Coastal Resources are aware of the nature of the statutes and their enforcement capabilities.

   List of responsible agencies/groups:

   - *Conservation Commission **
   - *Planning Board*
   - *Board of Health*
   - *Department of Marine and Coastal Resources*
   - *Police Department*

2. *Continue to monitor and assess actual and potential impacts on wetlands resources from adjacent development and increased usage.*

   Adopt a stormwater bylaw establishing minimum requirements and procedures to control the adverse effects of increased post-development stormwater runoff and nonpoint source pollution associated with new development and redevelopment.

   As warranted, consider measures such as increasing the no-build and no-disturbance buffer zones around wetlands resources required by the Wetlands Bylaws.

   Ensure that physical improvements in support of recreational use on and around wetlands resources do not impact those resources either directly or indirectly by increasing usage beyond the carrying capacity of the area.

   List of responsible agencies/groups:

   - *Conservation Commission **
   - *Planning and Economic Development Commission*

3. *Assure that legal assistance is available to the Conservation Commission for enforcement of the town Wetland Bylaws, especially as the bylaws pertain to new development abutting or potentially affecting environmentally sensitive areas such as sand dunes, beaches, and barrier beaches.*

   List of responsible agencies/groups:

   - *Board of Selectmen **
   - *Conservation Commission*

Objective II: Provide technical and scientific support for planning and decision-making entities on a wide range of coastal natural resource issues.

Background

In addition to the scientific, technical and legal support services required by the Conservation Commission described above, there is a broader need for such support services by other boards, committees, and commissions throughout the town for making planning, regulatory, and land acquisition decisions.

Recommendations

1. *Establish a scientific/technical advisory committee to assist boards, commissions, and committees to review and interpret scientific and engineering data and recommend management options supported by these reviews.*

   The Board of Selectmen should work with the various boards, commissions, and committees to identify current and potential areas of expertise needed. They should seek individuals or organizations having that experience and training and solicit their membership on the Scientific/Technical Advisory Committee to support the various boards, commissions, and committees. The Scientific/Technical Advisory Committee would meet as necessary, determined through the Board of Selectmen at the request of town departments. The Committee's input would be advisory in nature.

   List of responsible agencies/groups:

   - *Board of Selectmen **
   - *Conservation Commission*
   - *Department of Marine and Coastal Resources*
   - *Planning Board*
   - *Board of Health*
   - *Other departments or groups as may be appropriate*

2. *Enhance the environmental planning capability of the Town of Nantucket through bylaw changes via Annual Town Meeting.*

   Much of the Conservation Commission's effort is in response to permit applications for proposed projects. This sort of case-by-case review needs to be augmented by broader, proactive environmental planning.

   List of responsible agencies/groups:

   - *Conservation Commission **

Objective III: Identify critical natural resources associated with Nantucket and Madaket Harbors in order to better protect them.

Background

In order to make timely, informed regulatory or planning decisions pertaining to natural resources, it is important to identify the location and nature of such resources. Knowing where the resources are, prior to being faced with a decision, makes the process more predictable for both project proponents and

decision-makers. Identification and location of critical natural resources is also a component of oil spill contingency planning.

Recommendations

1. *Continue the coordinated inventory and mapping efforts of critical resource and open space areas around Nantucket and Madaket Harbors.*

   There are already several natural resource related data layers in the Town of Nantucket Geographic Information System (GIS) data layers. These should be regularly reviewed for accuracy, changes, etc. Additional important resource types should be identified, delineated, and incorporated into the town GIS data layers. In instances where the Commonwealth has mapped natural resources in and around the harbors, these layers should also be incorporated into the town's GIS.

   List of responsible agencies/groups:
   - *Conservation Commission **
   - *Department of Marine and Coastal Resources*
   - *Board of Selectmen*
   - *Resource-related non-profit groups*

Objective IV: Protect and restore critical eelgrass resources

Background

Eelgrass (*Zostera marina*) provides critical habitat for the commercially and recreationally important scallop fishery. It also helps stabilize the bottom of the harbors, lessening movement of sediments and resultant needs for dredging. Eelgrass may be affected by boating and shellfishing activities.

The species is protected through the permitting process administered by the Nantucket Conservation Commission, but there is need for additional layers of protection from cumulative impacts. Additionally, there may be the possibility of restoring damaged beds.

Recommendations

1. *Develop and implement mechanisms to conserve and restore eelgrass, in coordination with the Shellfish Management Plan (see Shellfish Management Plan recommendation). Apply these mechanisms, as well as existing research to the management of moorings and their impacts on eelgrass in Nantucket and Madaket Harbors.*

   When appropriate, the Conservation Commission should consider off-site mitigation opportunities. Such mitigation opportunities should involve using Chapter 91 license fees and permit fees to fund town-managed eelgrass planting, restoration, and monitoring projects around the harbors. As part of the off-site mitigation program, the Conservation Commission should develop a guidance document defining criteria for a "successful" mitigation project. The guidance document should also outline a strategy to ensure that "successful" mitigation is achieved.

   The Shellfish Management Plan should provide a means to assess the current status of eelgrass beds in the harbors by conducting yearly assessment of eelgrass coverage in both harbors. This should be translated to a GIS map that can be compared to the Commonwealth of Massachusetts' Department of Environmental Protection eelgrass studies which are updated approximately every four years.

   List of responsible agencies/groups:
   - *Department of Marine and Coastal Resources **
   - *Harbor and Shellfish Advisory Board*
   - *Nantucket Shellfish Association*
   - *Conservation Commission*
   - *Other concerned citizens*

Objective V: Reduce impacts on native natural resources and systems from invasive species, both plant and animal.

Background

Native plants and animals can be significantly affected by the introduction of non-native species, particularly when those invasive species have no natural controls on their spread. There are several invasive species found in or around Nantucket Harbors. These include *Phragmites*, *Codium*, other macroalgal species, green crabs, and asian crabs. Often when species such as these are introduced, the natural biodiversity suffers.

Recommendations

1. *Support and enhance the Nantucket Biodiversity Initiative.*

   The Nantucket Biodiversity Initiative is intended to identify, locate, inventory and monitor the species of plant and animal assemblages on the island. As such, it includes the Nantucket and Madaket Harbor planning areas. It further is designed to educate the people of Nantucket and beyond about the importance of protecting the rich biodiversity of the islands.

   The following are partners in the Nantucket Biodiversity Initiative and should be considered the responsible agencies/groups:

   - *University of Massachusetts Boston Field Station **
   - *Maria Mitchell Association*
   - *Conservation Foundation*
   - *Nantucket Islands Land Bank Commission*
   - *Mass Audubon*
   - *Nantucket Land Council*
   - *Commonwealth of Massachusetts Natural Heritage Endangered Species Program*
   - *Science Department, Nantucket High School*
   - *Trustees of Reservations*
   - *Tuckernuck Land Trust*

2. *Work towards the management and potential eradication of invasive species, including both macroalgal species in the harbors and terrestrial and wetland species along the harbors' shores.*

   A management plan for the eradication of vegetative species in and around the harbors should be developed. The resultant plan could be implemented by town agencies, volunteer groups, and private individuals as part of regulatory decisions, etc. The plan should identify species of concern, their location, techniques and/or tools necessary for their eradication, any inherent difficulties with the eradication process, and what agencies, organizations, or individuals could be utilized in the eradication process.

   List of responsible agencies/groups:

   - *Conservation Commission **
   - *Department of Marine and Coastal Resources*
   - *Non-governmental organizations associated with natural resource management and protection*
   - *Academic groups*
   - *Individuals with expertise and/or training in invasive species management*

3. *Continue the existing culling program of green and asian crabs.*

   Green and asian crabs adversely affect shellfish populations. An ongoing effort to remove these invasive species has been developed and implemented through the Nantucket Department of Marine and Coastal Resources. It is described in the 2005 publication entitled "Predator Investigation", written by Keith Conant of the Marine and Coastal Resources Department.

List of responsible agencies/groups:

- *Department of Marine and Coastal Resources **
- *Students*
- *Fishers*

Objective VI: To increase public knowledge about marine mammals common to Nantucket.

Recommendations

1. *Educate the public about the island's marine mammals, including cetaceans and pinnipeds. Distribute brochures explaining federal and state protection of marine mammals with local numbers for reporting strandings and harassment.*

   List of responsible agencies/groups:

   - *Nantucket Marine Mammal Stranding Team **

3.6 WATER QUALITY

Goal: **To maintain and enhance the water quality of Nantucket and Madaket Harbors through education, monitoring, research and the dissemination of information.**

One fact that has not changed since the development of the Nantucket and Madaket Harbors Action Plan in 1993 and this update is that all harbor-related activities are literally contingent on water quality. Recreational and commercial fishing require that water quality be closely monitored. In addition, Nantucket's reliance on tourism mandates that clean swimming areas and beaches coincide with increased human impacts. Over the past decade, the Town of Nantucket, the Department of Marine and Coastal Resources, and numerous conservation and scientific groups have significantly increased research efforts in the harbors and fresh water systems in order to meet these needs.

Objective I: Increase awareness of water quality issues and ways to protect and enhance water quality through education, outreach and the dissemination of information.

Recommendations

1. *Develop school curricula on water quality protection and environmental awareness. Establish a curriculum piece for the Nantucket Public School for the 3rd, 6th, and 9th grades that integrates environmental awareness and environmental science within the MCAS requirements. Initiate field studies and in-class science demonstrations.*

   List of responsible agencies/groups:

   - *Nantucket School Committee **

2. *Establish a link from the Town of Nantucket website to a clearinghouse for water quality data and provide more information on the Department of Public Health website.*

   List of responsible agencies/groups:

   - *Department of Marine and Coastal Resources **
   - *Health Department*
   - *Conservation Commission*

3. *Seek funding to develop a "Guide to Protecting Nantucket's Waters", similar to the Martha's Vineyard publication. State funding and/or grants may be available for this project.*

List of responsible agencies/groups:

- *Department of Marine and Coastal Resources **
- *Nantucket Land Council*
- *The University of Massachusetts Field Station*

4. *Provide new homeowners with a free copy of the Guide along with a copy of all applicable regulations and rules.*

   List of responsible agencies/groups:

   - *Conservation Commission **
   - *Department of Marine and Coastal Resources*

5. *Mark all storm drains with red or yellow stencil scallops indicating direct input to harbor or indirect input to harbor (some treatment). Stenciling the word "dumping" in circle with line through it could also be used. Stenciling storm drains will help to inform residents of the drains' function and the fate of materials entering them.*

   List of responsible agencies/groups:

   - *Department of Public Works **
   - *Department of Marine and Coastal Resources*
   - *Historic District Commission*

6. *Develop brochures describing prohibition of dumping of chemicals, waste products, sediment, fuel, oil, or other pollutants and the associated fines. A comprehensive listing of prohibited substances and the effects on shellfish and water quality should be stated clearly.*

   List of responsible agencies/groups:

   - *Conservation Commission **
   - *Chamber of Commerce*
   - *Board of Health*
   - *Nantucket Land Council*
   - *Landscapers Association*

7. *Organize public forums and symposia throughout the year on topics such as septic systems, landscaping, and organic gardening.*

   List of responsible agencies/groups:

   - *University of Massachusetts Boston Field Station **
   - *Maria Mitchell Association*
   - *Board of Health*
   - *Department of Marine and Coastal Resources*
   - *Nantucket Land Council*
   - *Civic League*
   - *Nantucket Community Association*
   - *Other interested agencies/groups*

8. *Provide homeowners and landscapers with information on environmentally suitable fertilizer application rates, organic fertilizers, natural plantings, and other landscaping practices that would help protect the harbors and harbor watersheds. Make pamphlets such as the Landscaper's Association handout and the Nantucket Board of Health and Nantucket Land Council's pamphlet "Healthy Lawns and Landscapes" readily available at locations such as the Visitor's Center, the Town Building, and the Chamber of Commerce.*

List of responsible agencies/groups:

- *Conservation Commission **
- *Chamber of Commerce*
- *Board of Health*
- *Nantucket Land Council*
- *Landscapers Association*

9. *Provide boat owners with information regarding water quality, the "No Discharge Area" regulations and services, Best Management Practices recommended by Office of Coastal Zone Management for fueling and cleaning, prohibition on underwater hull cleaning, and the use of low-impact cleaning agents.*

   List of responsible agencies/groups:

   - *Department of Marine and Coastal Resources **
   - *Board of Health*
   - *Marine-related businesses*

10. *Distribute car-related water quality impact pamphlets to car owners along with registration renewal information.*

    List of responsible agencies/groups:

    - *Nantucket Registry of Motor Vehicles **
    - *Town of Nantucket Finance Department and Assessors Office*

11. *Establish and enforce new littering fines. Provide more trash receptacles at area beaches, and secure funds to maintain receptacles throughout planning area. Provide information to beach goers.*

    List of responsible agencies/groups:

    - *Department of Marine and Coastal Resources **
    - *Park and Recreation Commission*
    - *Sheriff's Office*
    - *Police Department*

12. *Educate year-round and summer residents about the dangers of bird droppings including discouraging the feeding of ducks and the development of high vegetation buffer zones around ponds. As part of this recommendation, post signs advising against feeding birds.*

    List of responsible agencies/groups:

    - *Board of Health **

13. *Utilize local TV and other media to educate the public about water quality issues.*

    List of responsible agencies/groups:

    - *Department of Marine and Coastal Resources **
    - *Board of Health*
    - *Nantucket Land Council*
    - *Office of Coastal Zone Management*
    - *Local conservation groups*

14. *Ensure that recommendations from the Estuaries Study are implemented.*

    List of responsible agencies/groups:

    - *Department of Marine and Coastal Resources **

- *Board of Health*
- *Nantucket Land Council*
- *Conservation Commission*

Objective II: Increase scientific research focused on water quality and specific issues and problems faced by Nantucket

Recommendations

1. *Seek funding for increased monitoring in both harbors. The use of both static systems and towed arrays to monitor nutrients, DO, photic depth, temperature, salinity, and current speed measurements can provide valuable information relating to water quality. Several locations in both harbors, such as the Town Pier or a floating summer dock, would provide ideal platforms for a static system connected to a data-logger recording chemical and physical water characteristics. These type of systems can greatly improve upon the "snapshot" measurements acquired during bi-weekly transects.*

   List of responsible agencies/groups:
   - *Department of Marine and Coastal Resources **
   - *SMAST*
   - *Other relevant organizations, institutions and groups*

2. *Develop a comprehensive Water Quality Management Plan incorporating goals, objectives, and recommendations in this section of the harbor plan with a protocol for updating and evaluating progress on a biannual basis. Establish timelines and funding sources.*

   List of responsible agencies/groups:
   - *Harbor and Shellfish Advisory Board **
   - *Department of Marine and Coastal Resources*
   - *Town Biologist*
   - *Health Department*
   - *Conservation Commission*
   - *Nantucket Land Council*
   - *UMass Boston Field Station*
   - *Other interested parties*

3. *Establish a permanent research facility(ies) that can accommodate current and future research requirements for the Town of Nantucket and can augment and interface with all existing facilities currently operated by the town and local organizations. Investigate strengthening a public/private partnership and funding sources to achieve this goal.*

   List of responsible agencies/groups:
   - *Department of Marine and Coastal Resources **
   - *Nantucket Shellfish Association*
   - *Harbor and Shellfish Advisory Board*
   - *Other relevant organizations, institutions and groups*

4. *Emphasize evaluation of habitat quality by undertaking local and periodic monitoring of eelgrass distribution and benthic organisms. Adopt standardized and recognized sampling protocols.*

   List of responsible agencies/groups:
   - *Relevant organizations, institutions and groups **
   - *Department of Marine and Coastal Resources*

5. *Undertake studies of associated flora and fauna, as well as bird populations.*

List of responsible agencies/groups:

- *Relevant organizations, institutions and groups **
- *Department of Marine and Coastal Resources*

6. *Establish a combination of currently used porosity measurement methods, such as the percolation tests used by the Board of Health and the Conservation Commission, and the Nantucket-based hydrographic research reports (both informal local geology classes and formal reports). Use this combination of methods to calculate or measure nutrient groundwater travel times in Nantucket soils and sediments in order to properly calibrate computer simulation models and to calculate mass input rates for nitrogen and phosphorus.*

   List of responsible agencies/groups:

   - *Relevant organizations, institutions and groups **
   - *Conservation Commission*

7. *Actively monitor changes in population of algae species associated with excess nutrient concentration such as* Ulva lactuca *(sea lettuce).*

   List of responsible agencies/groups:

   - *Relevant organizations, institutions and groups **
   - *Department of Marine and Coastal Resources*

8. *Use current groundwater monitoring and sampling practices (such as those used by the UMass Boston Nantucket Field Station, the Nantucket Land Council, and the Nantucket Conservation Foundation) as a template to create a larger island-wide effort to evaluate groundwater contaminants such as excess nutrients, bacteria, etc. Citizens should be part of this island-wide effort ("Citizen Science").*

   List of responsible agencies/groups:

   - *Relevant organizations, institutions and groups **
   - *Department of Marine and Coastal Resources*

9. *Evaluate harbor modeling products used for water quality management decisions by the Department of Marine and Coastal Resources every three years as to effectiveness, ease of use, and applicability. Incorporate results into the Water Quality Management Plan (WQMP).*

   List of responsible agencies/groups:

   - *Department of Marine and Coastal Resources **

10. *Create a data clearinghouse to provide access to maps, historical data, links to remediation solutions for businesses and individuals, information for teachers, etc. A comprehensive database of past and ongoing research should be developed and regularly updated, allowing scientists and other monitoring groups to freely share and access up-to-date information.*

    List of responsible agencies/groups:

    - *Department of Marine and Coastal Resources **
    - *Nantucket Land Council*
    - *Nantucket Biodiversity Initiative*
    - *Maria Mitchell Association*
    - *Board of Health*
    - *Other relevant organizations, institutions and groups*

11. *Investigate methods for identifying fecal bacteria sources using DNA and bacterial identifiers to distinguish between avian, human, and canine introduced fecal matter.*

List of responsible agencies/groups:

- *Board of Health **
- *Department of Marine and Coastal Resources*
- *Conservation Commission*

12. *Ensure that suitable monitoring is established to assess any environmental effects of aquaculture activities. This will be particularly important if any non-shellfish aquaculture activities are permitted in the future.*

    List of responsible agencies/groups:

    - *Department of Marine and Coastal Resources **

13. *Establish research priorities and integrate existing studies on and off-island to quantify and evaluate the effects of water quality degradation on shellfish populations (see Water Quality Management Plan and Shellfish Management Plan).*

    List of implementing agencies/groups:

    - *Harbor and Shellfish Advisory Board **
    - *Department of Marine and Coastal Resources*
    - *Town Biologist*
    - *Nantucket Shellfish Association*
    - *Health Department*
    - *Conservation Commission*
    - *Nantucket Land Council*
    - *UMass Boston Field Station*
    - *Maria Mitchell Association*
    - *Other interested parties*

14. *Conduct yearly benthic and water column grab samples to evaluate presence or absence of cysts deposited from the Harmful Algal Bloom (HAB) outbreak in 2005 caused by the dinoflagellate Alexandrium tamarense.*

    List of implementing agencies/groups:

    - *Department of Marine and Coastal Resources **
    - *Harbor and Shellfish Advisory Board*

Objective III: Adopt new bylaws to ensure that water quality is maintained and improved.

Recommendations

1. *Inform area parents of the Children's Protection Act (Chapter 85 of the Commonwealth of Massachusetts Acts of 2000). Every school, day care provider, or like institution has to file an Integrated Pest Management plan with the state. Those listed so far are the Nantucket New School, Nantucket Public Schools, Small Friends of Nantucket, and Wee Whalers. The Public School Plan states that no pesticides are used on the outside portions of the property. Request that Park and Recreation and the Nantucket Boys and Girls Club file and implement similar plans and require all schools (public and private) to have IPM plans on file in Town Building according to state law*

    List of responsible agencies/groups:

    - *Board of Selectmen **
    - *Conservation Commission*
    - *Nantucket Boys and Girls Club*
    - *Nantucket Park and Recreation Commission*

- *Institutions with IPM plans*

2. *Adopt warrant articles that reduce or eliminate quick release fertilizers and excessive use of fertilizers within the harbors watershed protection districts.*

   List of responsible agencies/groups:
   - *Board of Selectmen **
   - *Conservation Commission*

3. *Work with the Planning Board to draft new Zoning Bylaws that protect harbor waters. Use recommendations from the Comprehensive Wastewater Management Plan, the Septage Management Plan, and the Estuaries Project to derive specific language for these articles. The first set of articles should be brought forward at the 2008 Annual Town Meeting.*

   List of responsible agencies/groups:
   - *Board of Selectmen **
   - *Conservation Commission*
   - *Board of Health*

4. *During the process of renewing the town contract for landscaping, make it an order of condition that no pesticides or quick release fertilizers be used on town owned land.*

   List of responsible agencies/groups:
   - *Board of Selectmen **
   - *Conservation Commission **

5. *Establish a bylaw prohibiting dumping of any chemical, waste product, sediment, fuel, oil, or other pollutant in storm-drains. Establish a fine for each violation. In addition, review Massachusetts suggested storm water bylaw language to ensure local Conservation Commission standards include adequate protection of stormwater catch basins.*

   List of responsible agencies/groups:
   - *Board of Selectmen **
   - *Planning Board*
   - *Conservation Commission*

6. *Where applicable adopt recommendations from the Estuaries Reports as bylaws*

   List of responsible agencies/groups:
   - *Board of Selectmen **

7. *Ensure that goals as stated by the Board of Selectmen (2006-2007) regarding water quality, septic and storm water management are all updated to incorporate the recommendations included in this harbor plan.*

   List of responsible agencies/groups:
   - *Board of Selectmen **

8. *Adopt new bylaws that incorporate the Best Management Practices suggested in the Office of Coastal Zone Management's Clean Marina Guidelines.*

   List of responsible agencies/groups:
   - *Board of Selectmen **

Objective IV: Increase and maintain regulatory notices to inform the public of potential health risks associated with shellfish closures and the consumption of fish from some ponds.

Recommendations

1. *Distribute multi-lingual pond quality information and state warnings on fish consumption for area ponds through area tackle shops and chandleries. Multi-lingual regulatory notices should be placed at ponds with fish consumption warning issues (Miacomet, Gibbs, Sesachacha, Hummock, Long, and Tom Nevers ponds).*

   List of responsible agencies/groups:
   - *Board of Health **
   - *Department of Marine and Coastal Resources*

2. *Check and maintain all regulatory notices related to shellfish closures; post multi-lingual notices.*

   List of responsible agencies/groups:
   - *Board of Health **
   - *Department of Marine and Coastal Resources*

Objective V: Identify and reduce non-point source pollution by using Best Management Practices and methods available.

Recommendations

1. *Implement the stormwater infrastructure improvements outlined in Earthtech's 2005 Stormwater Outfall Analysis including all Best Management Practices and recommended technologies. Continue financial support of these projects.*

   List of implementing groups/agencies
   - *Board of Selectmen **
   - *Department of Public Works*
   - *Finance Committee*

2. *Establish a comprehensive list of all ponds and coastal areas that require rehabilitation and identify specific proposals and methodologies for implementing such rehabilitation in conjunction with state agencies. Prioritize each water body or area on the list using criteria such as (but not limited to) state of degradation of habitat, public health concerns, reduction in state threatened or protected species, essential fish habitat, spread of invasive species, or other related indicators. Develop a coordinated program and timeline for rehabilitation based on priority level and identify potential funding sources.*

   List of responsible agencies/groups:
   - *Local conservation groups such as the Nantucket Land Council **
   - *Department of Marine and Coastal Resources*
   - *Board of Health*
   - *Nantucket Land Council*
   - *Conservation Commission*
   - *Department of Public Works*
   - *Massachusetts Office of Coastal Zone Management*

3. *Investigate the feasibility of reducing avian "nuisance species" such as Canada Geese and Mute Swans. Methods could include using coyote/fox statues in fields to repel Canada Geese, reducing or eliminating hand feeding, and restoring high vegetation around ponds.*

List of responsible agencies/groups:

- *Conservation Commission **

3.7 COMMERCIAL AND RECREATIONAL FISHING

Goal: **To sustain and improve the commercial and recreational fisheries of Nantucket by: protecting and enhancing a suitable habitat; providing the infrastructure for efficient and safe harvesting, appropriate monitoring of catch, and aquaculture and research facilities as appropriate to support natural stocks; developing a shellfish management plan; and ensuring that the highest possible water quality is maintained.**

Commercial and recreational fishing are two activities that help to give Nantucket its identity. The future of these industries depend on several factors including water quality, establishing and maintaining adequate harvest limits, and ensuring access to the water.

Objective I: ***To preserve, protect, and enhance shellfish populations resulting in a sustainable fishery.***

Background

Nantucket's largest commercial fishery is that of the bay scallop. While many people rely on this fishery as a source of income, catches vary greatly from year to year. The 2005-2006 season was particularly troublesome, with fishers bringing in only 1/6th of the total catch from the previous season. This drastic drop in total catch generated support for the development of a shellfish management plan.

Several shellfish "management plans" have been developed in the past, yet none of these plans took a comprehensive approach to shellfish management, nor were they implemented.

Recommendations:

1. *Develop and implement a Shellfish Management Plan by October 1, 2008 to protect and enhance the island's shellfish resources, employing either community-based management or co-management.*

   This shellfish management plan will serve as the basic document from which Nantucket's shellfishery management and governance practices are derived. The shellfish management plan should be developed with the cooperation of all stakeholders including government agencies, the shellfishers, and researchers.

   This shellfish management plan should:

   - *Define or re-define the legal definition of scallop acceptable for harvest by October 1, 2007*
   - *Establish guidelines and objectives for comprehensive scientific research. This section should attempt to encourage collaboration between the town biologist and the shellfishers, as well as any independent consultants*
   - *Establish guidelines for monitoring efforts*
   - *Develop an enforcement plan, identifying how the plan will be enforced, as well as the person(s) responsible for enforcement. This section should attempt to avoid situations in which enforcement personnel also hold other potentially conflicting positions*
   - *Outline the means by which propagation might be employed to support the fishery. Establish policies and objectives for shellfish propagation activities.*
   - *Present any relevant controls on the shellfish fisheries such as license and/or catch limitations, gear restrictions, and closed areas*
   - *Incorporate practices to preserve and enhance the natural resources crucial to the fishery*
   - *Develop an implementation section of the plan, identifying how the plan will be implemented, as well as the person(s) responsible for implementation.*

- *Identify and incorporate best practices for population enhancement, harvesting, seed management, or any other activities linked to the preservation and enhancement of the natural resource.*
- *Propose guidelines and provisions for evaluating direct or indirect impacts of proposed land use developments, transportation entities, recreational activities or any water-impacting activity on the fishery and the resources.*

List of responsible agencies/groups:

- *Department of Marine and Coastal Resources **
- *Shellfish and Harbor Advisory Board*
- *Nantucket Shellfish Association*
- *Other concerned citizens*

2. *Continue existing propagation efforts for soft shell clams, oysters, and bay scallops. Re-establish a bay scallop propagation facility at the Brant Point boathouse with a focus not only on propagation but also on research to gauge the facility's success at supplementing the natural stock with genetically diverse scallops.*

   Use of the Brant Point facility should include, but not be limited to:

   - *A shellfish propagation facility that would include a hatchery for the production of local seed to be used for population studies, appropriate fisheries enhancement, and aquaculture enterprises. This element of the facility would seek to reduce or eliminate the importation of seed for a variety of shellfish from outside sources.*
   - *A research facility for use by the town, local scientists, students, and visiting scientists as appropriate, for the purposes of monitoring and improving Nantucket's harbor water quality, developing science on shellfish species and habitat, and providing educational programs for the public.*
   - *A marine sciences education facility to benefit young people and adults, where public access would be encouraged.*
   - *A governance mechanism that will ensure that research programs are maximized for the benefit of local water quality, that shellfish seed production is successful, and that town departments and staff have sufficient access to the facility to continue local programs and activities.*
   - *A mechanism to ensure long range funding for the facility and an extension of the lease on the property for the town.*

   List of responsible agencies/groups:

   - *Department of Marine and Coastal Resources **
   - *Nantucket Shellfish Association*
   - *Harbor and Shellfish Advisory Board*

3. *Continue to seek funding through grants, shellfish license fees, and fines to support fisheries development, management, and research.*

   List of responsible agencies/groups:

   - *Department of Marine and Coastal Resources **
   - *Nantucket Shellfish Association*
   - *Harbor and Shellfish Advisory Board*

Objective II: Maintain and improve the infrastructure necessary to support both shellfishing and finfishing.

Background

Finfishing is a small industry on Nantucket, dominated by five charter boat companies and recreational fishers. The charter boats target a variety of species including bluefish, striped bass, bonita, shark, marlin, tuna, fluke, and cod.

Commercial finfishing also exists, with two draggers and approximately fifteen fluke fishers who bring their catch into Nantucket Harbor.

In addition to maintaining existing infrastructure such as pumpouts, affordable berthing space, and fuel, for the charter boats and commercial fishers, it is also important to ensure continued public access to the shore for the purposes of surfcasting, shellfishing, and launching/hauling boats. The current situation provides too few launches, resulting in long lines and parking difficulties for fishers and other launch users.

Recommendations

1. *Improve and expand upon existing waterfront access points and seek new access for fisheries uses through easements, Chapter 91 license requirements, land purchases, recovery of historical points of access not recorded by the town, or other means. Some sites to consider in particular include: Brant Point, the Land Bank property at Petrol Landing, Spruce Street, Warren's Landing, East and West Polpis access points, and the Town Pier. Ensure that these access points do not result in the unreported taking of shellfish by designating specific unloading areas.*

   List of responsible agencies/groups:
   - *Board of Selectmen **
   - *Harbor and Shellfish Advisory Board*
   - *Nantucket Shellfish Association*
   - *Nantucket Marine Trades Association*
   - *MA Department of Environmental Protection*
   - *Department of Marine and Coastal Resources*
   - *Nantucket Right of Way Committee*

2. *Expand availability of adequate and affordable dock and mooring spaces to support commercial and recreational fisheries by including special conditions in Chapter 91 licenses.*

   List of responsible agencies/groups:
   - *Harbor and Shellfish Advisory Board **
   - *Nantucket Shellfish Association*
   - *Nantucket Marine Trades Association*
   - *Department of Environmental Protection*
   - *Department of Marine and Coastal Resources*
   - *Board of Selectmen*

3. *Increase and improve existing shore-side infrastructure, including boat repair facilities and marine supply shops to support commercial and recreational fishing opportunities.*

   Through Chapter 91 permitting and local zoning, new shore-side infrastructure can be acquired through public investments such as the possibilities under consideration at Petrol Landing. Infrastructure can also be acquired via commercial enterprises. Refer to the Commercial Waterfront section of this report for more information on these opportunities.

   List of responsible agencies/groups:
   - *Board of Selectmen **

- *Department of Marine and Coastal Resources*
- *Nantucket Marine Trades Association*
- *Others*

3.8 PUBLIC ACCESS IN NANTUCKET AND MADAKET HARBORS

For the purposes of this project, "public access" does not include opportunities to view or reach the waters of Madaket Harbor or Nantucket Harbor provided for a cost. For example, this discussion excludes situations in which one might access the water via boat for a fee.

Goal: **To preserve and improve physical and visual public access to the waters and shorelines of Nantucket and Madaket Harbors.**

Objective I: Identify, maintain, and improve existing public access sites to and along the shore.

Background

Public access to Nantucket's shoreline and water is obtained in three ways: through acquisitions, easements, and regulatory conditions.

On the upland (above mean high water), access is permitted on some properties owned by various landholding groups such as the Town of Nantucket, the Nantucket Land Bank, the Conservation Commission, the Massachusetts Audubon Society, the Nantucket Conservation Foundation, and the Trustees of Reservations.

In addition to public access permitted on these privately held properties, the public can also access the water at some town-owned road ends, and via historic rights of way.

Public access within the intertidal area (between the mean high and low water), is permitted for fishing, fowling, navigation, and their natural derivatives per the Public Trust Doctrine. These rights are also codified in Chapter 91 of Massachusetts General Laws. To protect public trust rights on tidelands, Chapter 91 and its accompanying waterways regulations may specify signage, stairs, overhead clearance, strolling rights within the intertidal zone, berthing space for commercial fishing vessels, etc. Over 50 Chapter 91 licenses within the planning area currently call for public access in one form or another (see Appendix 3).

The Public Trust Doctrine also applies below mean low water, extending out three nautical miles from the shore.

Recommendations

1. *Inventory and map all existing public access, including those access points established through the Chapter 91 licensing process and those held by all landholding agencies. As part of this process, assess each site's condition (i.e. signage, parking, handicap accessibility, necessary improvements, opportunities for expansion) and clarify the legal status of the property.*

   An initial map of Nantucket has been developed depicting public access points based on conversations with town officials and landholding organizations, and available GIS data. The Town of Nantucket and the Right of Way Committee should continue to identify and map existing public access sites, as well as investigate the conditions of the sites on a regular basis. Furthermore, the town and the Right of Way Committee should investigate the legal status of each site and ensure that the proper paperwork has been filed to legally record those parcels that may have been obtained unofficially (Figures 3.1 to 3.3).

   List of responsible agencies/groups:

   - *Right of Way Committee **

2. *Ensure that existing public access points are retained and maintained for use by the general public.*

   The town should identify the party responsible for site maintenance at each public access point (including visual access points), and work with them to ensure unobstructed and safe public use. In addition, the town should work with the Department of Environmental Protection to review and enforce Chapter 91 license conditions including appropriate signage.

   Enforcement and maintenance should be conducted on a regular schedule to ensure that access is not impeded in any way. A penalty system should be developed to encourage appropriate upkeep of sites.

   Respect and support enforcement of any time restrictions on public access established by property owners, easements, or regulatory conditions.

   List of responsible agencies/groups:

   - *Right of Way Committee **
   - *Department of Environmental Protection*

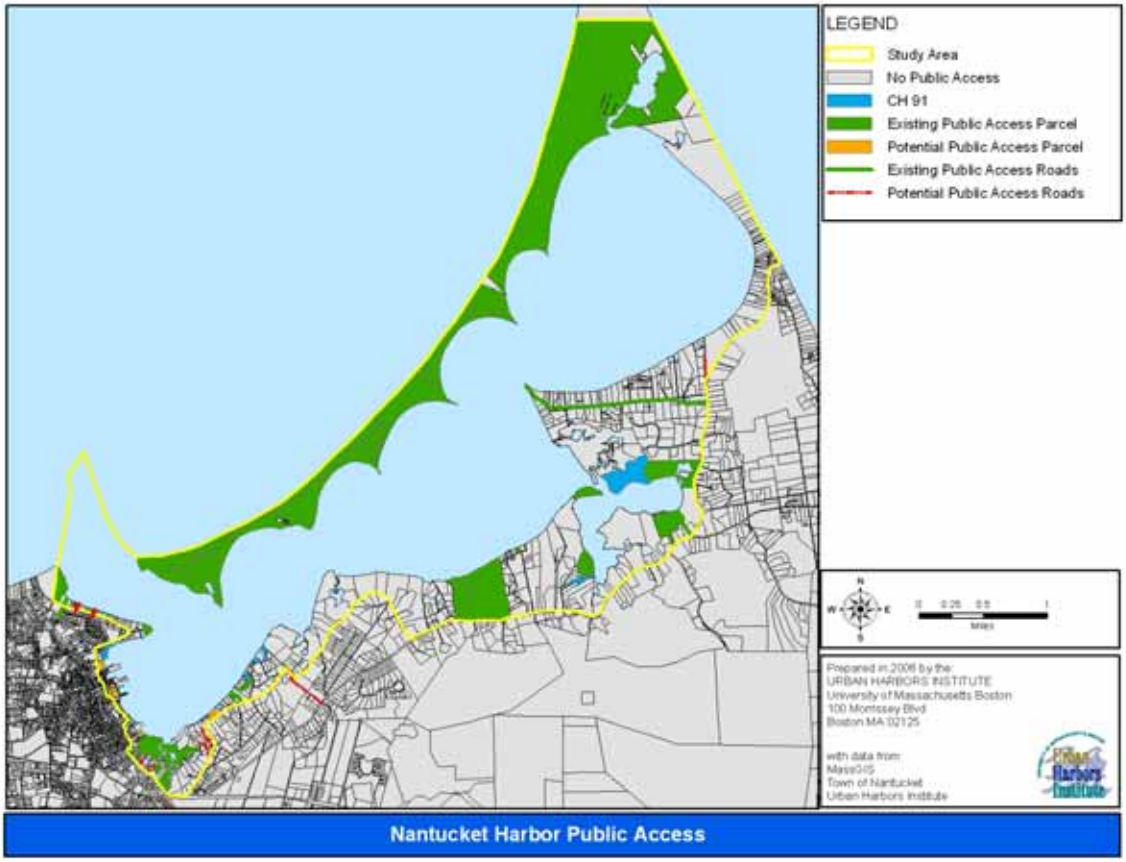


Figure 3.1 Public Access around Nantucket Harbor.

3. *Develop and distribute guides identifying public access points to and along the shores of the harbors.*

   The Right of Way Committee should work with all landholding groups to develop a public access guide that includes information about location, ownership of the parcel, available parking, the allowable types of access (i.e. fishing, bird watching, etc.), times when access is permissible, amenities, handicap accessible sites, etc.. The guide should be updated regularly to provide accurate information about public access opportunities.

List of responsible agencies/groups:

- *Right of Way Committee **
- *Landholding groups*
- *Chamber of Commerce*

4. *Improve and standardize signage at existing shoreline and waterfront access sites*

   The Right of Way Committee and the Department of Public Works should develop a standard public access sign, have signs constructed and installed at existing and new sites, and develop a plan for the regular inspection of signs. This standard format should also be used for all Chapter 91 license conditions requiring signage.

   List of responsible agencies/groups:

   - *Right of Way Committee **
   - *Department of Environmental Protection*
   - *Department of Public Works*
   - *Beach Manager*

Objective II: Expand the number of access points in a systematic way that responds to the needs of the various segments of the population that use the harbors.

Background

While many public access sites already exist, there is still a need to increase access opportunities, specifically for people requiring handicapped access, for commercial and recreational fishers, and others who need to haul and launch their boats. Additionally, some sites should be expanded to include amenities such as restrooms and parking. In considering new or expanded access to the harbor, it is important to consider the type and quality of the natural resources in the area. Certain natural resources, such as tidal wetlands or nesting areas, can be damaged or disrupted by human intrusion. In all cases of proposed new or expanded access, the planned level and type of access should be carefully evaluated and aligned with the capability of the natural resources to tolerate the activity. In the case of sites with existing or proposed water-dependent use, new or expanded public access should avoid undue interference with the water-dependent use.

Nothing in this plan or in any of the recommendations contained herein, however, should be construed as taking any position as to whether the Steamship Authority should provide any additional or different types of public access to the Steamship Authority dock than currently exists, or whether the Steamship Authority should maintain the same amount of public access as it currently provides to its dock. This plan recognizes that the principal purpose of providing public access to the Steamship Authority dock is so that the Steamship Authority can perform its essential governmental function of providing adequate transportation of persons and necessaries of life for the island of Nantucket, and that the Steamship Authority has legitimate security, safety and operational reasons for limiting or sometimes even prohibiting other types of public access to its property that would hinder its ability to carry out its statutory mission of providing safe, economical, convenient and reliable ferry service for the island.

Recommendations

1. *Inventory and map potential new public access points. Use this information to guide future acquisitions.*

   The Right of Way Committee should work with all landholding groups to identify and map general areas where increased access should be sought. Such an effort would lead to greater coordination in the acquisition of public access sites.

   List of responsible agencies/groups:

   - *Right of Way Committee **
   - *Landholding groups*

- *Department of Public Works*
- *Board of Selectmen*

2. *Improve boating access (specifically for fishers and recreational boaters).*

   The Department of Marine and Coastal Resources and the Right of Way Committee should work with the Harbor and Shellfish Advisory Board and the Nantucket Shellfish Association to identify potential sites for expansion or acquisitions of boating access sites. Consideration should be given to areas that can accommodate parking, and that will have minimal impact on surrounding natural resources.

   List of responsible agencies/groups:

   - *Right of Way Committee **
   - *Department of Marine and Coastal Resources*
   - *Harbor and Shellfish Advisory Board*
   - *Nantucket Shellfish Association*

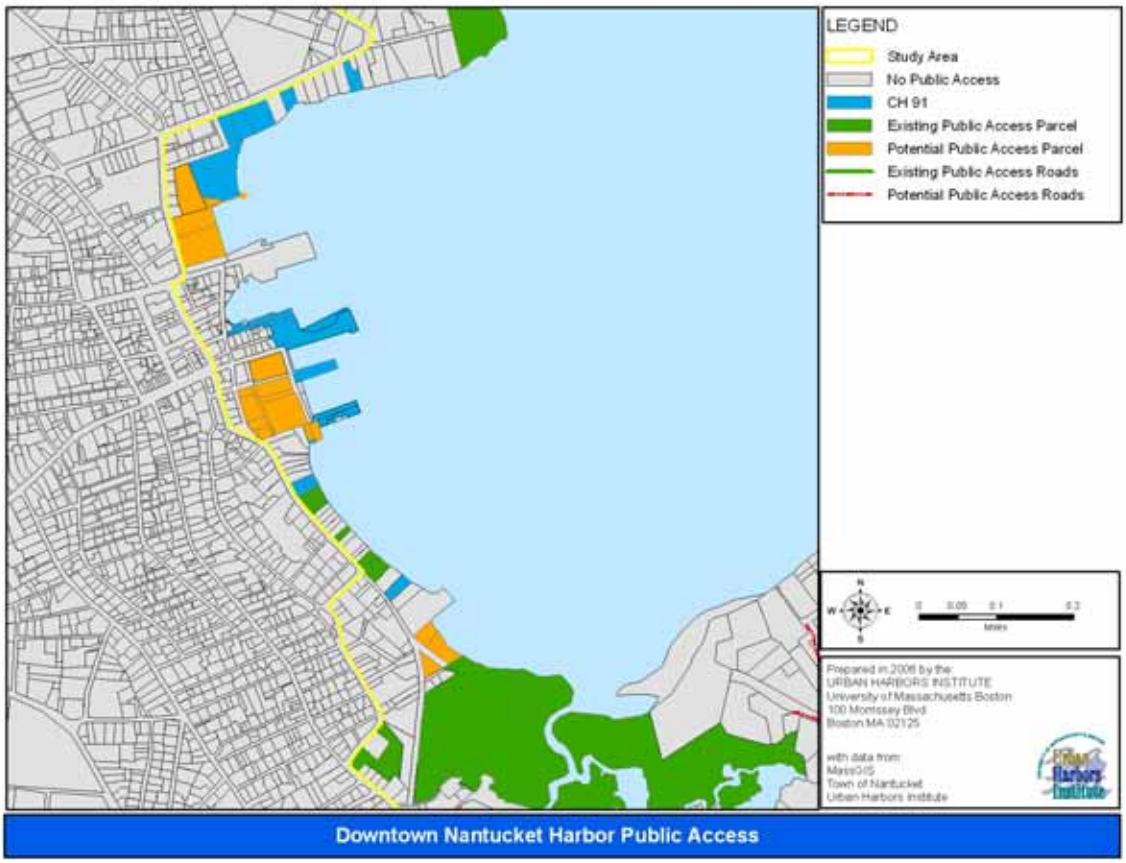


Figure 3.2 Downtown Public Access.

3. *When appropriate, the town should continue to require public access easements (including new launch sites and parking, pedestrian access, and affordable slips/moorings) on all new or expanded waterfront development.*

   List of responsible agencies/groups:

   - *Planning Board **
   - *Department of Environmental Protection*
   - *Department of Marine and Coastal Resources*

- *Conservation Commission*
- *Board of Selectmen*

4. *The town should provide incentives to homeowners to encourage providing public access on their property. Incentives may include limiting the hours of public access and providing assistance with beach cleaning efforts.*

   List of responsible agencies/groups:
   - *Planning Board **
   - *Department of Marine and Coastal Resources*

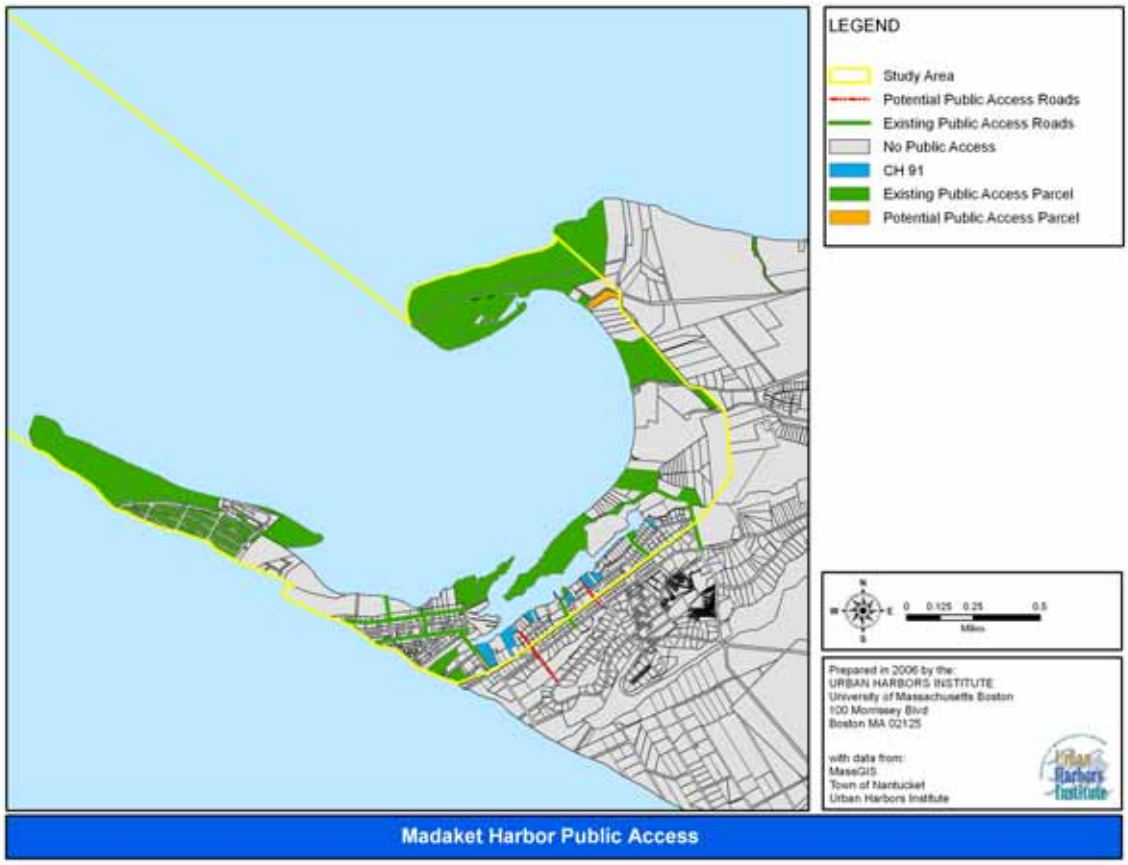


Figure 3.3 Public Access in Madaket Harbor.

5. *Chapter 91 licenses issued by the Department of Environmental Protection should incorporate public access conditions consistent with this plan. More specifically, licenses should contain, where appropriate, conditions including but not limited to parking, restrooms, signage, pedestrian access, handicap access visual access, boating access, boat storage, trash receptacles, boat ramps, commercial berthing, and/or boat lift.*

   List of responsible agencies/groups:
   - *Planning Board **
   - *Conservation Commission*
   - *Massachusetts Department of Environmental Protection*
   - *Right of Way Committee*
   - *Department of Marine and Coastal Resources*
   - *Department of Public Works*

- *Board of Selectmen*

6. *The town should explore the feasibility of developing a "harbor walk" with standardized access signs and interpretive signs along Nantucket Harbor, recognizing that pedestrian walkways are a waterfront use that should not be implemented to the detriment of commercial or recreational boating interests. Lateral access along the waterfront for pedestrian traffic unrelated to active harbor uses should only be encouraged where water dependent uses providing direct access to the harbor are not compromised. In areas where new waterfront pedestrian walkways would interfere unacceptably with existing water-dependent commercial or recreational boating activities, off-site public benefits or amenities related to the waterfront should be considered. Where appropriate, the "harbor walk" should be handicap-accessible.*

   List of responsible agencies/groups:
   - *Right of Way Committee **
   - *Commission on Disability*
   - *Chamber of Commerce*

7. *The town should file the paperwork needed to legally record currently-used access points that have not been officially or properly obtained.*

   List of responsible agencies/groups:
   - *Right of Way Committee **

Objective III: Maintain existing visual access to the harbors and the waters' edge and work for improved visual access.

Background

The natural and cultural resources of Nantucket and Madaket Harbors and surrounding landscape have scenic qualities that add to the enjoyment and attraction of being on or near the water. For many residents and visitors, these scenic resources are most available from public ways and pedestrian access points surrounding the harbor. In built-up areas viewsheds can be impaired by plantings, buildings, fences, and other types of obstructions. While there is no formal visual access plan for the island, there should be increased recognition of the value of scenic resources and the town should undertake a planning process to identify and preserve outstanding views and visual access points.

Recommendations

1. *Identify outstanding views and visual access points along the harbors*

   The town should conduct a viewshed study (inventory and qualify scenic resources) and inventory existing and potential visual access points. As part of the study, develop criteria for protecting scenic resources and for providing places where the public has visual access to the harbor. Once the study is complete, these criteria should be incorporated into the town's site plan review for waterfront development and, as appropriate, into the town's comments on Chapter 91 license applications.

   List of responsible agencies/groups:
   - *Planning Board **
   - *Department of Environmental Protection*

3.9 DOCKS, WHARVES, AND PIERS

Goal: **To preserve and enhance the natural resources, ability to navigate, public access along the shoreline and traditional character of Nantucket and Madaket Harbors by limiting the construction of new, or the expansion of existing private docks, wharves, or piers.**

Background

Presently, the construction of new private docks, wharves or piers is prohibited through zoning on all of Nantucket, with the exception of the Residential Commercial District. In the latter district, a moratorium on new docks and piers has been in place since 2005 and by vote of the 2007 Annual Town Meeting was extended through April 30, 2008. In extending the ban, Town Meeting approved a provision to allow for the construction of a public dock or pier on both Tuckernuck and Muskeget islands because of the need for access.

Docks, wharves, and piers can have a number of impacts to the environment and natural resources, to the ability to navigate along the shore, to public access along the shoreline or to shellfishing areas, and to the traditional community character of an area. In passing the zoning ordinance prohibiting these structures outside of the Residential Commercial District, the town indicated that it felt private use of the waters along the shore was detrimental to the wishes of its citizens.

Exceptions to the prohibition of new docks, wharves, and piers were made for governmental and public entities.

Objective: ***To limit the construction of new private docks, wharves and piers, and the extension or expansion of existing private docks, wharves, and piers.***

Recommendations

1. *Develop language to be considered at the 2007 Special Town Meeting to amend the town Zoning Bylaw to prohibit new, expanded, or extended private docks, wharves, or piers in any town waters. Include provisions to exempt governmental agencies or public entities from this prohibition.*

   This recommended amendment to the Zoning Bylaw should be submitted to the Special Town Meeting in the Fall of 2007.

   List of responsible agencies/groups:

   - *Planning Board **

2. *Complete a survey of the existing docks, wharves and piers to ensure that the structures are all licensed under the provisions of MGL Chapter 91 and that the structures meet all requirements noted in their license.*

   A partial listing of the existing licenses for docks, wharves, and piers on Nantucket Island will be provided as part of this updated harbors action plan (see Appendix 3). It is suggested that the Town of Nantucket could coordinate a group of volunteers to complete the list and survey the existing docks to compare their existing configuration with that licensed through Chapter 91. Any violations of the provisions of licenses for the structures should be reported to the Waterways Division of the Massachusetts Department of Environmental Protection for enforcement.

   List of responsible agencies/groups:

   - *Department of Marine and Coastal Resources **
   - *Planning Department*
   - *Conservation Commission*

3. *Review the legal status of permit applications for private docks that have already been submitted.*

   Some applications for private docks in the current Residential Commercial District have been submitted in the past to one or another of the various permitting agencies, e.g. the Nantucket Conservation Commission, the Massachusetts Department of Environmental Protection, and/or the U.S. Army Corps of Engineers. These permit applications should be reviewed to clarify their legal status as part of this above recommendation for prohibition of new private docks, wharves, and piers.

   List of responsible agencies/groups:

   - *Conservation Commission **
   - *Department of Marine and Coastal Resources*
   - *Office of the Town Counsel*

4. *Implement standards for design and construction of docks, wharves, and piers, that will protect the safety of people, buildings and infrastructure, in addition to natural resources both in normal use and in the case of a significant storm.*

   The Planning Board should propose design standards and criteria to be incorporated into the Zoning Bylaw that will ensure that docks, wharves, and piers will be safe for those using them and that the docks will not become a danger to the public or to natural resources in instances of significant storms.

   List of responsible agencies/groups:

   - *Planning Department **
   - *Building Department*

5. *Establish criteria to evaluate whether a dock, wharf, or pier has substantially deteriorated and a process to have deteriorated docks, wharves, or piers repaired or removed.*

   The Department of Marine and Coastal Resources, in conjunction with the Building Inspector, should develop criteria to evaluate whether such a structure should be considered deteriorated. Following such a determination, the Department of Marine and Coastal Resources should notify the dock's owner of the deterioration and set a period of time in which the dock must be repaired to satisfactory condition or be removed. The Department of Marine and Coastal Resources may determine that only a portion of the structure is substantially deteriorated and must be repaired or removed, allowing the rest of the pier to remain. The Massachusetts Department of Environmental Protection may be able to assist in this effort through the provisions of MGL Chapter 91.

   List of responsible agencies/groups:

   - *Department of Marine and Coastal Resources **
   - *Building Inspector*

3.10 COMMERCIAL WATERFRONT

Goal: **To preserve, promote and support water-dependent uses of the harbor and the commercial waterfront.**

Background

The commercial waterfronts of Nantucket and Madaket Harbors are centers of the island's traditional and existing water-based industrial and commercial uses including water-borne passenger and cargo transportation, commercial fishing, recreational boating, and the businesses that support these activities. Nantucket's natural harbors provided shelter for the original wharves, piers and seafaring industries. Over subsequent years alterations and investments have expanded and enhanced these locations to support contemporary water-dependent uses. The improved harbors, with engineered shorelines, infrastructure, docks and piers are irreplaceable assets essential to the community's existence and economy. Today, environmental and land use regulations discourage alteration of natural resources and

the construction or expansion of docks and piers in areas beyond the existing commercial waterfronts. Activities that require direct access to the water must be given priority in these developed harbor areas.

Objective: ***Discourage the displacement of existing water-dependent uses and activities. Give highest priority to uses and activities that require access to coastal waters when making land-use decisions on waterfront redevelopment.***

Recommendations

1. *Develop and adopt into the Nantucket Zoning Bylaw, a Harbor Overlay District (Figures 3.4 and 3.5) to be applied to the commercial waterfront areas of Nantucket and Madaket Harbors to ensure that:*
    - *Existing water-dependent uses are not displaced by nonwater-dependent uses;*
    - *Harbor waters and the immediate shoreline and pier areas are dedicated to water-dependent uses;*
    - *Commercial uses allowed by the underlying district regulations are compatible with, support, or otherwise do not interfere with water-dependent uses of the site; and,*
    - *No conversion of commercial use to residential use (new residential use allowed only on upper floors of new structures).*

    List of responsible agencies/groups:
    - *Planning Board **
    - *Board of Selectmen*

2. *Include in the harbor plan, and adopt into the town's Zoning Bylaws, a list of priority water-dependent uses, activities and services as guidance to property owners and developers.*

    This will serve as a guide not only for municipal land use decisions, but also for Chapter 91 licensing decisions by the Department of Environmental Protection.

    - *Boating support services:*
        - *Boat ramp or other public boating access facilities*
        - *Boat haul-out capabilities*
        - *Boat repair and maintenance or waterfront facilities associated with inland sites providing these services*
        - *Launch service*
        - *Fuel and pump-out services*
        - *Upland boat storage*
        - *Services such as ice, laundry, bait, provisions*
        - *Businesses such as ship chandlery, fishing outfitter*
        - *Parking*

    - *Commercial fishing*
        - *Berthing*
        - *Loading/unloading areas*
        - *Gear storage facilities*
        - *Parking*
        - *Seafood wholesaler*
        - *Retail fish market*

    - *Commercial charter boat*
        - *Berthing*
        - *Support facilities*

- *Waterfront public access and amenities (as an enhancement to all other uses, except where water-dependent operations would present a safety concern)*
  - *Public restrooms*
  - *Public parks*
  - *Seating*

- *Passenger and cargo ferry pier and facilities*

List of responsible agencies/groups:

- *Board of Selectmen **
- *Department of Environmental Protection*

3. *Include in the harbor plan, and prohibit in the town's Zoning Bylaws, a list of water-dependent uses that are not consistent with the objectives of the harbor plan.*

- *Cruise ship terminals or support services;*
- *Personal watercraft rental;*
- *New facilities of private tenancy, i.e., facilities at which the advantages of use accrue to a relatively limited group of specified individuals rather than to the public at large.*

List of responsible agencies/groups:

- *Board of Selectmen **
- *Department of Environmental Protection*

Building Use, the RC District and the Proposed Downtown Overlay District

Figure 3.4 Downtown Showing Building Use, the RC District and the Proposed Overlay District.

4. *Adopt waterfront property assessment policies that provide incentives for water-dependent uses.*

   List of responsible agencies/groups:

   - *Board of Selectmen **
   - *Assessor's Office*

Figure 3.5 Madaket Harbor Showing the RC District and the Proposed Overlay District.

5. *Identify scenic views (or characteristics of scenic views) of the harbor landscape and waterscape to guide decision making on potential impacts to visual access.*

   The protection of scenic values is particularly important to communities with economies built around tourism. Coastal scenic viewsheds include views of the harbor or ocean from land-based sites such as public roads, walks, parks, and vista points as well as views from vessels in coastal waters looking toward the coastal landscape which might consist of either natural or cultural features or both.

   Planning and regulatory decisions for protection of coastal scenic resources will be made on a case-by-case basis. However, it is useful to catalog either the types of scenic resources warranting protection or specific elements of existing viewsheds that should be preserved or protected. In general, views that include landscapes, places, or structures characteristic or symbolic of the particular place, that are unique or irreplaceable, have outstanding visual qualities, or that is characteristic of the traditions or history of the community, are considered worthy of protection. Oftentimes a natural or historical resource that contributes to a scenic view will itself be protected (by ownership or regulation) against alteration, but not its broader context. An effort should be made to identify and describe the particular values of viewsheds in the harbor planning areas that will serve to guide future decision making.

List of responsible agencies/groups:

- *Right of Way Committee **
- *Conservation Commission*
- *Planning Board*
- *Historic District Commission*

6. *Identify all structures on or adjacent to the waterfront that can be considered historic assets in the context of a working waterfront and add them to the Historic District Commission's list of individually or contributing significant structures.*

   List of responsible agencies/groups:

   - *Historic District Commission **

3.11 HARBOR OPERATIONS, SAFETY, NAVIGATION AND MOORINGS

Goal: **To provide a boating environment that promotes safety and balanced uses while maintaining the character and protecting the natural resources of the harbors.**

Objective I: To improve the waiting list system for moorings in Nantucket Harbor.

Background

Mooring space in both Nantucket and Madaket Harbors is in high demand. The Department of Marine and Coastal Resources maintains two separate waitlists depending on vessel size. The list for a vessel of 26 feet or less, had over 600 people on it as of October 2006. Each year, between 30 and 40 of those on the 26-foot and under waiting list receive a mooring. While the waiting list for larger boats (over 26 feet) is currently 202 people, the turnover is much less, with only one or two new people getting moorings each year.

Although the waiting lists are bound to remain long, the process by which the lists are maintained can be improved to provide more accurate and up-to date information for the Department of Marine and Coastal Resources and boaters alike.

One of the existing problems with the waiting list is that, once boaters sign up to be on the list, they do not have to renew their position, nor do they have to update their contact information. This results in waiting lists of people who may no longer be interested in moorings, and creates difficulties when trying to contact people.

The Department of Marine and Coastal Resources recently developed an application for mooring permits. This application gathers contact information and vessel information for each applicant. The Department of Marine and Coastal Resources will send this form out to each member of the waiting lists on an annual basis to keep records current. Applicants will have to return the form and a check for $5.00 to the Department of Marine and Coastal Resources to renew their position. These funds will be used by the Department of Marine and Coastal Resources for their mooring program. As part of the initial process, email addresses will be collected so that future renewals and communications can be conducted electronically.

Recommendations

1. *The Department of Marine and Coastal Resources should implement a waiting list application process that requires individuals to annually update their contact information and to reaffirm their desire to remain on the waiting list by paying a $5.00 fee.*

   List of responsible agencies/groups:

   - *Department of Marine and Coastal Resources **

2. *The Department of Marine and Coastal Resources should make the waiting lists available on the Department's website.*

   In order to minimize the number of phone calls and questions about where people sit on a waiting list, the Department of Marine and Coastal Resources will maintain an on-line copy. This will enable mooring applicants to monitor their progress on the waiting list, and will reduce the number of mooring-related questions coming into the Department of Marine and Coastal Resources.

   List of responsible agencies/groups:

   - *Department of Marine and Coastal Resources **

Objective II: To ensure that both the number and size of boats does not exceed the carrying capacities of either Nantucket or Madaket Harbors.

Background

While the harbors physically have space to accommodate more boats, the Department of Marine and Coastal Resources has placed a cap on the number of mooring permits that they issue. This is necessary to balance a number of different uses and factors that are influenced by the number of boats in the harbors. This current cap has been set in part to address water quality and eelgrass concerns and to ensure that it remains possible to safely haul boats in the event of a storm. In addition, an increase in the number of boats would create new opportunities for user conflicts, and would overwhelm the companies that currently manage moorings and service and store boats. Finally, an increase in the number of boats in the harbors would require new public access sites, including parking.

Although mooring numbers have been capped, the town has never officially defined a carrying capacity for either harbor. Generally, the carrying capacity refers to the number of boats that can be accommodated within a harbor. However, it may also need to reflect the size distribution of boats and, possibly, the ratio of sailboats to powered vessels.

There are at least three ways to determine a harbor's carrying capacity, and they often focus on maintaining desired conditions. *Physical carrying capacity* refers to the maximum number of vessels that can be accommodated in the harbor at one time without jeopardizing boating safety or efficiency. *Social carrying capacity* considers the impacts that different uses and intensities of uses have on recreational and social experiences. *Ecological carrying capacity* refers to the *"maximum level of use, in terms of numbers and types of activities, before an unacceptable or irreversible decline in ecosystem value occurs"* (Gona, 2004). Public input during the harbor plan update process suggests that a carrying capacity for the harbors might include physical, ecological, *and* social considerations.

As all these methods of determining carrying capacity are very subjective, such a determination can only be achieved by finding a compromise that all stakeholders can live with. This is what the Department of Marine and Coastal Resources has been striving to achieve with its current limit on the number of mooring permits.

In addition to the number of boats allowed in the harbors, the size of the boat also impacts natural resources, user conflicts, and the ability to safely manage activities in the harbor. Even a small number of large, commercial passenger vessels may exceed the carrying capacity of Nantucket Harbor. In 1998, in response to concerns of town officials and the business community, the Board of Selectmen issued a statement that large cruise ships have an unacceptable impact on Nantucket and should not be encouraged. Navigational safety concerns, the capacity of the current tourist infrastructure and transportation systems to handle large influxes of people arriving at once, and the importance of maintaining the quality of visitor experience, are the reasons cited for the town's policy to discourage large cruise ship visits.

Recommendations

1. *The Department of Marine and Coastal Resources should assess the need to quantify the carrying capacity of Nantucket's harbors. The Department of Marine and Coastal Resources should assess the need to quantify the carrying capacity of Nantucket's harbors in consultation with the Steamship*

Authority and all other harbor users to the extent that their activities may be affected by any change in current conditions.

If the decision is to move forward with quantifying the carrying capacity, they should consider: (1) which definition(s) of carrying capacity they wish to address; (2) whether or not the current conditions are also the "desired" conditions which they will strive to maintain; and (3) what types of research would be necessary in order to determine the impact of boats on the desired conditions.

List of responsible agencies/groups:

- *Department of Marine and Coastal Resources **

2. *Until the above recommendation has been completed, the Department of Marine and Coastal Resources should continue to cap the number of moorings in the harbor at approximately 2100 vessels, while maintaining a similar ratio of smaller boats (less than 26 feet) to larger vessels. The current ratio is approximately 7:1 (smaller boats:larger boats).*

   This cap will help prevent additional damage to the natural resources within the harbors, prevent an increase in user-conflicts, and avoid overwhelming those responsible for managing the existing moorings or emergency boat haul-out.

   List of responsible agencies/groups:

   - *Department of Marine and Coastal Resources **

3. *The Department of Marine and Coastal Resources should determine the maximum number of mooring permits that can be issued to a waterfront homeowner.*

   Currently, waterfront homeowners may apply for mooring permits in order to keep their boats offshore of their properties. Currently, no language or regulations exist that limit the number of mooring permits that can be requested by a waterfront property owner; however, no one has yet asked for more than two such permits. While the Department of Marine and Coastal Resources may deny a request for a mooring permit, language should be developed to officially limit the number of boats a waterfront homeowner can moor off their property at a maximum of two per property. The Department of Marine and Coastal Resources should take into consideration conflicts of use and impacts to natural resources when making their decision.

   List of responsible agencies/groups:

   - *Department of Marine and Coastal Resources **

4. *Mooring permits for waterfront properties should only be issued for boats that are held in the owner's name and registered in Massachusetts.*

   List of responsible agencies/groups:

   - *Department of Marine and Coastal Resources **

5. *The Department of Marine and Coastal Resources and the Nantucket Planning and Economic Development Commission should periodically reevaluate the issues related to cruise ship visits to Nantucket. This reevaluation should consider navigation limitations, the town's ability to cope with a significant increase in visitor numbers and how such increases would affect on-shore facilities and services. Such evaluation should take into account the size of vessels, the passenger capacities, the planned frequency and duration of visits, and the timing/season of visits.*

   List of responsible agencies/groups:

   - *Department of Marine and Coastal Resources **
   - *Nantucket Planning and Economic Development Commission*

6. *If cruise ship visits are acceptable, a per person landing fee should be levied and these funds should be used by the Department of Marine and Coastal Resources.*

List of responsible agencies/groups:

- *Department of Marine and Coastal Resources **

7. *There should be no anchoring of vessels east of First Point. All large, commercial passenger vessels should anchor between the anchorage and First Point.*

   List of responsible agencies/groups:

   - *Department of Marine and Coastal Resources **

8. *Cruise lines and other large, commercial passenger vessels that frequently visit Nantucket should be required to install, maintain and utilize their own ground tackle. The location of, and necessity for these moorings should be determined by the Department of Marine and Coastal Resources.*

   List of responsible agencies/groups:

   - *Department of Marine and Coastal Resources **

Objective III: To grid all existing mooring fields.

Background

The 1993 Harbors Action Plan recommended that each mooring field be gridded. While this activity was completed for some areas, others such as Monomoy are not gridded. Establishing a grid system does not always create additional spaces to moor boats; however it does provide points of reference that enable people to set a mooring with some accuracy. Gridding also helps people locate their moorings in an efficient manner.

Recommendations

1. *The Department of Marine and Coastal Resources should continue to establish grid patterns for all existing mooring fields, ensuring that the process of gridding does not drastically change the number of vessels allowed in each mooring field.*

   List of responsible agencies/groups:

   - *Department of Marine and Coastal Resources **

2. *The Department of Marine and Coastal Resources should develop a more detailed anchorage plan for Nantucket Harbor.*

   List of responsible agencies/groups:

   - *Department of Marine and Coastal Resources **

Objective IV: To reduce the negative impacts of moorings on eelgrass.

Background

The traditional, and most popular mooring used in Nantucket consists of a mushroom anchor attached to a length of heavy bottom chain. The heavy bottom chain is then attached to a light chain via a shackle and swivel, and this light chain runs to the mooring buoy. Reaching the mooring is facilitated by the addition of a mooring pennant and pick-up buoy. Although these moorings are extremely effective in anchoring boats, they cause damage to the benthic environment. As a moored vessel moves due to currents, tides and the weather, the bottom chain is dragged in circles around the mushroom anchor. If the mooring is located within an eelgrass bed, a circular swath of eelgrass will be “mowed” by the bottom chain. As the length of bottom chain may be up to 2.5 times the maximum water depth, the diameter of the damaged area of seagrass may be large. An additional impact that mushroom anchors may have on eelgrass occurs when the moorings are removed from eelgrass beds each year to allow the scallop dredges to pass freely over the eelgrass. This removal process may further damage eelgrass beds by disrupting the sediment. When these moorings are reset in the spring using GPS, some may not be located exactly where they had been the previous year, resulting in a series of overlapping circular scars in eelgrass beds.

Other mooring systems may be suitable for Nantucket, and such systems should continue to be evaluated. The Department of Marine and Coastal Resources has used a number of helix anchors as moorings. These anchors are drilled into the seafloor and require less scope when being used as a mooring. Tests have shown that they are extremely effective as moorings; however, they are expensive to install and difficult to uninstall. Due to these factors, rather than removing the anchors during the winter, it would only be feasible to remove the tackle. This has proved to be an issue with scallopers as the helix anchor can severely impede their work. Experiments with caps to cover the anchors have had mixed results. While helix moorings may not be the answer to the issue of moorings and eelgrass beds, the Town of Nantucket, the Nantucket Marine Trades Association, the Department of Marine and Coastal Resources, the Harbor and Shellfish Advisory Board, the Nantucket Shellfish Association and other interested parties should continue to study alternative mooring systems to determine their suitability for Nantucket.

Recommendations

1. *The Town of Nantucket should continue to explore different types of moorings to determine which is best for use in Madaket and Nantucket Harbors. The analysis should take into consideration the impacts of the mooring type on the eelgrass beds and the scallop fishery. Additionally, mooring types may be suitable in certain situations or applications, but unsuitable in others.*

   List of responsible agencies/groups:
   - *Department of Marine and Coastal Resources **
   - *Harbor and Shellfish Advisory Board*
   - *Nantucket Shellfish Association*
   - *Other interested parties*

2. *Compile existing research dealing with the impacts of moorings on eelgrass. Apply this research to the management of moorings in Nantucket and Madaket Harbors, outlining the specific changes (if any) to be made, and the strategies that will be used to make the changes.*

   List of responsible agencies/groups:
   - *Department of Marine and Coastal Resources **
   - *Other interested parties*

Objective V: To improve harbor safety.

Background

While Nantucket and Madaket Harbors are generally safe, there are a number of improvements that would increase the safety levels within the harbors. One critical safety issue with Nantucket Harbor deals with the partial submergence of the jetties protecting the entrance at mid- to high-tide. This significantly reduces the jetties' ability to protect the harbor entrance and increases susceptibility to erosion and storm damage. A potential additional benefit to raising the jetties is that the speed at which water moves through the channel should increase. This should reduce siltation within the channel and so may reduce the need for costly dredging.

An additional safety issue in Nantucket Harbor is the location of the fuel off-loading facility and the tank farm. These are a potential threat to safety as they are located in the downtown area. Additionally, the location means that there is increased truck traffic in the downtown area. There are currently plans to develop an off-loading facility on the south shore of the island and to locate the fuel storage facility at, or near the airport. While an off-loading facility away from the downtown area may be challenging, the general feeling is that its physical and economic feasibility should be explored along with other alternatives to evaluate what measures reasonably can and should be taken to create a better situation than the existing one.

Outdoor lighting on shoreline properties can be a nuisance and a safety problem for boaters navigating in the harbor at night. Glaring light from fixtures whose bulbs are inadequately shielded and from bright light

reflecting on the water obscure navigation aids and affect vision, making it difficult to see other boaters, structures and hazards.

Nantucket does regulate outdoor lighting to eliminate problems of glare. Specifically, town bylaws seek to minimize light trespass on adjacent properties and public and private ways by limiting wattages and lumens of outdoor lights and by controlling the direction of lighting and the area that can be illuminated. Chapter 102 of the Code of Nantucket contains regulations and standards for all outdoor lighting throughout the island. This bylaw, passed in April 2005, requires all outdoor lighting to conform to the requirements of the code within three years. The Zoning Bylaw also establishes performance standards for outdoor lighting as part of site plan review.

The reduction of light pollution around the harbors to ensure navigational safety is not specifically mentioned among the purposes of these bylaws. The types of limitations on lighting imposed by these regulations are, however, appropriate for reducing light pollution on the waterways. This plan recommends enforcement of the bylaws on shoreline property with particular attention to shoreline lighting that is visible from the water.

An additional way to increase safety within the harbors is to develop comprehensive no-wake zone maps to educate boaters.

Recommendations

1. *The Department of Marine and Coastal Resources, in cooperation with the Steamship Authority and all other harbor users, should continue to work with the Army Corps of Engineers to repair and raise jetties at the entrance to Nantucket Harbor and the Board of Selectmen should actively support the department's efforts.*

   List of responsible agencies/groups:
   - *Department of Marine and Coastal Resources **
   - *Board of Selectmen*
   - *Army Corps of Engineers*

2. *The town should actively encourage a study of the feasibility of relocating the current fuel off-loading and storage facilities to a location away from the downtown area, as well as other alternatives, to evaluate what measures reasonably can and should be taken to create a better situation than the existing one. The Steamship Authority should also be included in the preparation of this study as appropriate.*

   List of responsible agencies/groups:
   - *Board of Selectmen **
   - *Department of Marine and Coastal Resources*
   - *Planning Board*

3. *Gather bathymetric data in both harbors using low cost techniques so that this data can be used for navigation purposes and to develop bathymetric models. These can then be used to study changes over time.*

   List of responsible agencies/groups:
   - *Department of Marine and Coastal Resources **

4. *The Department of Marine and Coastal Resources should lead an initiative to identify existing lighting that trespasses on the harbors. Discontinue unnecessary shoreline lighting and enforce compliance with existing regulations for outdoor lighting.*

   List of responsible agencies/groups:
   - *Department of Marine and Coastal Resources **
   - *Lighting Enforcement Officer*

5. *Adopt additional lighting controls into the Harbor Overlay District regulations specific to waterfront conditions. Consider amending Section 102-4 (Uplighting; highlighting; floodlighting; motion lighting; recreation facilities) of Chapter 102 (Outdoor lighting) of the Nantucket Bylaws to include specific mention of the impact of lighting on the safe navigation of vessels, modeled after § 102-3(G) which deals with the impacts of lighting on the safe navigation of motor vehicles on roads.*

   List of responsible agencies/groups:
   - *Department of Marine and Coastal Resources **
   - *Planning and Economic Development Commission*

6. *The Department of Marine and Coastal Resources should develop and distribute a comprehensive no-wake zone map to educate boaters. Signs should also be posted where possible.*

   List of responsible agencies/groups:
   - *Department of Marine and Coastal Resources **

7. *The town should secure funding and permits for dredging projects as outlined in the 5- and 10-year plans, or as necessary.*

   List of responsible agencies/groups:
   - *Department of Marine and Coastal Resources **

Goal: To increase the security of the harbors and to ensure smooth and continued operations in the event of a significant maritime disaster, storm or accident.

Objective VI: Ensure that the movement of goods and people to and from the island can continue in the event that vessel access became restricted.

Background

Nantucket continues to be almost entirely reliant on large vessel access to the harbor for the movement of people, goods and material between the island and the mainland. While the airport provides some access, it is unlikely to be able to cope if vessel access were to become limited. If a large vessel were to become disabled or were to sink in the channel or once inside the harbor, or if access to the harbor were blocked by ice for an extended period of time, vessel access could be highly disrupted and this could have serious implications on the island as a whole.

The location of the current commercial wharf in the center of downtown increases the need for truck traffic in the area. It also means that any hazardous materials must be transported through the populated center of the town.

Recommendation

1. *The Town of Nantucket, in coordination with the Steamship Authority and other harbor users as appropriate, should study the feasibility of developing a second commercial dock that would be capable of handling large vessels carrying passengers, goods and vehicles in an emergency. A facility located outside of the downtown area may help alleviate some of the truck traffic problems and reduce the amount of hazardous materials transported through populated areas. The study should also evaluate other alternatives for addressing these emergencies, including improving the area's ice-breaking capabilities and the channel, and determining what measures can and should be taken to be able to establish immediate temporary off-loading facilities in any such emergency.*

   List of responsible agencies/groups:
   - *Board of Selectmen **
   - *Department of Marine and Coastal Resources*

Objective VII: Ensure that boating services and infrastructure is adequate to meet the needs of boats in Nantucket and Madaket Harbors – especially during a storm event.

Background

The somewhat isolated location of Nantucket requires that it be largely self-sufficient in terms of boating services. In fact, according to the Harbormaster, boating services are the single-most limiting factor in terms of the number of boats allowed to dock and moor in the harbors. The primary concern is that a situation will arise in which the haul-out capacity of the island is reduced, compromising the safety of boats and boaters in a storm event. It is important that the town and private companies work together to prevent the loss of haul-out capabilities that would jeopardize the ability to take boats out of the water in an emergency situation.

Recommendation

1. *All efforts should be made to maintain the haul-out capacity on Nantucket at levels that will allow for the safe and timely removal of boats from the water in an emergency situation.*

   List of responsible agencies/groups:
   - *Board of Selectmen **
   - *Department of Marine and Coastal Resources*
   - *Private businesses*

2. *The town should continue to investigate options for developing a new boat ramp at the south end of town. While there appear to be no "ideal" locations, a ramp may still be feasible.*

   List of responsible agencies/groups:
   - *Department of Marine and Coastal Resources **
   - *Board of Selectmen*
   - *Conservation Commission*
   - *Harbor and Shellfish Advisory Board*
   - *Private businesses*

3. *The Department of Marine and Coastal Resources currently works with local businesses to coordinate the hauling of boats in the event of an imminent storm. This should be formalized in writing and the responsibilities of the town and private providers should be defined.*

   List of responsible agencies/groups:
   - *Department of Marine and Coastal Resources **
   - *Private businesses*

3.12 OIL SPILL RESPONSE

Goal: To minimize adverse impacts from involuntary discharges of petroleum products into Nantucket and Madaket Harbors.

Background

Both Nantucket and Madaket Harbors are rich in natural resources, *i.e.* eelgrass beds, beaches and scallops, that are used both commercially and for recreation. A release of any petroleum-based product could have major impacts to both the natural systems of the harbors and human use of the resources.

Nantucket Harbor has several facilities that handle petroleum products at or near the shoreline, as well as thousands of vessels that use petroleum for fuel. Madaket Harbor has a smaller number of vessels and only one fueling station at the head of Hither Creek; however, because the creek is so constricted, there is the potential for significant damage to marshes and shellfish if an oil spill were to occur there.

The current "Nantucket Coastal Oil Spill Response Plan" was written in 1991 and has not been updated since. The objectives of *"this local plan are to enable timely, efficient coordinated and effective action to minimize damage from oil spills through (1) the development and implementation of immediate oil containment or deflection practices, (2) the identification, ranking and mapping of Highly Vulnerable Areas (HVA's), (3) the listing of oil containment and removal resources, both governmental and private, available for local spill response activities."*

Much of the information in the plan is out of date. In lieu of the plan, an informal—but apparently quite effective—response process has evolved with coordination between the Nantucket Department of Marine and Coastal Resources, the Nantucket Fire Department, and the U.S. Coast Guard Station at Brant Point. This seems to function based on personal interactions of individuals within those departments as opposed to any coordinated, pre-planned system. It is not clear how well the response actions would be coordinated and how effective they would be if these individuals were not available at the time of a spill.

Objective I: Update the existing Nantucket Coastal Oil Spill Response Plan.

Background

The existing plan should be updated in several ways:

- The "Chain of Command" in the case of a spill needs to be clarified and current contact information incorporated
- The list of Highly Vulnerable Areas should be reviewed and updated as necessary
- The inventory of available equipment and facilities that could be utilized in the case of an oil spill should be updated

Recommendations

1. *Review and update the existing Nantucket Coastal Oil Spill Response Plan. The original plan was developed through the Nantucket Planning and Economic Development Commission with partial funding from the Massachusetts Office of Coastal Zone Management (CZM). It established an Oil Spill Response Planning Team that included members of several town departments, CZM, the Massachusetts Department of Environmental Protection, the US Coast Guard, and several citizens of the Town of Nantucket. This seems to be a reasonable model and could be used to update the plan.*

   List of responsible agencies/groups:
   - *Nantucket Planning and Economic Development Commission **
   - *Department of Marine and Coastal Resources*
   - *Office of Coastal Zone Management*
   - *Department of Environmental Protection*
   - *Fire Department*
   - *US Coast Guard*

2. *Identify a Nantucket Oil Spill Response Coordinator. It is recommended that there be a single individual and department that would act as coordinator in the case of an oil spill in either Nantucket of Madaket Harbors. This individual/department would ensure communication between the various involved parties, contact additional agencies at the state or federal level as needed, and ensure that all aspects of the response and follow-up were completed in a satisfactory manner.*

   List of responsible agencies/groups:
   - *Department of Marine and Coastal Resources **

Objective II: Increase preparedness for involuntary oil spills at each fueling facility along the shore.

Background

There are several facilities along the shores of Nantucket and Madaket Harbors that handle petroleum-based fuel (off loading, sales to individual boats, etc.). There are several other facilities where individual boat-owners may fuel their own vessels or where vessels containing a load of fuel might congregate. Each of these has some potential to be the site of a spill.

The required response to a spill depends on a number of factors, such as the type of fuel involved, the amount of fuel involved, and the location of the spill (i.e. is it near an environmentally sensitive area or is it likely to be a danger to health). Not every spill requires a full response including the deployment of booms or use of dispersants. Accidental spillages of small quantities of gas or diesel while fuelling a boat may require no more than the use of special absorbent pads. A larger oil spill may require the deployment of specialized equipment.

The use of specialized equipment may require special training or heavy machinery to help with deployment. It is therefore important to deploy such equipment strategically around the harbors in areas where it is most likely to be required and where the necessary personnel and equipment are at hand.

Less advanced response equipment, such as absorbent pads and "Speedy Dry", could be required at all locations where boats can tie up. However, materials must also be provided so that boaters can be informed as to how to safely dispose of any contaminated materials that have resulted from a small clean-up.

Recommendations

1. *Mandate that all fuel off-loading facilities, and sites containing 5 or more boat slips where the fueling of vessels occurs, develop and maintain a current plan to respond to a spill at that facility; have suitable, specialized equipment to respond to a spill at their facility or nearby; and have trained staff available for initial response.*

   Each facility with 5 or more slips or that off-loads fuel should work with the Nantucket Oil Spill Coordinator and/or the Nantucket Oil Spill Response Team to develop a suitable initial response plan for action in the case of a spill at their facility or nearby in the harbor. Part of this planning effort should be to identify, acquire, and maintain suitable equipment for initial response to the type of potential spills at that facility and have staff available that is trained in when and how to use this equipment.

   The planning effort could initially be part of the update of the Nantucket Oil Spill Response Plan with future updates involving the Nantucket Oil Spill Coordinator. Presently, Harbor Fuel provides training for its staff. The town should investigate whether this training could be made available to other entities on a regular basis. Failing that, some method of training staff at the various facilities should be developed. An added benefit to the town from such a training program is that there would be a larger cadre of trained initial responders in the case of a large spill.

   List of responsible agencies/groups:

   - *Department of Marine and Coastal Resources **
   - *Board of Selectmen*
   - *Nantucket Oil Spill Coordinator*
   - *Fire Department*
   - *US Coast Guard*

2. *Simple clean-up materials should be required at all facilities where boats can tie up or be launched. Educational material should also be available at these sites so that the public is informed as to the need for cleaning up even small spills and how to safely dispose of any materials used.*

   List of responsible agencies/groups:

   - *Nantucket Oil Spill Coordinator **

3. *Boaters should be reminded that certain oil spill clean-up materials are available for free through the Department of Marine and Coastal Resources.*

   List of responsible agencies/groups:

   - *Nantucket Oil Spill Coordinator **
   - *Department of Marine and Coastal Resources*

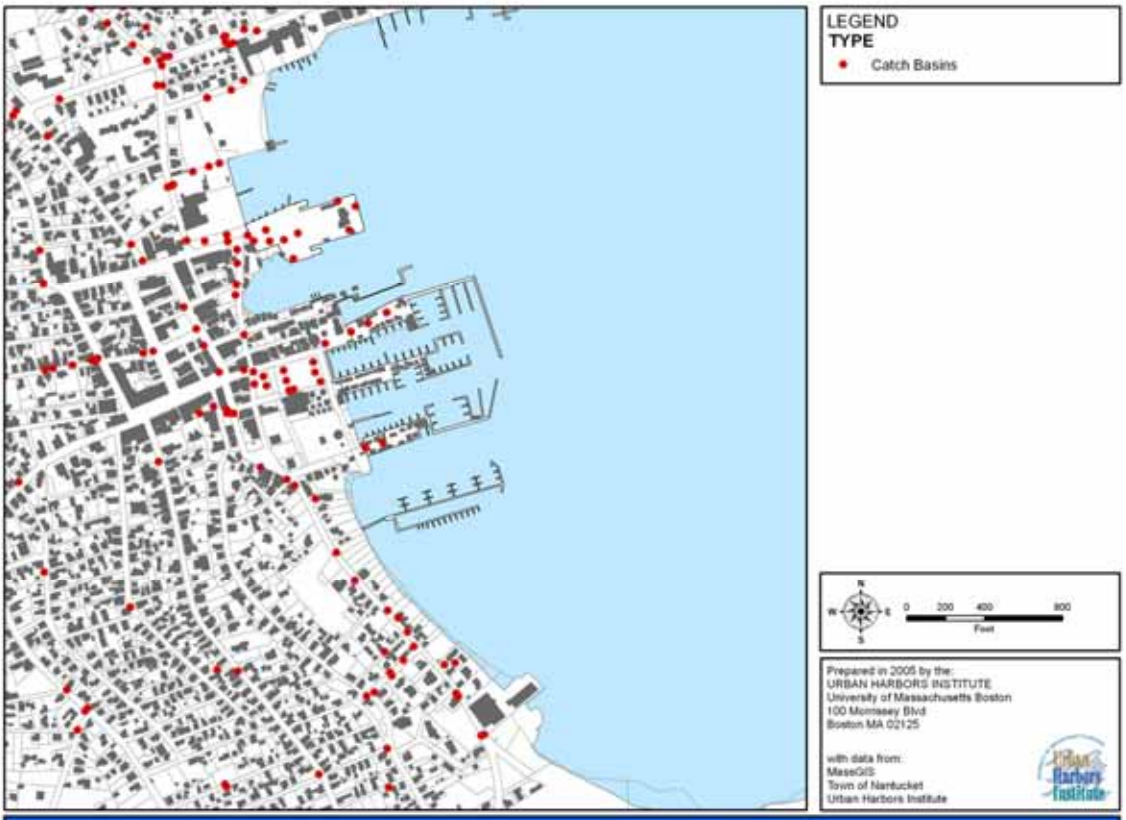


Figure 3.6 Location of Catch Basins in the Downtown Area.

Objective III: Increase preparedness for involuntary oil spills on land but in proximity to the harbors or the stormwater system.

Background

In the event of a significant spill in proximity to the waterfront, a full oil spill response might be required. However, if the oil has not yet entered the harbor or the stormwater system, preventing this may greatly reduce the impacts on the harbor itself.

Recommendations

1. *Oil spill response equipment should include a simple system that can be implemented to prevent any spilled liquid from entering catch basins and subsequently contaminating the harbors or other waters. If an extensive spill were to occur on land, a number of catch basins may need to be covered. To ensure that this is implemented as efficiently as possible, emergency responders should be provided with maps that indicate those catch basins that feed into especially sensitive areas or are in close proximity to a water body.*

   List of responsible agencies/groups:

   - *Nantucket Coastal Oil Spill Coordinator*

2. *Stencil storm drains with a symbol that identifies those that discharge directly into the harbors. Covering these should be prioritized in the event of a fuel spill on land (Figures 3.6 and 3.7).*

   List of responsible agencies/groups:

   - *Department of Public Works **
   - *Department of Marine and Coastal Resources*
   - *Historic District Commission*

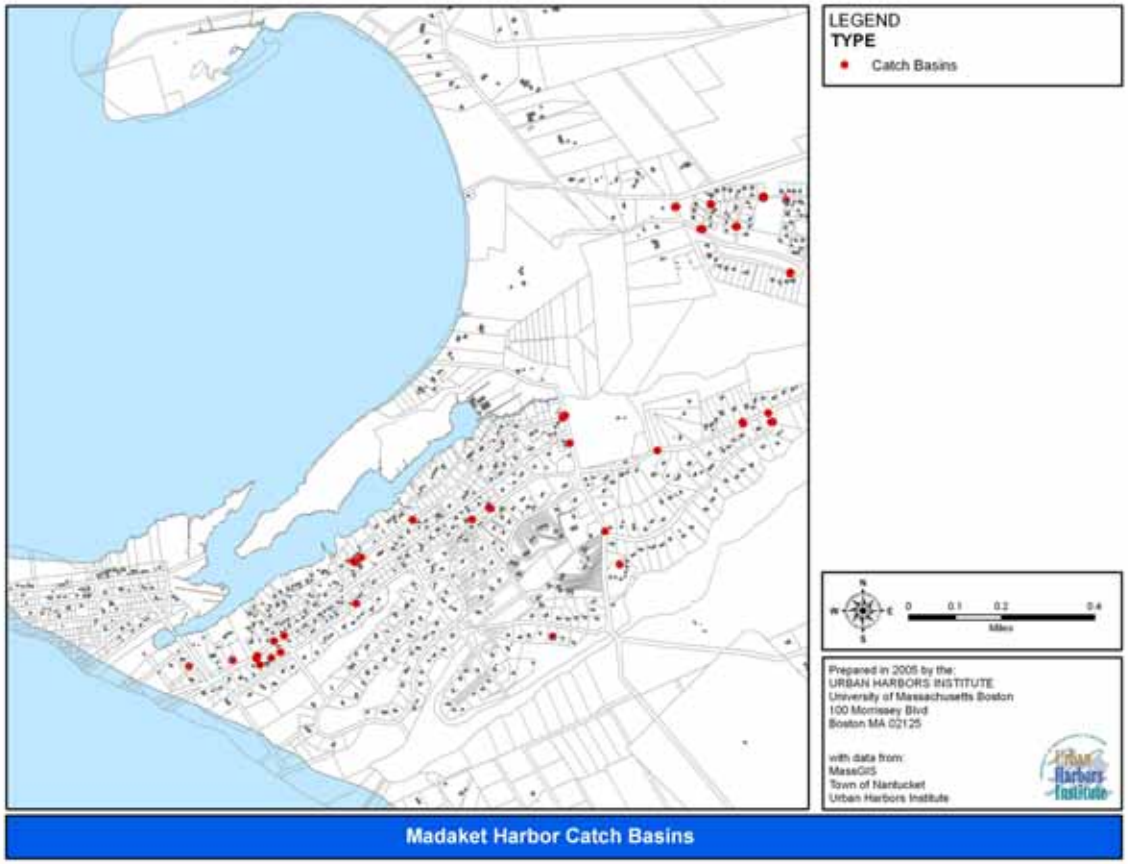


Figure 3.7 Location of Catch Basins in Madaket.

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APPENDIX 1 – ACTION ITEMS FROM THE 1993 PLAN AND THE 2007 UPDATE

New recommendations are shaded in green

PLAN IMPLEMENTATION						
	1993 RECOMMENDATION	**RESPONSIBLE PARTY**	**STATUS AFTER 1993 PLAN**	**DISCUSSION**	**2007 RECOMMENDATION**	**TIMELINE**
Objective I Recommendation 1		Board of Selectmen*			The Board of Selectmen should develop an implementation strategy for this Harbors Plan. As part of its implementation strategy, the Board of Selectmen should consider charging a board with coordinating and overseeing the implementation of this Harbors Plan.	1
NATURAL RESOURCE PROTECTION						
	1993 RECOMMENDATION	**RESPONSIBLE PARTY**	**STATUS AFTER 1993 PLAN**	**DISCUSSION**	**2007 RECOMMENDATION**	**TIMELINE**
Objective I Recommendation 1	Enforce local wetland by-law and Mass. Wetlands Protection Act	Conservation Commission*; Nantucket Planning Board; Nantucket Board of Health; Nantucket Department of Marine and Coastal Resources; Nantucket Police Department	On-going	Conservation Commission enforces wetland by-law and MA Wetlands Protection Act. Public education may be useful to describe the Conservation Commissions role, jurisdiction, and limitations.	Continue to enforce existing town by-laws pertaining to natural resource conservation and protection (including Chapter 193 – Zoning; Chapter 136 – Wetlands; Chapter 99 – Nantucket and Madaket Harbor Watersheds; and Chapter 56 – Regulation of Motor Vehicles on Beaches). The Conservation Commission should develop more restrictive regulations if they feel that such moves can be scientifically justified.	1
Objective I Recommendation 2		Conservation Commission*; NP&EDC			Continue to monitor and assess actual and potential impacts on wetlands resources from adjacent development and increased usage. Adopt a stormwater bylaw establishing minimum requirements and procedures to control the adverse effects of increased post-development stormwater runoff and nonpoint source pollution associated with new development and redevelopment. As warranted, consider measures such as increasing the no-build and no-disturbance buffer zones around wetlands resources required by the Wetlands Bylaws. Ensure that physical improvements in support of recreational use on and around wetlands resources do not impact those resources either directly or indirectly by increasing usage beyond the carrying capacity of the area.	2-3

Objective I Recommendation 3		Nantucket Board of Selectmen*; Nantucket Conservation Commission			Assure that legal assistance is available to the Conservation Commission for enforcement of the town wetlands bylaws; especially as the bylaws pertain to new development abutting or potentially affecting environmentally sensitive areas such as sand dunes, beaches, and barrier beaches.	1
Objective II Recommendation 1		Board of Selectmen*; Conservation Commission; Department of Marine and Coastal Resources; Planning Board; Board of Health, Other departments or groups as may be appropriate			Establish a scientific/technical advisory committee to assist boards, commissions, and committees to review and interpret scientific and engineering data and recommend management options supported by these reviews.	2
Objective II Recommendation 2		Conservation Commission*			Enhance the environmental planning capability of the Town of Nantucket through bylaw changes via Annual Town Meeting. Much of the Conservation Commission's effort is in response to permit applications for proposed projects. This sort of case-by-case review needs to be augmented by broader, proactive environmental planning.	3
Objective III Recommendation 1	Maintain an inventory of existing open spaces within harbor areas	Conservation Commission*; Department of Marine and Coastal Resources; Board of Selectmen; Resource-related non-profit groups	Completed and on-going	This inventory is completed and updated using GIS.	Continue the coordinated inventory and mapping efforts of critical resource and open space areas around Nantucket and Madaket Harbors.	4
Objective IV Recommendation 1		Department of Marine and Coastal Resources*; SHAB; Nantucket Shellfish Association; Conservation Commission; Other concerned citizens			Develop and implement mechanisms to conserve and restore eelgrass, in coordination with the Shellfish Management Plan (see Shellfish Management Plan recommendation). Apply these mechanisms, as well as existing research to the management of moorings and their impacts on eelgrass in Nantucket and Madaket Harbors.	3

Objective VRecommendation 1		UMASS Boston Field Station*; Maria Mitchell Association; Nantucket Conservation Foundation; Nantucket Land Bank Commission; MA Audubon; Nantucket Land Council; Commonwealth of MA Natural Heritage Endangered Species Program; Nantucket High School Science Department; Trustees of Reservations; Tuckernuck Land Trust			Support and enhance the Nantucket Biodiversity Initiative.	1
Objective V Recommendation 2		Conservation Commission*; Department of Marine and Coastal Resources; NGOs associated with natural resources management and protection; Academic Groups; Individuals with expertise and/or training in invasive species management			Work towards the management and potential eradication of invasive species, including both macroalgal species in the harbors and terrestrial and wetland species along the harbors' shores.	5
Objective V Recommendation 3		Department of Marine and Coastal Resources*; Students; Fishers			Continue the existing culling program of green and asian crabs.	1
Objective VI Recommendation 1		Nantucket Marine Mammal Stranding Team*			Educate the public about the island's marine mammals, including cetaceans and pinnipeds. Distribute brochures explaining federal and state protection of marine mammals with local numbers for reporting strandings and harassment.	4
	Inventory and map critical resource areas around the harbors.	Conservation Commission*; Department of Marine and Coastal Resources; Board of Selectmen; Resource-related non-profit groups	One inventory completed, deserves further attention	The Nantucket Watershed group developed maps, but they are not used by town boards and commissions.	See Objective III, Recommendation 1 of this section	4

	Produce a document describing environmentally responsible building on the harbor shores geared for home builders	Conservation Commission; NP&EDC; Building Department	Not developed	A generalized document may not be most effective, given the individual project review conducted by the Conservation Commission. State and local regulations already mandate standards through the building code, conservation commission regulations, etc. making such a document duplicative.	None	
	Enforce Board of Health regulations on Toxic and Hazardous Materials	Board of Health	On-going		None	
	Enforce Board of Health Regulations on Underground Fuel and Chemical Tanks	Board of Health	On-going	Fire Department keeps data on the presence and age of tanks. The fire department and the Board of Health work together on enforcement issues.	None	
	Pursue public education materials regarding pollution of waters by cleaning agents, fertilizers, failing septic systems, etc. Disseminate materials.	Board of Selectmen; Realtors Association; Chamber of Commerce; Tourist Information Bureau	On-going	Central coordination of public education efforts would be helpful.	None	
	Support conservation restrictions	Board of Selectmen; Massachusetts Division of Conservation Services	On-going	BOS have supported several presented by the Nantucket Land Council, Conservation Foundation, Land Bank and private property owners.	None	
	Pursue open space program	Nantucket Land Bank; Conservation Commission; Nantucket Conservation Foundation; Nantucket Land Council	On-going	This is being actively done through the variety of existing land trust/land acquisition groups.	None	
	New development abutting environmentally sensitive areas should be sited in a manner to protect critical natural resources. Incorporate this action item into the Open	Conservation Commission; Planning Board; Board of Health	On-going. The open-space plan has not been updated since before the 1993	Town Biologist reviews plans and gives input to Conservation Commission. The Conservation Commission addresses each development proposal on a case-by-case basis. Strong local regulations protect wetlands, but are limited to	None	

	Space Plan		Harbor Plan	protection of specific wetland interests and area of jurisdiction.		
WATER QUALITY						
	1993 RECOMMENDATION	**RESPONSIBLE PARTY**	**STATUS AFTER 1993 PLAN**	**DISCUSSION**	**2007 RECOMMENDATION**	**IMPLEMENT BY YEAR**
Objective IRecommendation 1	Develop school curriculum on water quality protection & environmental awareness	Nantucket School Committee*	Partially completed	High school offers a marine science class for grades 10-12. The curriculum does not address water quality or environmental awareness.	Develop school curricula on water quality protection and environmental awareness. Establish a curriculum piece for the Nantucket Public School for the 3rd, 6th, and 9th grade that integrates environmental awareness and environmental science within the MCAS requirements. Initiate field studies and in-class science demonstrations.	3
Objective I Recommendation 2		Department of Marine and Coastal Resources*; Department of Public Health; Conservation Commission			Establish a link on the town website to a clearinghouse for water quality data and provide more information on the Department of Health's website.	1
Objective I Recommendation 3		Department of Marine and Coastal Resources*; Nantucket Land Council; the University of Massachusetts Boston			Seek funding to develop a "Guide to Protecting Nantucket's Waters" similar to the Martha's Vineyard publication.	1
Objective I Recommendation 4	Develop & distribute education materials for land owners within harbor watersheds addressing various non-point sources of pollution and their management	Conservation Commission*; Department of Marine and Coastal Resources	Completed & On-going	Department heads speak to the annual area association meetings, make presentations to the Civic League, Chamber, Rotary. Have held numerous public forums on Watershed Initiatives, Water Quality, and SMAST Estuaries Project	Provide homeowners with a free copy of the Guide to Protecting Nantucket's Waters, along with a copy of all applicable regulations and rules to new homeowners.	2
Objective I Recommendation 5		Department of Public Works*; Department of Marine and Coastal Resources; Historic District Commission			Mark all storm drains with red or yellow stencil scallops indicating direct input to harbor or indirect input to harbor (some treatment). Stenciling the word “dumping” in circle with line through it could also be used. Stenciling storm drains will help to inform residents of their function and the fate of materials entering them.	2

Objective I Recommendation 6		Conservation Commission*; Chamber of Commerce; Board of Health; Nantucket Land Council; Landscapers Association			Develop brochures describing prohibition of dumping of chemicals, waste products, sediment, fuel, oil, or other pollutants and the associated fines. A comprehensive listing of prohibited substances and the effects on shellfish and water quality should clearly be stated.	3
Objective I Recommendation 7	Develop & distribute education materials for land owners within harbor watersheds addressing various non-point sources of pollution and their management	UMass Boston Field Station*; Department of Marine and Coastal Resources; Maria Mitchell Association; Board of Health; Nantucket Land Council; Civic League; Nantucket Community Association; Other interested agencies/groups	Completed & On-going	Department heads speak to the annual area association meetings, make presentations to the Civic League, Chamber, Rotary. Have held numerous public forums on Watershed Initiatives, Water Quality, and SMAST Estuaries Project	Organize public forums and symposia throughout the year on topics such as septic systems, landscaping, and organic gardening.	2
Objective I Recommendation 8	Adopt new by-laws to minimize residential use of herbicides, pesticides & fertilizers	Conservation Commission*; Chamber of Commerce; Board of Health; Nantucket Land Council; Landscapers Association	Incomplete	By-law drafted but not accepted.	Provide homeowners and landscapers with information on environmentally suitable fertilizer application rates, organic fertilizers, natural plantings, and other landscaping practices that would help protect the harbors and harbor watersheds. Make pamphlets such as the Landscaper's Association handout and the Nantucket Board of Health and Nantucket Land Council's pamphlet “Healthy Lawns and Landscapes” readily available at locations such as the Visitor’s Center, the Town Building, and the Chamber of Commerce.	1
Objective I Recommendation 9	Develop & distribute education materials for boaters on locations & use of pump-outs, toxic waste, recycling, etc	Department of Marine and Coastal Resources*; Board of Health; Marine-related businesses	Completed & On-going	Handouts. Recycling bins at the Town Pier. Information distributed to boats upon arrival. Handouts by the mooring company. Materials located at MCRD.	Provide boat owners with information regarding water quality, the “No Discharge Area” regulations and services, and the use of low-impact cleaning agents. This information should be distributed when boat owners renew their mooring permits or schedule service.	2
Objective I Recommendation 10		Nantucket Registry of Motor Vehicles*; Town of Nantucket Finance Department and Assessor's Office			Distribute car related water quality impact pamphlets to car owners along with registration renewal information.	3

Objective I Recommendation 11		Department of Marine and Coastal Resources*; Park and Recreation Commission; Sheriff's Office; Police Department			Establish and enforce new littering fines; post clearly. Provide more trash receptacles at area beaches and seek funding to maintain receptacles	2
Objective I Recommendation 12	Monitor and map waterfowl & gull nesting areas; establish management practices to minimize impacts to water quality	Board of Health*	On-going	Beach Management Program, bird census along with other agencies Audubon, Conservation Foundation, Trustees of Reservations. Town reports published annually.	Educate year-round and summer residents about the dangers of bird droppings, including discouraging the feeding of ducks and the development of high vegetation buffer zones around ponds. Post signs advising against feeding birds.	2
Objective IRecommendation 13		Maria Mitchell Association*; Department of Marine and Coastal Resources; Board of Health; Office of Coastal Zone Management; Local conservation groups			Utilize local TV and other media to educate the public about water quality issues.	2
Objective I Recommendation 14		Department of Marine and Coastal Resources*; Board of Health; Nantucket Land Council; Conservation Commission			Ensure that recommendations from the Estuaries Study are implemented.	2-3
Objective II Recommendation 1		Department of Marine and Coastal Resources*; SMAST; Other relevant organizations, institutions or groups			Seek funding for increased monitoring in both harbors. The use of static systems and towed arrays to monitor nutrients, DO, photic depth, temperature, salinity, and current speed measurements can provide valuable information relating to water quality.	2
Objective II Recommendation 2		Harbor and Shellfish Advisory Board *; Department of Marine and Coastal Resources; Town Biologist; Health Department; Conservation Commission; Nantucket Land Council; UMass Boston Field Station; Other interested parties			Develop a comprehensive Water Quality Management Plan incorporating goals, objectives, and recommendations in this section of the harbor plan with a protocol for updating and evaluating progress on a biannual basis. Establish timelines and funding sources.	1

Objective II Recommendation 3		Department of Marine and Coastal Resources*; Harbor and Shellfish Advisory Board; Nantucket Shellfish Association; Other relevant organizations, institutions, or groups			Establish a permanent research facility(ies) that can accommodate current and future research requirements for the Town of Nantucket and can augment and interface with all existing facilities currently operated by the town and local organizations. Investigate strengthening a public/private partnership and funding sources to achieve this goal.	2
Objective II Recommendation 4		Relevant organizations, institutions, and groups*; Department of Marine and Coastal Resources			Emphasize evaluation of habitat quality by undertaking local and periodic monitoring of eelgrass distribution and benthic organisms. Adopt standardized and recognized sampling protocols.	3
Objective II Recommendation 5		Relevant organizations, institutions, and groups*; Department of Marine and Coastal Resources			Undertake studies of associated flora and fauna, as well as bird populations.	3
Objective II Recommendation 6		Relevant groups, institutions, and groups*; Conservation Commission			Establish a combination of currently used porosity measurement methods, such as the percolation tests used by the Board of Health and the Conservation Commission, and Nantucket-based hydrographic research reports (both informal local geology classes and formal reports). Use this combination of methods to calculate or measure nutrient groundwater travel times in Nantucket soils and sediments in order to properly calibrate computer simulation models and to calculate mass input rates for nitrogen and phosphorus.	3
Objective II Recommendation 7		Other relevant organizations, institutions, and groups*; Department of Marine and Coastal Resources			Actively monitor changes in population of algae species associated with excess nutrient concentration such as *Ulva lactuca* (sea lettuce).	2
Objective II Recommendation 8	Establish citizens' monitoring program	Relevant organizations, institutions, and groups*; Department of Marine and Coastal Resources	On-going	Several individual entities continue to collect water samples (monthly) Health, Marine, UMass (citizen participation not viable). Town reports published annually on website. There may be an opportunity now to start a citizen's water quality monitoring group.	Use current groundwater monitoring and sampling practices (such as those used by the UMass Boston Nantucket Field Station, the Nantucket Land Council, and the Nantucket Conservation Foundation) as a template to create a larger island-wide effort to evaluate groundwater contaminants such as excess nutrients, bacteria, etc. Citizens should be part of this island-wide effort ("Citizen Science").	3

Objective II Recommendation 9		Department of Marine and Coastal Resources*			Evaluate harbor modeling products used for water quality management decisions by the Department of Marine and Coastal Resources every three years as to effectiveness, ease of use, and applicability. Incorporate results into the Water Quality Management Plan (WQMP).	3
Objective IIRecommendation 10		Department of Marine and Coastal Resources*; Maria Mitchell Association; Board of Health; Other relevant organizations, institutions, and groups			Create a data clearinghouse to provide access to maps, historical data, links to remediation solutions for businesses and individuals, information for teachers, etc. A comprehensive database of past and ongoing research should be developed and regularly updated, allowing scientists and other monitoring groups to freely share and access up-to-date information.	1
Objective II Recommendation 11		Board of Health*; Department of Marine and Coastal Resources; Conservation Commission			Investigate methods for identifying fecal bacteria sources using DNA and bacterial identifiers to distinguish between avian, human, and canine introduced fecal matter.	2
Objective II Recommendation 12		Department of Marine and Coastal Resources*			Ensure that suitable monitoring is established to assess any environmental effects of aquaculture activities. This will be particularly important if any non-shellfish aquaculture activities are permitted in the future.	2
Objective II Recommendation 13		Harbor and Shellfish Advisory Board*; Department of Marine and Coastal Resources; Town Biologist; Nantucket Shellfish Association; Health Department; Conservation Commission; Nantucket Land Council; UMass Boston Field Station; Maria Mitchell Association; Other interested parties			Establish research priorities and integrate existing studies on and off-island to quantify and evaluate the effects of water quality degradation on shellfish populations (see Water Quality Management Plan and Shellfish Management Plan).	1
Objective II Recommendation 14		Department of Marine and Coastal Resources*; Shellfish and Harbor Advisory Board			Conduct yearly benthic and water column grab samples to evaluate presence or absence of cysts deposited from the Harmful Algal Bloom (HAB) outbreak in 2005 caused by the dinoflagellate Alexandrium tamarense.	2

Objective III Recommendation 1		Board of Selectmen*; Conservation Commission; Nantucket Park and Recreation Commission; Institutions with IPM Plans			Inform area parents of the Children's Protection Act (Chapter 85 of the Commonwealth of Massachusetts Acts of 2000; http://www.mass.gov/legis/laws/seslaw00/sl000085.htm). Encourage the Park and Recreation Department and the Nantucket Boys and Girls Club to file and implement similar plans and require all schools (public and private) to have IPM Plans on file in Town Building according to state law.	2
Objective III Recommendation 2	Adopt new by-laws to minimize residential use of herbicides, pesticides & fertilizers	Board of Selectmen*; Conservation Commission	Incomplete	By-law drafted but not accepted.	Adopt warrant articles that can reduce or eliminate quick release fertilizers and excessive use of fertilizers within the harbors watershed protection districts.	1
Objective III Recommendation 3		Board of Selectmen*; Board of Health; Conservation Commission			Work with the Planning Board to draft new Zoning Bylaws that protect harbor waters. Use recommendations from the Comprehensive Wastewater Management Plan, the Septage Management Plan, and the Estuaries Project to derive specific language for these articles. The first set of articles should be brought forward at the 2008 Annual Town Meeting.	1
Objective III Recommendation 4		Board of Selectmen*; Conservation Commission			During the process of renewing the town contract for landscaping, make it an order of condition that no pesticides or quick release fertilizers be used on town-owned land.	3
Objective III Recommendation 5		Board of Selectmen*; Planning Board; Conservation Commission			Establish a bylaw prohibiting dumping of any chemical, waste product, sediment, fuel, oil, or other pollutant in storm-drains. Establish a fine for each violation. In addition review Massachusetts' suggested storm water bylaw language to ensure local Conservation Commission standards include adequate protection of stormwater catch basins.	2
Objective III Recommendation 6		Board of Selectmen*			Where applicable adopt recommendations from the Estuaries Reports as bylaws.	2
Objective III Recommendation 7		Board of Selectmen*			Ensure that goals as stated by the Board of Selectmen (2006-2007) regarding water quality, septic and storm water management are all updated to incorporate the recommendations included in this harbor plan.	1
Objective III Recommendation 8		Board of Selectmen*			Adopt new bylaws that incorporate the Best Management Practices suggested in the Office of Coastal Zone Management's Clean Marina Guidelines.	2
Objective IV Recommendation 1		Board of Health*; Department of Marine and Coastal Resources			Multi-lingual regulatory notices should be placed at ponds with fish consumption warnings issued (Miacomet, Gibbs, Sesachacha, Hummock, Long and Tom Nevers ponds).	1

Objective IVRecommendation 2		Board of Health*; Department of Marine and Coastal Resources			Check and maintain all regulatory notices related to shellfish closures; post multi-lingual signs	1
Objective V Recommendation 1		Board of Selectmen*; Department of Public Works; Finance Committee			Implement the stormwater infrastructure improvements outlined in Earthtech's 2005 Stormwater Outfall Analysis including all Best Management Practices and recommended technologies. Continue financial support of these projects.	2
Objective V Recommendation 2		Local conservation groups such as the Nantucket Land Council *; Department of Marine and Coastal Resources; Board of Health; Nantucket Land Council; Conservation Commission; Department of Public Works; Massachusetts Office of Coastal Zone Management			Establish a comprehensive list of all ponds and coastal areas that require rehabilitation and identify specific proposals and methodologies for implementing such rehabilitation in conjunction with state agencies. Prioritize each water body or area on the list using criteria such as (but not limited to) state of degradation of habitat, public health concerns, reduction in state threatened or protected species, essential fish habitat, spread of invasive species, or other related indicators. Develop a coordinated program and timeline for rehabilitation based on priority level and identify potential funding sources.	5
Objective V Recommendation 3	Monitor and map waterfowl & gull nesting areas; establish management practices to minimize impacts to water quality	Conservation Commission*	On-going	Beach Management Program, bird census along with other agencies Audubon, Conservation Foundation, Trustees of Reservations. Town reports published annually.	Investigate the feasibility of reducing avian "nuisance species" such as Canada Geese and Mute Swans. Methods could include using coyote/fox statues in fields to repel Canada Geese, reducing or eliminating hand feeding, and restoring high vegetation around ponds.	2
	Investigate the feasibility of dredging Bass Point, Pocomo Point, and Polpis Harbor to improve water circulation	Board of Selectmen (DEM, Army Corps)	Completed	1993 entrance to Polpis Harbor dredged (32,500 cubic yards) disposal site Quaise Point. All cuspate spits dredged 1996, (9,999 cubic yards) Pocomo Point disposal site for beach nourishment. **Note no effect on water circulation quality	See Objective V, Recommendation 7 of Harbor Operations, Safety, Navigation, and Moorings	3

	Complete the quantitative assessment of health of harbor by WHOI	Board of Health; County Commissioners	Completed	WHOI report submitted 1993 (limited copies available).	None	
	Complete an inventory and status report of storm drains, sewer outfalls, etc into both harbors. Apply pollution abatement methods where necessary	Department of Marine and Coastal Resources; Board of Health; Department of Public Works; NP&EDC	Completed & On-going	Town Biologist in conjunction with MCZM, GIS and DPW mapped 52 storm drain outfall pipes MCRD created a wetland @ Washington St. Extension to treat storm water from Union St., Lower Orange St. Washington Street. Catch basin filters installed three locations (2) Washington Street, Children's Beach Retrofit of all drains outlined in the Strom Water Management plan developed by DPW. No such inventory exists for Madaket. Earth Tech completed a report (2005) evaluating outfalls and suggesting solutions and best management practices.	None	
	Investigate the need & methods for improving water circulation, Monomoy Creeks, Folgers Creeks, Coskata Pond	Board of Selectmen	Completed & On-going	Commissioned a $50K water circulation modeling program…dredging assessment. This has now moved to the UMass Dartmouth SMAST Estuaries project for both Nantucket Harbor Watershed and Madaket Harbor Watershed Districts.	None	
	Develop monitoring scheme and weekly record keeping of data on boats with heads	Department of Marine and Coastal Resources; Private Waterfront Industry	On-going		None	

	Implement the policy directions established in the water quality management plan to be developed by WHOI	Town Departments and County agencies	On-going	Biologist sampling protocols for Nantucket-Madaket Harbors - well established. Pond management for Miacomet, Long, Sesechacha. Hummock includes water quality analysis, Town reports published annually.	None	
	Assess need for zoning bylaw for waterfront overlay district including state standards for coastal protection & water quality	Planning Board; NP&EDC	Waterfront overlay district not developed		None	
	Seek Federal No-Discharge Designation for both harbors	Board of Selectmen; Department of Marine and Coastal Resources	Completed	August 17,1992 Federal No-Discharge Designation (2/4) average120,000 gallons/year. Cooperation with the Nantucket Boat Basin. Equipment purchased for the Town, Boat Basin and Madaket Marine to support FNDZ.	None	
	Provide trash/recycling barrels at boating facilities	Department of Marine and Coastal Resources; Department of Public Works; Marine-related businesses	Completed	Installed and mandated along with clear trash bags provided to all visiting boaters by MCRD, garbage dumpsters located at MCRD.	None	
	Implement & enforce existing regulations	Department of Marine and Coastal Resources; Board of Health; Coast Guard	On-going	Instituted formalized training for Harbormaster and Shellfish Wardens recognized at the state level for certification, trained in MGL90b authority, No Discharge Zone Enforcement, coordinated effort with U. S. Coast Guard daily.	None	
	Recommend use of environmentally safe cleaning agents	Department of Marine and Coastal Resources; Marine-related businesses	On-going	By-laws adopted for the use biodegradable soaps; No use of on-board dish washers or washing machines. Boat Basin, chandleries and HM distribute handouts. Copies available at MCRD. Difficult	None	

				to control off-island purchases.		
	Develop plan to enforce use of pump-out facilities	Department of Marine and Coastal Resources; Health Department	On-going	By-law adoptions for fines relating to pollution. Fines increased to $300/discharge and a possible ban from Nantucket waters. Education to every visiting boat. Information available at MCRD. Compliance for targeting events with dye tablets, Figawi, Opera Cup, Bucket Race, New York Yacht Club.	None	
	Implement existing local by-laws to mitigate pollution from land use around harbors	Conservation Commission; Board of Health; Fire Department; Plumbing Inspector	On-going	Several discussions, several different forums, DPW, MCRD, CONCOM, Health. Established at ATM Nantucket Harbor Watershed and Madaket Watershed districts at ATM, SMAST Estuaries project, CWMP and Septic Management Plan.	None	
	Provide containers for disposal of hazardous materials and boat waste	Department of Marine and Coastal Resources; Department of Public Works; Marine-related businesses	On-going	Provided for at the Town Pier and Nantucket Boat Basin.	None	
	Designate critical habitat protection areas that are not suitable for development	NP&EDC; Conservation Commission; Harbor Planning Advisory Committee; SHAB			None	

COMMERCIAL AND RECREATIONAL FISHING						
	1993 RECOMMENDATION	**RESPONSIBLE PARTY**	**STATUS AFTER 1993 PLAN**	**DISCUSSION**	**2007 RECOMMENDATION**	**TIMELINE**
Objective I Recommendation 1	Implement the fish & shellfish management plan through regulations and non-regulatory initiatives	Department of Marine and Coastal Resources*; SHAB; Nantucket Shellfish Association; Other concerned citizens	Not completed	Non-regulatory initiatives do not appear to be effective.	Develop and implement a shellfish management plan by October 1, 2008 to protect and enhance the island's shellfish resources, employing either community-based management or co-management.	1
Objective I Recommendation 2		Department of Marine and Coastal Resources*; Nantucket Shellfish Association; SHAB			Continue existing propagation efforts for soft shell clams, oysters, and bay scallops. Re-establish a bay scallop propagation facility at the Brant Point boathouse with a focus not only on propagation but also on research to gauge the facility's success at supplementing the natural stock with genetically diverse scallops.	2
Objective I Recommendation 3	Secure funding for shellfish resource and infrastructure enhancement	Department of Marine and Coastal Resources*; Nantucket Shellfish Association; SHAB	On-going	Funding established at ATM 75% of permit sales dedicated to shellfish propagation, Dept. of Agriculture and DMF have passed through legislation $22,500 per year.	Continue to seek funding through grants, shellfish license fees, and fines to support fisheries development, management, and research.	1
Objective IIRecommendation 1	Develop a program to improve, maintain and locate additional boat ramps and launches in the harbors	Board of Selectmen*; SHAB; Nantucket Shellfish Association; Nantucket Marine Trades Association; MA Department of Environmental Protection; Department of Marine and Coastal Resources; Nantucket Right of Way Committee	On-going	No official program. Jackson Point built in 2002, F Street rebuilt in 2005, Children's designed in 2002- funding pending, Warren's landing/Wood property. Under consideration. Three alternative sites were investigated in Town	Improve and expand upon existing waterfront access points and seek new access for fisheries uses through easements, Chapter 91 license requirements, land purchases, recovery of historical points of access not recorded by the town, or other means.	1
Objective II Recommendation 2	Enhance commercial fishing slips and off-loading accessibility through local special permits for Major Commercial Developments and Ch. 91	SHAB*; Nantucket Shellfish Association; Nantucket Marine Trades Association; MA Department of Environmental Protection; Department of Marine and Coastal Resources; Board of Selectmen	On-going	2001, added 15 commercial slips at Town pier (never allowed prior). Land Bank considering commercial offloading and slips at Petrel Landing 2005-06. 2005 rebuild east end of Town Pier with improved commercial facilities loading- offloading area scheduled times. Possible gantry assistance.	Expand availability of adequate and affordable dock and mooring spaces to support commercial and recreational fisheries by including special conditions in Chapter 91 licenses.	3

				Few Ch. 91 Licenses require commercial fishing access.		
Objective II Recommendation 3		Board of Selectmen*; Department of Marine and Coastal Resources; Nantucket Marine Trades Association; Others			Increase and improve existing shore-side infrastructure, including boat repair facilities and marine supply shops to support commercial and recreational fishing opportunities.	2
	Prepare a fish and shellfish management plan	Department of Marine and Coastal Resources*; SHAB; Nantucket Shellfish Association; Other concerned citizens	Several plans written; none implemented	Several reports have been written, but none are official management plans.	See Objective I, Recommendation 1 of this section	1
	Place additional dinghy docks at the Town Pier, Children's Beach Dock and other areas where there is a demand	Department of Marine and Coastal Resources*; SHAB; Nantucket Shellfish Association; Other concerned citizens	On-going	Town Pier expansion in 2001 added over 300 feet of dinghy dock. Dinghy racks have become the norm at Polpis, Madaket, Town Pier, Shimmo, and certain private properties.	See Objective II, Recommendation 1 of this section	1
	Determine the need and economic viability for a commercial fishing pier	SHAB; NP&EDC; Conservation Commission; Fishing Association	On-going		None	
PUBLIC ACCESS						
	1993 RECOMMENDATION	**RESPONSIBLE PARTY**	**STATUS AFTER 1993 PLAN**	**DISCUSSION**	**2007 RECOMMENDATION**	**TIMELINE**
Objective I Recommendation 1	Develop a plan to acquire and maintain additional rights-of-way to the shores of the harbors	Right of Way Committee*	On-going	Acquisition efforts continue by both the town and various land management groups.	Inventory and map all existing public access, including those access points established through the Chapter 91 licensing process and those held by all landholding agencies. As part of this process, assess each site's condition (i.e. signage, parking, handicap accessibility, necessary improvements, opportunities for expansion) and clarify the legal status of the property.	2

Objective I Recommendation 2		Right of Way Committee*; Department of Environmental Protection			Ensure that existing public access points are retained and maintained for use by the general public.	3
Objective I Recommendation 3	Develop a public coastal access guide for the harbors	Right of Way Committee*; Landholding Groups; Chamber of Commerce	On-going	Developed and distribute their guide which included a lot of pertinent information compiled by several entities copies at MCRD. This guide is not 100% complete.	Develop and distribute guides identifying public access points to and along the shores of the harbors.	3
Objective I Recommendation 4	Maintain signage for all coastal access sites	Right of Way Committee*; Department of Public Works; Beach Manager; Department of Environmental Protection	On-going	MCRD continue to do this with DPW and Beach Management. Many signs required by Ch. 91 licenses do not exist.	Improve and standardize signage at existing shoreline and waterfront access sites.	3
Objective II Recommendation 1	Right of Way Subcommittee should inventory public harbor access sites and their condition; prepare a list of potential sites for acquisition; identify possible access sites requiring legal research; research legal status of street ends and public roads	Right of Way Committee*; Landholding Groups: Department of Public Works; Board of Selectmen	On-going	Potential sites have been identified.	Inventory and map potential new public access points. Use this information to guide future acquisitions.	3
Objective II Recommendation 2		Right of Way Committee*; Department of Marine and Coastal Resources; SHAB; Nantucket Shellfish Association			Improve boating access (specifically for fishers and recreational boaters).	3
Objective IIRecommendation 3	Require public access easements, when appropriate, on all new or expanded waterfront development	Planning Board*; Department of Environmental Protection; Department of Marine and Coastal Resources; Conservation Commission; Board of Selectmen	On-going	Public access benefits are incorporated into all project proposal reviews and decisions of the Board that related to either of the harbors. They have required pubic access benefits for the Yacht Club, White Elephant, etc. The public access benefits have not been summarized or included in any sort of comprehensive	When appropriate, the town should continue to require public access easements (including new launch sites and parking, pedestrian access, and affordable slips/moorings,) on all new or expanded waterfront development.	1

				town or harbor-wide inventory.		
Objective II Recommendation 4		Planning Board*; Department of Marine and Coastal Resources			The town should provide incentives to homeowners to encourage providing public access on their property. Incentives may include limiting the hours of public access and providing assistance with beach cleaning efforts.	3
Objective II Recommendation 5	Work with DEP to ensure public access is provided from C.91 projects	Conservation Commission; Planning Board*; DEP; Department of Marine and Coastal Resources; Right of Way Committee; Department of Public Works; Board of Selectmen	On-going	MCRD reviews all plans for water dependant projects and insures that public access is a component of that review. Cash settlements have been received, Old North Wharf, Nantucket Electric- cable project, CONCOM review very thorough with Biologist and HM. Many CH 91 licenses call for public access, but required signage is lacking at many of those sites.	Chapter 91 licenses issued by the Department of Environmental Protection should incorporate public access conditions consistent with this plan. More specifically, license should contain, where appropriate, conditions including but not limited to parking, restrooms, signage, pedestrian access, visual access, boating access, boat storage, trash receptacles, boat ramps, commercial berthing, and/or boat lifts.	2
Objective II Recommendation 6		Right of Way Committee*; Chamber of Commerce			The town should explore the feasibility of developing a “harbor walk” with standardized access signs and interpretive signs along Nantucket Harbor. Where appropriate, the “harbor-walk” should be handicap-accessible.	5
Objective II Recommendation 7		Right of Way Committee*			The town should file the paperwork needed to legally record currently-used access points that have not been officially or properly obtained.	3
Objective III Recommendation 1		Planning Board*; Department of Environmental Protection			Identify outstanding views and visual access points along the harbors	1
	Pursue an aggressive open space and right of way acquisition program to protect public access and wetland protection	The Town and any relevant private or public agencies	On-going, deserves additional attention	Acquisition takes place, but is not done aggressively as part of a specific program.	None	

DOCKS, WHARVES, AND PIERS						
	1993 RECOMMENDATION	**RESPONSIBLE PARTY**	**STATUS AFTER 1993 PLAN**	**DISCUSSION**	**2007 RECOMMENDATION**	**TIMELINE**
Objective I Recommendation 1		Planning Board*			Develop language to be considered at the Special 2007 Annual Town Meeting to amend the town Zoning Bylaw to prohibit new, expanded, or extended private docks, wharves, or piers in any town waters. Include provisions to exempt governmental agencies or public entities from this prohibition.	1
Objective I Recommendation 2		Department of Marine and Coastal Resources*; Planning Department; Conservation Commission			Complete a survey of the existing docks, wharves and piers to ensure that the structures are all licensed under the provisions of MGL Chapter 91 and that the structures meet all requirements noted in their license.	3
Objective I Recommendation 3		Conservation Commission*; Department of Marine and Coastal Resources; Office of the Town Counsel			Review the legal status of permit applications for private docks that have already been submitted.	2
Objective I Recommendation 4		Planning Department*; Building Department			Implement standards for design and construction of docks, wharves, and piers, that will protect the safety of people, buildings and infrastructure in addition to natural resources both in normal use and in the case of a significant storm.	3
Objective I Recommendation 5		Department of Marine and Coastal Resources*; Building Inspector			Establish criteria to evaluate whether a dock, wharf, or pier has substantially deteriorated and a process to have deteriorated docks, wharves, or piers repaired or removed.	3
COMMERCIAL WATERFRONT						
	1993 RECOMMENDATION	**RESPONSIBLE PARTY**	**STATUS AFTER 1993 PLAN**	**DISCUSSION**	**2007 RECOMMENDATION**	**TIMELINE**

Objective I Recommendation 1		Planning Board*; Board of Selectmen			Develop and adopt into the Nantucket Zoning Bylaw, a Waterfront Overlay district to be applied to the commercial waterfront areas of Nantucket and Madaket Harbors to ensure: (1) Existing water-dependent uses are not displaced by nonwater-dependent uses; (2)-Harbor waters and immediate shoreline and pier areas are dedicated to water-dependent uses; (3) Commercial uses allowable by the underlying district regulations are compatible with, support, or otherwise not interfere with water-dependent uses of the site; (4) No conversion of commercial use to residential use (New residential use allowed only on upper floors of new structures).	1
Objective IRecommendation 2		Board of Selectmen*; Department of Environmental Protection			Include in the Harbor Plan and adopt into the town's Zoning Bylaws a list of priority water-dependent uses, activities and services as guidance to property owners and developers.	1
Objective I Recommendation 3		Board of Selectmen*; Department of Environmental Protection			Include in the Harbor Plan and prohibit in the town's Zoning Bylaws a list of water-dependent uses that are not consistent with the objectives of the Harbor Plan.	1
Objective I Recommendation 4	Adopt waterfront property assessment policies that provide incentives for water-dependent uses	Board of Selectmen*; Assessor's Office	Incomplete		Adopt waterfront property assessment policies that provide incentives for water-dependent uses.	3
Objective I Recommendation 5	Identify scenic views or landscape or waterscape and develop protection policies	Right of Way Committee*; Historic District Commission; Conservation Commission; Planning Board	Incomplete		Identify scenic views (or characteristics of scenic views) of the harbor landscape and waterscape to guide decision making on potential impacts to visual access.	3
Objective I Recommendation 6		Historic District Commission*			Identify all structures on or adjacent to the waterfront that can be considered historic assets in the context of a working waterfront and add them to the Historic District Commission's list of individually or contributing significant structures.	3
	Review options to address and promote maritime-related uses, activities and traditional designs of the downtown commercial area	Planning Board*; Board of Selectmen	Incomplete		See Objective I, Recommendation 1 of this section.	1
	Consider relocation of the fuel off-loading site for Harbor fuel and the Electric Company and	Board of Selectmen; Harbor Fuel; Nantucket Electric Company; Airport Commission	On-going	Electric cable has reduced the need for the number of tanks, tanks removed. Pipeline avgas, now using the freight boat. An off- shore	See Objective V, Recommendation 2 of Harbor Operations, Safety, Navigation, and Moorings	3

	determine permanent location for airport fuel off-loading			option for fueling for airport on south shore is under consideration.		
	Examine the feasibility of a facility for commercial fishing and marine-related boats	Steamship Authority; Board of Selectmen; Department of Marine and Coastal Resources; SHAB; Fishing Association	On-going	Identified in the 70'2, designed, funded?, permitted? For an area beyond the Nantucket Shipyard. Environmental concerns and the lack of up-land adjacent property are some of the causes for not moving forward.	None	
	Inventory structural and open space harbor front resources to evaluate what exists, what is needed, and where needs may be met to provide adequate facilities for water dependent uses	NP&EDC	Incomplete	UHI inventoried and mapped waterfront land use in Downtown Nantucket	None	
	Implement a data collection to record types and intensities of commercial harbor activities on a seasonal basis	NP&EDC	Incomplete		None	
	Develop and implement HDC design guidelines for the Downtown Waterfront District which reflect the nature of the historic architecture	Historic District Commission			None	
	Refine the Nantucket Island Architectural and Cultural Resources Survey	Historic District Commission; Nantucket Historical Association			None	
HARBOR OPERATIONS, SAFETY, NAVIGATION AND MOORINGS						
	1993 RECOMMENDATION	**RESPONSIBLE PARTY**	**STATUS AFTER 1993 PLAN**	**DISCUSSION**	**2007 RECOMMENDATION**	**TIMELINE**

Objective I Recommendation 1		Department of Marine and Coastal Resources*			The Department of Marine and Coastal Resources should implement a waiting list application process which requires individuals to update their contact information and pay a $5 fee to reaffirm their interest in being on the waiting list.	2
Objective I Recommendation 2		Department of Marine and Coastal Resources*			The Department of Marine and Coastal Resources should make the waiting lists available on the Department's website.	2
Objective II Recommendation 1		Department of Marine and Coastal Resources*;			The Department of Marine and Coastal Resources and SHAB should assess the need to quantify the carrying capacity of Nantucket's harbors.	3
Objective II Recommendation 2		Department of Marine and Coastal Resources*			Until the above recommendation has been completed, the Department of Marine and Coastal Resources should continue to cap the number of moorings in the harbor at approximately 2100 vessels, while maintaining a similar ratio of smaller boats (less than 26 feet) to larger vessels. The current ratio is approximately 7:1 (smaller boats:larger boats).	1
Objective II Recommendation 3	Quantify Nantucket and Madaket Harbors carrying capacity for moorings to protect other marine-activities, natural resources, and water quality	Department of Marine and Coastal Resources*	On-going	Difficult to quantify since the size of boats has increased significantly – Factors: Gridding, size and type placement, removal of moorings prior to October 15th in shellfish areas, helix moorings. Waitlist currently has over 600 people for vessels 26 feet or less	Determine the maximum number of mooring permits that can be issued to a waterfront homeowner.	1
Objective II Recommendation 4		Department of Marine and Coastal Resources*			Mooring permits for waterfront properties should only be issued for boats that are held in the owner's name and registered in Massachusetts.	1
Objective II Recommendation 5		Department of Marine and Coastal Resources*; NP&EDC			The Department of Marine and Coastal Resources and the Nantucket Planning and Economic Development Commission should periodically reevaluate the issues related to cruise ship visits to Nantucket. This reevaluation should consider navigation limitations, the town's ability to cope with a significant increase in visitor numbers and how such increases would affect on-shore facilities and services. Such evaluation should take into account the size of vessels, the passenger capacities, the planned frequency and duration of visits, and the timing/season of visits.	3
Objective II Recommendation 6		Department of Marine and Coastal Resources*			If cruise ship visits are acceptable, a per person landing fee should be levied and these funds should be used by the Department of Marine and Coastal Resources.	3

Objective II Recommendation 7		Department of Marine and Coastal Resources*			There should be no anchoring of vessels east of First Point. All large, commercial passenger vessels should anchor between the anchorage and First Point.	1
Objective II Recommendation 8		Department of Marine and Coastal Resources*			Cruise lines and other large, commercial passenger vessels that frequently visit Nantucket should be required to install, maintain and utilize their own ground tackle. The location of, and necessity for these moorings should be determined by the Department of Marine and Coastal Resources.	1
Objective III Recommendation 1	Establish Official Mooring Fields and Anchorages, including grids for each mooring field	Department of Marine and Coastal Resources*	On-going	Mooring field designation by the HM, Ch. 91, Section 10A. Commercial permit for rental moorings approved by the Corps of Engineers. Gridding complete - Children's, General, South of Town Pier, Hither Creek, not feasible for (Easy St, Hulbert, Swains).	The Department of Marine and Coastal Resources should continue to establish grid patterns for all existing mooring fields, ensuring that the process of gridding does not drastically change the number of vessels allowed in each mooring field.	3
Objective III Recommendation 2	Establish Official Mooring Fields and Anchorages, including grids for each mooring field	Department of Marine and Coastal Resources*	On-going	Mooring field designation by the HM, Ch. 91, Section 10A. Commercial permit for rental moorings approved by the Corps of Engineers. Gridding complete - Children's, General, South of Town Pier, Hither Creek, not feasible for (Easy St, Hulbert, Swains).	The Department of Marine and Coastal Resources should develop a more detailed anchorage plan for Nantucket Harbor.	3
Objective IV Recommendation 1	Recommend mooring tackle for use in the harbors. Inspect mooring tackle every 3 years	Department of Marine and Coastal Resources*; SHAB; Nantucket Shellfish Association; Other interested parties	Completed	Regulations on file, copy in by-laws. Records kept (electronically and paper). Handouts available at MCRD. Renewal contingent upon inspection of payment record. The Department of Marine and Coastal Resources keeps up-to-date with new technologies but there is little local enthusiasm for moving away from traditional moorings	The Town of Nantucket should continue to explore different types of moorings to determine which is best for use in Madaket and Nantucket Harbors. The analysis should take into consideration the impacts of the mooring type on the eelgrass beds and the scallop fishery. Additionally, mooring types may be suitable in certain situations or applications, but unsuitable in others.	2
Objective IV Recommendation 2	Recommend mooring tackle for use in the harbors. Inspect mooring tackle every 3 years	Department of Marine and Coastal Resources*; Other interested parties	Completed	Regulations on file, copy in by-laws. Records kept (electronically and paper). Handouts available at MCRD. Renewal contingent upon inspection of payment record. The Department of Marine and Coastal Resources keeps up-to-date with new	Compile existing research dealing with the impacts of moorings on eelgrass. Apply this research to the management of moorings in Nantucket and Madaket Harbors, outlining the specific changes (if any) to be made and the strategies that will be used to make the changes.	2

				technologies but there is little local enthusiasm for moving away from traditional moorings		
Objective V Recommendation 1		Department of Marine and Coastal Resources*; Board of Selectmen; Army Corps of Engineers			The Department of Marine and Coastal Resources should continue to work with the Army Corps of Engineers to repair and raise the jetties at the entrance to Nantucket Harbor. The Board of Selectmen should actively support the department's efforts.	2
Objective V Recommendation 2		Board of Selectmen*; Department of Marine and Coastal Resources; Planning Board			The town should actively encourage the relocation of the current fuel off-loading facility to the south shore and the fuel storage facility (tank farm) to a location in the vicinity of the airport.	3
Objective V Recommendation 3		Department of Marine and Coastal Resources*			Gather bathymetric data in both harbors using low cost techniques so that this data can be used for navigation purposes and to develop bathymetric models. These can then be used to study changes over time.	2
Objective V Recommendation 4		Department of Marine and Coastal Resources*; Lighting Enforcement Officer			The Department of Marine and Coastal Resources should lead an initiative to identify existing lighting that trespasses on the harbors. Discontinue unnecessary shoreline lighting and enforce compliance with existing regulations for outdoor lighting.	3
Objective V Recommendation 5		Department of Marine and Coastal Resources*; NP&EDC			Adopt additional lighting controls into the Harbor Overlay District regulations, specific to waterfront conditions. Consider amending Section 102-4 (Uplighting; highlighting; floodlighting; motion lighting; recreation facilities) of Chapter 102 (Outdoor lighting) of the Nantucket Bylaws to include specific mention of the impact of lighting on the safe navigation of vessels, modeled after § 102-3(G) which deals with the impacts of lighting on the safe navigation of motor vehicles on roads.	3
Objective V Recommendation 6		Department of Marine and Coastal Resources*			Develop and distribute a comprehensive no-wake zone map to educate boaters. Signs should also be posted where possible.	3
Objective V Recommendation 7		Department of Marine and Coastal Resources*			The town should secure funding and permits for dredging projects as outlined in the 5 and 10-year plans or as necessary.	

Objective VI Recommendation 1		Board of Selectmen*; Department of Marine and Coastal Resources			The Town of Nantucket should pursue opportunities to develop a second commercial dock that would be capable of handling large vessels carrying passengers, goods, and vehicles in an emergency. A facility located outside of the downtown area may help alleviate some of the truck traffic problems and reduce the amount of hazardous materials transported through populated areas.	5
Objective VII Recommendation 1		Board of Selectmen*; Department of Marine and Coastal Resources; Private businesses			All efforts should be made to maintain the haul-out capacity on Nantucket at levels that will allow for the safe and timely removal of boats from the water in an emergency situation.	1
Objective VII Recommendation 2		Department of Marine and Coastal Resources*; Board of Selectmen; Private businesses; Conservation Commission: SHAB			The town should continue to investigate options for developing a new boat ramp at the south end of town. While there appear to be no “ideal” locations, a ramp may still be feasible.	4
Objective VII Recommendation 3		Department of Marine and Coastal Resources*; Private businesses			The Department of Marine and Coastal Resources currently works with local businesses to coordinate the hauling of boats in the event of an imminent storm. This should be formalized in writing and the responsibilities of the town and private providers should be defined.	2
	Minimize the use of jet skis by prohibiting commercial rentals through town regulation	Board of Selectmen* Department of Environmental Protection	Completed	By laws written and adopted at ATM, records at MCRD. No rental companies located on the Island at this time.	See Objective I, Recommendation 3 of the Commercial Waterfront Section.	1
	Produce a harbor guide or chart showing mooring fields, anchorages, channels, fairways areas of potential hazards	Department of Marine and Coastal Resources; SHAB	Completed	Done by several entities with several collaborative funding mechanisms Land Council, Chamber of Commerce, SHAB, MCRD. Needs to be re-printed. Information/charts copied and available at MCRD.	None	
	Examine the possibility of classifying moorings into categories: resident, resident commercial, nonresident, nonresident commercial	Department of Marine and Coastal Resources; SHAB; Board of Selectmen	Deemed not necessary	Classifications have been established. Residential, commercial, livery, repair, rental, non-resident category prohibited. Moorings are also assigned based on size and type (sail or motorized) of vessel.	None	

	Enforce local laws and regulations relating to harbor safety and navigation. Maintain catalog of applicable laws and regulations	Department of Marine and Coastal Resources; Board of Selectmen	On-going	Established formalized training, for full-time and seasonal employees. Increased patrols with staff limitations.	None	
	Department of Marine and Coastal Resources should enforce Nantucket Code on Abandonment of Vessels, Moorings	Department of Marine and Coastal Resources	On-going	SHAB proposed new regulations reducing the reporting times. Derelict and abandoned boats being removed -mechanisms in affect to recover costs. By-law in place: § 137-7. abandonment of vessels, moorings, etc.	None	
	Pursue changes in Town Code of Nantucket to improve safety, control, enforcement, and environmental conditions of the wharves and waterways	Department of Marine and Coastal Resources and SHAB	On-going	Regulations and by-laws instituted on an on-going basis, jet skis, kite boards, no wake zones, pollution, mooring tackle changes etc. all on an annual basis based on the public's input for what is needed.	None	
	Increase Cooperation of local, state, & federal agencies to maintain Nantucket Harbor's Federal Navigation Channel	Board of Selectmen; Department of Marine and Coastal Resources	On-going	US Coast Guard working with MCRD, added new channel markers. Half tide-full tide jetty discussion on-going as it relates to water quality and navigation. East Jetty is a danger needs to be marked on charts --submerged at half water.	None	
	Maintain channel markers and siting buoys	Department of Marine and Coastal Resources	On-going	Increased from 35 to 65 marks. MCRD marks all channels & rocks within the three-mile limit of the waters of Nantucket. Need to maintain turning area.	None	
	Analyze the need for a harbor and water sheet overlay management plan	NP&EDC	On-going	Several discussions, several different forums, DPW, MCRD, CONCOM, Health. Established at ATM Nantucket Harbor Watershed and Madaket Watershed districts at ATM, SMAST Estuaries Project, CWMP and Septic Management Plan.	None	

OIL SPILL RESPONSE						
	1993 RECOMMENDATION	**RESPONSIBLE PARTY**	**STATUS AFTER 1993 PLAN**	**DISCUSSION**	**2007 RECOMMENDATION**	**TIMELINE**
Objective I Recommendation 1	Finalize and implement oil spill contingency plan	NP&EDC*; Department of Marine and Coastal Resources; Office of Coastal Zone Management; Department of Environmental Protection; US Coast Guard; Fire Department	Completed	1991 report on file MCRD, NFD. Outdated	Review and update the existing Nantucket Coastal Oil Spill Response Plan.	2-3
Objective I Recommendation 2	Finalize and implement oil spill contingency plan	Department of Marine and Coastal Resources*	Completed	1991 report on file MCRD, NFD. Outdated	Identify an Oil Spill Response Coordinator.	2-3
Objective II Recommendation 1	Finalize and implement oil spill contingency plan	Department of Marine and Coastal Resources*; Board of Selectmen; Oil Spill Coordinator; US Coast Guard; Fire Department	Completed	1991 report on file MCRD, NFD. Outdated	Mandate that all fuel off-loading sites, facilities containing 5 or more boat slips, or sites where fuelling of vessels occurs develop and maintain a current plan to respond to a spill at that facility, have suitable, specialized equipment to respond to a spill at their facility or nearby and have trained staff available for initial response.	2-3
Objective II Recommendation 2	Finalize and implement oil spill contingency plan	Oil Spill Coordinator*	Completed	1991 report on file MCRD, NFD. Outdated	Simple clean-up materials should be required at all facilities where boats can tie up or be launched. Educational material should also be available at these sites so that the public is informed as to the need for cleaning up even small spills and how to safely dispose of any materials used.	2-3
Objective II Recommendation 3	Finalize and implement oil spill contingency plan	Oil Spill Coordinator*; Department of Marine and Coastal Resources	Completed	1991 report on file MCRD, NFD. Outdated	Boaters should be reminded that certain oil-spill clean-up materials are available for free through the Department of Marine and Coastal Resources	2-3
Objective III Recommendation 1	Finalize and implement oil spill contingency plan	Oil Spill Coordinator*	Completed	1991 report on file MCRD, NFD. Outdated	Oil spill response equipment should include a simple system that can be implemented to prevent any spilled liquid from entering catch basins and subsequently contaminating the harbors or other waters.	2-3

Objective III Recommendation 2	Finalize and implement oil spill contingency plan	Department of Public Works*; Department of Marine and Coastal Resources; Historic District Commission	Completed	1991 report on file MCRD, NFD. Outdated	Stencil storm drains with a symbol that identifies those that discharge directly into the harbors. Covering these should be prioritized in the event of a fuel spill on land.	2-3

	Amend by-laws to minimize non-point pollution from expanded development in watersheds	Conservation Commission*; Planning and Economic Development Commission	Completed	Addresses importance in: Section 99-3(B) “It is in the public interest to delineate the boundaries of the Nantucket and Madaket Harbor Watersheds, thus providing a frame of reference for diverse, multi-jurisdictional strategies and activities which promote the purposes of this section.” Might include structural improvements (i.e., dredging, extension of sanitary sewers/package treatment facilities, retrofit of storm drainage systems to reduce nutrient loading, and the development of planning contingencies and improvements devised to support spill containment), and regulatory activities, such as public health regulations. Open space preservation activities, such as land acquisition and implementation of conservation restrictions, by the Land Bank Commission and other entities are encouraged within the watershed, because they reduce the land use impacts which can degrade the water quality of these Harbors. It is also important that educational strategies devised to inform the public of ways to preserve the Harbors’ water quality have defined watersheds as frames of reference.	See Objective I, Recommendation 2 of Natural Resources Section	2-3

TOURISM & RECREATION						
	1993 RECOMMENDATION	**RESPONSIBLE PARTY**	**STATUS AFTER 1993 PLAN**	**DISCUSSION**	**2007 RECOMMENDATION**	**TIMELINE**
	Provide improved public service facilities in the central business district. New or improved major commercial developments on the waterfront should be conditioned to provide public service facilities	Board of Selectmen*; Department of Environmental Protection	On-going	$128K bathroom renovation at MCRD through State/federal funding. Boat basin has also done major upgrades to bathrooms and pump-out-facilities. Fresh water now available at two locations at the town pier, with pump-out options being added in 2006.	See Objective I, Recommendation 2 of the Commercial Waterfront section	1
	Analyze the need for a harbor and water sheet overlay management plan	NP&EDC	Incomplete		None	
	Develop & disseminate a waterfront guide	Visitor Services; Chamber of Commerce; Information Services	On-going	Info available everywhere, in several different formats plus harbor guide (which needs re-printing).	None	
	Coordinate efforts to promote fishing as an important tourist activity in both harbors	Department of Marine and Coastal Resources; Chamber of Commerce; local fishing associations	On-going	Charters, eco-tours, whale watching, and scallop charter all offered at the commercial slips at MCRD. Community Sailing has many new programs for sailing, kayaking, lessons etc.	None	
	Implement a data collection system that records the types of harbor uses on a seasonal basis	Department of Marine and Coastal Resources	On-going	Several different forms/cards used, check off sheets developed. Tied to parking for live-aboards. Records of every pump-out submitted to the state annually to satisfy CVA grant funding. Records maintained at the MCRD	None	

APPENDIX 2 – PROPOSED AMENDMENTS TO THE NANTUCKET CODE OF ORDINANCES, CHAPTER 139

HARBOR OVERLAY DISTRICT

Article prepared for 2007 Annual Town Meetings was tabled and a revised article is being prepared for 2007 Special Town Meeting

DOCKS, PIERS AND WHARVES

Article prepared for 2007 Annual Town Meetings was tabled and a revised article is being prepared for 2007 Special Town Meeting

APPENDIX 3 - SUMMARY OF CHAPTER 91 LICENSES

#	Street	Owner	Co-Owner	License Plan Number	Applicant	Date	Project Description	Public Access Component
15	HARBOR VIEW WY	NANTUCKET TOWN OF	C/O PARK & REC	10021	Nantucket Harbor Master	7/8/04	Children's Beach: Pier and Boat Ramp to "provide public access to navigable waters and shoreline stabilization for the protection of a water dependent use".	Lateral passage between the high and low water marks with the exception of structures and property not intended for lateral passage; Foot passage from dawn to dusk within the area seaward of the high water mark; Cannot impede or discourage the free flow of pedestrian movement by limiting hours of availability of any areas designated for public passage or by placing gates, fences, or other structures that would impede access; Public access is permitted in lands lying seaward of the low water mark; Place public access signs on the northerly and southerly sides of the boat ramp adjacent to the mean high water shoreline
	OLD NORTH WF			10199	Old North Wharf Cooperative, Inc.	6/10/05	Timber pier and tie-off piles for "noncommercial docking and boating access to navigable waters"	Lateral passage between the high and low water marks with the exception of structures and property not intended for lateral passage; Foot passage from dawn to dusk within the area seaward of the high water mark; Cannot impede or discourage the free flow of pedestrian movement by limiting hours of availability of any areas designated for public passage or by placing gates, fences, or other structures that would impede access; Public access is permitted in lands lying seaward of the low water mark; Place public access signs along the delineated access way
	OLD NORTH WF			9139	Old North Wharf Trust	12/12/01	For the purpose of a management office, a private social club, and several private residences, a docking and boating facility for access to navigable waters and public access for passive recreational purposes: Maintain a 370 sq. ft. office building, a 392 sq. ft. Fish House building, a 680 sq. ft. Nautilus building, 65 sq. ft. of the Lydia building, 88 sq. ft. of the Independence building, 50 sq. ft. of the Constitution building, and 40 sq. ft. of the Wharf Rat	**Special Condition 1:** Public passage via foot for all lawful purposes, within the designated 10 foot clear pedestrian walkway; Place no fewer than 5 trash receptacles for public use immediately adjacent to said public pedestrian walkway; access should be available to the general public on a daily basis from 5:30 am to 11:00 pm, free of charge; May prevent unlawful activity. **Special Condition 2:** May adopt rules governing the public accessible areas of the site, subject to prior review and written approval by the Department, as is necessary for the protection of public health and safety and private property, and to ensure public use and enjoyment by minimizing conflicts between user groups. **Special condition 3:** The licensee shall provide 2 signs denoting public access to the wharf. One sign shall be visible by the pedestrians on the Easy Street sidewalk at the beginning of the pedestrian access easement on a

							Club building. Also covers the following existing structures: a 64 ft. long bulkhead; 14 sq. ft. of existing dock seaward of Nautilus; 126 sq. ft. of existing dock with 128 sq. ft. of finger piers; 66 cu. yards of existing fill along the northern side of the wharf; and 1220 sq. ft. of deck space comprising 186 sq. ft. at the Coffin property, 680 sq. ft. at the Peru property, 130 sq. ft. at the Carey property and 224 sq. ft. at the fourth structure east of Easy Street	standard public works street sign, and the other sign shall be located where the lateral access easement connects to the abutting southerly parcel as depicted on Sheet 3 of 10 of the License Plans. **Special Condition 4:** Provide berthing, including vehicular access on the landside for loading and unloading of gear and catch on a 24 hr./day basis) to at least one member of the Nantucket commercial fishing fleet on a year-round basis at a slip located on the pier north of the fish house (may charge an appropriate fee similar to those charged in Nantucket Harbor); Public is allowed to use and pass freely in the area of property lying between the high and low tide marks for fishing, fowling, navigation, and the natural derivatives thereof; Public has the right to use and pass freely, for any lawful purpose, upon lands lying seaward of the low water mark; Cannot impede or discourage the free flow of pedestrian movement by limiting hours of availability of any areas designated for public passage or by placing gates, fences, or other structures that would impede access
64	MONOMOY RD	PILGRIM GARY L & RUTH E		9912	Gary and Ruth Pilgrim	4/12/04	Construct and maintain a ramp and pile held float and to maintain an existing pier for noncommercial docking and boating access to navigable waters	Lateral passage between the high and low water marks for the purpose of fishing, fowling, navigation, and the natural derivatives; Foot passage from dawn to dusk within the area seaward of the high water mark; Cannot impede or discourage the free flow of pedestrian movement by limiting hours of availability of any areas designated for public passage or by placing gates, fences, or other structures that would impede access; Public is access permitted in lands lying seaward of the low water mark; Place public access signs on the northerly and southerly sides of the boat ramp adjacent to the mean high water shoreline
	OLD NORTH WF			10114	Old North Wharf Cooperative, Inc.	3/31/05	Construct and maintain a pile supported pier, deck, and tie-off pile for noncommercial docking and boating access to navigable waters	Lateral passage between the high and low water marks for the purpose of fishing, fowling, navigation, and the natural derivatives; Foot passage from dawn to dusk within the public access way delineated on the license plan; Cannot impede or discourage the free flow of pedestrian movement by limiting hours of availability of any areas designated for public passage or by placing gates, fences, or other structures that would impede access; Public access is permitted in lands lying seaward of the low water mark; Place public access signs on the easterly and westerly sides of the boat ramp adjacent to the mean high water shoreline
42	EASTON ST	GIFFORD WHITNEY TRST	42 EASTON STREET NOM	10194	Whitney Giffo– -- Trustee of	6/11/2005	Construct and maintain a pile supported timber pier	Lateral passage between the high and low water marks for the purpose of fishing, fowling, navigation,

			TRUST		42 Easton Street Nominee Trust		and outhaul for noncommercial docking and boating access to navigable waters.	and the natural derivatives; Foot passage from dawn to dusk within the area of the property lying seaward of the high water mark; Cannot impede or discourage the free flow of pedestrian movement by limiting hours of availability of any areas designated for public passage or by placing gates, fences, or other structures that would impede access; Public access is permitted in lands lying seaward of the low water mark; Place public access signs on both side of the pier adjacent to the mean high water shoreline
	OLD NORTH WF			9582	Old North Wharf Company	3/20/03	Construct and maintain two finger piers, mooring piles and deck extension for noncommercial docking and boating access to navigable waters.	Lateral passage between the high and low water marks; Foot passage from dawn to dusk within the public access way delineated on the license plan; Cannot impede or discourage the free flow of pedestrian movement by limiting hours of availability of any areas designated for public passage or by placing gates, fences, or other structures that would impede access; Public access is permitted in lands lying seaward of the low water mark; Place public access signs along the delineated access way.
	OLD NORTH WF			9631	Old North Wharf Company	5/13/03	Construct and maintain floats and support piles for non commercial docking and boating access to navigable waters	Lateral passage between the high and low water marks; Foot passage from dawn to dusk within the public access way delineated on the license plan; Cannot impede or discourage the free flow of pedestrian movement by limiting hours of availability of any areas designated for public passage or by placing gates, fences, or other structures that would impede access; Public access is permitted in lands lying seaward of the low water mark; Place public access signs along the delineated access way.
90	WASHINGTON ST	CROWE ROBERT B TRUSTEE	ORANGE REALTY TRUST	9804	Lyle Howland	11/11/03	Construct and maintain a timber pier, ramp, float, and outhaul piles for noncommercial docking and boating access to navigable waters	Lateral passage between the high and low water marks for the purpose of fishing, fowling, navigation, and the natural derivatives thereof; Foot passage from dawn to dusk within the public access way delineated on the license plan; Cannot impede or discourage the free flow of pedestrian movement by limiting hours of availability of any areas designated for public passage or by placing gates, fences, or other structures that would impede access; Public access is permitted in lands lying seaward of the low water mark; Place public access signs along the northerly and southerly sides of the pier adjacent to the mean high water shoreline.
24	OLD NORTH WF	OLD NORTH WHARF COOPERATIVE INC	C/O NEMO L–C - ONE IF BY LAND	9583	Old North Wharf Company	3/20/03	Construct and maintain a finger pier and tie-off piles	Shall not restrict the public's right to use and to pass freely, for any lawful purpose, upon lands lying seaward of the low water mark. Said lands are held in trust by the Commonwealth for the benefit of the public

34	WASHINGTON ST	NANTUCKET TOWN OF		8795	Town of Nantucket	4/6/01	Construct and maintain a pile and timber pier, mooring piles, ramps, and fixed floating docks for commercial and public recreational docking and boating access to navigable waters	Public foot passage permitted for any purpose, from dawn to dusk, within the property lying seaward of the high water mark; Public shall be allowed free passage around all structures on the property; Town shall place a public access sign at each property line, adjacent to the mean high water shoreline; berths should be assigned in a fair manner, and may be assigned based on vessel characteristics; berths shall be made available for transient use during periods of vacancy in excess of 24 hours; public has right to use and pass freely upon the area of the subject property lying between the high and low water marks for the purpose of fishing, fowling, navigation, and the natural derivatives thereof; public can pass freely upon lands lying seaward of the low water mark
21	COMMERCIAL WF	COREY RICHARD G TRUSTEE	21 COMMERCIAL WHARF NOM TR	9449	21 Commercial Wharf Nominee Trust	10/17/02	Construct and maintain a pile supported timber dock for noncommercial docking and boating access to navigable waters	Public passage around all structures within the intertidal area; Public access signs shall be placed at each property line adjacent to the mean high water shoreline; Public foot passage is allowed from dawn to dusk within the property lying seaward of the high water mark; Public is allowed to pass freely on area lying between high and low water marks for the purpose of fishing, fowling, navigation, and the natural derivatives thereof; Public can pass freely upon lands lying seaward of the low water mark
				9200	John P. Dunfey	1999?	Maintain existing pile-supported residential structure for private residence and appurtenant deck	Public access to and from the intertidal area of Nantucket Harbor to the dedicated public pedestrian access easement on Old North Wharf at a minimum from dawn until dusk, seven days a week. The access way shall be located on the western side of the property, encompassing the area between the structure and the property line. Accessway shall provide even and level grading and shall be constructed and maintained of durable materials. The intent of the public access condition is to allow public strolling and viewing of the cove in addition to the public rights of fishing, fowling, and navigation. No gates, fences, or other obstructions may be placed on any areas open to public in a manner that would impede or discourage the free flow of pedestrian movement thereon. Signs should be placed on the western side of the property. Signs shall be of adequate size to be clearly visible to pedestrian traffic on the public access easement along Old North Wharf and from the boating public on the harbor side. Signs may include any reasonable rules for use. Licensee shall contribute $2,700.00 to the Harbormaster for the installation of a public use at Ames Street adjacent to Millie's Bridge. The licensee may adopt rules

								governing the publicly accessible areas of the site, subject to the prior review and written approval of the Department as are necessary for the public health and safety and the private property, and to ensure public use and enjoyment by minimizing conflicts between user groups. The licensee shall not restrict the public's right to use and pass freely, for any lawful purpose, upon lands lying seaward of the low water mark. Public shall be able to use and pass freely on the property lying between the high and low water marks for the purpose of fishing, fowling, navigation, and the natural derivatives thereof. The licensee shall not limit the hours of availability of any areas of the property designated for public passage, nor place any gates, fences, or other structures on such areas in a manner that would impede or discourage the free flow of pedestrian movement thereon.
22	OLD NORTH WF	OLD NORTH WHARF COOPERATIVE INC	C/O WILLIAMSON ROY	9710	David L. Douglas	6/1/03	Construct and maintain an approximate 400 square foot addition to a previously authorized residential structure for residential use	Licensee will make a $1,500.00 donation to the Harbormaster earmarked for the Nantucket Municipal Waterfront improvement and Maintenance Fund for the installation of new, publicly accessible dinghy docks at the Town of Nantucket's municipal pier. The licensee shall not restrict the public's right to use and pass freely, for any lawful purpose, upon lands lying seaward of the low water mark. The licensee shall not limit the hours of availability of any areas of the property designated for public passage, nor place any gates, fences, or other structures on such areas in a manner that would impede or discourage the free flow of pedestrian movement thereon.
38	SHIMMO POND RD	ALFIERI DOMINICK & EILEEN TRST	WINDSONG NOMINEE TRUST	4449	Alice C. Erickson	3/9/95	Maintain two existing timber groins for the purpose of shoreline stabilization for the protection of existing structures	Licensee shall allow the public to use and pass freely on the property lying between the high and low water marks for the purpose of fishing, fowling, navigation, and the natural derivatives thereof. The licensee shall not limit the hours of availability of any areas of the property designated for public passage, nor place any gates, fences, or other structures on such areas in a manner that would impede or discourage the free flow of pedestrian movement thereon.
23	OLD NORTH WF	OLD NORTH WHARF COOPERATIVE INC	C/O SANFORD ALFRED F III ETAL TRS	4594	Old North Wharf Trust	8/8/95	Construct and maintain an extension to an existing timber pier for docking and boating access to navigable waters.	Public allowed to pass on foot, for any purpose and from dawn to dusk, within the area of the property lying seaward of the high water mark. The licensee shall not restrict the public's right to use and pass freely upon lands lying seaward of the low water mark. The licensee shall not limit the hours of availability of any areas of the property designated for public passage, nor place any gates, fences, or other structures on such areas in a manner that would impede or

								discourage the free flow of pedestrian movement thereon.
45	HULBERT AV	WETHERILL DAVID C TR	A C WETHERILL INCOME TR	5861	David C. Wetherill, Trustee	7/23/96	Maintain an existing timer bulkhead and timber groins for shoreline stabilization for protection of existing structures	In accordance with any license condition, easement, or other public right of lateral passage that exists in the area of the subject property lying between the high and low water marks, the Licensee shall allow the public in the exercise of such rights, to pass freely over all structures in the intertidal area. Public access signs shall be placed on both the easterly/westerly sides of the easternmost timber groin authorized herein, adjacent to the mean highwater shoreline. Public shall be allowed to use and pass freely upon the area of the property lying between the high and low water marks for the purpose of fishing, fowling, navigation, and the natural derivatives thereof. The licensee shall not restrict the public's right to use and pass freely upon lands lying seaward of the low water mark. The licensee shall not limit the hours of availability of any areas of the property designated for public passage, nor place any gates, fences, or other structures on such areas in a manner that would impede or discourage the free flow of pedestrian movement thereon.
50	TENNESSEE AV	MINSTRELL NORMA M & CHASE NANC		4229	Nancy A. Chase and Norma M. Minstrell	12/14/94	Maintain an existing pile supported pier for noncommercial docking and boating access to navigable waters.	In accordance with any license condition, easement, or other public right of lateral passage that exists in the area of the subject property lying between the high and low water marks, the Licensee shall allow the public in the exercise of such rights, to pass freely over all structures in the intertidal area. Licensee shall place a ladder and public access sign on both the northeasterly and southwesterly sides of the pier, adjacent to the mean high water shoreline. The ladders shall be constructed of durable materials, shall be fixed to the pier in such a manner so as not to rest on the marsh, shall have a minimum width of 2 feet, and shall have adequate railings extending above the pier decking in order to facilitate safe passage. If, at any time, pier reconstruction in excess of 50% is necessary, the Licensee shall raise the decking, within the intertidal zone, to provide a minimum clearance of 5 feet between the pier and the mean high water datum. Upon reconstruction, signs and ladders shall no longer be required. Public shall be allowed to use and pass freely upon the area of the property lying between the high and low water marks for the purpose of fishing, fowling, navigation, and the natural derivatives thereof. The licensee shall not restrict the public's right to use and pass freely upon lands lying seaward of the low water mark. The licensee shall not

								limit the hours of availability of any areas of the property designated for public passage, nor place any gates, fences, or other structures on such areas in a manner that would impede or discourage the free flow of pedestrian movement thereon.
23	OLD NORTH WF	OLD NORTH WHARF COOPERATIVE INC	C/O SANFORD ALFRED F III ETAL TRS	4110	Old North Wharf Trust	10/26/94	Place and maintain two single-pile dolphins, one double-pile dolphin, and 4 triple pile dolphins for commercial docking and boating access to navigable waters	Public allowed to pass on foot, for any purpose and from dawn to dusk, within the area of the property lying seaward of the high water mark. The licensee shall not restrict the public's right to use and pass freely upon lands lying seaward of the low water mark. The licensee shall not limit the hours of availability of any areas of the property designated for public passage, nor place any gates, fences, or other structures on such areas in a manner that would impede or discourage the free flow of pedestrian movement thereon.
42	SHIMMO POND RD	STEWART JAMES TR		4109	Low Shimmo Nominee Trust, James M. Stewat, Trustee	10/26/94	Maintain an existing platform, gangway, and four pile-held floats for noncommercial docking and boating access to navigable waters.	The licensee shall not restrict the public's right to use and pass freely upon lands lying seaward of the low water mark. The licensee shall not limit the hours of availability of any areas of the property designated for public passage, nor place any gates, fences, or other structures on such areas in a manner that would impede or discourage the free flow of pedestrian movement thereon.
11	H ST	HOLMES JEAN S TRUSTEE	THE JS HOLMES NOMINEE TRUST	4560	Jean S. Holmes	4/14/95	Maintain an existing post-supported pier with gangway and pile-held float for noncommercial docking and boating access to navigable waters	In accordance with any license condition, easement, or other public right of lateral passage that exists in the area of the subject property lying between the high and low water marks, the Licensee shall allow the public in the exercise of such rights, to pass freely over all structures in the intertidal area. Licensee shall place a ladder and public access sign on both the northeasterly and southwesterly sides of the pier, adjacent to the mean high water shoreline. The ladders shall be constructed of durable materials, shall be fixed to the pier in such a manner so as not to rest on the marsh, shall have a minimum width of 2 feet, and shall have adequate railings extending above the pier decking in order to facilitate safe passage. If, at any time, pier reconstruction in excess of 50% is necessary, the Licensee shall raise the decking, within the intertidal zone, to provide a minimum clearance of 5 feet between the pier and the mean high water datum. Upon reconstruction, signs and ladders shall no longer be required. Public shall be allowed to use and pass freely upon the area of the property lying between the high and low water marks for the purpose of fishing, fowling, navigation, and the natural derivatives thereof. The licensee shall not limit the

								hours of availability of any areas of the property designated for public passage, nor place any gates, fences, or other structures on such areas in a manner that would impede or discourage the free flow of pedestrian movement thereon.
50	EASTON ST	NANTUCKET ISLAND RESORTS LLC	C/O NI MANAGEMENT	5343	Sherburne Associates Realty Trust	4/4/96	Maintain existing pier extensions for docking and boating access to navigable waters	Public allowed to pass on foot, for any purpose and from dawn to dusk, within the area of the property landward of the bulkhead along the waters edge. The licensee shall not restrict the public's right to use and pass freely upon lands lying seaward of the low water mark. The licensee shall not limit the hours of availability of any areas of the property designated for public passage, nor place any gates, fences, or other structures on such areas in a manner that would impede or discourage the free flow of pedestrian movement thereon.
50	EASTON ST	NANTUCKET ISLAND RESORTS LLC	C/O NI MANAGEMENT	5342	Sherburne Associates Realty Trust	4/4/96	Maintain existing bulkheads, backfill, walkways and pile-supported piers for shoreline stabilization for the protection of existing structures and docking and boating access to navigable waters.	In accordance with any license condition, easement, or other public right of lateral passage that exists in the area of the subject property lying between the high and low water marks, the Licensee shall allow the public in the exercise of such rights, to pass freely around all structures in the intertidal area. Public access signs shall be placed at both the easterly and westerly property lines adjacent to the bulkhead. Nothing in this condition shall be construed as preventing the licensee from excluding the public from portions of said structures or property not intended for lateral passage. Public shall be allowed to use and pass freely upon the area of the property lying between the high and low water marks for the purpose of fishing, fowling, navigation, and the natural derivatives thereof. The licensee shall not restrict the public's right to use and pass freely upon lands lying seaward of the low water mark. The licensee shall not limit the hours of availability of any areas of the property designated for public passage, nor place any gates, fences, or other structures on such areas in a manner that would impede or discourage the free flow of pedestrian movement thereon.
38	SHIMMO POND RD	ALFIERI DOMINICK & EILEEN TRST	WINDSONG NOMINEE TRUST	5813	Windsong Nominee Trust	7/15/96	Maintain an existing timber bulkhead and groins for shoreline stabilization for the protection of existing structures	Public shall be allowed to use and pass freely upon the area of the property lying between the high and low water marks for the purpose of fishing, fowling, navigation, and the natural derivatives thereof. The licensee shall not limit the hours of availability of any areas of the property designated for public passage, nor place any gates, fences, or other structures on such areas in a manner that would impede or discourage the free flow of pedestrian movement

								thereon.
28	TENNESSEE AV	ROWLEY SHIRLEY M TR	SHIRLEY M ROWLEY TRUST	3630	Durwood B. and Shirley M. Rowley	2/4/94	Maintain an existing pile supported pier with gangway and pile-held float for noncommercial docking and boating access to navigable waters	In accordance with any license condition, easement, or other public right of lateral passage that exists in the area of the subject property lying between the high and low water marks, the Licensee shall allow the public in the exercise of such rights, to pass freely around all structures in the intertidal area. Public access signs shall be placed at both the northeasterly and southwesterly sides of the pier adjacent to the mean high water shoreline. Nothing in this condition shall be construed as preventing the licensee from excluding the public from portions of said structures or property not intended for lateral passage.
14	BALTIMORE ST	WHELDEN HAROLD R		3627	Harold R. Whelden	2/4/94	Maintain an existing pile-supported pier with gangway and pile-held float for noncommercial docking and boating access to navigable waters	In accordance with any license condition, easement, or other public right of lateral passage that exists in the area of the subject property lying between the high and low water marks, the Licensee shall allow the public in the exercise of such rights, to pass freely around all structures in the intertidal area. Public access signs shall be placed at both the easterly and westerly sides of the pier adjacent to the mean high water shoreline. Nothing in this condition shall be construed as preventing the licensee from excluding the public from portions of said structures or property not intended for lateral passage. Public shall be allowed to use and pass freely upon the area of the property lying between the high and low water marks for the purpose of fishing, fowling, navigation, and the natural derivatives thereof. The licensee shall not limit the hours of availability of any areas of the property designated for public passage, nor place any gates, fences, or other structures on such areas in a manner that would impede or discourage the free flow of pedestrian movement thereon.
28	EASTON ST	DOUBLEDAY SANDRA PINE		4510	Sandra Pine Doubleday	5/5/95	Maintain an existing timber bulkhead, pile-supported pier, gangway and pile-held float for noncommercial docking and boating access to navigable waters and shoreline stabilization for the protection of existing structures	In accordance with any license condition, easement, or other public right of lateral passage that exists in the area of the subject property lying between the high and low water marks, the Licensee shall allow the public in the exercise of such rights, to pass freely around all structures in the intertidal area. Public access signs shall be placed at both property lines, adjacent to the existing bulkhead. Nothing in this condition shall be construed as preventing the licensee from excluding the public from portions of said structures or property not intended for lateral passage. Public shall be allowed to use and pass freely upon the area of the property lying between the high and low water marks for the purpose of fishing, fowling, navigation, and the

								natural derivatives thereof. The licensee shall not restrict the public's right to use and pass freely upon lands lying seaward of the low water mark. The licensee shall not limit the hours of availability of any areas of the property designated for public passage, nor place any gates, fences, or other structures on such areas in a manner that would impede or discourage the free flow of pedestrian movement thereon.
16	D ST	BARTLETT FRANKLIN ETAL TRS		3778	Sand Bar Trust	4/11/94	Maintain an existing pile-supported pier with ramp and pile-held float for noncommercial docking and boating access to navigable waters	In accordance with any license condition, easement, or other public right of lateral passage that exists in the area of the subject property lying between the high and low water marks, the Licensee shall allow the public in the exercise of such rights, to pass freely around all structures in the intertidal area. Public access signs shall be placed at both the easterly and westerly sides of the pier. Nothing in this condition shall be construed as preventing the licensee from excluding the public from portions of said structures or property not intended for lateral passage. Public shall be allowed to use and pass freely upon the area of the property lying between the high and low water marks for the purpose of fishing, fowling, navigation, and the natural derivatives thereof. The licensee shall not restrict the public's right to use and pass freely upon lands lying seaward of the low water mark. The licensee shall not limit the hours of availability of any areas of the property designated for public passage, nor place any gates, fences, or other structures on such areas in a manner that would impede or discourage the free flow of pedestrian movement thereon.
55	HULBERT AV	LILLY DAVID M & PERRIN B		3612	David M. and Perrin B. Lilly	12/27/93	Maintain an existing timber bulkhead and two timber groins for shoreline stabilization for the protection of existing structures	Public shall be allowed to use and pass freely upon the area of the property lying between the high and low water marks for the purpose of fishing, fowling, navigation, and the natural derivatives thereof. The licensee shall not limit the hours of availability of any areas of the property designated for public passage, nor place any gates, fences, or other structures on such areas in a manner that would impede or discourage the free flow of pedestrian movement thereon.
26	TENNESSEE AV	HITHERVIEW ASSOC LIMITED PTNSP	C/O ANNESE JEAN C	3618	Jean C. Annese	12/27/93	Maintain an existing pile-supported pier with gangway and 2 pile-held floats for noncommercial docking and boating access to navigable waters	In accordance with any license condition, easement, or other public right of lateral passage that exists in the area of the subject property lying between the high and low water marks, the Licensee shall allow the public in the exercise of such rights, to pass freely around all structures in the intertidal area. Public access signs shall be placed at both the southwesterly and

								northeasterly sides of the pier. Nothing in this condition shall be construed as preventing the licensee from excluding the public from portions of said structures or property not intended for lateral passage. Public shall be allowed to use and pass freely upon the area of the property lying between the high and low water marks for the purpose of fishing, fowling, navigation, and the natural derivatives thereof. The licensee shall not limit the hours of availability of any areas of the property designated for public passage, nor place any gates, fences, or other structures on such areas in a manner that would impede or discourage the free flow of pedestrian movement thereon.
33	HULBERT AV	SAGER LOIS G ETAL TRS	C/O GIBBONS KATHRYN	3255	The Gibbons Company	5/19/93	Maintain an existing timber bulkhead and groin for shoreline stabilization and the protection of existing structures	Public shall be allowed to use and pass freely upon the area of the property lying between the high and low water marks for the purpose of fishing, fowling, navigation, and the natural derivatives thereof. The licensee shall not limit the hours of availability of any areas of the property designated for public passage, nor place any gates, fences, or other structures on such areas in a manner that would impede or discourage the free flow of pedestrian movement thereon.
13	C ST	MADAKET PROPERTY PRTNERSHIP LP		4874	Robert M. Ray	10/6/95	Maintain an existing pier, ramp, and pile-held float for noncommercial docking and boating access to navigable waters	In accordance with any license condition, easement, or other public right of lateral passage that exists in the area of the subject property lying between the high and low water marks, the Licensee shall allow the public in the exercise of such rights, to pass freely over all structures in the intertidal area. Public access signs and ladders shall be placed at both the easterly and westerly sides of the pier, adjacent to the mean high water shoreline. A ladder shall be constructed of durable materials, fixed to the pier in such a way as to not rest on the marsh, shall have a minimum width of 2 feet, and shall have adequate railings extending above the pier decking in order to facilitate safe passage. Nothing in this condition shall be construed as preventing the licensee from excluding the public from portions of said structures or property not intended for lateral passage. If, at any time, pier reconstruction in excess of 50% is necessary, the Licensee shall raise the decking, within the intertidal zone, to provide a minimum clearance of 5 feet between the pier and the mean high water datum. Upon reconstruction, signs and ladders shall no longer be required. Public shall be allowed to use and pass freely upon the area of the property lying between the high and low water marks for the purpose of fishing, fowling, navigation, and the

								natural derivatives thereof. The licensee shall not restrict the public's right to use and pass freely upon lands lying seaward of the low water mark. The licensee shall not limit the hours of availability of any areas of the property designated for public passage, nor place any gates, fences, or other structures on such areas in a manner that would impede or discourage the free flow of pedestrian movement thereon.
329	MADAKET RD	MACLEAN MARY JANE &	JENNINGS ANNE TRUSTEES	4873	Rita M. Moran	12/8/95	Maintain an existing pier, ramp, and pile-held floats for noncommercial docking and boating access to navigable waters	In accordance with any license condition, easement, or other public right of lateral passage that exists in the area of the subject property lying between the high and low water marks, the Licensee shall allow the public in the exercise of such rights, to pass freely over all structures in the intertidal area. Public access signs shall be placed on both the easterly and westerly sides of the pier. Nothing in this condition shall be construed as preventing the licensee from excluding the public from portions of said structures or property not intended for lateral passage. Public shall be allowed to use and pass freely upon the area of the property lying between the high and low water marks for the purpose of fishing, fowling, navigation, and the natural derivatives thereof. The licensee shall not restrict the public's right to use and pass freely upon lands lying seaward of the low water mark. The licensee shall not limit the hours of availability of any areas of the property designated for public passage, nor place any gates, fences, or other structures on such areas in a manner that would impede or discourage the free flow of pedestrian movement thereon.
51	HULBERT AV	DAVIS RAMONA N TR	C/O DAVIS STEPHEN	4860	Ramona N. Davis, Trustee #51 Hulbert Avenue Realty Trust	9/25/95	Maintain an existing timber groin for shoreline stabilization for the protection of existing structures	In accordance with any license condition, easement, or other public right of lateral passage that exists in the area of the subject property lying between the high and low water marks, the Licensee shall allow the public in the exercise of such rights, to pass freely over all structures in the intertidal area. Public access signs shall be placed at both the easterly and westerly sides of the groin. Nothing in this condition shall be construed as preventing the licensee from excluding the public from portions of said structures or property not intended for lateral passage. Public shall be allowed to use and pass freely upon the area of the property lying between the high and low water marks for the purpose of fishing, fowling, navigation, and the natural derivatives thereof. The licensee shall not limit the hours of availability of any areas of the property designated for public passage, nor place any gates, fences, or other structures on such areas in a manner

							that would impede or discourage the free flow of pedestrian movement thereon.
6	OLD NORTH WF	SMITH D VAN & ANN E	6175	Richard Lovelace	1/30/97	Maintain an existing catwalk and deck for residential use	Licensee shall allow public to pass on foot for any public purpose 24 hours a day, within the area of the property lying seaward of the present high water mark. The purpose is to allow access in and across the intertidal zone located onsite for activities such as strolling, nature watching, and observation of the water, in addition to fishing, fowling, and navigation. The Licensee may adopt rules governing the publicly accessible areas within the site, subject to Department review, for the purpose of ensuring public health and safety and private property and to ensure public use and enjoyment by minimizing conflicts between user groups. Public shall be allowed to use and pass freely upon the area of the property lying between the high and low water marks for the purpose of fishing, fowling, navigation, and the natural derivatives thereof. The licensee shall not limit the hours of availability of any areas of the property designated for public passage, nor place any gates, fences, or other structures on such areas in a manner that would impede or discourage the free flow of pedestrian movement thereon.
4	OLD NORTH WF	ANDREWS VIRGINIA F	5601	George Andrews	4/2/96	Maintain an existing boathouse, deck, and three tie-piles for storage of boats and other associated water-dependent purposes, and docking and boating access to navigable waters	Public shall be allowed to use and pass freely upon the area of the property lying between the high and low water marks for the purpose of fishing, fowling, navigation, and the natural derivatives thereof. The licensee shall not limit the hours of availability of any areas of the property designated for public passage, nor place any gates, fences, or other structures on such areas in a manner that would impede or discourage the free flow of pedestrian movement thereon.
14	TENNESSE E AV	SHARP RANDOLPH JR	5359	Randolph G. Sharp	3/28/96	Maintain an existing pier, ramp, and pile-held float for noncommercial docking and boating access to navigable waters	In accordance with any license condition, easement, or other public right of lateral passage that exists in the area of the subject property lying between the high and low water marks, the Licensee shall allow the public in the exercise of such rights, to pass freely over all structures in the intertidal area. Public access signs and ladders shall be placed at both the easterly and westerly sides of the pier, adjacent to the mean high water shoreline. A ladder shall be constructed of durable materials, fixed to the pier in such a way as to not rest on the marsh, shall have a minimum width of 2 feet, and shall have adequate railings extending above the pier decking in order to facilitate safe passage. Nothing in this condition shall be construed as

							preventing the licensee from excluding the public from portions of said structures or property not intended for lateral passage. If, at any time, pier reconstruction in excess of 50% is necessary, the Licensee shall raise the decking, within the intertidal zone, to provide a minimum clearance of 5 feet between the pier and the mean high water datum. Upon reconstruction, signs and ladders shall no longer be required. Public shall be allowed to use and pass freely upon the area of the property lying between the high and low water marks for the purpose of fishing, fowling, navigation, and the natural derivatives thereof. The licensee shall not restrict the public's right to use and pass freely upon lands lying seaward of the low water mark. The licensee shall not limit the hours of availability of any areas of the property designated for public passage, nor place any gates, fences, or other structures on such areas in a manner that would impede or discourage the free flow of pedestrian movement thereon.
4	CHARLES ST	GUMAER ELLIOTT W JR	8351	Allen P. Mills and Elliot W. Gumaer, Jr., Trustees of Mills Nominee Trust	10/29/99	Maintain an existing timber bulkhead, returns, and groins for shoreline stabilization for the protection of existing structures	In accordance with any license condition, easement, or other public right of lateral passage that exists in the area of the subject property lying between the high and low water marks, the Licensee shall allow the public in the exercise of such rights, to pass freely over the timber groins. Public shall be allowed to use and pass freely upon the area of the property lying between the high and low water marks for the purpose of fishing, fowling, navigation, and the natural derivatives thereof. The licensee shall not limit the hours of availability of any areas of the property designated for public passage, nor place any gates, fences, or other structures on such areas in a manner that would impede or discourage the free flow of pedestrian movement thereon.
12	TENNESSEE AV	CANTELLA DAVID V	8540	P&M Reis Trucking, Inc. & David V. Cantella	11/1/99	Maintain existing pier, ramp, and float for noncommercial docking and boating access to navigable waters	In accordance with any license condition, easement, or other public right of lateral passage that exists in the area of the subject property lying between the high and low water marks, the Licensee shall allow the public in the exercise of such rights, to pass freely around all structures in the intertidal area. Public access signs shall be placed at both the easterly and westerly sides of the pier. Nothing in this condition shall be construed as preventing the licensee from excluding the public from portions of said structures or property not intended for lateral passage. Public shall be allowed to use and pass freely upon the area of the property lying between the high and low water marks for the purpose of fishing, fowling, navigation, and the natural

								derivatives thereof. The licensee shall not restrict the public's right to use and pass freely upon lands lying seaward of the low water mark. The licensee shall not limit the hours of availability of any areas of the property designated for public passage, nor place any gates, fences, or other structures on such areas in a manner that would impede or discourage the free flow of pedestrian movement thereon.
	OLD SOUTH WF	HESS WALTER R TR	C/O NIR RETAIL LLC	8618	21 Commercial Wharf Nominee Trust	6/21/00	Maintain existing decks for residential use	In accordance with any license condition, easement, or other public right of lateral passage that exists in the area of the subject property lying between the high and low water marks, the Licensee shall allow the public in the exercise of such rights, to pass freely around all structures in the intertidal area. Public access signs shall be placed at each property line, adjacent to the mean high water shoreline. Nothing in this condition shall be construed as preventing the licensee from excluding the public from portions of said structures or property not intended for lateral passage. Public foot passage is allowed from dawn to dusk within the property lying seaward of the high water mark. Public shall be allowed to use and pass freely upon the area of the property lying between the high and low water marks for the purpose of fishing, fowling, navigation, and the natural derivatives thereof. The licensee shall not restrict the public's right to use and pass freely upon lands lying seaward of the low water mark. The licensee shall not limit the hours of availability of any areas of the property designated for public passage, nor place any gates, fences, or other structures on such areas in a manner that would impede or discourage the free flow of pedestrian movement thereon.
14	TENNESSEE AV	SHARP RANDOLPH JR		8873	Randolph G. Sharp	8/8/01	Maintain an existing catwalk, ramp, and float for noncommercial docking and boating access to navigable waters	In accordance with any license condition, easement, or other public right of lateral passage that exists in the area of the subject property lying between the high and low water marks, the Licensee shall allow the public in the exercise of such rights, to pass freely over all structures in the intertidal area. Public access signs shall be placed at both the easterly and westerly sides of the pier, adjacent to the high water shoreline. Nothing in this condition shall be construed as preventing the licensee from excluding the public from portions of said structures or property not intended for lateral passage. Public foot passage is allowed from dawn to dusk within the property lying seaward of the high water mark. Public shall be allowed to use and pass freely upon the area of the property lying between the high and low water marks for the purpose of

							fishing, fowling, navigation, and the natural derivatives thereof. The licensee shall not restrict the public's right to use and pass freely upon lands lying seaward of the low water mark. The licensee shall not limit the hours of availability of any areas of the property designated for public passage, nor place any gates, fences, or other structures on such areas in a manner that would impede or discourage the free flow of pedestrian movement thereon.
32	WASHINGTON ST	KOTALAC RICHARD E JR	5296	Richard Kotalac, Jr.	1/19/96	Construct and maintain a two-story residential and commercial building, and an attached, one-story boathouse for the sale of marine supplies on the ground floor; upper floor residential purposes; and boat storage	Licensee shall construct, landscape, and maintain in good repair a walkway along the southern property line. Walkway shall be a minimum of 5 feet wide, including a connection to the Town Pier, incorporate amenities such as lighting and trash receptacles, and consist of adequately compacted crushed shells or a similar material. Licensee shall reserve and maintain the open area, approx. 2200 sq. ft., between the seaward edge of the existing dune and the present low water mark, as public open space for all lawful purposes including, but not limited to strolling, swimming, other beach recreational activities. Licensee shall allow the storage of small boats and dinghies within the site's open space. Said storage shall occur along the landward portion of the beach area or within future storage racks if the town provides the racks. The public access conditions shall be available to the general public, free of charge, at a minimum from dawn to dusk. The areas should also be maintained, in good repair, clear and free from debris. Licensee may adopt rules governing the publicly accessible areas of the site, subject to prior review and written approval of the Department, as are necessary for the protection of public health and safety and private property, and to ensure public use and enjoyment by minimizing conflicts between user groups. Signage shall be posted, clearly visible from Washington Street and Town Pier. Signs shall be placed at all entryways, encourage public patronage of the facilities, state the hours of public access, and any reasonable rules for their use. At least one sign shall be places in a prominent location stating the waterways license number of the project and a location on the site where the license can be inspected by the public. Licensee shall prune and maintain the hedge row along the southern property line to an adequate width and height, to ensure views are enhanced and maintained from Washington Street to the water. In the event that the town develops a public access plan for this section of the waterfront, and said plan includes the construction of a boardwalk or similar facility

								across the open space described above, the Licensee shall grant the town permission to construct the boardwalk. The licensee shall not restrict the public's right to use and pass freely upon lands lying seaward of the low water mark. Unless otherwise expressly provided by this license, the licensee shall not limit the hours of availability of any areas of the property designated for public passage, nor place any gates, fences, or other structures on such areas in a manner that would impede or discourage the free flow of pedestrian movement thereon.
16	MEDOUIE CREEK RD	GRAY DAVID JR EST OF	C/O HANST DALE E TR	7550	David M. Gray	10/6/98	Maintain an existing pier, gangway, floats, boat ramp and piles for noncommercial docking, and boating access to navigable waters	In accordance with any license condition, easement, or other public right of lateral passage that exists in the area of the subject property lying between the high and low water marks, the Licensee shall allow the public in the exercise of such rights, to pass freely around all structures in the intertidal area. Public access signs shall be placed on both the easterly and westerly sides of the pier, adjacent to the mean high water shoreline. Nothing in this condition shall be construed as preventing the licensee from excluding the public from portions of said structures or property not intended for lateral passage. Public foot passage is allowed from dawn to dusk within the property lying seaward of the high water mark. Public shall be allowed to use and pass freely upon the area of the property lying between the high and low water marks for the purpose of fishing, fowling, navigation, and the natural derivatives thereof. The licensee shall not restrict the public's right to use and pass freely upon lands lying seaward of the low water mark. The licensee shall not limit the hours of availability of any areas of the property designated for public passage, nor place any gates, fences, or other structures on such areas in a manner that would impede or discourage the free flow of pedestrian movement thereon.
16	NORTH RD	STEVE JILL TRUST	C/O NEW ENGLAN D DEVELOP MENT	7242	The Steve Jill Trust	11/26/99	Maintain an existing bulkhead for shoreline stabilization for the protection of existing structures	Public shall be allowed to use and pass freely upon the area of the property lying between the high and low water marks for the purpose of fishing, fowling, navigation, and the natural derivatives thereof. The licensee shall not limit the hours of availability of any areas of the property designated for public passage, nor place any gates, fences, or other structures on such areas in a manner that would impede or discourage the free flow of pedestrian movement thereon.
113	MADAKET RD	KELTZ GREGORY P & HEATHER B		7525	Gregory and Heather Keltz	6/19/98	Construct and maintain a catwalk with stairs,	In accordance with any license condition, easement, or other public right of lateral passage that exists in the

		gangway, and float for noncommercial docking and boating access to navigable waters	area of the subject property lying between the high and low water marks, the Licensee shall allow the public in the exercise of such rights, to pass freely over all structures in the intertidal area. Public access signs shall be placed on both the easterly and westerly sides of the catwalk, adjacent to the mean high water shoreline. Nothing in this condition shall be construed as preventing the licensee from excluding the public from portions of said structures or property not intended for lateral passage. Public shall be allowed to use and pass freely upon the area of the property lying between the high and low water marks for the purpose of fishing, fowling, navigation, and the natural derivatives thereof. The licensee shall not limit the hours of availability of any areas of the property designated for public passage, nor place any gates, fences, or other structures on such areas in a manner that would impede or discourage the free flow of pedestrian movement thereon.

APPENDIX 4 - SHELLFISH MANAGEMENT PLAN OUTLINE

Purpose for developing a Shellfish Management Program

The two principal purposes for the development of a Shellfish Management Plan are:

- To manage the resource at a sustainable yield via resource definition and harvest monitoring, and
- To assign responsibility for the human effort associated with resource management including: regulatory and planning authority, management and/or elimination of deleterious influences, staffing, and budgets

The plan brings together all shellfish-related town data and history in one place to be used in development of a management regime. It explains how management and enforcement will take place and provides the background and reasoning behind regulations and other management decisions. Finally, it establishes an approach to future shellfish management issues.

> *Note: Most of the material that follows was developed using Dave Whittaker's Shellfish Management Plan outline. He may be reached at the Massachusetts Division of Marine Fisheries (DMF), (508) 563-1779 ext. 126 or David.Whitaker@state.ma.us. Mr. Whitaker also teaches a course in developing a Shellfish Management Plan for the Massachusetts Shellfish Officer's Course at the Massachusetts Maritime Academy.*

Framework of a Shellfish Management Plan

A Shellfish Management Plan provides an opportunity and mechanism for a community to bring together, in one document, all of the information available about how the town has managed shellfishing in the past, how it is presently managed, and plans for future management.

1. Brief description of the town and its natural resources related to shellfish

This should be a brief, 1–2 paragraph overview of the town's demographics and available shellfish area

a) Population of the town (both overall number and centers of concentration)

b) Coastline (total length, length related to shellfishing areas, types of shoreline (*e.g.* rocky, sandy, etc.))

c) Brief description of shellfishing area(s) including a general description of species' locations

2. Historical background of shellfishing in the town

This section can use graphs and charts to show summaries and trends of historical data. Some brief narratives may be necessary or beneficial, particularly for sections b), f), g), and h)

a) Catch statistics (available through the Division of Marine Fisheries if not available in town records)

b) Propagation activities (a brief overview of major historical activities used and their successes or failures)

c) Commercial fisheries (species, techniques, volume, etc.)

d) Recreational fisheries (species, techniques, volume, etc.)

e) Aquaculture activities (a brief overview of major historical activities and their successes or failures)

f) Diseases, die-offs, fish kills or other damages to the fishery

g) History of closures

h) Town structure/organization for managing the resources (*i.e.,* role of Department of Marine Resources, shellfish warden, Shellfish Advisory Board, Board of Health, etc.)

3. Budget Breakdown

This may be a copy of the Application For Reimbursement form sent annually by the town to the DMF

a) Personnel (including salaries and benefits)

b) Equipment (a listing of equipment and supplies with cost breakdowns for each)

c) Propagation costs (a listing by species and cost for each)

d) General expenses

4. Shellfish Resources

This section should include maps. Resource and habitat maps should indicate DMF-identified shellfish growing areas.

a) Status of shellfish areas within the town

   (1) Description of town management of areas, with maps and text

   (2) State DMF classifications

b) Accessibility to the resources

   (1) Shore vs. boat-only access

   (2) Public access locations related to shellfishing

c) Resource and habitat maps

   (1) Maps of current species locations (not including aquaculture)

   (2) Maps with location of aquaculture leases (noting species)

   (3) Maps of commercial and recreational shellfishing areas

5. Other Marine Resource Usage

Elements from Harbor Management Plans or the like may be used for this section, if they are available. It is generally a good idea for fishery management to prioritize the most important shellfish areas to protect them from potentially conflicting uses. List areas that are zoned for specific purposes, *e.g.,* mooring areas or dock-free zones. Ideally a map should be provided that shows each area and documents the harbor in such a way that is it obvious where overlapping uses may occur.

a) Mooring areas and marinas

b) No discharge zones

c) Areas designated for waterskiing, personal watercraft, etc.

d) Locations of existing or proposed docks and piers

6. Resource Management

<u>This is the most important element of the Shellfish Management Plan.</u> This is the section in which the town outlines its short- and long-term goals and plans for shellfish management and propagation. Short-term plans should be specific, *e.g.,* how much seed or relay stock will be planted when and where, what areas will be "rotated" (providing maps, dates, etc.). How does the town assess harvest amounts (by sub-areas) and how will the data be used. If applicable, charts may be used to show seasonal areas for relay planting. Work in progress should be noted as well. It is useful to document what has and hasn't worked in the past.

a) Relays and transplants (noting areas planted with dates and amounts)

b) Seed programs

   (1) If the town has an upweller or other grow-out program, note the amount to be produced and when. Describe specific areas where planting will take place and when

(2) If the town intends to buy seed at plantable size, note the amount to be planted, where and when

c) Predator control programs (describes which species, methods and techniques, and when they are conducted)

d) Area rotations (specifically describe the boundaries for the areas, including maps; the dates of opening and closing; and the amounts of species to be planted)

e) Law enforcement capabilities (note seasonal fluctuations, staff changes, etc.)

f) Future plans (note goals, plans for new programs, management of new types of equipment, etc.)

g) Maximum sustainable yield, maximum economic yield, and/or optimum sustainable yield. (If standing crop is known, develop a maximum sustainable yield (MSY) for each management area. Note that a MSY cannot effectively be developed without knowledge of the standing crop and a dependable harvest reporting system.)

h) Harvest documentation methods, describing what catch reporting techniques will be used, who will collect the data and how, how it will be analyzed and stored, and how it will be used relative to developing or implementing a MSY, MEY, or OSY.

i) How implementation of the management plan will respond to unusual situations such as die-off, exceptionally mild or harsh winters, etc. that can have a significant impact on the standing crop

7. Shellfish Lease Program

A map of leased areas is useful for this section.

a) Policy of the town regarding shellfish leases

b) Number and location (using maps) of existing leases

c) Estimated annual production (species and amounts)

8. Shellfish Permits

Very briefly list the types of permits to be issued and their respective fees. If the town has specific residency time requirements or other requisites, make note of it.

a) Numbers of permits of various types issued and maximum number, if any

b) Fees for various categories of licenses issued

c) Requirements for the various types of licenses (residency, community service, etc.)

d) Processes by which permits are obtained and/or transferred

9. Rules and Regulations

A copy of the town's current shellfish regulations

10. Other Related Programs

This section can provide brief descriptions and references to significant related activities that are on-going or planned in the town.

i. Water quality programs

ii. Public education/outreach programs

iii. Special projects related to shellfishing

11. Appendices

Any additional pertinent information related to shellfishing in the town, *e.g.,* a list of defined terms, a bibliography of published reports and studies, etc.

APPENDIX 5 - PARTIAL LIST OF WATER QUALITY DOCUMENTS

Title	Author	Organization	Date
Nantucket Harbor Water Quality 2006 Annual Report	Keith Conant, Town Biologist	TON-MCRD	2006
Hummock Pond 2005 Monitoring Report	George W. Knoecklein, Northeast Aquatic Research	TON-MCRD	Mar. 006
Miacomet Pond 2005 Annual Report	Keith Conant, Town Biologist	TON-MCRD	Feb. 2006
Madaket Harbor/Long Pond 2005 Annual Report	Keith Conant, Town Biologist	TON-MCRD	Jan. 2006
Madaket Harbor/Long Pond 2005 Sampling Stations	Keith Conant, Town Biologist	TON-MCRD	Jan. 2006
Sesachacha Pond 2005 Annual Report	Keith Conant, Town Biologist	TON-MCRD	Mar. 1, 2006
Nantucket Harbor Water Quality 2005 Annual Report	Keith Conant, Town Biologist	TON-MCRD	Jan. 2006
Predicting Groundwater Nitrate Concentration from Land Use	K.K. Gardner and M. Vogel	GroundwaterVol. 43; Issue 3; page 343	May 1, 2005
Evaluating Drainage Outfall: Nantucket, Massachusetts	Earth Tech, Inc.	TON-DPW	Jan.1, 2005
Summary of Groundwater, Surface Water and Gas sampling Results, Nantucket Landfill	Camp Dresser & McKee	TON-DPW	Apr. 2004
Nantucket Harbor Water Quality 2004 Annual Report	Tracy Curley, Town Biologist	TON-MCRD	2004
Report of the Nantucket Harbor Watershed Workgroup	Nantucket Harbor Watershed Work Group	TON	Jun. 1, 2003
Nantucket Harbor Water Quality 2003 Annual Report	Tracy Curley, Town Biologist	TON-MCRD	2003
Nantucket Harbor Water Quality 2002 Annual Report	Tracy Curley, Town Biologist	TON-MCRD	2002
Nantucket Groundwater Nitrate Study (Thesis)	Kristen Gardner	Nantucket Land Council has copy	2002
Madaket Harbor Circulation Study (Project 01-11/MWI)	Ward, M.C. and J.C. Swanson.	Applies Science Associates Narragansett, RI	2002
Southwest Polpis Harbor Bacteria Study	Comac Collier	Nantucket Land Council	2001
Temperature and Dissolved Oxygen Transects for Nantucket Harbor 2001	Keith Conant, Assistant Town Biologist	TON-MCRD	Mar. 12, 2002
Nantucket Harbor Water Quality 2001 Annual Report	Tracy Curley, Town Biologist	TON-MCRD	2001
Sesachacha Pond Annual Report 2001	Tracy Curley, Town Biologist	TON-MCRD	2001
Miacomet Pond, Nantucket, Massachusetts, Annual Report 2001	Tracy Curley, Town Biologist	TON-MCRD	2001
Hummock Pond, Nantucket, Massachusetts, Annual Report 2001	Tracy Curley, Town Biologist	TON-MCRD	Feb. 2002
Nantucket Harbor Water Quality 2000 Annual Report	Tracy Curley, Town Biologist	TON-MCRD	2000
Islands Watershed 2000 Water Quality Assessment Report	Susan G. Connors, DEP/ Div. Of Watershed Management	Report Number: 97-AC-2 DWM Control Number: CN 084.0	Sept. 2003
Hummock Pond, Annual Report Janua–y - December 2000	Tracy Curley, Town Biologist	TON-MCRD	2000

Miacomet Pond Annual Report 2000	Tracy Curley, Town Biologist	TON-MCRD	2000
Land-derived nitrogen loading to Nantucket Harbor,	I. Valeila, et al.	Boston Univ. Marine Program	May, 2000
Sesachacha Pond Annual Report Janua–y - December 2000	Tracy Curley, Town Biologist	TON-MCRD	Dec. 2000
Pond Sampling Report for Miacomet Site 1 and Site 2	Envirotech Laboratories, Inc.	TON-MCRD	Apr.10, 2000
Pond Sampling Report for Miacomet Site 1 and Site 2	Envirotech Laboratories, Inc.	TON-MCRD	Jul. 5, 2000
Nantucket Harbor Water Quality Monitoring January - November 1999	Tracy Sundell, Town Biologist	TON-MCRD	1999
Sesachacha Pond Annual Report January - December 1999	Tracy Sundell, Town Biologist	TON-MCRD	Dec. 1999
Miacomet Pond Annual Report January - December 1999	Tracy Sundell, Town Biologist	TON-MCRD	Dec. 1999
Nantucket Harbor Monitoring Report, 1998	George W. Knoecklein, Northeast Aquatic Research	TON-MCRD	Sept. 15, 1999
Sesachacha Pond Annual Report January - December 1998	Tracy Sundell, Town Biologist	TON-MCRD	Dec. 1998
Beach Water Sampling Results Summary '97	Tracy Sundell, Town Biologist	TON-MCRD	1997
Hummock Pond 1997 Annual Report January - December	Tracy Sundell, Town Biologist	TON-MCRD	Dec. 1997
Memo re: Miacomet Po–d - first draft of report	Marc Bellaud	Aquatic Control Technology, Inc.	Dec. 5, 1997
Nantucket Harbor Water Quality Annual Report January - December 1997	Tracy Sundell, Town Biologist	TON-MCRD	Jan. 1998
Sesachacha Pond Annual Report January - December 1997	Tracy Sundell, Town Biologist	TON-MCRD	Dec. 1997
Sesachacha Nutrient Data 19–5 - 1997 (table 5)	Tracy Sundell, Town Biologist	TON-MCRD	1997
1997 Goose Pond/Consue Springs Assessment Report	George W. Knoecklein	TON-MCRD	Jul. 1, 1997
Nantucket Harbor Study: A quantitative assessment of the environmental health of Nantucket Harbor for the development of a nutrient management plan	B. Howes, et al.	TON	Jun. 19, 1995
Hummock Pond 1996 Annual Report January - December	Tracy Sundell, Town Biologist	Town of Nantucket Shellfish & Marine Department	Dec. 1996
Nantucket Harbor Water Quality 1996 Annual Report January - December 1996	Tracy Sundell, Town Biologist	TON-MCRD	Dec. 1996
Sesachacha Pond Annual Report January - December 1996	Tracy Sundell, Town Biologist	TON-MCRD	Dec. 1996
The Effects of Pond Opening on surface and groundwater dynamics and Quality, Hummock Pond, Nantucket Island, MA	Theresa Miller, M.S. Thesis	Univ of NH	May, 1996
Long Pond Annual Report 1996 January - December	Tracy Sundell, Town Biologist	TON-MCRD	1996
Hummock Pond Annual Report January - December 1995	Tracy Sundell, Town Biologist	TON-MCRD	Dec. 1995
Miacomet Pond Annual Report January - December 1995	Tracy Sundell, Town Biologist	TON-MCRD	Dec. 1995
Surface Water Nutrient Flux from the Mill Brook Watershed: Cranberry bogs, freshwater marshes and nutrient input to the Nantucket/Polpis Harbor System	B. Howes and N.P. Millham	Biology Dept. WHOI	1995

Water Quality for Nantucket Harbor	Tracy Sundell, Town Biologist	TON-MCRD	Dec. 1995
Sesachacha Pond Annual Report January - December 1995	Tracy Sundell, Town Biologist	TON-MCRD	Dec. 1995
Long Pond Progress Report 1995	Tracy Sundell, Town Biologist	TON-MCRD	Dec. 1995
Simulation of the effects of ground-water withdrawals and recharge on groundwater flow in Cape Cod, Martha's Vineyard, and Nantucket Island Basins	J.P. Masterson and P.M. Barlow	USGS Open File report 94-0316	1994
Update, Point Source Study		TON-MCRD	Aug. 26, 1994
Miacomet Pond 1994 (Results from 19–2 - 1994)	Tracy Sundell, Marine Biologist	TON-MCRD	Dec. 31, 1994
Sesachacha Pond 1994 Annual Report	Tracy Sundell, Marine Biologist	TON-MCRD	Dec. 31, 1994
Overview of Nantucket Fresh Ponds: 1991 – 1992	Brian L. Howes and Dale D. Goehringer	Biology Department, WHOI	Jun. 22, 1993
Sampling Results from 1993	T. Curley and A. Reinhard	TON-MCRD	1993
Progress Report, Point Source Study	Health and Marine Departments	TON-MCRD	Aug. 7, 1992
Nutrient related water quality of Nantucket Harbor: Interim Report	Brian L. Howes and Dale D. Goehringer	TON-MCRD	1992
Wildlife Habitat Evaluation, Long Pond, Nantucket Island, Massachusetts	IEP, Inc.	Prepared for Tris'am's Long Pond Owners Association	May 22, 1990
Nantucket Harbor Nitrogen Inputs Chart (followed by Polpis Cranberry Bog Study)	B. Howes, et al.	Biology Department, WHOI	1990
Final Report: Nantucket Water Resources Management Plan	Horsley Witten and Hegerman, Inc.	Prepared for TON	1990
Preliminary Water Quality Survey: Nantucket Harbor to Wauwinet Harbor: Technical Report to the TON	Brian L. Howes and Dale D. Goehringer	Prepared for TON	1989
Nutrient conditions in Sesachacha Pond, Massachusetts. Technical Report prepared for Aubrey Consulting, Inc. and the Town of Nantucket, Mass	Brian L. Howes and Dale D. Goehringer	Prepared for TON	1989
Estimating Recharge Rates to the sand and gravel aquifer using tritium, Nantucket MA	J.F. Knott and J.C. Olimpio	USGS Water Supply Paper 2297	1986
Nantucket Island: Sole Source Aquifer determination: EPA 49 FR 2952	William D. Ruckelshaus	US EPA	1984
Water Resources of Nantucket Island, Massachusetts	E.H. Walker	USGS Hydrological Investigation HA 615	1980

Note: This table is modeled on the Cape Cod Water Reports Database from the 2004 Cape Cod Watershed Action Plan Mass EOEA Appendix

These references only include water quality papers, many biological and geological papers exist and should be compiled in a general Nantucket Science database

APPENDIX 6 - WATER QUALITY WEBSITES FOR NANTUCKET

This list includes the most current water quality data available for Nantucket's harbors and the Mass DEP's recent recommendations and science related to nitrogen inputs and Total Minimum Daily Loads (TMDL) for 89 Massachusetts embayments. If you want to understand the issues facing the Cape and Islands regarding protection of our harbors, beaches, and watershed, please read the following documents. A copy or link to each of these will also be posted on: www.nantucketharborplan.com

- Town of Nantucket Department of Marine and Coastal Resources water quality reports: www.nantucket-ma.gov/departments/marine
- Mass DEP coastal resources and estuaries home page http://www.mass.gov/dep/water/resources/brochure.htm
- Eelgrass Maps http://www.mass.gov/dep/water/resources/maps/eelgrass/eelgrass.htm
- Massachusetts Center for Environmental Health including Beach water quality reports http://www.mass.gov/dph/beha/tox/reports/beach/beaches.htm or http://www.mass.gov/dph/ceh
- Coliform testing at Nantucket beaches: http://mass.digitalhealthdepartment.com/public_21/beaches.cfm?btown=Nantucket
- "*Islands Watershed 2000 Water Quality Assessment Report*" on the MADEP website: http://www.mass.gov/dep/brp/wm/wqassess.htm
- The Massachusetts Estuaries Project "Embayment Restoration and Guidance for Implementation Strategies". Everything you ever wanted to know about nitrogen inputs, stormwater effects, and how the Estuaries Project TMDL results will be implemented and evaluated. Long, but very comprehensive and helpful. http://www.mass.gov/dep/water/resources/mamep.doc
- Also helpful: Massachusetts Estuaries Project Site-Specific Nitrogen Thresholds for Southeastern Massachusetts Embayments: Critical Indicators Interim Report www.mass.gov/dep/water/resources/nitroest.pdf
- Total Maximum Daily Loads; the basics: http://www.mass.gov/dep/water/resources/islands1.pdf and draft TMDL's for the islands http://www.mass.gov/dep/water/resources/islands1.pdf
- How do we get these results and what do they mean? "Nitrogen Modeling to Support Watershed Management: Comparison of Approaches and Sensitivity Analysis" http://www.mass.gov/dep/water/resources/nitrpt.pdf#search=%22Nantucket%20Harbor%20%2B%20fertilizers%20%2B%20nitrogen%20%22
- Where does it go and how fast? "Ground-Water Recharge Areas and Traveltimes to Pumped Wells, Ponds, Streams, and Coastal Water Bodies, Cape Cod, Massachusetts" http://pubs.usgs.gov/sim/2004/2857/

APPENDIX 7 – WATERSHED DESIGNATION

Chapter 99: Designation of the Nantucket and Madaket Harbors Watershed

Adopted by the Annual Town Meeting of the Town of Nantucket 4-12-1999 by Art. 70, approved 8-10-1999. Amendments noted where applicable.]

GENERAL REFERENCES Zoning — See Ch. 139.

§ 99-1. Purpose. [Amended 4-15-2003 ATM by Art. 64, approved 7-22-2003]

It is hereby resolved and declared that Nantucket and Madaket harbors are valuable environmental, economic, recreational, and aesthetic resources.

§ 99-2. Definitions.

As used in this chapter the following terms shall have the meanings indicated:

MADAKET HARBOR WATERSHED — The area constituting the watershed for Madaket Harbor, as described in a technical report entitled “Nantucket Water Resources Management Plan”, 1990, by Horsley, Witten, Hegemann, Inc., and as delineated on a map entitled “Madaket Harbor Watershed”, Nantucket GIS, dated January, 2003. **[Added 4-15-2003 ATM by Art. 64, approved 7-22-2003]**

NANTUCKET HARBOR WATERSHED — The area constituting the watershed for Nantucket Harbor, as described in a technical report entitled "Nantucket Water Resources Management Plan," 1990, by Horsley, Witten, Hegemann, Inc., and as delineated on a map entitled "Nantucket Harbor Watershed," Nantucket GIS, dated January, 1999.

§ 99-3. Strategies and activities within watersheds. [Amended 4-15-2003 ATM by Art. 64, approved 7-22-2003]

A. The Nantucket and Madaket Harbor Watersheds encompass those areas of the Town, based on the definition of the harbors’ watersheds, within which human activities may affect the quality of the waters of Nantucket and Madaket Harbors.

B. It is in the public interest to delineate the boundaries of the Nantucket and Madaket Harbor Watersheds, thus providing a frame of reference for diverse, multijurisdictional strategies and activities which promote the purposes of this section. In the future, these activities might include structural improvements (i.e., dredging or other activities to enhance water circulation, extension of sanitary sewers/package treatment facilities to mitigate septic discharges, the retrofit of storm drainage systems to reduce nutrient loading, and the development of planning contingencies and improvements devised to support spill containment), and regulatory activities, such as public health regulations. Open space preservation activities, such as land acquisition and implementation of conservation restrictions, by the Land Bank Commission and other governmental and nonprofit entities are encouraged within the watershed, because they reduce the land use impacts which can degrade the water quality of these harbors. It is also important that educational strategies devised to inform the public of ways to preserve the harbors’ water quality have defined watersheds as frames of reference.

§ 99-4. Applicability.

Nothing in this chapter shall have any effect upon or applicability to the Zoning Bylaw of the Town of Nantucket (Nantucket Code, Chapter 139), nor shall this chapter regulate expressly or impliedly any land use or operate in any manner as a land use regulation.

APPENDIX 8 – PUBLIC MEETINGS

Public Input Meetings			
Date	**Time**	**Location**	**Topics**
August 29, 2005	4:00-6:00 pm	Siasconset Casino	Open discussion; introduction and all topics
September 20, 2005	5:30-7:30 pm	Madaket Admiralty Hall	Open discussion; introduction and all Madaket Harbor topics
September 28, 2005	7:00-9:00 pm	Town Building	Preliminary report to Board of Selectmen
October 3, 2005	7:00-9:00 pm	Nantucket High School	Commercial & recreational fishing; harbor safety, navigation & moorings
October 4, 2005	4:00-6:00 pm	Nantucket High School	Public access; tourism and recreation
October 17, 2005	4:00-6:00 pm	Nantucket High School	Water quality; natural resource protection
October 18, 2005	4:00-6:00 pm	Nantucket High School	Downtown waterfront
February 15, 2007	6:30-9:00 pm	Nantucket High School	Public comment on draft plan
February 22, 2007	6:30-9:00 pm	2 Fairgrounds Road	Planning Board Public Meeting

Meeting with Massachusetts Office of Coastal Zone Management			
Date	**Time**	**Location**	**Topics**
August 17, 2006	10:00-noon	37 Washington Street	State approval scoping session

Nantucket and Madaket Harbors Action Plan Review Committee			
Date	**Time**	**Location**	**Topics**
August 17, 2006	1:00-3:00 pm	2 Fairgrounds Road	Introduction and issues
August 24, 2006	4:00-6:00 pm	2 Fairgrounds Road	Water quality
August 31, 2006	4:00-6:00 pm	37 Washington Street	Docks and piers
September 7, 2006	4:00-6:00 pm	2 Fairgrounds Road	Fisheries and natural resources
September 14, 2006	4:00-6:00 pm	37 Washington Street	Chapter 91 and the harbor plan
September 21, 2006	4:00-6:00 pm	2 Fairgrounds Road	Public access and zoning
September 28, 2006	4:00-6:00 pm	2 Fairgrounds Road	Other issues, review
October 19, 2006	4:00-6:00 pm	2 Fairgrounds Road	Review draft goals, objectives, recommendations
October 25, 2006	4:00-6:00 pm	2 Fairgrounds Road	Continue review of goals, objectives, recommendations
November 8, 2006	6:00-8:00 pm	Town Building	Presentation of draft to Board of Selectmen
January 12, 2007	1:00-3:00 pm	2 Fairgrounds Road	Review and revision of draft plan
March 14, 2007	4:00-6:30 pm	2 Fairgrounds Road	Review and address public comments
March 29, 2007	4:00-6:30 pm	2 Fairgrounds Road	Review of plan and warrant articles
April 26, 2007	1:00-6:20 pm	2 Fairgrounds Road	Final review of public comments

APPENDIX 9 – CHAPTER 137: TOWN WHARVES AND WATERWAYS

Taken from the Code of the Town of Nantucket (as of May 2, 2007)

[HISTORY: Adopted by the Annual Town Meeting of the Town of Nantucket 4-5-1983 by Art. 28, approved 5-9-1984. Amendments noted where applicable.]

§ 137-1. Definitions.

As used in this chapter, the following terms shall have the meanings indicated:

DIVER — Includes swimmers using fins and/or masks and/or snorkel tubes or self-contained underwater breathing devices and may include those diving without aids, where the circumstances are appropriate.

GRAY WATER — In Nantucket waters as defined above, gray water is a vessel's water/soap discharge, which is derived from galley, bath, showers, dishwashing and laundry equipment. **[Added 4-15-2003 ATM by Art. 62, approved 6-30-2003]**

HARBOR MASTER (MARINE SUPERINTENDENT) — Chief Harbor Master, duly empowered by the General Laws of the commonwealth.

IMMEDIATE FAMILY — Parents, grandparents, children, sister, brother, and spouse. **[Added 4-4-2006 ATM by Art. 63, approved 8-2-2006]**

MOOR — Any space wherein a vessel is confined by wet slip, float, mooring, rack, sling, haul-out, trailer or other type of docking facility. **[Added 4-4-2006 ATM by Art. 63, approved 8-2-2006]**

NANTUCKET WATERWAYS or WATERWAYS — Includes all of the navigable waters within the boundaries of the Town, which shall include all harbors, rivers, bays or ponds, including waterways which, from time to time, may be temporarily nonnavigable by reason of low tides, drought or seasonal weather and water conditions.

PERSONS — Includes individuals, corporations, societies, associations, partnerships and trusts.

RESCUE PERSONNEL — State and federal law enforcement officials, Nantucket Fire Department, Police Department, Marine and Coastal Resources Department personnel and Nantucket Sheriff's Department Dive Team members. **[Added 4-10-2000 ATM by Art. 56, approved 8-2-2000]**

§ 137-2. Town wharf use regulations.

A. Except in an emergency, no boats shall be made fast to any of the Town's wharves, floats or piers without the permission of the Harbor Master.

B. There shall be no scaling or cleaning of fish or shellfish on any of the Town's wharves, ramps, floats or piers from Brant Point inward of Nantucket Harbor or in Hither Creek from Jackson's Point inward.

C. No person shall leave any boat or vessel, fishing equipment, fish or any other personal property upon Town landing places, floats, wharves or pier for longer than is necessary in the act of loading or unloading the same to and from boats or vehicles.

D. The Town shall not be responsible for any loss or damage to boats or vessels at the Town wharves, floats, pier or moorings. Owners will be held responsible for damage caused by them or their vessels to structures and pilings and related facilities owned by the Town.

E. No warp or line shall be passed across the channels or any dock so as to obstruct or interfere with vessels navigating in the area.

F. Except in an emergency, no boats shall fuel at any of the Town's wharves, floats or piers without the permission of the Harbor Master. **[Added 4-4-2006 ATM by Art. 63, approved 8-2-2006]**

§ 137-3. Additional use regulations.

A. The Board of Selectmen shall have the power to establish standard contracts and contract terms and fees for the rental of wharves, slips, docks and moorings.

B. Tug boats, cargo boats and any other boats used for commercial purposes (other than charter boats and commercial fishing boats) shall not be permitted to moor at the Nantucket Town pier or wharves in Madaket, except by permission of the Board of Selectmen or Harbor Master, as appropriate.

C. All boats or vessels using the Town wharves shall observe all police, fire, health and sanitary regulations of the Town, and the owners or operators of such boats shall not permit acts contrary to good order, public safety or public health, including public profanity or obscene language or indecent exposure. Unnecessary noise, loud talking or playing of musical instruments between the hours of 11:00 p.m. and 8:00 a.m. is not permitted. No person upon such boats shall throw garbage, paper, refuse or debris of any kind into the harbor.

D. No vessel or watercraft of any kind whatsoever which is unseaworthy or in badly deteriorated condition or which is likely to injure a person or damage private or public property or which might become a menace to navigation shall be permitted to moor in Town waters or tie up at the Town wharves. The Harbor Master may determine whether any watercraft is unseaworthy, dangerous or in a badly deteriorated condition to render it unsafe. Upon making such a determination, the Harbor Master shall give notice to the owner, in writing, of such determination as follows: (a) if the owner is known, then by mail or hand-delivery; (b) if the owner is unknown, then by publication in a newspaper of general circulation within the Town. If, after 10 days following the publication or written notice as provided in the preceding sentence, the owner has failed to remedy the conditions leading to the determination, the Harbor Master may take appropriate steps for removal of same. At any time, the Harbor Master, notwithstanding the foregoing, may act immediately in the event of an emergency to take appropriate steps for immediate removal of any watercraft that presents an eminent threat to life or property; provided, however, that as soon as practicable after taking such action, notice of the action taken shall be provided in the manner set forth in this section. If, after 30 days from the date of notice or publication, the owner of the removed vessel shall fail to reimburse the Town for removal costs, the vessel may then, at the discretion of the Harbor Master, be sold at public auction to cover the costs of removal. If said auction produces surplus proceeds after payment of the costs of removal, said surplus shall be held in a separate account and be paid over to the owner upon proof of ownership. This shall not be deemed to apply to vessels in immediate distress as a result of current emergencies. **[Amended 4-12-1999 ATM by Art. 69, approved 8-10-1999; 4-12-2004 ATM by Art. 48, approved 9-3-2004]**

E. Advertising signs on vessels or wharves will not be permitted at any Town-owned wharf, ramp or pier, except commercial slips. **[Amended 4-4-2006 ATM by Art. 63, approved 8-2-2006]**

F. Repairing (other than emergency and maintenance repairs of minor nature), overhauling and/or remodeling of any watercraft at Town wharves or ramps is prohibited.

G. All persons liable for injuring or damaging Town-owned wharves and properties shall forthwith reimburse the Town in an amount equal to the cost of repairing (new for old) such damage, as determined by the Marine Department or Board of Selectmen.

H. Commercial or business use of any vessel or watercraft docked at any Town-owned dock, pier or

wharf is prohibited, except:

(1) Charter or commercial fishing boats; or other uses defined as "water dependent" within the meaning of MGL c. 91, § 1, provided that such uses and the vessels employed in such uses are first allocated dock space in accordance with regulations to be adopted by the Board of Selectmen after a public hearing. **[Amended 4-10-2000 ATM by Art. 57, approved 8-2-2000]**

I. Effective May 1, 1990, no vessel or watercraft of any kind whatsoever which is painted with paints containing butyltin compounds shall be permitted to moor in Town waters or tie up at the Town wharves, whether private or public. **[Added 4-10-1989 ATM by Art. 117, approved 7-24-1989]**

§ 137-4. Mooring regulations.

A. Any vessel habitually moored in Nantucket shall obtain a mooring permit from the Harbor Master. No permit for a mooring, float or raft shall be transferable to another person, except to a person within the immediate family of the permittee upon approval of the Harbor Master. **[Amended 4-4-2006 ATM by Art. 63, approved 8-2-2006]**

B. All moorings must be registered and no mooring shall be placed or maintained in any of the waters of the Town without the approval of and registration by the Marine Department. Only vessels owned by the person holding the permit or lawfully in the possession of persons lawfully entitled to possession and use of a boat for the season for which a mooring is granted, and displaying the proper sticker, will be allowed to fasten to the mooring. The permit may be issued for one or more vessels under common control, but only one vessel can be fastened to a mooring at any time. Subletting of moorings is prohibited. **[Amended 11-13-1990 STM by Art. 48, approved 3-19-1991; 4-10-2002 ATM by Art. 50, approved 7-31-2002]**

C. All applications for a permanent mooring space in any Nantucket harbor or waterway shall be submitted in writing on an approved form to the Marine Department. At the time of application if the applicant does not own a boat or is not a person lawfully entitled to possession and use of a boat for the season for which a mooring is granted, no mooring permit will be issued. If an individual holds a valid mooring permit and sells his/her rights to the boat with the intention of replacing it, he/she will have 12 months to replace the boat. If, at the end of 12 months, the boat has not been replaced, the mooring permit shall be forfeited. **[Amended 4-10-2002 ATM by Art. 50, approved 7-31-2002]**

D. No boat shall use a mooring within the Town unless the mooring meets the following minimum standards:

Length of Boat (feet)	Mushroom Mooring (pounds)	Concrete Block Mooring
Under 14	50	
15 to 18	75	
19 to 22	100	Subject to individual approval
23 to 28	150	
29 to 32	200	
33 to 50	500*	
51 to 65	700	
Over 65	Subject to ruling by Harbor Master	

*NOTE: Three hundred to 400 pounds may be used where holding ground warrants, subject to

E. Scope and size of chain on moorings. Length of mooring chain shall be at least the vertical height above the sea bottom to four feet above mean high water. Moorings for boats up to 26 feet in length shall have a chain of 3/8 inch or larger; moorings for boats from 26 feet to 40 feet shall have a chain

of 1/2 inch or larger; and mooring for boats from 40 feet or larger in overall length shall use a chain of 5/8 inch. Maximum length of chain shall be no more than 2.5 times the maximum depth of the water, except where the Harbor Master determines otherwise. The location of all moorings shall be determined from time to time by the Harbor Master. No mooring shall be located in the main stream or any channel of any of the harbors of the Town, unless, in the opinion of the Harbor Master, the particular circumstances require it. Moorings shall be located so that vessels lying on them shall not block any channel or approach to wharves or other moorings in the vicinity or create any other hazard to navigation. If used, pennant length shall be twice the distance from the bow chock to the water line. Pennant line size shall be 3/8 inch for boats up to 10 feet, 7/16 inch for boats 21 feet to 30 feet, 1/2 nylon for boats 31 feet to 40 feet.

F. Any mooring may be inspected and its owner may be ordered by the Harbor Master to remove or relocate it whenever, in the judgment of the Harbor Master, the safety of other vessels or the optimum use of the area requires such action. The expense of such removal or relocation shall be the responsibility of the owner. Except in emergency situations, an owner shall have at least 14 days to relocate or remove a mooring when so ordered by the Harbor Master. All private moorings shall be removed from any shellfish areas prior to October 15. **[Amended 5-4-1993 ATM by Art. 52, approved 5-24-1993]**

G. Each mooring buoy, both summer and winter, shall be painted white and have a minimum one-inch blue band visible above the water and shall be marked with numbers assigned by the Harbor Master Department. The numbers and/or letters shall be a minimum of three inches in height and be clearly visible at all times. Spar buoys shall be upright at all times and not less than 40º at any period of tide and not less than 18 inches exposed. Mooring buoys shall be of customary shape and materials, and the Harbor Master may order the removal of any buoys deemed to be inappropriate in form or appearance. A mooring permit sticker assigned by the Harbor Master shall be affixed to the port side of the bow or the port side of the mast on classic-design wooden sailboats. The number will correspond with the number on the mooring float. **[Amended 11-13-1990 STM by Art. 48, approved 3-19-1991; 5-4-1993 ATM by Art. 52, approved 5-24-1993]**

H. Any existing mooring in place prior to April 5, 1983, shall be allowed to remain in place, provided that it meets the inspection criteria defined above. The owner of said mooring shall be allowed to upgrade to any new standards as defined by this chapter. Nothing in the Code of the Town of Nantucket shall affect the ability, power and duty of the Town and any other governmental entity to relocate moorings for the purpose of opening or maintaining a channel or main stream or for the Town and/or any other governmental entity to exercise rights, if any, to preserve and protect the public's right of navigation. Editor's Note: Former Subsection I, restricting moorings for certain nonresidents, added 4-10-1989 ATM by Art. 118, approved 7-24-1989, which immediately followed this subsection, was repealed 4-4-2006 ATM by Art. 63, approved 8-2-2006. **[Amended 4-12-1999 ATM by Art. 69, approved 8-10-1999]**

§ 137-5. Mooring permits.

A. Permits for the use of mooring spaces shall be for a period of one year, or any fraction thereof, terminating on December 31 of each year, unless revoked by the Harbor Master for good cause, and shall be renewable annually for one year. Payment for mooring permits shall be made in full before the permit will be issued. **[Amended 4-10-2002 ATM by Art. 49, approved 7-31-2002]**

B. In areas where no additional spaces are available, applicants therefor shall be placed on a continuing waiting list maintained at the office of the Harbor Master. The waiting list shall be a public document and shall be posted conspicuously. The waiting list shall include all applicants for moorings in chronological order of application, regardless of the applicants' preferences for particular mooring locations. The person at the top of the waiting list shall have priority to obtain the next available location, but may waive the right to the next available location if it is not in a place convenient for him or her without losing his or her place at the top of the waiting list. In the event of a waiver, the next person on the list shall be offered the location, and if that person waives the right to the location, the

next successive person shall be offered the location, et cetera, until someone in succession on the list takes it and registers a mooring there. Notice to the person entitled to the next available mooring shall be in writing or by any reasonable method.

C. All boats 10 feet or under, without power, shall be exempt from this section.

D. All dinghies not in use between October 15 and April 1 on property controlled by the Town, shall be removed to the owner's property. **[Added 4-4-2006 ATM by Art. 63, approved 8-2-2006]**

§ 137-6. Hazards to navigation.

Moorings, buoys, lobster pots, crab pots, eel pots or other obstacles that will cause or create a hazard to navigation shall not be placed in areas usually used as channels for navigation. In cases of doubt, the Harbor Master shall be consulted in advance before setting them in place. Hazards to navigation shall be subject to summary removal by the Harbor Master, without notice or hearing, and neither the Harbor Master nor the Town shall be responsible for any losses to the owners thereof caused by such removal.

§ 137-7. Abandonment of vessels, moorings, etc.

A. Except in a maritime emergency currently affecting those aboard or others in the immediate vicinity, no vessel, mooring or other object shall be deliberately abandoned, sunk or otherwise placed in waters within the Town of Nantucket where it may constitute a hazard. Any abandoned, sunk or improperly placed vessel, mooring or object so found and any vessel otherwise improperly secured, swamped, sunk, washed ashore or found in a restricted area may be ordered by the Harbor Master to be removed or relocated. The Harbor Master shall give notice to the owner, in writing, of his order as follows: (a) if the owner is known, then by mail or hand-delivery; (b) if the owner is unknown, then by publication in a newspaper of general circulation within the Town. If, after 10 days following the publication or written notice as provided in the preceding sentence, the owner has failed to remedy the conditions leading to the order, the Harbor Master may take appropriate steps for removal or relocation of same. At any time, the Harbor Master, notwithstanding the foregoing, may act immediately in the event of an emergency to take appropriate steps for immediate removal or relocation of any watercraft that presents an imminent threat to life or property; provided, however, that as soon as practicable after taking such action, notice of the action taken shall be provided in the manner set forth in this section. If, after 30 days, the owner of the removed vessel shall fail to reimburse the Town for removal or relocation costs, the vessel may then, at the discretion of the Harbor Master, be sold at public auction to cover the costs of removal or relocation. If said auction produces surplus proceeds after payment of the costs of removal, said surplus shall be held in a separate account and be paid over to the owner upon proof of ownership. **[Amended 4-12-1999 ATM by Art. 69, approved 8-10-1999; 4-12-2004 ATM by Art. 48, approved 9-3-2004]**

B. Nothing in the above shall be deemed to prevent emergency action by the Harbor Master with or without notice to the owner if, in his judgment, such action is necessary.

§ 137-8. Diving from wharves prohibited.

There shall be no diving from any public wharves, piers or from any bulkheads abutting any waterways of the Town.

§ 137-9. Underwater divers.

Divers using fins and/or masks and/or snorkel tubes or self-contained underwater breathing devices, except within designated and marked swimming areas, shall:

A. While diving, display a standard diver's flag consisting of a red field with a white diagonal stripe of a size not less than 12 inches by 15 inches.

B. Display such flag prominently on a float or other similar device which shall hold such flag upright and shall extend vertically a minimum distance of three feet from the surface of the water so as to be visible to passing boats.

C. Stay within 100 feet of the aforementioned flag or move the flag on said float or device with him while he is submerged and return to the surface within 100 feet of said flag.

D. No diver shall operate in properly marked or customary boat channels unless, for special purposes, permission is granted in advance by the Harbor Master. The diver shall have the responsibility to inquire of the Harbor Master about the location of customary boat channels if he is in doubt about the situation.

E. On approaching a diver's flag, all boats must proceed with caution and shall remain outside a one-hundred-foot radius from said diver's flag.

F. Divers operating at night shall be equipped with and use appropriate underwater lights, in addition to displaying the aforementioned diver's flag.

§ 137-10. Town launching ramps.

A. The usage of Town launching ramps shall be controlled from time to time by rules established by the Board of Selectmen and posted. These rules may include control of temporary parking of boat trailers and motor vehicles at or near the approach to each ramp.

B. With the exception of charter or commercial fishing boats or a storm/repair emergency, persons using Town ramps for hauling of larger boats requiring cradles shall do so only with permission, in advance, in writing, from the Harbor Master. Cradles and/or boats shall not remain on the Town ramps for more than one hour.

§ 137-11. Pollution. [Amended 5-17-1988 ATM by Art. 103, approved 9-28-1988; 4-10-1989 ATM by Art. 112, approved 7-24-1989; 5-4-1993 ATM by Art. 52, approved 5-24-1993; 4-12-1999 ATM by Art. 69; approved 8-10-1999; 4-10-2000 ATM by Art. 55, approved 8-2-2000; 4-30-2003 ATM by Art. 63, approved 8-27-2003]

A. The dumping or discharge of oil, sewage, dead fish, garbage, waste, rubbish or debris of any kind anywhere so as to pollute the waters, shores or beaches of the Town is prohibited. The use of on-board laundry or mechanical dishwashing machinery with over-board discharge is also prohibited in Nantucket waterways as defined in § 137-1. In support of the August 17, 1992, federal designation of Nantucket waters as a federal no-discharge zone, the discharge from all vessels of any sewage, whether treated or not, into such waters is prohibited. By May 1, 1990, all commercial piers, private and public, shall be equipped with working pump-out facilities. Facilities at each pier shall be at least adequate to fully service the maximum number of maximum-sized vessels able to tie up at that pier. In addition, the facility at the Town Pier in Nantucket Harbor shall be adequate to fully service all vessels both moored in the harbor and tied up at that pier.

B. Any violations of this section will incur penalties of $300. Each day or part thereof during which a discharge or dumping occurs shall constitute a separate violation. Subsequent violations may result in a denial of use of Town of Nantucket-owned and/or -operated port facilities or moorings. Any such denial shall be issued by the Harbormaster, after a hearing, subject to the right of the offender to an appeal to the Board of Selectmen, or, if applicable to the Department of Environmental Protection, pursuant to MGL c. 91, § 10A.

§ 137-12. Waterskiing.

A. Waterskiing is prohibited on all waterways of the Town, except outside of navigation channels and

swimming and mooring areas on Nantucket Sound, Polpis Harbor and Madaket Harbor. Waterskiers and boats towing them shall not operate in or across navigation channels at any time.

B. Waterskiing, as hereinbefore permitted, is subject to the provisions of the General Laws of the Commonwealth of Massachusetts and to the further restriction that there shall be no waterskiing within 400 feet of bathers, divers, piers, wharves, floats, other boats or of any shore. "Waterskiing" shall include motor-propelled surfboards and water bikes and the towing or manipulation of a surfboard or other similar device behind a motorboat. Waterskiing in approved areas shall only be done during daylight hours. **[Amended 4-10-1989 ATM by Art. 110, approved 7-24-1989]**

C. Said propelled surfboards may navigate along regular channels of navigation to reach and return from open waters where they are permitted to operate but shall not interfere with the operation of other vessels.

§ 137-13. Floats.

The placement of outhauls, temporary floats and/or rafts held by anchors or bottom moorings shall be subject to written approval of the Harbor Master. All such outhauls, floats or rafts will be identified with registration numbers assigned by the Harbor Master. Numbers assigned shall be permanently affixed to the land and seaward side of the float or raft in contrasting color and shall be a minimum of three inches in size.

§ 137-14. Occupancy of vessels. [Amended 5-4-1993 ATM by Art. 52, approved 5-24-1993]

No vessel, while said vessel is used as a residence, may remain overnight or be used as a residence in Nantucket harbors unless equipped with sewage holding tanks. All mooring permit applicants must provide the Harbor Master with a local contact who, within six hours' notice from the Harbor Master, will be available to aid the Harbor Master in the event of an emergency concerning the applicant's boat.

§ 137-15. Fish cars.

All fish cars in navigable waters of the Town shall be subject to the approval of the Harbor Master and shall be plainly marked according to law so that they shall be visible at all times. Stakes shall not be driven to be used for mooring any vessel or boat or for tying up any fish car, unless, in the judgment of the Harbor Master, their use will not be an obstruction. All cars shall be attached to a land point so that the attaching line does not exceed 10 feet beyond the mean low waterline. The Harbor Master may terminate any permission previously granted where, in his judgment, such termination is appropriate.

§ 137-16. Speed. [Amended 5-4-1993 ATM by Art. 52, approved 5-24-1993]

Within the outermost end of Jackson's Point inward and through the area defined within a line drawn from Coatue Point to the West Jetty on a two-hundred-seventy-degree magnetic heading, marked by an appropriate informational buoy and signs maintained by the Town, with the exception of designated areas for waterskiing, vessels shall be operated at the speed of which they can maintain steerage way and create a minimum wake, and in no case shall they be operated at more than posted speed limits. This rule shall not apply to vessels engaged in emergency operations.

§ 137-17. Compatibility with other regulations.

Nothing contained herein shall be held or construed to supersede or conflict with or interfere with or limit jurisdiction of the United States government or limit or conflict with the laws and regulations of the Commonwealth of Massachusetts, except that in case of concurrent laws or regulations in any case, it shall be intended that the stricter, more restrictive rule or regulation shall apply.

§ 137-18. Violations and penalties.

Whoever violates any of the provisions of this chapter or refuses or neglects to obey the lawful and reasonable orders of those empowered to enforce the same, or resists them in the discharge of their duties, shall be fined not less than $50 for the first violation and not more than $300 for each violation thereafter within the same calendar year. Where a vessel is or has been operated in violation of any provision of the chapter and the owner, operator or other responsible person cannot be found within a twenty-four-hour period or where it appears that the vessel and the person in violation will depart from the Town in order to avoid the enforcement of the penalties of this chapter, the Harbor Master may seize and hold said vessel as security and may move it to a safe place of storage, including dry land storage, until the violation has been disposed of administratively or judicially; and if a violation has been found, the costs of seizing and holding said vessel shall be assessed against the vessel, and the vessel shall be sold at public auction to pay such penalties and costs if not otherwise paid. If said auction produces surplus proceeds after payment of penalties and costs, said surplus shall be held in a separate account and be paid over to the owner of the vessel upon proof of such ownership.

§ 137-19. Complaints.

All complaints concerning the use of moorings and movements of such vessels on the waterways of the Town shall be submitted in writing to the Marine Department for its action. All complaints concerning waterway facilities, wharves, docks, ramps, dredging and related matters shall be submitted in writing to the Board of Selectmen. Neither the Harbor Master nor the Board of Selectmen shall be required to hold a hearing or take action on any matter not first submitted in writing.

§ 137-20. Enforcement. [Amended 4-6-1987 ATM by Art 32, approved 7-15-1987; 4-12-1999 ATM by Art. 69, approved 8-10-1999]

The Marine Superintendent, the Harbor Master and Assistant Harbor Masters are hereby designated enforcing persons hereunder. The enforcing person may, as an alternative to initiating criminal proceedings, proceed to a noncriminal disposition of any violation of this chapter pursuant to the procedures set forth in MGL c. 40, § 21D.

§ 137-21. Personal watercraft. [Added 4-12-1994 ATM by Art. 69, approved 4-29-1994; amended 4-10-2000 ATM by Art. 54, approved 8-2-2000; 4-10-2002 ATM by Art. 51, approved 7-31-2002]

No person shall engage in the business of renting to the public, for public operation, any personal watercraft, jet ski, surf jet, wet bike or any motorboat that uses an inboard motor powering a water jet pump or a propeller as its primary source of motive power and that is designed to be operated by a person sitting, standing or kneeling on the vessel rather than the conventional manner of sitting or standing inside a vessel within the waters of the commonwealth and within all coastal waters and inland bodies of water as lie within the limits of the Town of Nantucket without first having obtained a license to do so from the Town of Nantucket Board of Selectmen in compliance with this section and in compliance with all federal, state or local laws pertaining to their use.

A. As used in this section, the following terms shall include but are not limited to:

JET SKI — A ski propelled by machinery and designed to travel over water.

PERSONAL WATERCRAFT — A small vessel of less than 16 feet in length which uses an inboard motor powering a waterjet pump or a propeller as its primary source of motive power and that is designed to be operated by a person sitting, standing or kneeling on the vessel rather than the conventional manner of sitting or standing inside a vessel. This term includes jet skis, wet bikes and surf jets.

SURF JET — A surfboard propelled by machinery and designed to travel over water.

WET BIKE — A vessel designed to travel over water, supported by skis propelled by machinery.

B. Subject to such approvals of the commonwealth as may be appropriate, the Board of Selectmen shall adopt rules, regulations and reasonable fees for the issuance of such licenses, renewals thereof and operation of licensees, including but not limited to:

(1) Adequate insurance for the protection of the public;

(2) An appropriately equipped chase boat required at all times;

(3) Personal safety equipment for the safety of users of rented equipment;

(4) Location of premises so as to be consistent with other water and harbor uses and with the Town's Harbor Plan;

(5) Loading, unloading and storage of petroleum products intended for use in personal watercraft, jet skis, surf jets or wet bikes in accordance with recommendations as may be made by the Chief of the Fire Department of the Town;

(6) Designated area for use consistent with navigation and other public uses;

(7) That if any of the rules and regulations are declared unlawful for any reason, the remaining rules and regulations shall continue in full force and effect.

C. On land owned by the Town of Nantucket, the use of, the rental of and the operation of personal watercraft shall be prohibited.

D. No person shall operate any personal watercraft jet ski, surf jet or wet bike within the waters comprising Nantucket Harbor, as shown on the National Oceanic and Atmospheric Administration (NOAA) navigational chart Number 13241, northerly to the end of the east and west jetties or in the established navigation lane between said jetties easterly to the Head of the Harbor, in Polpis Harbor or along any portion of the shoreline of Nantucket Harbor. Said personal watercraft shall be launched from the Children's Beach boat ramp and shall navigate through Nantucket Harbor along the most direct route as marked by buoys, to Nantucket Sound.

E. No person shall operate any personal watercraft, jet ski, surf jet or wet bike within the waters bounded by a line drawn from "The Rock" off the "Fortieth Pole" and marked by a hazard buoy, northwesterly to the R-2 lighted bell buoy, northwesterly to the westernmost point of Muskeget Island, southeasterly to the westernmost tip of Smith's Point including the entire shorelines of Muskeget, Tuckernuck and New Smith's Point (Esther Island). Said personal watercraft shall be launched from the Walter S. Barrett and Jackson Point public access boat ramps and shall navigate through Hither Creek along the most direct route as marked by buoys, to the westernmost tip of Eel Point, thence north to Nantucket Sound or south to the Atlantic Ocean.

F. No person shall operate any personal watercraft, jet ski, surf jet or wet bike within or on the waters of the great ponds or any interior body of water of less than 300 acres in size on Nantucket or Tuckernuck Islands or on New Smith's Point (Esther Island).

G. No personal watercraft shall be transported to, or launched from, a public beach or public beach parking area, a public boat ramp or public boat ramp parking area except those named in Subsections D and E.

H. Exemptions. In addition to the exemptions in § 137-22, personal watercraft may be operated within the waters described in Subsections D, E and F if the personal watercraft is needed for emergency purposes when there is reasonable belief that such use is necessary to protect persons, animals or property.

I. And to authorize and direct the Board of Selectmen to take any other action necessary relating to any rules and regulations promulgated thereunder or take any other action related to the foregoing, subject to such approvals of the Commonwealth as may be required.

§ 137-22. Exemptions. [Added 4-10-2000 ATM by Art. 56, approved 8-2-2000]

Rescue personnel are exempt from § 137-21 while engaged in training exercises, emergency operations and ordinary law enforcement activities.

§ 137-23. Water kiteboarding. [Added 4-12-2004 ATM by Art. 47, approved 9-3-2004]

A. No person shall engage in the business of renting to the public kiteboarding equipment to be used by such renter, within the waters of Nantucket for the activity of kiteboarding, and further no person shall engage in the business within the waters of Nantucket for the purposes of training, teaching, and/or coaching the activity of kiteboarding using actual kiteboards for use in the waters of Nantucket, without first having obtained a permit to do so from the Nantucket Board of Selectmen in compliance with this section and incompliance with all federal, state or local laws.

B. "Kiteboarding" is the use of a kite utilizing wind and air to lift, provide power or energy to a harnessed rider/passenger who is equipped with a board for touch down, whether such board is formally a surfboard, kite board, wake board, or other stabilizing flat object, used for the recreational purposes of kiteboarding.

C. Subject to such approvals of the Commonwealth as may be appropriate, the Board of Selectmen shall adopt rules and regulations and reasonable fees for the issuance of such licenses, renewals thereof and operation of licensees and for the regulation of recreational kiteboarding generally to assure the safety and convenience of the public, including but not limited to: **[Amended 4-4-2006 ATM by Art. 63, approved 8-2-2006]**

   (1) Adequate insurance for the protection of the public;

   (2) An appropriately equipped chase boat required at all times;

   (3) Personal safety equipment for the safety of users of rented equipment;

   (4) Avoidance of interference with other water and harbor uses;

   (5) Loading and unloading of kiteboarding equipment.

D. This section may be enforced by any police officer, the Harbor Master, or any of their designees, using noncriminal tickets pursuant to §§ 1-2 through 1-6 of the Code of Nantucket.

Prepared by the:

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