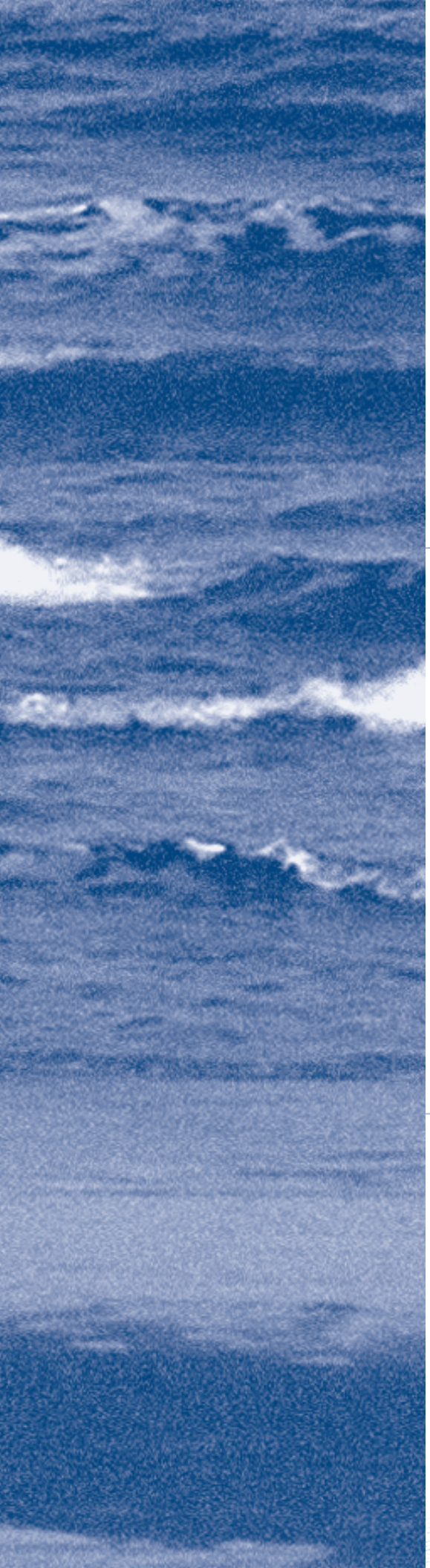

Massachusetts Ocean Management Plan

Volume 1

Management and Administration

December 2009

The Commonwealth of Massachusetts

Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Deval L. Patrick
GOVERNOR

Timothy P. Murray
LIEUTENANT GOVERNOR

Ian A. Bowles
SECRETARY

Tel: (617) 626-1000
Fax: (617) 626-1181
http://www.mass.gov/envir

December 31, 2009

On May 28, 2008, Governor Deval Patrick signed the Massachusetts Oceans Act of 2008, which directed me as Secretary of the Executive Office of Energy and Environmental Affairs to develop a comprehensive management plan to serve as the basis for the protection and sustainable use our oceans and coastal waters. I am pleased to present the final Massachusetts Ocean Management Plan, which places the Commonwealth at the forefront of the national movement towards comprehensive ocean planning and management.

This ocean plan is the product of an extraordinary planning process. In June 2009, my office published the draft plan, which was itself the product of 18 public meetings, 90 stakeholder consultations, and countless hours on the part of private citizens and state officials alike. In the subsequent five-month period of public review, we received over 300 written comments and hours of testimony in five public hearings and 25 informational meetings. I would like to thank the Ocean Advisory Commission and the Science Advisory Council, as well as the staff of EEA agencies, led by Assistant Secretary Deerin Babb-Brott and the hard-working staff of the Office of Coastal Zone Management, for all of their work and contributions to this final plan.

This process has documented, through the best available science and compelling personal testimony, the critical importance of our marine ecosystem, and reinforced our responsibility to manage human uses in a framework of strong environmental protection. With our waters already busy with such traditional uses as fishing, shipping, and recreation, we also look seaward to renewable energy resources such as tidal currents and strong offshore winds as well as the ocean's bounty for aquaculture of fish and shellfish. And, as always, the marine environment is a natural wonder that provides habitat for a wide variety of species. The charge presented by the Oceans Act is to carefully balance the protection and use of our ocean in a manner that preserves and enhances its ecological integrity. I believe the final plan meets that test and sets a strong basis for adaptive management for the future.

In response to public comments on the draft plan as well as additional information brought to bear during the public review period, the final plan adds strong new protections for

critical marine life and habitats, identifies areas suitable for renewable energy development, and initiates a five-year program of high-priority research. The final plan includes stronger and more detailed siting and performance standards associated with important environmental resources and revised management provisions for Regional Planning Authorities regarding wind energy development. And through the research program – undertaken in collaboration with, and supported with funding from, the Massachusetts Ocean Partnership – we will continue to address the most pressing issues identified in this final plan, including the need to fully characterize our marine habitats, identify and respond to the cumulative impacts of human uses and climate change, and carefully monitor the ocean system to track the effectiveness of our management measures.

The sea has sustained the Bay State for generations. With this plan, we deepen and formalize the Commonwealth's commitment to managing its ocean resources with the best science and strong environmental protections.

I want to thank the members of the public and stakeholder groups who gave of their time and their expertise over the past 18 months to make the Massachusetts Ocean Management Plan an example for the nation and the world. I congratulate them on their contributions, and hope they take as much pride in the product as I do. And while the final plan is now complete, my staff will continue to engage the citizens of the Commonwealth as we revise our environmental regulations to incorporate the new protections mandated by the plan. I look forward to continued collaboration and success going forward.

Sincerely,

Ian A. Bowles
Secretary
Executive Office of Energy and
Environmental Affairs

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Chapter 1 - Introduction

Massachusetts ocean waters are rich with natural resources and busy with human activity. Our marine environment supports recreation and tourism, fishing and shellfishing, shipping and trade, and scientific research. The Commonwealth's marine waters also harbor infrastructure that supports the well-being and standard of living of Massachusetts citizens, such as offshore liquefied natural gas facilities, fiber optic and electrical cables, and natural gas pipelines.

Today, these ecologically and economically vital public resources face unprecedented development pressure and represent potential solutions for new challenges, such as climate change. In addition to existing ocean uses, new proposals for renewable energy, deepwater aquaculture, off-shore sand mining, and other activities highlight the need to effectively manage the protection and use of our ocean waters for the benefit of current and future generations.

In response to these challenges, Governor Deval Patrick signed the Oceans Act on May 28, 2008—requiring the Secretary of Energy and Environmental Affairs (EEA) Ian Bowles to develop a comprehensive ocean management plan, with a draft plan by June 30, 2009, and a final plan promulgated by December 31, 2009. This document presents the final Massachusetts Ocean Management Plan.

The Oceans Act

The Oceans Act of 2008[1] specifically directs that the Massachusetts Ocean Management Plan:

> (i) set forth the commonwealth's goals, siting priorities and standards for ensuring effective stewardship of its ocean waters held in trust for the benefit of the public; and (ii) adhere to sound management practices, taking into account the existing natural, social, cultural, historic and economic characteristics of the planning areas; (iii) preserve and protect the public trust; (iv) reflect the importance of the waters of the commonwealth to its citizens who derive livelihoods and recreational benefits from fishing; (v) value biodiversity and ecosystem health; (vi) identify and protect special, sensitive or unique estuarine and marine life and habitats; (vii) address climate change and sea-level rise; (viii) respect the interdependence of ecosystems; (ix) coordinate uses that include international, federal, state and local jurisdictions; (x) foster sustainable uses that capitalize on economic opportunity without significant detriment to the ecology or natural beauty of the ocean; (xi) preserve and enhance

[1] See Appendix 1 for the language of the Oceans Act of 2008.

public access; (xii) support the infrastructure necessary to sustain the economy and quality of life for the citizens of the commonwealth; (xiii) encourage public participation in decision-making; (xiv) adapt to evolving knowledge and understanding of the ocean environment; and (xv) identify appropriate locations and performance standards for activities, uses and facilities allowed under the Ocean Sanctuaries Act, including but not limited to renewable energy facilities, aquaculture, sand mining for beach nourishment, cables, pipelines.

In addition, the Oceans Act:

- Stipulates that the ocean management plan be implemented through existing state review procedures, with all licenses, permits, and leases required to be consistent to the maximum extent practicable with the plan.
- Requires that the plan be revised and publicly reviewed at least every five years.
- Establishes commercial and recreational fishing as allowed uses subject to the jurisdiction of the Division of Marine Fisheries.
- Allows for appropriate-scaled renewable energy development in ocean waters, provided such development is consistent with the ocean management plan.
- Establishes an Ocean Resources and Waterways Trust Fund (Trust Fund) to be funded by mitigation fees, grants, Legislative appropriations, and income from investments and used to restore or enhance marine habitat and resources or compensate for navigational impacts resulting from ocean development.

Finally, the Oceans Act includes several process-related provisions. The Act set the schedule for plan development and promulgation, established requirements for formal public review, and provided for an Ocean Advisory Commission (OAC) and Science Advisory Council (SAC) to assist the Secretary in developing the ocean management plan.

The Planning Process

Following the directives of the Oceans Act, plan development proceeded in three phases: information gathering, draft plan development, and formal public review of the draft plan/plan finalization. Throughout the entire process, EEA developed the Massachusetts Ocean Management Plan in the context of an extensive public participation program. This included 18 public listening sessions held across the state to gather initial information, five public workshops to introduce the planning approach and solicit feedback before draft plan release, regular OAC and SAC meetings, five formal public hearings following the release of the draft plan, and hundreds of meetings with stakeholders such as pilots, fishermen, non-governmental organizations, and academia during the development of the draft and final plans.

- Phase 1: Information Gathering - Data gathering was an ongoing part of plan development, but a particular focus in the early months. At a series of statewide workshops and EEA presentations, the OAC, SAC, and public participants reviewed information gathered and data quality. Appendix 2 summarizes data used in the plan.
- Phase 2: Draft Plan Development - In this phase, spatial analysis occurred and options for the management approach were refined, while public participation and expert input continued. In addition, the OAC and SAC reviewed plan components. This phase culminated with the release of the draft Massachusetts Ocean Management Plan on June 30, 2009.
- Phase 3: Formal Public Review of Draft Plan - Copies of the draft plan were made available and notice of its availability for public review was provided in the Environmental Monitor. As specified in the Oceans Act, five formal public hearings were held. After the specified 60-day public comment period following the public hearings, EEA compiled and reviewed the more than 300 comments received following the release of the draft plan. The Massachusetts Ocean Management Plan was then revised and finalized for promulgation by December 31, 2009.

Plan Purpose and Goals

The basic purpose of the Massachusetts Ocean Management Plan is to translate the policy direction and specific requirements of the Oceans Act into a comprehensive management approach that can be implemented through existing state programs and regulations. To do this, EEA: 1) developed plan goals (highest-level statements of what the plan seeks to achieve) and strategies (measures to achieve the goals) based on the values and directives of the Oceans Act; 2) used the strategies to help guide the assessment of the compatibility and impacts of certain human uses (i.e., those allowed under the Ocean Sanctuaries Act) with existing uses and marine resources; 3) used spatial data to represent the results of this compatibility/impact assessment while also identifying particularly vulnerable marine resources; 4) evaluated management options; and 5) developed an ocean management plan that is responsive to the four goals of the Oceans Act, as described below.

These four plan goals were derived from the Oceans Act:

1. *Balance and protect the natural, social, cultural, historic, and economic interests of the marine ecosystem through integrated management* - This goal was achieved through the development of an integrated ocean management plan that is responsive to the Oceans Act, is implemented in coordination across jurisdictional levels, and achieves balance through the designation of areas for uses and activities allowed pursuant to the Oceans Sanctuaries Act in the ocean management planning area.
2. *Recognize and protect biodiversity, ecosystem health, and the interdependence of ecosystems* - This goal was achieved by identifying special, sensitive, and unique areas and protecting

these areas based on the first generation of an ecosystem-based management approach.

3. *Support wise use of marine resources, including renewable energy, sustainable uses, and infrastructure* - This goal was achieved by identifying use areas and promulgating enforceable management measures that: identify locations and performance measures for allowable uses and infrastructure, require renewable energy development of appropriate scale, minimize conflicts with/impacts to existing uses and resources, develop measures for reconciling use conflicts with fisheries, and streamline permitting.
4. *Incorporate new knowledge as the basis for management that adapts over time to address changing social, technological, and environmental conditions* - This goal was achieved through the development of an adaptive framework for the ocean management plan that: establishes the plan as a key driver of future ocean-related scientific research; provides a basis for sound ocean policy, management, and science in the future; results in science and research in response to identified management and policy issues and continues to engage stakeholders in future plan iterations; and provides a foundation to communicate scientific information to the public.

Plan Overview

The draft Massachusetts Ocean Management Plan, which was released on June 30, 2009, included significant background and contextual information to assist the public in reviewing the proposed comprehensive management approach. The final plan was refined to minimize this contextual and background information, focusing on the management measures and administrative structure to facilitate plan implementation. This document presents the Massachusetts Ocean Management Plan for final promulgation and consists of two volumes:

- Volume 1: Management and Administration - Following this introduction, Volume 1 presents the integrated management approach for the ocean management planning area with the accompanying maps. It identifies both use areas and special, sensitive, and unique areas for protection. It also presents the comprehensive management measures that will be implemented. In addition, Volume I describes how the ocean management plan will be administered, including sections on mitigation measures and the Trust Fund, agency implementation of the plan, the ongoing planning structure, the plan modification process, proposed regulatory changes, and the interaction between the Ocean Sanctuaries Act and the plan.
- Volume 2: Baseline Assessment and Science Framework - The baseline assessment, which was mandated by the Oceans Act, includes information cataloguing the current state of knowledge regarding human uses, natural resources, and other ecosystem components of Massachusetts ocean waters. The science framework builds on the baseline assessment, as well as science and data strategies

developed for the plan's management measures, to identify and prioritize the future scientific research and data acquisition that will support continued evolution of the Massachusetts Ocean Management Plan.

For additional information about the details of the planning process and the history of ocean planning in Massachusetts, please see the draft Massachusetts Ocean Management Plan, Volumes 1 and 2, as well as the technical documents available, at www.mass.gov/eea/mop.

Chapter 2 - Management

The Oceans Act directs the ocean management plan to establish management areas and performance standards for development within the ocean planning area[1] and to identify and protect significant marine resources.[2] This section establishes those areas and standards.[3]

Management Areas

The ocean management plan establishes three categories of management areas: Prohibited, Renewable Energy, and Multi-Use.

Prohibited Area

The Prohibited Area (Figure 2-1)[4] is coincident with the Cape Cod Ocean Sanctuary, within which a variety of uses, activities and facilities are expressly prohibited by the Ocean Sanctuaries Act, as amended by the Oceans Act, and are therefore prohibited under the ocean plan.

Renewable Energy Areas

Renewable Energy Areas allow commercial- and community-scale wind energy development. Based on current technology, the deployment of large-scale wave and tidal power facilities appears unlikely in the first five-year term of the ocean plan. However, at least three tidal power pilot projects are under development, including the Town of Edgartown's Muskeget Channel Tidal Energy Project, discussed below. Wave and tidal energy facilities, as well as community wind energy facilities, are also allowed in the Multi-use Area, as explained in more detail below.

Two Wind Energy Areas are designated for commercial-scale wind energy facilities based on the presence of a suitable wind resource and water depth, and the absence of conflict with other uses or sensitive resources, as derived through an environmental

[1] "The Plan…shall identify appropriate locations and performance standards for activities, uses and facilities allowed under [the Ocean Sanctuaries Act]."
[2] "The Plan shall…identify and protect special, sensitive or unique estuarine and marine life and habitats."
[3] As the legal basis for management, the Oceans Act requires that approvals for development within the planning area must be consistent with the Plan "Upon the secretary's adoption of an ocean management plan, all certificates, licenses, permits and approvals for any proposed structures, uses or activities in areas subject to the ocean management plan shall be consistent, to the maximum extent practicable, with the plan." As discussed below, EEA will undertake rulemaking in 2010 to modify applicable regulations to implement the management measures described herein.
[4] For production purposes, all figures referenced in this chapter are placed at the end of the Ocean Management Plan.

screening process.[5] These areas—which constitute 2% percent of the planning area's 2,144.5 square miles—will be subject to additional baseline feasibility analysis for such factors as wave climate and sub-bottom geology. Using generic industry guidelines for spacing, these areas could accommodate approximately 150 3.6 megawatt (MW) turbines at full build-out. Based on further analysis for technical or economic viability, there may be siting constraints that would reduce the sites' capacity.

The Gosnold Wind Energy Area (Figure 2-1) is designated for commercial wind energy development (defined as projects that are larger than the community-scale allocations described under Renewable Energy Siting/Management below), subject to terms described under Renewable Energy Siting/Management, below. Community-scale wind energy development is also allowed within the Gosnold Wind Energy Area. Future project development in this area is subject to review under the Massachusetts Environmental Policy Act (MEPA) and all other necessary local, state and federal approvals. The intent of the designation is to signify that, based on the rigorous environmental screening under the ocean management plan, the area is presumptively suitable for commercial-scale wind. Development of a commercial-scale wind energy facility shall be permitted in this area subject to reasonable conditions developed in consultation with local officials.

The Martha's Vineyard Wind Energy Area (Figure 2-1) is designated for wind energy development at a scale to be determined by the Martha's Vineyard Commission. As discussed under Siting/Management, below, planning authorities with regulatory authority shall define the appropriate scale of any wind energy project located within waters of those municipalities that are subject to the jurisdiction of such regional planning authorities as of the date of this plan.

The ocean management plan also identifies three locations (one in federal waters adjacent to the planning area) for commercial-scale wind that are considered provisional sites (Figure 2-1). These areas passed the exclusionary screening process but appear to have potentially more significant technical limitations, cumulative impacts, and/or less suitability for wind energy. Therefore, these locations are not proposed for designation as Wind Energy Areas at this time, and are not currently being explored for further feasibility by the Commonwealth. This does not preclude other entities from developing additional information and analysis for the provisional sites, but such assessments would be subject to review by EEA, and designation of any or all of the provisional sites in the planning area as Wind Energy Areas would require a modification to the ocean management plan consistent with the formal amendment process described in Chapter 3.

[5] See Appendix 3 for a description of the wind energy screening process.

In addition, EEA has identified potentially suitable locations in federal waters for commercial-scale wind (Figure 2-1), recognizing that the three-mile limit of state jurisdiction (and the limit of jurisdiction of the ocean management plan) is an artificial constraint to considerations of technology, economics, and environmental and social benefits and impacts. At the Commonwealth's request, the Minerals Management Service (MMS) has convened a federal-state task force to assist MMS in the planning and regulatory review associated with leasing areas of federal waters for large-scale wind energy development. Based on consultation with the task force, and as an initial step in the federal leasing process, MMS will issue a Request for Interest to determine the interest in specific areas of federal waters to be considered for wind energy development.[6]

Multi-Use Area

The remainder—and the vast majority—of the planning area is designated as a Multi-use Area (Figure 2-1), which is open to all uses, activities and facilities allowed under the Ocean Sanctuaries Act, including but not limited to the following:

- Aquaculture
- Cables and pipelines
- Extraction of sand and gravel for beach nourishment
- Community-scale wind energy facilities of appropriate scale
- Wave and tidal energy facilities of appropriate scale

Management in the Multi-use Area is based on specific marine resources identified as key components of the Massachusetts marine ecosystem ("special, sensitive or unique marine or estuarine life and habitat"). The vulnerability of each resource to new uses, activities and facilities was determined and ranked through compatibility assessments. Similarly, management guidance for balancing impacts to commercial and recreation fishing and recreational boating was developed and the compatibility of these uses with new uses was assessed. The uses, activities and facilities listed above are managed not by spatial designation but by siting and performance standards, associated with mapped resources and uses (listed in Table 2-1) that direct development away from high value resources and concentrations of existing water-dependent uses.[7] The application of these standards to specific uses, activities and facilities is described under Management of Ocean Uses, below.

[6] For more information on the federal leasing process for offshore wind energy development, see http://www.mms.gov/offshore/RenewableEnergy/index.htm.
[7] See Draft Ocean Management Plan, Chapter 3, for complete discussion of the compatibility assessment process and development of the management measures.

The ocean management plan siting and performance standards apply to projects that are required under the Massachusetts Environmental Policy Act (MEPA) to develop Environmental Impact Reports (EIR) because such projects are determined, by definition, to be most likely to have potentially significant environmental impacts. Under MEPA, projects that exceed specified thresholds are presumed to have potentially significant impacts and require a mandatory EIR. Projects that exceed lower thresholds require a short-form review in an Environmental Notification Form (ENF) to allow agencies and the public to inform the Secretary of EEA whether additional review in a discretionary EIR is warranted. Impacts associated with those projects that do not require an EIR can be addressed at the appropriate level of state, regional, or local government.

- Siting and Performance Standards for Special, Sensitive, or Unique Marine and Estuarine Life and Habitat (SSU) - Uses, activities and facilities in the ocean planning area are subject to the following siting and performance standards for projects that require an EIR under MEPA:
    - Uses, activities or facilities proposed in the ocean planning area, subject to MEPA review, and represented on ocean management use/SSU maps shall avoid SSU areas identified thereon, pursuant to the SSU definitions in Appendix 4 and the terms listed below. Under MEPA review, the Secretary shall presume that the location of a project outside an SSU area represents a less environmentally damaging practicable alternative (LEDPA) than a location within an SSU area.[8] The presumption may be overcome by: (1) a clear demonstration that either no LEDPA exists or that the project will cause no significant alteration of the resource, or (2) a demonstration of clear and convincing evidence that the SSU area maps do not accurately characterize the resource or use. For projects not represented by ocean management use/SSU area maps, the proponent shall submit a request for an Advisory Opinion to the Secretary who shall determine, in consultation with the OT, the SSU areas applicable to the project, if any.
    - The SSU maps in the ocean management plan represent the best available information regarding the extent of SSU resources at the time of publication. Pursuant to an EIR scope issued by the Secretary, the development of project-specific information may require additional site characterization work to confirm the

[8] The Secretary shall determine the least environmentally damaging practicable alternative through MEPA review. For the purposes of that determination, the definition of "practicable" closely parallels that of the Clean Water Act 404(b)(1) Guidelines: an alternative is practicable if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of the project purpose.

presence/absence of a SSU resource (i.e., verify coverage of eelgrass beds which can have relatively high spatial variability over time, or define the extent of hard/complex seafloor areas which may call for higher resolution data). SSU resources that are identified through project-specific site characterization in an EIR are subject to the siting and performance standards. The interagency EEA Ocean Team will develop guidelines to address this issue as part of the implementation guidance; see discussion in Chapter 3.

- Projects proposed in the ocean planning area must demonstrate that the public benefits associated with the proposed project clearly outweigh the public detriments to the SSU resources.
- Projects proposed in the ocean planning area must demonstrate that they have taken all practicable steps to avoid damage to the SSU resource and that there will be no significant alteration of the SSU resource.
- For projects proposed outside of mapped SSU areas, the ocean management plan encourages the Secretary to acknowledge that the proponent has avoided impacts to the most significant marine resources of the Commonwealth and scope the project accordingly, subject to consideration of data and information received from agency and public comment.

Any use, activities or facilities requiring a state agency action, that is represented by an ocean management use/SSU map, is required to file an Environmental Notification Form (ENF), regardless of whether it exceeds a threshold for review under the MEPA regulations at 301 CMR 11.00.

- Siting and Performance Standards for Commercial Fishing and Recreational Fishing and Areas of Concentrated Recreational Activity - Uses, activities and facilities in the ocean planning area are subject to the following siting and performance standards for projects that require an EIR under MEPA:
  - Uses, activities or facilities proposed in the ocean planning area, subject to MEPA review, and represented on ocean management use/SSU maps shall, to the maximum extent practicable, avoid, minimize, and mitigate impacts to the existing use areas specified thereon.
  - Under MEPA review, the Secretary shall use mapped information to inform scoping for impact and/or alternatives analysis and may require additional project-specific characterization of existing uses and potential impacts as he deems appropriate.

Importantly, the resources and uses in Table 2-1 are not intended to represent the exclusive subject matter of MEPA review and agency permitting action. Rather, based on the direction of the Oceans Act, they have been identified as resources and uses that warrant particular attention through the regulatory

review process. The ocean management plan does not supersede any existing laws, including those that require the assessment of potential impacts to resources and uses not listed above. The Secretary of EEA retains his discretion under the MEPA statute and regulations to scope a project for any issue he deems necessary and appropriate, based on information presented by the project proponent and agency or public comment.

Table 2-1 - Siting and performance standards for EIR projects in the Multi-use Area

SSU Resource	Siting Standard	Performance Standard
• North Atlantic Right Whale core habitat (Figure 2-2) • Humpback (Figure 2-3) and Fin Whale (Figure 2-4) core habitat • Roseate Tern core habitat (Figure 2-5) • Special concern (Arctic, Least, and Common) tern core habitat (Figure 2-6) • Long-tailed Duck core habitat (Figure 2-7) • Leach's Storm Petrel important nesting habitat (Figure 2-8) • Colonial water birds important nesting habitat (Figure 2-9) • Hard/complex seafloor (Figure 2-10) • Eelgrass (Figure 2-11) • Intertidal flats (Figure 2-12) • Important fish resource areas (Figure 2-13)[9]	Specified uses presumptively excluded. The presumption may be overcome by a clear demonstration that either no less environmentally damaging practicable alternative exists or that the project will cause no significant alteration of the resource, or by a demonstration of clear and convincing evidence that the SSU area mapping was erroneous and that the underlying data does not accurately characterize the resource or use.	Demonstrate that the public benefits associated with the proposed project clearly outweigh the public detriments to the SSU resources. Demonstrate that all practicable steps have been taken to avoid damage to the SSU resource interests and values and that there will be no significant alteration of SSU resource values or interests.
Project Location within Areas of Existing Water-Dependent Uses	**Siting Standard**	**Performance Standard**
• Areas of high commercial fishing by effort and value (Figure 2-14)[10] • Areas of concentrated recreational fishing (Figure 2-15) • Areas of concentrated commerce and commercial fishing traffic (Figure 2-16) • Areas of concentrated recreational boating activity (Figure 2-17)[11]	Avoid, minimize, and mitigate impacts to the maximum extent practicable; use mapped areas to guide alternatives analysis and additional project-specific characterization of existing uses and potential impacts.	Meet all applicable permitting standards

[9] The Important Fish Resource Area SSU represents a notable component of the Massachusetts marine ecosystem. However, the data and methodology available during plan development resulted in a SSU designation that warrants further analysis. As a near-term action, the definition and spatial representation of this SSU will be refined to identify with greater specificity, areas of particular ecological significance to marine fish, shellfish, and crustaceans (see the Science Framework in Volume 2 for additional details).
[10] EEA will evaluate the benefit of refining maps of fishing activity based on gear type, as a near-term action, to further characterize/assess compatibility/conflict.
[11] Map will be refined, in the near future, to identify traffic patterns and associated intensity of use with greater specificity. See the Science Framework for additional details.

- Example Application - As an illustrative example of how management in the Multi-use Area is intended to operate, the extraction of sand and gravel has been determined to have potentially significant impacts to the following subset of SSU resources and important water-dependent uses:
    - North Atlantic Right Whale core habitat area
    - Fin and Humpback Whale important habitat
    - Areas of complex seafloor
    - Eelgrass
    - Inter-tidal flats
    - Important fish resource areas
    - Roseate Tern core habitat
    - Concentrated areas of recreational fishing
    - Areas of high commercial fishing

  A project that proposed to extract material for beach nourishment would be required to use the ocean management plan's resource and use maps to identify a borrow area(s) located outside core areas for right, humpback, and fin whales; eelgrass; intertidal flats; and hard/complex seafloor. This would include consultation with EEA and the Division of Marine Fisheries (DMF) regarding the site specific species associated with the important fish resource SSU. The project would have the option of demonstrating that no less environmentally damaging practicable alternative exists or that it would cause no significant adverse impact to the specified SSU resources. Alternatively, a case may be made that there is clear evidence that the mapped ocean plan data do not accurately characterize the specified resources.

  If no less environmentally damaging practicable alternative exists, the project would be required to demonstrate that the public benefits of the project clearly outweigh the public detriments to the SSU resources. Following MEPA review, the project would be required to demonstrate in permitting that, through its construction and operation design, it had taken all practicable steps to avoid damage to the SSU resource interests and values and that there would be no significant alteration of SSU resource values or interests.

  Similarly, the project would be required under MEPA to evaluate impacts to areas of high commercial and recreational fishing and concentrated areas of recreational activity through characterization of, and consultation with, potentially affected interests within those mapped areas. The proponent would be required to identify the potential economic impacts of the proposed project as part of the alternatives analysis and to assist the

Secretary in determining appropriate minimization and mitigation measures, if any. Comments from agencies, potentially affected parties, and the public would assist the Secretary in developing project-specific requirements for an appropriate level of characterization.

Management in the Multi-use Area thus establishes a higher level of protection for special, sensitive or unique resources in several ways. The ocean management plan: 1) modifies the MEPA standard of "avoid, minimize or mitigate damage to the environment to the maximum extent practicable" to include a rebuttable presumption that less damaging practicable alternatives exist for projects that would otherwise locate in SSU areas; 2) establishes a public benefits test; and 3) requires that project permits ensure that all practicable steps have been taken to avoid impacts to SSU resources and that there will be no significant adverse impacts to SSU resources. The ocean management plan also identifies and maps those resources, providing clear baseline information which will allow proponents, agency staff, and the public to focus on aspects of a given project of greatest potential environmental significance.

The Multi-use Area maintains the existing standard of "avoid, minimize or mitigate" impacts from new uses to existing water-dependent uses, but establishes a higher level of review by providing baseline information on concentrations of existing uses, identifying them as significant existing interests, and requiring that potential impacts and mitigation be addressed in MEPA review with the participation of potentially affected interests. The mapped areas, and comments from agencies, will guide scoping under MEPA for additional project-specific characterization of existing uses and potential impacts.

Finally, the Multi-use Area addresses the interests of sustainable uses, renewable energy, and necessary infrastructure by directing them away from locations where they would be likely to have the most impacts to the most significant resources and concentrations of human activities but otherwise allowing flexibility in their location and level of regulatory review, on a project-specific basis, based on their functional requirements, scale, and potential impacts to existing uses and marine resources.

Overall, management in the Multi-use Area represents an effort to balance the protection of significant existing uses and important environmental resources with the flexibility needed to allow the development of necessary infrastructure, sustainable uses, and new technologies such as renewable energy, in the context of the public trust and within limitations of existing data. As identified in the science framework and discussed in Chapter 3, ongoing analysis of existing data, future data development, and increased understanding of the marine environment and pattern of

human uses will result in refined ocean plan maps, particularly for important fish habitat and water dependent uses. Application of the siting standards, and management in the Multi-use Area under MEPA generally, should utilize the ocean management plan's maps and the data on which they are based in conjunction with best professional judgment informed by agency expertise and the participation of potentially affected parties.

Management of Uses in the Ocean Planning Area

This section describes management measures for uses, activities, and facilities allowed under the Ocean Sanctuaries Act, as amended by the Oceans Act.

Renewable Energy

In 2008, the legislature enacted two landmark laws to boost renewable energy in Massachusetts: 1) the Green Communities Act, which mandates that by 2020, 15% of our electric load be served by renewable energy, and 2) the Global Warming Solutions Act, which requires steep, economy-wide reductions in greenhouse gas emissions. To implement these mandates, Governor Patrick has called for 2,000 MW of wind power by 2020 in Massachusetts or adjacent state and federal waters. To put this 2,000 MW goal in proper perspective, it should be noted that the Commonwealth currently has approximately 15 MW of installed capacity. To achieve the 2,000 MW goal, the legislature and the Patrick Administration have put together numerous financial incentives to spur the growth of renewable energy, and the Patrick Administration is championing legislation to make the process for permitting onshore wind powered facilities more predictable and less lengthy. This push for additional renewable energy complements other efforts to reduce greenhouse gases, such as the tripling of funds devoted to improving energy efficiency, and the expansion of programs that support solar energy development.

However, these initiatives by themselves will not be sufficient to meet the renewable energy and greenhouse gas reductions mandated by the new legislation. Development of new renewable energy facilities is needed, and the ocean management plan establishes a framework for the potential of offshore marine renewable energy development.

- Wind Energy - The state's Global Warming Solutions Act requires that greenhouse gas emissions be reduced 80 percent from 1990 levels economy-wide by 2050, and calls on EEA to set a 2020 target between 10 and 25 percent below 1990 levels and develop a plan for achieving that

reduction. As referenced above, the state has set a goal of developing 2,000 MW of wind-power capacity by the year 2020. Offshore wind resources offer the prospect of considerable renewable energy, free of harmful emissions, and if developed with care and forethought, are compatible with other ocean uses and resources. It is a potentially inexhaustible resource that, in many cases, is available in close proximity to regions with the highest electricity demand, minimizing the need for costly new transmission lines. A recent analysis of potential renewable energy generation capacity in Massachusetts by Navigant Consulting identified the theoretical generation capacity from offshore wind energy facilities at 19,000 MW. After factoring for avian and marine mammal habitats, other marine resources, view sheds and shipping routes, the Navigant study identified the technical generation capacity from offshore wind energy facilities at 6,270 MW.

Recent developments in furthering the development of wind energy generation include the establishment of the Marine Renewable Energy Center (MREC) at the University of Massachusetts Dartmouth School of Marine Science and Technology, created to develop in-ocean test sites for energy conversion devices and accelerate the commercialization of new technologies. MREC is currently funding wind (shallow, transition and deep-water) and tidal resource assessment and environmental survey work in Edgartown and Nantucket within a proposed National Offshore Renewable Energy Innovation Zone that would support full scale testing of wave and wind energy devices. The general proposed location of the innovation zone is depicted on Figure 2-18, although the specific delineation is currently under review by the Minerals Management Service.

- Tidal Energy - Although current available technology does not support commercial-scale projects, technological advancements may support the possibility of tidal energy development in limited areas. In general, a peak tidal velocity of 4 knots appears to be the minimum for an economically viable, utility scale project. The literature cites only three known locations that are currently documented to have tidal velocities that approach 3 knots, including Muskeget Channel between Nantucket and Martha's Vineyard, Vineyard Sound between Naushon Island and Norton Point, within the Cape Cod Canal and to the southeast of Nantucket Island.

  However, recent information collected by UMass-Dartmouth in Muskeget Channel identifies current velocity in the channel exceeds 4 knots per second and demonstrates potential commercial viability. The Town of Edgartown's proposed Muskeget Channel Tidal Energy Project, which

holds a Preliminary Permit from the Federal Energy Regulatory Commission (FERC), is located between the islands of Nantucket and Martha's Vineyard. Initial estimates suggest that it could generate 10-20 MW of power at peak velocity. The Town of Nantucket is formally cooperating with Edgartown on project development.

In addition, there are currently two potential projects pending in the ocean planning area: Natural Currents Energy Services LLC is pursuing a project in Muskeget Channel and the Oceana Energy Company has proposed a project in Vineyard Sound.

- Wave Energy - The Renewable Energy Workgroup concluded that the prospect for wave energy development in Massachusetts is limited. However, non-utility-scale projects have been proposed, and at least one demonstration project has recently been in operation on the North Shore. As with tidal energy, technological advancements may support the possibility of wave energy development in limited areas.

- Appropriate Scale - The Oceans Act amends the Ocean Sanctuaries Act to allow the development of renewable energy facilities "of appropriate scale," provided that the renewable energy facility is otherwise consistent with an ocean management plan. In doing so, the Oceans Act recognized the importance of providing an opportunity to achieve significant social benefits from the development of renewable energy in balance with other social values. The Oceans Act addresses these interests by requiring that the seven factors listed in Table 2-2 be addressed in the definition of appropriate scale. These factors address the same values and concerns as the screening criteria and siting and performance standards developed through the planning process, as shown in Table 2-3.

  As discussed below, regional planning authorities (RPA) with regulatory authority shall define the appropriate scale of any wind energy project whose turbines are located within waters of those municipalities within the jurisdiction of such regional planning authorities as of the date of issuance of this plan.[12]

[12] As required by the Oceans Act, the ocean management plan will be incorporated into the CZM program following NOAA review and subsequently applied through the use of federal consistency. RPA definitions, regulations or decisions pertaining to the appropriate scale of renewable energy projects in their jurisdictional ocean waters shall not constitute applicable enforceable state policy for purposes of CZM federal consistency review of renewable energy projects in federal waters under the federal Coastal Zone Management Act.

Table 2-2 - Appropriate scale

Appropriate Scale Factor	As Addressed by the Ocean Management Plan[13]
Protection of the public trust	The exclusionary screening criteria for Renewable Energy Areas and the siting and performance standards associated with renewable energy facilities allowed in the Multi-use Area are designed to avoid, minimize and mitigate impacts to activities associated with fishing, fowling and navigation, in reasonable balance with the siting requirements of renewable energy
Public safety	The exclusionary screening criteria for Renewable Energy Areas and the siting and performance standards associated with renewable energy facilities allowed in the Multi-use Area address public safety by locating Wind Energy Areas away from concentrations of human activities, including shipping and commercial navigation, commercial and recreational fishing, and recreational boating, to the maximum extent practicable
Compatibility with existing uses	The exclusionary screening criteria for Renewable Energy Areas and the siting and performance standards associated with renewable energy facilities allowed in the Multi-use Area are designed to avoid, minimize and mitigate impacts to existing uses while not unduly limiting opportunity for renewable energy development
Proximity to the shoreline	Wind Energy Areas are sited no closer than 1 mile to the shoreline of inhabited land, where feasible. If a community pursues a project in the Multi-use Area, the determination of proximity will be a factor in community support for the project, as required below.
Environmental protection	The exclusionary screening criteria for Renewable Energy Areas and the siting and performance standards associated with renewable energy facilities allowed in the Multi-use Area are designed to avoid, minimize and mitigate impacts to important resources
Community benefit	For wind or tidal energy allowed in the Multi-Use Area (community-scale wind), the project will be required to demonstrate that the host community or communities formally support the project (as demonstrated through letter from Mayor or Board of Selectmen) and, for projects other than pilot or demonstration-scale projects, must provide an economic benefit to the community.
Appropriateness of technology and scale	"Appropriateness" is a function of the environmental, social and economic interests assessed above, and guides the distinction between community-scale wind (small because it may be located in busier, more visible waters) and Wind Energy Areas (larger, and sited to minimize conflicts)

[13] Pilot-scale renewable energy projects (e.g., those that are approved by the Federal Regulatory Energy Commission [FERC] as pilot projects) that meet existing regulatory standards are presumed to be of appropriate scale.

Table 2-3 - Siting and performance standards for community-scale wind and commercial-scale tidal energy facilities (see Figures 2-20 and 2-21)

Allowed Use	Siting Standard	Performance Standard	Natural Resource or Water-Dependent Use
Community Wind	Presumptively excluded from SSU resource areas; exclusion rebuttable by determinations of LEDPA, no significant alteration, or inaccurate data	Public benefit determination Avoid damage to SSU resources No significant alteration	• Roseate tern core habitat • Long-tailed Duck core habitat • Colonial waterbirds important nesting habitat • Special concern (Arctic, Least, and Common) tern core habitat • North Atlantic right whale core habitat Leach's storm petrel important nesting habitat • Fin and humpback whale core habitat • Eelgrass • Intertidal flats
	Avoid, minimize, and mitigate impacts	Meet all applicable permitting standards	• Areas of high commercial fishing effort and value • Areas of concentrated commerce and commercial fishing traffic • Areas of concentrated recreational fishing • Areas of concentrated recreational activity
Commercial Tidal	Presumptively excluded from SSU resource areas; exclusion rebuttable by determinations of LEDPA, no significant alteration, or inaccurate data	Public benefit determination Avoid damage to SSU resources No significant alteration	• North Atlantic right whale core habitat • Eelgrass • Intertidal flats • Important fish resource areas
	Avoid, minimize, and mitigate impacts	Meet all applicable permitting standards	• Areas of high commercial fishing effort and value • Areas of concentrated commerce and commercial fishing traffic • Areas of concentrated recreational fishing • Areas of concentrated recreational activity

For different types of renewable energy projects and/or those that are outside of the jurisdiction of regional planning authorities with regulatory authority, the ocean management plan defines appropriate scale as follows:

> Appropriate scale is that scale facility capable of being sited in a given location such that, as identified by the ocean plan, the following factors are addressed at a level of detail necessary for the secretary of EEA to make a determination of adequacy on an EIR, and, where applicable, for the Department of Environmental Protection (DEP) to authorize a project under the Chapter 91 and Water Quality Certificate regulations:
>
> 1. Public trust rights are protected
> 2. Public safety is protected
> 3. Significant incompatibilities with existing uses are avoided
> 4. Proximity to shoreline avoids and minimizes conflicts with existing uses and minimizes visual impact to the maximum extent feasible
> 5. Impacts to environmental resources are avoided, minimized, and mitigated to the maximum extent practicable
> 6. For community-scale wind and pilot-scale wave or tidal projects, the host community[14] (or communities) must formally support the project and, for projects other than test or demonstration-scale projects, must receive an economic benefit from the renewable energy facility. Further, other conditions described below apply to community wind projects.
> 7. The technology and scale of the facility are appropriate to the proposed location as demonstrated by consistency with 1 through 5, above.

- Siting/Management
  - RPAs with regulatory authority shall define the appropriate scale of any wind energy project located within waters of those municipalities that are subject to the jurisdiction of such regional planning authorities as of the date of issuance of this plan. For the Cape Cod Commission, this includes the waters of the municipalities of Provincetown, Truro, Wellfleet, Eastham, Orleans, Chatham, Harwich, Brewster, Dennis, Yarmouth, Barnstable, Mashpee, Sandwich, Bourne, and Falmouth. For the Martha's Vineyard Commission, this includes the waters of the municipalities of Aquinnah, Chilmark, Edgartown, Oak Bluffs, Tisbury

[14] For renewable energy projects, the term host community will mean any city or town in which all or part of the project's energy generating facilities are located within established municipal boundaries.

and West Tisbury. This Ocean Management Plan does not authorize the Martha's Vineyard Commission to define the appropriate scale of any wind energy or other project in the Gosnold Wind Energy Area, whether or not the Martha's Vineyard Commission has jurisdiction over that area pursuant to its enabling act.

- Commercial-scale wind projects are restricted to the Gosnold and Martha's Vineyard Wind Energy Areas. Community-scale wind energy facilities and compatible uses are also allowed within Wind Energy Areas. Projects in Wind Energy Areas are subject to mandatory review in an EIR and approval under other applicable law to avoid, minimize and mitigate impacts within the Wind Energy Area. The community in whose waters the turbines are located must receive direct economic benefit. The appropriate scale shall be determined with regard to the above factors, and in close consultation with the host community.
- Community-scale wind projects are allowed within the Multi-use Area subject to the following conditions: mandatory review in an EIR and the definition of appropriate scale (see Table 2-3 for siting and performance standards); the project will be required to demonstrate that the host community or communities formally support the project (as demonstrated through letter from the Mayor or Board of Selectmen); projects other than test or demonstration-scale projects must provide an economic benefit to the community; for projects which are subject to review as a development of regional importance by regional planning authority with regulatory authority, such projects must receive formal approval by the regional planning authority, and are subject to a determination by the Secretary of EEA, in consultation with the applicable regional planning authority[15] through the MEPA process that they are consistent with the ocean plan (the interagency Ocean Team will develop guidance to address this issue, working with the regional planning agencies, as part of the implementation guidance—see Chapter 3 for additional information). The Massachusetts Association of Regional Planning Agencies (MARPA) proposed a methodology for allocating turbines on the basis of each RPA's offshore territory within the planning area, linear distance along the nearshore plan boundary, number of municipalities, and total wind energy potential. On the basis of the MARPA methodology, the ocean plan establishes the following allocation of turbines that may be approved within each coastal area

[15] Coastal regional planning agencies are depicted on Figure 4-19 and include the Nantucket Planning and Economic Development Commission, Merrimack Valley Planning Commission, Metropolitan Area Planning Council, Old Colony Planning Council, Southeastern Regional Planning and Economic Development District, Cape Cod Commission, and Martha's Vineyard Commission.

represented by an RPA, to be allocated in a manner to be determined by the individual RPAs:

Merrimack Valley Planning Commission	7
Metropolitan Area Planning Council	22
Old Colony Planning Council	9
Southeastern Regional Planning and Economic Development District	10
Cape Cod Commission	24
Nantucket Planning and Economic Development Commission	11
Martha's Vineyard Commission	17
TOTAL	**100**

The ocean management plan allocations establish a rebuttable presumption that said number of turbines is the maximum number allowable per region. The presumption can be rebutted, and the cap per RPA raised, on a showing by the RPA to the Secretary (under the Routine Plan Update provisions described under Administration, Chapter 3) that either a project is not economically viable under the existing cap or that elevating the cap will cause no significant impact to appropriate scale interests.

- Commercial-scale tidal energy and wave energy facilities (defined as projects other than those approved by the FERC as pilot projects[16]) are allowed in the Multi-use Area, subject to review in a mandatory EIR and the definition of appropriate scale (see Table 2-3 for siting and performance standards).
- Pilot-scale wave and tidal energy facilities are allowed in Wind Energy and Multi-use Areas subject to the determination of appropriate scale set forth in Table 2-2. Pilot-scale projects are subject to an EIR if they exceed MEPA thresholds for a mandatory EIR or if the Secretary requires a discretionary EIR based on review of an ENF.

Extraction of Sand and Gravel for Beach Nourishment and Shore Protection

The Commonwealth has abundant sand and gravel assets, which offer great potential for beneficial use in beach restoration/nourishment and shoreline protection. Massachusetts' coastal communities are vulnerable to erosion and

[16] See FERC guidance for the Integrated Licensing Process: White Paper on Hydrokinetic Pilot Project Licensing Process and Hydrokinetic Pilot Project Criteria and Draft Application Checklist, current version dated April 2008 or as updated by FERC at http://www.ferc.gov/industries/hydropower/indus-act/hydrokinetics/energy-pilot.asp.

flooding as the primary coastal hazards that lead to the loss of lives or damage to property and infrastructure in developed coastal areas. In developed areas, especially where engineering structures are used to stabilize shorelines, natural sediment transport processes are interrupted, and under conditions of reduced sediment the ability of coastal resource areas such as dunes and beaches to provide storm damage prevention and flood control benefits is continually reduced. Climate change and sea-level rise will also contribute to coastal land loss in the Northeast. With an accelerated rate of sea-level rise, low-lying coastal areas will be particularly vulnerable to increased erosion, flooding, and inundation. In addition, these impacts will extend further inland, resulting in greater loss of land and damage to development along the coast of Massachusetts. The combination of rising sea levels, more frequent and intense storms, and increased coastal development will result in greater erosion and flooding impacts over time. As options for climate change adaptation are considered and strategies developed, interest in ocean sand and gravel resources for protection will increase.

While the Commonwealth has ample sand and gravel assets, the extraction of these resources for beach nourishment or shore protection needs to be balanced with the protection of marine ecosystems, with particular attention to sensitive or vulnerable areas like critical spawning or juvenile fish habitat. Efforts to identify areas for suitable sand and gravel for nourishment will require investigations to locate appropriate potential borrow areas, identify sediment quantities, and examine sediment characteristics. Existing surficial geology data provides a good general characterization of these resources, but higher resolution data is needed to identify specific areas. In addition, more refined habitat data is needed to characterize the most appropriate location of these areas. The immediate next steps for the management of sand and gravel resources will be to work with state agencies and the United States Geological Survey to refine existing data and identify specific locations for each region of the coastline that have appropriate sand resources. As part of EEA's ongoing habitat assessment, feasible regional locations will be screened to identify those with the least impacts to benthic and demersal resources, and a specific use and management plan will be developed.

- Siting / Management
    - Extraction of sand and gravel is allowed in the Multi-use Area, subject to siting and performance standards (Table 2-4) and other applicable law.

Table 2-4 - Siting and performance standards for the extraction of sand and gravel (see Figure 2-22)

Allowed Use	Siting Standard	Performance Standard	Natural Resource or Water-Dependent Use
Sand and gravel extraction	Presumptively excluded from SSU resource areas; exclusion rebuttable by determinations of LEDPA, no significant alteration, or inaccurate data	Public benefit determination Avoid damage to SSU resources No significant alteration	• North Atlantic Right whale core habitat • Roseate tern core habitat • Fin and humpback whale core habitat • Areas of hard/complex seafloor • Eelgrass • Inter-tidal flats • Important fish resource area
	Avoid, minimize, and mitigate impacts	Meet all applicable permitting standards	• Areas of concentrated recreational fishing • Areas of high commercial fishing effort and value

Cables and Pipelines

Cables and pipelines are important infrastructure components for the transmission and distribution of electricity, fuels, and telecommunications. The provision of these particular goods and services is connected to national energy and communication supply and security matters. With the development of high-bandwidth fiber-optic cables, these technologies are now replacing traditional wire cabling for communications networks. This linear infrastructure has several installations already in Massachusetts waters including electric and telecommunication connections between both Nantucket and Martha's Vineyard Islands and the mainland (Cape Cod) as well as the Hibernia cross-Atlantic communication cable system connected in Lynn.

On the fuel side, the transport of liquefied natural gas (LNG), in particular, through new pipeline systems, has also greatly increased the range of transport and delivery of this important energy resource. There are currently several pipeline installations in Massachusetts marine waters, including the HubLine high-pressure gas pipeline that transits around Boston Harbor from Beverly to Weymouth and connections to the HubLine from the two deep-water LNG ports of Northeast Gateway and Neptune located southeast of Gloucester.

A key issue for cables is the future development of offshore wind energy facilities that will require cable connections to the Massachusetts coast. Because potential offshore locations have not been identified, the ocean plan addresses cables through the siting

and performance standards described below. Future studies of options for siting deepwater wind energy facilities and associated potential transmission routes will provide information by which these standards can be refined and incorporated in the ocean plan. For both cables and pipelines, the intent of the ocean plan is to minimize the cumulative impact of future development by requiring that linear infrastructure be "bundled" within common corridors to the maximum extent feasible.

Pipelines are not specifically a presumptively approved activity under the Ocean Sanctuaries Act, but instead require a finding that a specific pipeline project is of "public necessity and convenience". Pursuant to Section 25 of the Oceans Act, EEA has proposed modifications to the regulatory definition of "public necessity and convenience" in a report submitted to the Joint Committee on Environment, Natural Resources and Agriculture.

- Siting/Management
    - Cables and pipelines are allowed in the Multi-use Area, subject to siting and performance standards (see Table 2-5) and other applicable law.

Table 2-5 - Siting and performance standards for cables and pipelines (see Figures 2-2 and 2-2)

Allowed Use	Siting Standard	Performance Standard	Natural Resource or Water-Dependent Use
Cables	Presumptively excluded from SSU resource areas; exclusion rebuttable by determinations of LEDPA, no significant alteration, or inaccurate data	Public benefit determination Avoid damage to SSU resources No significant alteration	• North Atlantic Right whale core habitat • Fin and humpback whales core habitat • Areas of hard/complex seafloor • Eelgrass • Inter-tidal flats
Pipelines	Presumptively excluded from SSU resource areas; exclusion rebuttable by determinations of LEDPA, no significant alteration, or inaccurate data	Public benefit determination Avoid damage to SSU resources No significant alteration	• North Atlantic Right whale core habitat • Fin and humpback whale core habitat • Areas of hard/complex seafloor • Eelgrass • Inter-tidal flats • Important fish resource areas
	Avoid, minimize, and mitigate impacts	Meet all applicable permitting standards	• Areas of high commercial fishing effort and value • Areas of concentrated recreational fishing

This plan does not address pipelines and cables identically, in that pipelines must avoid the important fish resource areas SSU while cables are not similarly restricted. However, this issue may be revisited based on further analysis of the impacts of pipelines versus cables, as discussed in Chapter 3.

Fishing and Aquaculture

Fishing in the Commonwealth has a long and deep history. Commercial and recreational fishing are significant drivers of the marine economy also important for their contributions to shoreside business. New Bedford, Gloucester, Provincetown, and Boston are home to the state's major commercial fleets, but nearly all harbors and inlets in Massachusetts support some type of commercial fishing activity. The Massachusetts marine aquaculture industry is also a very important and growing trade. Although currently focused on shellfish, with technological advances and improved understanding of oceanographic conditions, offshore aquaculture has considerable promise for the future. Recreational boating and fishing are widespread and also represent important marine values of the Bay State.

Commercial and recreational fishing are allowed uses managed by DMF. DMF maintains the sole authority for the opening and closing of areas for the taking of any and all types of fish, and works closely with its Marine Fisheries Advisory Commission, the New England Fishery Management Council, and Atlantic States Marine Fisheries Commission to manage species on a consistent basis across the region.

As directed by the Oceans Act, the ocean management plan reflects the importance of commercial and recreational fishing by identifying areas of high commercial fishing activity and concentrations of recreational fishing activity. To more fully understand and characterize the potential benefits and impacts of uses, activities and facilities to fishing, ongoing work will characterize commercial fishing effort by gear type (see the Science Framework for additional details). This will allow a more refined assessment of the compatibility or incompatibility of specific types of development with different kinds of fishing activities. Similarly, the ocean management plan began the process of collecting information from fishermen to characterize and map the details of their fishing activity. This information will assist in evaluating the potential impacts of specific projects. EEA intends to continue and standardize this information capture so it can be used consistently in the regulatory review of proposed development.

Aquaculture is licensed by the towns, the Division of Marine Fisheries, and the US Army Corps of Engineers. Additionally, the Department of Agricultural Resources provides a variety of services aimed at the promotion and development of

Massachusetts aquaculture. DAR's Aquaculture Program, located within the Division of Agricultural Technical Assistance, fosters development of the Massachusetts aquaculture industry through efforts aimed at implementation of the Commonwealth's Aquaculture Strategic Plan.

- Management of Aquaculture Class 4 Facilities

  There are five categories of aquaculture in Massachusetts, according to DMF regulations (322 CMR 15.00):

  1. No Structures/No Additions/No Discharges: Prototype, Shellfish Bottom Culture
  2. Structures (Water-Based)/No Additions/No Discharges: Prototype, Shellfish/Seaweed Water Column Culture
  3. Structures (Water-Based)/Additions/Discharges: Prototype, Recirculating/Flowthrough Culture
  4. Structures (Water-Based)/Additions/Discharges: Prototype, Net-Pen Culture of Finfish
  5. Projects in Federal Waters, can involve any of the four categories referenced above.

  Class 4 facilities are the most likely type of facilities to occur within the planning area. Ocean planning maps and siting and performance standards will assist in the site review and regulatory process, which per regulation includes evaluation of water quality, benthic habitat, submerged aquatic vegetation, endangered species, competing uses, navigation, access, and other topics.

Other Uses, Activities, and Facilities Allowed under the Ocean Sanctuaries Act

Other projects that may be permitted under the Ocean Sanctuaries Act, and may be of a scale to have potentially significant impacts, include:

- Projects authorized under Chapter 91 and deemed to be of public necessity and convenience
- Municipal wastewater treatment discharges and facilities
- Operation and maintenance of existing municipal, commercial or industrial facilities and discharges
- Channel and shore protection projects
- Improvements not specifically prohibited by the Oceans Sanctuaries Act

> If projects not otherwise specifically addressed by the ocean management plan but allowed under the Ocean Sanctuaries Act are proposed within the ocean planning area, reviewing agencies shall use the ocean plan maps and associated performance standards as the guidance for their review. The secretary shall exercise his discretion, based on comment from agencies and the public, in determining the applicable siting and performance standards as described in Table 2-1, above.

Management Tools

One of the main benefits of the ocean management plan is that it improves our understanding of resources and activities in Massachusetts waters, providing a significant amount of data and information that will facilitate improved decision-making in the planning, review and permitting of specific projects. The ocean management plan thus also provides an opportunity to apply new tools and new information to existing environmental law, building on the key themes of information, analysis, participation of affected parties, and mitigation.

As described in Chapter 3, EEA will develop implementation guidance to provide clarity and consistency to the assessment of project benefits and impacts, provide information necessary to address requirements of the Ocean Sanctuaries Act for projects that require a determination of public necessity and convenience, and provide information necessary to address the requirement of the Oceans Act that any permit or license issued by EEA or other affected agencies or departments of the Commonwealth be subject to an ocean development mitigation fee as shall be established by the secretary of energy and environmental affairs.

Relationship to the Ocean Sanctuaries Act

The management provisions of the ocean management plan have been developed to be consistent with those of the Ocean Sanctuaries Act. The purpose of the Ocean Sanctuaries Act, as expressed in Section 14 of the Act, is to protect the ocean sanctuaries

> … from any exploitation, development, or activity that would significantly alter or otherwise endanger the ecology or the appearance of the ocean, the seabed, or subsoil thereof….

Uses, activities and facilities allowed in the ocean planning area and subject to the ocean management plan are defined by the Ocean Sanctuaries Act. The ocean management plan does not allow or disallow uses, activities or facilities, but rather, pursuant to the Oceans Act, identifies with greater specificity and provides greater protection for, those resources to be protected.

Pursuant to Section 25 of the Ocean Act, an advisory committee was convened by CZM, on behalf of the Secretary to reviewing Section 16 of the OSA and the regulatory definitions of "public necessity and convenience" and "significant alteration". Based on the input and the deliberations of the Committee and informed by the process of developing this plan, a report has been prepared for, and submitted to, the Joint Committee on Environment, Natural Resources and Agriculture.

Modification of Existing Regulations

EEA, CZM and DEP , in consultation with DMF, will initiate rule-making in 2010 to modify regulations that govern Chapter 91, 401 Water Quality Certification, the Wetlands Protection Act, the Massachusetts Environmental Policy Act, the Ocean Sanctuaries Act, and the state Coastal Zone Management Program, as appropriate, to harmonize existing regulatory programs with the provisions of the ocean plan. See additional discussion in Chapter 3.

Chapter 3 - Plan Administration

The development of the ocean management plan was guided by the goals of integrated management, effective stewardship and protection of marine ecosystems, support for sustainable uses and services, and adaptive management. To carry these goals forward through implementation, mechanisms have been established to ensure successful execution and continued evolution of the plan. The Oceans Act of 2008 (Act) requires the review of the plan and its components—including the baseline assessment and enforceable provisions—at least once every five years. While this periodic formal review is critical, many of the administrative elements described below will provide for more frequent and ongoing integration of new data and information, expert guidance and stakeholder input, communication processes, and performance measures into the plan. EEA will undertake rulemaking in 2010 to implement these administrative provisions.[1]

Plan Implementation

In this section, key elements for the implementation of the ocean management plan are described. Some of these components were developed in direct response to the Oceans Act and others generated to ensure effective administration of specific provisions in the plan.

Secretarial Functions and Responsibilities

The Act confers upon the Secretary of EEA the authority for oversight, coordination, and planning of the Commonwealth's ocean waters, resources, and development. The Act further stipulates that all state agency authorizations for structures, uses, or activities must be consistent with the plan. Beyond coordinated regulatory approvals, there is also an important need to ensure that other agency actions related to ocean management—including policy development, scientific research, and regulatory decision-making—are in harmony with and advance the goals of the ocean management plan. During the planning phase, an internal team of EEA agency representatives provided important input and ensured that the draft plan was in step with state statutory and regulatory responsibilities. For plan implementation and evolution, the Secretary hereby designates an interagency ocean management team. The interagency EEA Ocean Team (OT)—chaired by the Office of Coastal Zone Management (CZM) and comprised of personnel from CZM, the Department of Environmental Protection's (DEP) Wetlands and Waterways Program, the Department of Fish and Game's (DFG) Natural Heritage and

[1] The secretary shall promulgate regulations to implement, administer and enforce this section and shall interpret this section and any regulations adopted hereunder consistent with his power to enforce the laws. These regulations shall include provisions for the review of the ocean management plan, its baseline assessment, and the enforceable provisions of relevant statutes and regulations at least once every 5 years.

Endangered Species Program and Division of Marine Fisheries, and the Massachusetts Environmental Policy Act (MEPA) Office—will serve as a coordinating body, offering assistance and advice to the Secretary to support his oversight, coordination, and planning authority functions for ocean waters and development. As explained below, the OT will provide the Secretary with specific counsel on details of plan implementation and updates, coordinated project review, recommendations for mitigation, validity and synthesis of ocean resource and uses data used in plan, and ocean-related policy and research. In addition to the OT, stakeholder and expert advisory bodies, as described in the Stakeholder Input, Expert Advice, and Partnerships section below, will also continue to provide important advisory functions to the Secretary.

Coordinated Project Review

Chapter 2 lays out the management framework of the ocean management plan, which establishes three type of management areas (i.e., Prohibited, Renewable Energy, and Multi-Use) and describes performance standards to protect special, sensitive or unique (SSU) natural resources and important existing water-dependent uses. Under this framework, the implementation of the performance standards occurs both in MEPA—through the development of information necessary to characterize potentially affected resources and uses and the evaluation of siting alternatives and impact minimization and mitigation—and in individual agency permitting—through the administration of specific statutory and regulatory rules and conditions. Because these SSU resources and water-dependent uses are not aligned exclusively with specific agency jurisdiction or sole expertise, the OT will serve as the appropriate venue for coordinating agency review for proposed structures, uses, or activities subject to the plan.

Upon receipt of an Environmental Notification Form (ENF) by the MEPA Office for a proposed project subject to the ocean plan, the OT would convene to review the ENF and determine if the project warranted preparation of an Environmental Impact Report (EIR) because it exceeds mandatory thresholds or by nature of scope and intensity of potential impact. The OT would seek concurrence as to the type and extent of data and information that would be required for the project to evaluate its conformity with the plan's management standards. (Note: As described below, after plan promulgation, guidance is to be developed for minimum and scalable required data and information standards by project type, associated review processes, and basic mitigation guidance.) After consultation in the OT, agencies would convey in their written comments the data and information requirements necessary to characterize SSU resources as recommendations for inclusion in the Secretary's EIR scope.

After the proponent has prepared and submitted an EIR, the OT would again convene to develop a coordinated response as to the EIR's responsiveness to characterizing SSU resources and important existing water-dependent uses and its compliance with the plan's management standards.

Along with the standard finding as to the project's adequate and proper compliance with MEPA, the Secretary's final MEPA Certificate would also contain a determination as to conformity with the siting provision of the ocean plan and outline the provisions for mitigation. The Certificate would direct individual agencies to include in their Section 61 findings a determination that their permit/license authorizations are consistent with the ocean management plan and with the Ocean Sanctuaries Act.

As originally recommended by the Ocean Management Task Force report, mitigation measures shall be coordinated by the MEPA Director on behalf of the Secretary. The OT shall make recommendations for potential projects that support the management and planning of ocean waters, resources, uses, and development as informed especially by the priorities identified in the Science Framework.

Implementation Guidance

While the plan presents a thorough management and administrative framework, important elements will need to be further developed and refined going forward. Accordingly, over the next year, a priority for the OT will be to develop implementation guidance for:

- standards to further characterize SSU resources and important existing water-dependent uses,[2] including use of plan data and/or additional resource survey requirements;
- requirements for developing and submitting data during project review;
- appropriate criteria to assist with siting decisions for proposed community wind projects, working with regional planning agencies; and
- protocols for the development of appropriate mitigation for unavoidable impacts.

[2] The compatibility analysis component of the plan (see Chapter 3 of the Draft Ocean Management Plan) considered the potential conflicts between types of allowable development and water-dependent uses and resources, based on existing experience and understanding of current technology. The specific compatibility issues are likely to change on a project-specific basis as further experience with such development is gained, and the nature of particular conflicts changes with evolving technology. Consequently, in the future the OT will periodically review the standards in the implementation guidance to ensure that they continue to be appropriate to characterize SSU resources and important existing water-dependent uses.

The guidance is intended to provide specific direction to agencies and project proponents regarding certain aspects of implementation of the ocean management plan during the review of projects subject to the plan.

Chapter 2 describes the data used in the plan to spatially define each resource and generally describes methodologies that could be used to characterize these resources. The OT will review these methodologies to establish standard, accepted practices in terms of survey methods and data analysis procedures that will be expected of project proponents to properly characterize SSU resources and important, existing water-dependent uses. Accompanying this element of this guidance will be the development of specific requirements for data submittal to state agencies. These requirements may ultimately take the form of metadata standards, but there may be other components addressed as well. Last, commenters have submitted environmental monitoring reports from a recent offshore gas pipeline project to support the proposition that pipeline construction and operation is generally equivalent to those associated with electric or telecommunication cables, for which the Important Fish Resource Area SSU does not apply. EEA will establish a Task Force of agency staff, industry, and environmental interests with the charge to evaluate the available data, consider pipeline-specific compatibility issues, and define and map the appropriate fish resource SSU (see the science framework for additional details).

As described in Chapter 2, regional planning agencies have a role in community-scale and commercial wind energy development projects. EEA envisions that the OT will work with the regional planning agencies and private developers to establish an appropriate level of siting guidance for such projects, acknowledging that there are regional distinctions that would require flexibility in application of this guidance. EEA will then use the results from both of these endeavors to amend the ocean management plan, if necessary, through the provisions for plan modification described in this chapter.

Ocean Development Mitigation Fees and Ocean Resources and Waterways Trust

Pursuant to the Act, an Ocean Resources and Waterways Trust Fund (Trust) has been established by the Executive Office for Administration and Finance. The Trust will receive all proceeds from ocean development mitigation fees as well as appropriations or other credits. Distinct from occupation or displacement fees under Chapter 91 rules or from potential proceeds from competitive bids and/or lease terms associated with renewable energy projects, ocean development mitigation and compensation fees are payments associated with impacts to resources and uses from

development projects subject to the plan. The amount of the ocean development mitigation fees will be established by the Secretary through the MEPA process and represents mitigation for unavoidable resource impacts and compensation for impairments of use. It is expected that this mitigation will serve as the total project mitigation for natural resource impacts, and that permitting agencies will not add to this mitigation through their project reviews. The scope and scale of the mitigation varies depending on the specifics of project. As trustee, the EEA Secretary is also responsible for decisions on expenditures from the Trust which will be made in consultation with the Departments of Environmental Protection and Fisheries and Wildlife and in accordance with the following guidance and prioritization:

- Mitigation funds received from a renewable energy project are to go into the Trust with the provision that fifty percent of the funds be directed to the "host" community(ies).[3] The host community(ies) must utilize such funds in accordance with the provisions in Section 1 of Oceans Act (MGL, Chapter 10, Section 35HH) and articulated below.
- Funds received from mitigation for impacts by an ocean development project are to be used for the restoration or enhancement of marine habitat and resources, except that:
    - Funds derived from impacts to public navigation by an ocean development project should be targeted to navigational improvements.
    - Funds for projects related to the enhancement of fisheries resources should be targeted to fisheries restoration and management programs.
- Other funds credited to the Trust are to be used only for the purposes of environmental enhancement, restoration and management of ocean resources pursuant to the ocean plan.

Expenditure of funds not deriving from a MEPA process shall also be consistent with the guidance above.

While not included as ocean development mitigation fees, income from occupation or displacement fees under Chapter 91 rules as administered by DEP will continue to be deposited in the General Fund.

[3] For renewable energy projects, the term host community will mean any city or town in which all or part of the project's energy generating facilities are located within established municipal boundaries. If the generating facility comprises more than one municipality, the host municipalities shall share the fifty percent on a *pro rata* basis based on the fractional share of megawatts generated by the respective portion of the facility.

Also not included as ocean development mitigation fees, energy royalty fees may be established for renewable energy projects as follows:

- For pilot/community scale renewable energy projects, the renewable energy benefits (e.g., energy, jobs) will stand for any royalty fees.
- For commercial scale renewable energy projects, as part of the Request for Proposal and related contractual process, the Commonwealth will negotiate royalty fees to be made as annual payments for a percentage of total energy production. The royalty shall be matched with a commensurate payment—or combination of energy royalty and benefits of equivalent value (e.g., energy, jobs, municipal improvements)—to the host community(ies).
- For both pilot/community and commercial scale projects, nothing in this plan changes, nor should be construed to change, the authority of a municipality to negotiate impact fees or other community benefits with renewable energy project developers.

Revisions to Plan

While our understanding of the life, habitats, processes, and services of marine ecosystems continues to grow, important gaps still exist in our knowledge of this complex environment. Similarly, our ability to map the locations, occurrence, and intensity of current human uses has improved, but is not fully complete. At the same time, there are new uses being proposed for the Commonwealth's marine waters and in neighboring state and federal waters. For this reason, the Act calls for the ocean management plan to be revisited every five years. In addition to the formal plan amendments, there are other administrative changes that could be critical to the plan's implementation but would not warrant wholesale amendment of the plan. This section details the different types of plan modifications and the processes associated with these changes.

Routine Plan Updates

As an initiative grounded in spatially-explicit information, planning for the Commonwealth's marine waters relies on data that depict the extent, concentration, and temporal nature of the natural resources (biological, physical, and chemical) and uses, activities, and facilities in and affecting the planning area. A significant amount of data and information was compiled, synthesized, and developed for use in creating the plan. As stated above and elsewhere in the plan, there are some missing or incomplete data sets that are being developed or sought as priority actions as part of plan implementation (see the Science Framework). In addition, through ongoing monitoring, assessment, and scientific studies, existing data sets are periodically (or, in some cases, continually) being updated and improved.

The process described in this section is for certain routine updates to the plan deemed necessary for effective and efficient administration, and for keeping the plan up to date with current information, but not warranting wholesale revision through formal amendment. Such revisions would include updated data and information that directly or indirectly affect the state or locations of SSU resources and important existing water-dependent uses (as defined and described in Chapter 2), small shifts in management area boundaries, and other "fine-tuning" adjustments that do not result in significant changes to the management framework or geographic extent of the plan.

The procedure for these administrative changes to the ocean management plan is anticipated to be:

- Requests for a plan update will be submitted to the Secretary or generated internally by the EEA OT.
- The OT will conduct an initial evaluation of the proposed plan update according to these general criteria:
    - The proposed update meets a confirmed need for adjustments to the plan.
    - The proposed update clarifies the management or administrative framework of the current plan.
    - The extent to which the proposed update results in changes to the management framework or geographic extent of management areas.
- For a proposed update that pertains to new or updated data, the OT will also assess the information along the lines of these general criteria:
    - The data set is the product of a robust study design that conforms to accepted scientific standards defining the specific study area(s), study period, survey/collection methods and frequency, quality controls, and adheres to other customary principles such as peer review.
    - The data are accompanied by acceptable geospatial meta-data which identify and document critical elements such as: the creator or originator of the data, an abstract describing the content of the dataset, information about the resolution (or scale) and accuracy of the data, and detailed description of the data table attributes.
    - If the data has been transformed, synthesized, or extracted, any such modifications are clearly identified and decisions as to the establishment of thresholds (e.g., statistical divisions or other limits/cut-offs set for abundance values or concentrations) are clearly articulated.
- Based on its initial screening review, the OT will make a decision as to the merit of the proposed plan update. If favorable, the OT will forward the

proposed modification along with necessary contextual information describing the proposed change, its necessity, and any associated information to the Ocean Advisory Commission and to the Science Advisory Council.

- With input from the OAC, SAC, and the OT, the Secretary will either (1) move forward to include the proposed change in the plan by providing public notice of the intent to accept to proposed data set and seeking input during a 30 day public comment period, or (2) decline to move forward due to deficiencies or limitations of the proposed update.
- Based on the public comments received, the Secretary may—at his discretion—hold one or more public hearings on the proposed update.
- The Secretary will make a final decision as to approval for inclusion of the proposed update to the plan. This final decision will be noticed in the Environmental Monitor and, if accepted, the modification will be reflected in the most recent version of the plan and—if the change is new or updated data—the data set will be incorporated into the Massachusetts Ocean Resources Information System.

Formal Amendments

In accordance with the statutory requirement under the Oceans Act, the ocean management plan will be formally revised and amended at least once every five years. It is anticipated that the plan amendment process will be akin to the one undertaken to develop the first plan with a few adjustments. Such amendment could include updated data and information that directly or indirectly affect the state or locations of SSU resources and important existing water-dependent uses (as defined and described in Chapter 2), significant shifts in management area boundaries, and other changes that result in significant changes to the management framework or geographic extent of the plan. The process will continue to include intensive efforts for public input and participation, specific stakeholder discussions, engagement of the OAC and SAC, assessments of data and information, and a review of management framework, measures and policies. It is expected that future planning process for plan amendments will make greater use of the issue-specific workgroups that were used in the initial phase of the first draft plan development by enhancing their roles as functional forums for topical experts but also for interested and affected members of the public to engage in focused discussions. Another probable adjustment will be more employment of combined OAC and SAC meetings, where these two consultative bodies can engage directly with one another bringing science, policy and stakeholder perspectives together in deliberation.

The procedure for amendments to the ocean management plan is anticipated to be:

- The Secretary will initiate the plan amendment process by providing public notice of the intent to amend the current ocean management plan and the convening of a minimum of five public hearings (one each in the following regions: North Shore, metro Boston, South Shore, Cape and Islands, and South Coastal).
- Public hearings will be held to receive comment on current version of plan and its implementation over past period (~3-4 years).
- Initial OAC and SAC meetings will be held to initiate consultation with these bodies on the plan amendment and to obtain input on scope for plan revisions (including the baseline assessment and the science framework updates).
- Issue-oriented work groups will be established and meetings will be held.
- OAC and SAC meetings will be held over the period of the plan amendment process.
- A draft plan amendment will be developed and released for public comment.
- Public hearings will be held on the draft amended plan and the public comment period will remain open for a minimum of 60 days after last hearing.
- Based on public comment, revisions will be made to draft.
- The final amended plan will be promulgated.

Stakeholder Input, Expert Advice, and Partnerships

The Oceans Act included several requirements to enhance public input and incorporate scientific expertise during the development of the ocean management plan. EEA developed and implemented an extensive public involvement program both leading up to issuance of the draft plan and subsequently after the draft was published. The Act prescribed two advisory bodies to assist EEA in the development of the plan: the Ocean Advisory Commission (OAC) provided policy input during plan development, and their meetings served as a vehicle for public workshops and general public input. The Ocean Science Advisory Council (SAC) advised EEA on the science and data analysis aspects during plan development.

The extensive effort in public involvement, OAC and SAC input, and the effective relationship with the Massachusetts Ocean Partnership (MOP) all were important in the development of the ocean management plan. As the ocean management plan enters into its implementation phase, EEA anticipates continuing these efforts and partnerships with various entities such as the OAC, SAC, MOP, regional planning agencies, federal agencies, the Northeast Ocean Regional Council, and other institutions and agencies involved in related science and research. The sections below describe these partnerships and the

approach EEA will take to working with various stakeholders to ensure the continued success and evolution of ocean management.

Ocean Advisory Commission

The Oceans Act requires the OAC to meet at least quarterly, at the discretion of the Secretary of EEA (Secretary), and also prescribes OAC membership terms. As described in the Oceans Act, responsibility for selecting OAC members lies with the Governor, Speaker of the House of Representatives, Senate President, Senate Minority Leader, and House Minority Leader. This statutory requirement also includes mandates for OAC member terms, which are staggered one-, two- and three-year appointments. Because the Oceans Act envisions the OAC continuing its policy advisory role during plan implementation, the OAC will have standing meetings scheduled quarterly. However, at the discretion of the OAC Chair and in coordination with EEA, the OAC will meet only if there are agenda items.

The OAC will have several main functions: first, it will continue to serve as a policy advisory body to the Secretary during plan implementation, with a specific role as part of plan amendments (see above section describing plan amendment process). The OAC also will be a forum for annual discussions of plan implementation, using the plan's performance indicators and other information as appropriate. Finally, the OAC will be a forum for discussing new and/or emerging policy issues, which will include opportunities for specific-issue oriented meetings including appropriate stakeholder groups. For example, panel discussions will be used to help inform OAC members, EEA, and other stakeholders on particular subjects, allowing for an in-depth understanding to be gained. OAC meetings will be public and will be noticed appropriately. As feasible, OAC meetings will be held in various regions of the coast to enhance opportunities for stakeholder involvement.

Ocean Science Advisory Council

The Ocean Act establishes the SAC to assist the Secretary in compiling scientific information necessary for plan development and tasks the Secretary as coordinator of the SAC. The Act gives the Secretary responsibility for appointing SAC members and specifies institutions to be represented. The Oceans Act does not prescribe membership duration, but EEA anticipates reviewing SAC membership annually or establishing staggered terms.

As described in the science framework, EEA has identified several priority science and data acquisition tasks, and SAC input regarding these tasks will be important. To balance this need with the practical aspects of asking SAC members to commit their

time and expertise, EEA envisions forming issue-specific committees to focus on particular science-related aspects of implementing the ocean management plan and the Science Framework. Priority issues in the science framework, such as habitat classification, acquisition of spatial and socioeconomic data regarding human uses, climate change, and the assessment of performance indicators, will benefit from SAC committees of select scientists with specific expertise in these issues. These committees will meet as necessary and appropriate, on the order of two or three times annually, to provide input to EEA. Committee members will be selected for their expertise in committee subject matter and will be appointed by the Secretary, who will also serve as coordinator for these committees. Organization of these committees will occur in early 2010, and the membership and need for individual committees will be reviewed by the Secretary annually.

EEA also anticipates coordinating with MOP on issues related to the work of the SAC. For example, during fall 2009 MOP worked with EEA to bring together a national panel to discuss alternative approaches to defining ecological value of ocean resources. In the future, EEA envisions working with MOP on similar, targeted, issue-specific workshops involving national experts in particular scientific disciplines.

Regional Planning Agencies

As described in Chapter Two, regional planning agencies (RPAs) have a particular role in the ocean management plan for the development and review of renewable energy projects, including commercial-scale and community-scale wind energy projects. Regional planning agencies (Merrimack Valley Planning Commission, Metropolitan Area Planning Council, Cape Cod Commission, Martha's Vineyard Commission, Nantucket Planning and Economic Development Commission,[4] and the Southeastern Regional Planning and Economic Development District) are also represented on the OAC. The RPA's presence on the OAC will continue to provide valuable insight regarding local and regional ocean management-related issues.

EEA anticipates working closely with the RPAs to implement provisions of the ocean management plan related to commercial-scale and community-scale wind energy projects. As discussed in Chapter Two, those regional planning agencies with regulatory authority will be developing terms for defining "appropriate-scale" as related to renewable energy projects; EEA will coordinate with the RPAs during this work. Additionally, EEA will coordinate with pertinent RPAs when community-scale

[4] The Oceans Act currently does not list the Nantucket Planning and Economic Development Commission on the OAC. For operative purposes, the Nantucket Planning Commission will serve on the OAC at the request of the Secretary, and has been participating in the OAC to date as an active observer. EEA will support adding the Nantucket Planning and Economic Development Commission to the OAC as part of a future amendment to the Oceans Act as practical.

wind energy projects are proposed and being reviewed. See Chapter Two for additional detail about RPA roles and responsibilities regarding community-scale wind energy.

Federal Agency and Tribal Government Coordination

A key component of the development of the ocean management plan was the coordination with federal agencies. EEA made significant efforts to coordinate with federal regulatory agencies, including the US Environmental Protection Agency, National Marine Fisheries Service, US Fish and Wildlife Service, and US Army Corps of Engineers (Corps) to seek consistency and maximize efficiency with federal regulatory programs. As EEA develops regulatory provisions for plan implementation, EEA will continue to coordinate with appropriate federal agencies to ensure such regulatory efficiencies are realized. In particular, such coordination mechanisms will include working with the Corps regulatory processes through pre-application consultations, National Environmental Policy Act (NEPA) and Massachusetts Environmental Policy Act (MEPA) consistency.

During the development of the ocean management plan, EEA also met with representatives of Mashpee Wampanoag Tribe and the Wampanoag Tribe of Gay Head (Aquinnah). EEA as appropriate will continue such coordination efforts in the future. Projects subject to federal review will conduct formal tribal consultation as required under Section 106 of the National Historic Preservation Act and any other necessary federal or state law or policy.

In addition to project-specific coordination with federal agencies, EEA, through the Office of Coastal Zone Management (CZM), will also be working with the NOAA Office of Ocean and Coastal Resources Management to formally adopt the ocean management plan into the Massachusetts CZM Program. The Oceans Act mandates this effort, which CZM anticipates will begin in early 2010. Once the ocean management plan is adopted into the CZM program, EEA will be able to apply the federal consistency provisions of CZM (enabling the ocean management plan provisions to apply to the state's review of federal actions and permitting decisions).

Finally, EEA also will be coordinating with the Minerals Management Service (MMS) through a recently constituted Task Force on developing renewable energy projects in federal waters. This MMS-Massachusetts Task Force convened for the first time in November 2009 and will be meeting to discuss appropriate steps in the MMS renewable energy and leasing program. The Task Force includes state and federal agencies, tribal representatives, regional planning agencies, and Cape Cod, Nantucket, Martha's Vineyard, and Buzzard's Bay municipal representatives.

Northeast Regional Ocean Council

In June 2009, President Obama issued an executive directive calling for the development of a national ocean policy to ensure the protection, maintenance, and restoration of the health of ocean, coastal, and Great Lakes ecosystems and resources and a national framework for effective marine spatial planning in the United States. Led by the White House Council on Environmental Quality, an Interagency Ocean Policy Task Force released its interim report on national ocean policy in September 2009 and its interim marine spatial planning framework in December 2009. Among other recommendations, the marine spatial planning framework calls for regional ocean bodies—such as the Northeast Regional Ocean Council (NROC)—to coordinate the development of voluntary regional ocean plans. Massachusetts was a founding member of NROC and continues to be active in this entity, which brings state and federal agencies together to address regional ocean issues. As a continuing member of NROC, EEA anticipates working closely with NROC (and other entities as appropriate) on the development of a regional ocean plan.

Massachusetts Ocean Partnership

The Massachusetts Ocean Partnership (MOP), an independent organization of ocean stakeholders funded by the Gordon and Betty Moore Foundation, was a key partner during the development of the ocean management plan. MOP worked closely with EEA by providing financial and technical assistance with data analysis, background marine spatial planning research, other various science and research projects, and communications and stakeholder involvement. MOP provided funding and staff that enabled EEA to hold workshops, post on-line videos of meetings and hearings, and engage stakeholders throughout the development of the ocean management plan.

Following plan promulgation, EEA and MOP will continue this effective partnership to ensure continued stakeholder involvement and to enable evolution of the ocean management plan. As described in the science framework (see Volume Two), EEA and MOP anticipate collaborating on a number of the priority science and data acquisition items. These priority research tasks (such as acquisition of higher resolution data related to human uses, development and implementation of a habitat classification methodology, implementation of a data network, and others) are key aspects of the EEA vision for the next version of the ocean management plan and are also MOP priorities. To assist in these tasks, MOP and EEA may also collaborate on additional efforts, such as convening issue-specific, invited-expert workshops as needed. Finally, EEA will continue to work with MOP on communications and

outreach, such as tasks related to informing stakeholders of specific science and research projects.

Science/Data Acquisition Partners

A key aspect of the ocean management plan is that it is based on the best available science, which comes from sources both within and outside Massachusetts state government. EEA intends that this science basis will remain a foundational aspect of the ocean management plan in the future. As in the development of the ocean management plan, EEA will look to existing partners and new collaboration opportunities with other institutions and agencies. However, where possible EEA will provide support to existing programs that provide data and science that will be important to ocean management. The science framework (see Volume Two) provides an overview of some of the partners EEA anticipates working with on specific science/data acquisition priority projects. Other partners include Massachusetts agencies, such as the Natural Heritage and Endangered Species Program for their avifauna expertise, and the Division of Marine Fisheries. EEA will continue to partner with other federal agencies, such as the National Marine Fisheries Service, and other entities such as the Northeast Regional Association of Coastal Ocean Observing Systems for ocean observing/monitoring data. EEA will also look for additional opportunities to collaborate with other entities.

Progress and Performance Assessment

An integrated approach to ocean management is based on an understanding of the ocean ecosystem and the human services provided, such that management decisions incorporate ecosystem and human-use factors. Therefore, it is important that the ocean management plan adapt as better information and science are developed, policy goals evolve, and as experience in applying the ocean management plan framework is gained.

An important part of the science framework is the development and implementation of an assessment/evaluation system using a series of indicators selected for their effectiveness and efficiency in tracking specific environmental and socioeconomic components and processes, and assessing selected management options to provide feedback in an adaptive management approach. The science framework discusses the performance indicators that EEA has selected for use in evaluating the effectiveness of the ocean management plan in meeting its goals, and in evaluating socio-economic and environmental conditions in the planning area. The sections below provide an overview of the approach EEA intends to follow for evaluating the information gained through these indicators and in communicating this evaluation to the public.

Performance Indicators

As described in the science framework, EEA has developed a series of performance indicators (grouped by general subject matter—governance, environmental, and socio-economic) intended to assess the ocean management plan and to identify general trends in the ocean planning area. These indicators are presented in Table 3-1.

Table 3-1 - Performance indicators for the ocean management plan

Category	Indicator
Environmental	Change in location and/or extent of core and important habitat (e.g., feeding, nesting, breeding) of SSU species (whales, birds)
	Change in abundance/population density of species within existing SSUs (whales, birds)
	Change in areal extent of SSU resources (eelgrass, mudflats, hard/complex bottom)
	Change in fish, mollusks, and crustacean species within existing SSUs: 1) change in total biomass/abundance; 2) change in distribution of biomass/abundance across species*
	Expansion of the range of watched invasive species
	Fish Population Assessment (through use of metrics such as biomass of species, volume of fisheries landings, mean length of fish sampled, # individuals)
	Mean sea level rise
	Sea surface, water column, and bottom temperature
Socio-economic	Economic value of fisheries (commercial)
	Economic value and leased area of aquaculture operation
	Economic value of fisheries (recreational)
	Economic value and total production capacity of offshore renewable energy
	Economic value of recreational boating
Governance	Number and areal extent of management areas: SSUs, areas designated for a particular use, and areas designated for multi-use
	Number of projects proposed/permitted in use areas and areal extent, by type
	Number of projects proposed/permitted in SSUs
	Number of actions in science framework initiated/implemented
	% of required state energy produced from renewable energy in planning area
	Resources expended for implementation of plan and science framework
	Mitigation funds paid to the Ocean Use Trust Fund

As discussed in the science framework, other performance indicators (particularly in the socio-economic and environmental categories) were examined for their potential applicability, and in many cases data availability was a limiting factor. As additional

data becomes available, and in response to future policy issues, EEA intends to review periodically the list of performance indicators, and the analyses conducted under the auspices of each, to ensure that they are appropriate and useful. Further refinement of the indicators listed in Table 1 will also be reviewed periodically. In general, the governance indicators are intended to help EEA and other stakeholders identify the success or any issues in implementing the ocean management plan. The socio-economic and environmental indicators are intended to help identify new or emerging issues that may be appropriately addressed in the ocean management plan. If other management approaches are pursued in the ocean management plan, these indicators may be revised.

Process for Reporting Progress

As described above, EEA intends to report annually to the OAC on the progress made in implementing the ocean management plan. This will allow a review of any issues that emerged or were addressed during the previous year, trends that are being seen through the application of the performance indicator framework, or potential identification of new, emerging, or evolving policy issues for the ocean management plan.

Appendix 1 - The Oceans Act of 2008

Chapter 114 of the Acts of 2008
AN ACT RELATIVE TO OCEANS.

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same as follows:

SECTION 1. Chapter 10 of the General Laws is hereby amended by inserting after section 35GG the following section:-

Section 35HH. There shall be established and set up on the books of the commonwealth a separate fund to be administered by the secretary of energy and environmental affairs, as trustee, in consultation with the department of environmental protection, to be known as the Ocean Resources and Waterways Trust Fund. There shall be credited to the fund any revenue from appropriations or other monies authorized by the general court and specifically designated to be credited to the fund, any appropriation or grant explicitly made to the fund and any income derived from the investment of amounts credited to the fund and the proceeds from any ocean development mitigation fees established pursuant to section 18 of chapter 132A. The priority for use of funds derived from compensation or mitigation for ocean development projects shall be to restore or enhance marine habitat and resources impacted by the project for which the compensation or mitigation shall have been received. The funds derived from compensation or mitigation related to public navigational impacts shall be dedicated to public navigational improvements; provided, however, that any funds for the enhancement of fisheries resources shall be directed to conduct fisheries restoration and management programs. Any other amounts credited to the fund shall be used, without further appropriation, only for the purposes of environmental enhancement, restoration and management of ocean resources by the secretary pursuant to section 4C of chapter 21A. No expenditure from the fund shall cause the fund to be in deficiency at the close of a fiscal year. Monies deposited in the fund that are unexpended at the end of the fiscal year shall not revert to the General Fund and shall be available for expenditure in the subsequent fiscal year.

SECTION 2. Chapter 21A of the General Laws is hereby amended by inserting after section 4B the following section:-

Section 4C. (a) The ocean waters and ocean-based development of the commonwealth, within the ocean management planning area described in this section, shall be under the oversight, coordination and planning authority of the secretary of energy and environmental affairs, hereinafter referred to as the secretary, in accordance with the public trust doctrine. Notwithstanding any general or special law to the contrary, the secretary, in consultation with

the ocean advisory commission established pursuant to subparagraph (c) and the ocean science advisory council established pursuant to subparagraph (d), shall develop an integrated ocean management plan, which may include maps, illustrations and other media. The plan shall: (i) set forth the commonwealth's goals, siting priorities and standards for ensuring effective stewardship of its ocean waters held in trust for the benefit of the public; and (ii) adhere to sound management practices, taking into account the existing natural, social, cultural, historic and economic characteristics of the planning areas; (iii) preserve and protect the public trust; (iv) reflect the importance of the waters of the commonwealth to its citizens who derive livelihoods and recreational benefits from fishing; (v) value biodiversity and ecosystem health; (vi) identify and protect special, sensitive or unique estuarine and marine life and habitats; (vii) address climate change and sea-level rise; (viii) respect the interdependence of ecosystems; (ix) coordinate uses that include international, federal, state and local jurisdictions; (x) foster sustainable uses that capitalize on economic opportunity without significant detriment to the ecology or natural beauty of the ocean; (xi) preserve and enhance public access; (xii) support the infrastructure necessary to sustain the economy and quality of life for the citizens of the commonwealth; (xiii) encourage public participation in decision-making; (xiv) and adapt to evolving knowledge and understanding of the ocean environment; and (xv) shall identify appropriate locations and performance standards for activities, uses and facilities allowed under sections 15 and 16 of chapter 132A. The division of marine fisheries, pursuant to chapter 130 and any other applicable general or special law, shall have sole responsibility for developing and implementing any fisheries management plans or fisheries regulations. Marine fisheries shall be managed in compliance with the applicable rules and regulations of the division of marine fisheries and federal or interstate fishery management plans issued pursuant to said chapter 130 or any other applicable general or special law and shall be integrated, to the maximum extent practicable, with an ocean management plan.

(b) An ocean management plan shall include any waters and associated submerged lands of the ocean, including the seabed and subsoil, lying between the line designated as the "Nearshore Boundary of the Ocean Management Planning Area", which is depicted on a plan dated January 31, 2006, prepared by the office of coastal zone management and maintained at the executive office of energy and environmental affairs and with the clerks of the house and the senate, and the seaward boundary of the commonwealth, as defined in 43 U.S.C. § 1312. An ocean management plan may take into account the different regional characteristics of the commonwealth's waters. A plan shall include existing municipal, state and federal boundaries and may include recommendations for clarifying those boundaries.

(c)(i) There shall be an ocean advisory commission to assist the secretary in developing the ocean management plan. The commission shall consist of 3 members of the senate, 1 of whom shall be appointed by the minority leader of the senate; 3 members of the house of representatives, 1 of whom shall be appointed by the minority leader of the house of representatives; the director of coastal zone management or his designee; the director of marine

fisheries or his designee; the commissioner of environmental protection or his designee; and 8 members to be appointed by the governor, 1 of whom shall be a representative of a commercial fishing organization, 1 of whom shall be a representative of an environmental organization, 1 of whom shall have expertise in the development of offshore renewable energy, 1 of whom shall be a representative of the Cape Cod commission, 1 of whom shall be a representative of the Martha's Vineyard Commission, 1 of whom shall be a representative of the Merrimack Valley Planning Commission, 1 of whom shall be a representative of the metropolitan area planning council and 1 of whom shall be a representative of the Southeastern Regional Planning and Economic Development District. Members shall be appointed for terms of 3 years, except that, initially, 4 members appointed by the governor shall be appointed for terms of 2 years and 3 members appointed by the governor shall be appointed for terms of 1 year. The appointing authority may fill any vacancy that occurs in an unexpired term. The members of the commission shall be selected with due regard to coastal geographic distribution.

(ii) The commission shall meet at least quarterly and at the discretion of the secretary. The commission shall hold public meetings relative to matters within the jurisdiction of the ocean management plan and shall make recommendations to the secretary for the proper management and development of the plan. The secretary shall consider the recommendations of the commission.

(iii) The office of coastal zone management and division of marine fisheries shall provide technical support to the commission.

(d) There shall be an ocean science advisory council to assist the secretary in creating a baseline assessment and obtaining any other scientific information necessary for the development of an ocean management plan. The council shall consist of 9 members to be appointed by the secretary, 3 of whom shall be scientists from academic institutions, at least 1 of whom shall be from the School for Marine Science and Technology at the University of Massachusetts at Dartmouth and at least 1 of whom shall be from the Department of Environmental, Earth and Ocean Sciences at the University of Massachusetts at Boston; 3 of whom shall be scientists from private, nonprofit organizations, at least 1 of whom shall be a scientist designated by the Massachusetts Fishermen's Partnership; and 3 of whom shall be scientists from government agencies with demonstrated technical training and experience in the fields of marine ecology, geology, biology, ichthyology, mammalogy, oceanography or other related ocean science disciplines, at least 1 of whom shall be from the division of marine fisheries. The secretary shall serve as coordinator of the council. The council shall meet at least quarterly and at any other time that the secretary shall deem necessary to assist him in compiling the scientific information necessary for the development of an ocean management plan.

(e) Upon the secretary's adoption of an ocean management plan, all certificates, licenses,

permits and approvals for any proposed structures, uses or activities in areas subject to the ocean management plan shall be consistent, to the maximum extent practicable, with the plan.

(f) The secretary shall develop and implement a public outreach and information program to provide information to the public regarding the ocean management planning process.

(g) The secretary shall, at least 6 months before establishing an ocean management plan pursuant to this section, provide for public access to the draft plan in electronic and printed copy form and shall provide for a public comment period, which shall include at least 4 public hearings in at least 4 different coastal regions. The secretary shall publish notice of the hearings in the Environmental Monitor within 30 days of the date of the hearing. A notice of the public hearing shall also be placed, at least once each week for the 4 consecutive weeks preceding the hearing, in newspapers with sufficient circulation to notify the residents of the coastal region where the hearing shall be held. The hearing shall be held not sooner than 30 days and not later than 35 days after the notice is published in the Environmental Monitor. The public comment period shall remain open for at least 60 days from the date of the final public hearing. After the close of the public comment period, the secretary shall issue a final ocean management plan and shall file the plan, together with legislation necessary to implement the plan, if any, by filing the same with the clerks of the house of representatives and senate.

(h) The secretary shall promulgate regulations to implement, administer and enforce this section and shall interpret this section and any regulations adopted hereunder consistent with his power to enforce the laws. These regulations shall include provisions for the review of the ocean management plan, its baseline assessment and the enforceable provisions of relevant statutes and regulations at least once every 5 years.

(i) The joint committee on state administration and regulatory oversight, in this subsection called the committee, may review a proposed ocean management plan or regulations proposed or adopted pursuant to this chapter. The committee shall consult with the joint committee on environment, natural resources and agriculture in performing this review. The committee may hold public hearings concerning a proposed ocean management plan or a proposed or existing regulation and may submit to the secretary comments concerning the merit and appropriateness of the plan or regulations to be promulgated and an opinion on whether the proposed plan or regulations are authorized by, and consistent with, this chapter and existing state laws and regulations. The secretary shall respond in writing within 10 days to the committee's written questions relevant to the committee's review of a proposed plan or proposed or existing regulation. The secretary shall provide to the committee, without charge, copies of all public records in the secretary's custody relating to the proposed plan or regulation or action in question within 10 days of a request by the committee. The committee may issue a report with proposed changes to a proposed plan or proposed or existing regulation and shall transmit this report to the secretary. If the secretary does not adopt the proposed changes

contained in the committee's report, the secretary shall notify the committee in writing of the reasons why he did not adopt the changes either at the time he adopts a proposed plan or proposed regulation or within 21 days of receiving the committee's report on an existing regulation.

(j) The ocean management plan shall be consistent with this section and all other general and special laws. The ocean management plan shall not be construed to supersede existing general or special laws, or to confer rights and remedies in addition to those conferred by existing general or special laws.

(k)(1) In the geographic area subject to the ocean management plan, as described in paragraph (b), commercial and recreational fishing shall be allowable uses, subject to the exclusive jurisdiction of the division of marine fisheries. Any component of a plan which regulates commercial or recreational fishing shall be developed, promulgated and enforced by the division of marine fisheries pursuant to its authority under chapter 130.

(2) A component of an ocean management plan which does not have as its primary purpose the regulation of commercial or recreational fishing but which has an impact on such fishing shall minimize negative economic impacts on commercial and recreational fishing. Prior to inclusion in an ocean management plan, a component with such a reasonably foreseeable impact shall be referred to the division of marine fisheries, which shall, in writing and in a timely and efficient manner, evaluate the component for its impact on commercial and recreational fishing and, if possible, develop and recommend to the secretary any suggestions or alternatives to mitigate or eliminate any adverse impacts.

(3) The director of marine fisheries, subject to the approval of the marine fisheries advisory commission, shall have sole authority for the opening and closing of areas within the geographic area described in subsection (b) for the taking of any and all types of fish, pursuant to section 17A of chapter 130. Nothing in this section shall be construed to limit the powers of the director pursuant to section 17 of chapter 130 or any other provision thereto.

SECTION 3. Section 12B of chapter 132A of the General Laws, as appearing in the 2006 Official Edition, is hereby amended by striking out the definitions of "Commissioner" and "Department" and inserting in place thereof the following definition:-

"Director", the director of coastal zone management.

SECTION 4. Said section 12B of said chapter 132A, as so appearing, is hereby further amended by inserting after the definition of "Facilities plan" the following definition:-

"Office", office of coastal zone management.

SECTION 5. Section 12C of said chapter 132A, as so appearing, is hereby amended by striking out, in lines 1 and 3, the word "department" and inserting in place thereof, in each instance, the following word:- office.

SECTION 6. Section 14 of said chapter 132A, as so appearing, is hereby amended by striking out, in line 2, the word "department" and inserting in place thereof the following word:- office.

SECTION 7. Said chapter 132A, as so appearing, is hereby further amended by striking out section 15 and inserting in place thereof the following section:-
Section 15. Except as otherwise provided in this section, the following activities shall be prohibited in an ocean sanctuary:

(1) the building of any structure on the seabed or under the subsoil;

(2) the construction or operation of offshore or floating electric generating stations, except: (a) on an emergency and temporary basis for the supply of energy when the electric generating station is otherwise consistent with an ocean management plan; or (b) for appropriate-scale renewable energy facilities, as defined by an ocean management plan promulgated pursuant to section 4C of chapter 21A, in areas other than the Cape Cod Ocean Sanctuary; provided, however, that (i) the renewable energy facility is otherwise consistent with an ocean management plan; (ii) siting of all such facilities shall take into account all relevant factors, including but not limited to, protection of the public trust, compatibility with existing uses, proximity to the shoreline, appropriateness of technology and scale, environmental protection, public safety and community benefit; and (iii) in regions where regional planning agencies have regulatory authority, a regional planning agency may review the appropriate-scale offshore renewable energy facilities as developments of regional impact and the applicant may seek review pursuant to the authority of the energy facilities siting board to issue certificates of environmental impact and public interest pursuant to sections 69K through 69O of chapter 164;

(3) the drilling or removal of any sand, gravel or other minerals, gases or oils;

(4) the dumping or discharge of commercial, municipal, domestic or industrial wastes;

(5) commercial advertising; or

(6) the incineration of solid waste or refuse on, or in, vessels moored or afloat within the boundaries of an ocean sanctuary.

SECTION 8. Section 16 of said chapter 132A, as so appearing, is hereby amended by striking out, in lines 14 and 15, the words "telecommunications and energy" and inserting in place thereof the

following words:- public utilities or the department of telecommunications and cable.

SECTION 9. Said section 16 of said chapter 132A, as so appearing, is hereby further amended by striking out, in line 20 and in lines 28 and 29, the word "department" and inserting in place thereof, in each instance, the following word:- office.

SECTION 10. Said section 16 of said chapter 132A, as so appearing, is hereby further amended by striking out, in lines 29 and 30, the words "fisheries, wildlife and environmental law enforcement" and inserting in place thereof the following words:- fish and game.

SECTION 11. Section 16A of said chapter 132A, as so appearing, is hereby amended by inserting after the word "department", in line 6, the following words:- of environmental protection.

SECTION 12. Section 16B of said chapter 132A, as so appearing, is hereby amended by striking out, in line 26 and in lines 30 and 31, the words "and the division of water pollution control" and inserting in place thereof the following words:- of environmental protection.

SECTION 13. Section 16C of said chapter 132A, as so appearing, is hereby amended by inserting after the word "department", in lines 1 and 5, the following words:- of environmental protection.

SECTION 14. Section 16E of said chapter 132A, as so appearing, is hereby amended by inserting after the word "department", in lines 1 and 2 and line 5, the following words:- of environmental protection.

SECTION 15. Said section 16E of said chapter 132A, as so appearing, is hereby further amended by inserting after the word "commissioner", in lines 13 and 14, the following words:- of environmental protection.

SECTION 16. Section 16F of said chapter 132A, as so appearing, is hereby amended by inserting after the word "department", in line 1, the following words:- of environmental protection.

SECTION 17. Said section 16F of said chapter 132A, as so appearing, is hereby further amended by striking out the last sentence.

SECTION 18. Section 18 of said chapter 132A, as so appearing, is hereby amended by inserting, after the word "of", in line 2, the following words:-energy and.

SECTION 19. Said section 18 of said chapter 132A, as so appearing, is hereby further amended by striking out, in lines 7 and 8 and line 9, the word "department" and inserting in place thereof, in each instance, the following word:- office.

SECTION 20. Said section 18 of said chapter 132A, as so appearing, is hereby further amended by adding the following paragraph:-

Any permit or license issued by a department, division, commission, or unit of the executive office of energy and environmental affairs and other affected agencies or departments of the commonwealth for activities or conduct consistent with this chapter shall be subject to an ocean development mitigation fee as shall be established by the secretary of energy and environmental affairs; provided, however, that no fee shall be assessed on commercial and recreational fishing permits or licenses. All the proceeds of the ocean development mitigation fee shall be deposited in the Ocean Resources and Waterways Trust Fund established pursuant to section 35HH of chapter 10.

SECTION 21. Nothing in this act shall be construed to alter the jurisdictional authority of the division of marine fisheries. Nothing in this act shall be construed to prohibit the transit of commercial fishing vessels and recreational vessels in state ocean waters.

SECTION 22. Any project that, before the effective date of this act, has: (1) filed a license application under chapter 91 of the General Laws and received a written determination of completeness from the department of environmental protection; (2) if subject to section 61 of chapter 30 of the General Laws, received a certificate of adequacy regarding a final environmental impact report; or (3) if the project is subject to the jurisdiction of the energy facilities siting board, received both a final decision from the energy facilities siting board and a certificate of adequacy regarding a draft environmental impact report, shall not be subject to the requirements of said ocean management plan.

SECTION 23. The secretary of energy and environmental affairs shall promulgate a final ocean management plan by December 31, 2009. Upon adoption, an ocean management plan shall formally be incorporated into the Massachusetts coastal zone management program, as referenced in section 4A of chapter 21A of the General Laws.

SECTION 24. Section 8 of this act shall take effect upon the adoption of an ocean management plan or by December 31, 2009, whichever occurs first.

SECTION 25. The secretary of energy and environmental affairs shall convene an advisory committee for the purpose of reviewing section 16 of chapter 132A of the General Laws and regulations promulgated pursuant thereto. The advisory committee shall review the regulatory definitions of "public necessity and convenience" and "significant alteration". The secretary shall submit a report, together with legislative recommendations, if any, to the joint committee on environment, natural resources and agriculture by December 31, 2009.

Approved May 28, 2008

Appendix 2 - Data Used in Plan Development

The following table lists the data used in development of the draft Massachusetts Ocean Management Plan. It includes the datalayer name used in MORIS, the Massachusetts Ocean Resource Information System (available at www.mass.gov/czm/mapping/index.htm), the original source of the data (labeled "originator"), and a brief description of the data. More detailed information about specific datalayers can be found in the layer's metadata record, which can be viewed in MORIS by clicking on the 'Layer Info' tab.

Datalayer Name	Originator	Description
Active Disposal Sites	Massachusetts Office of Coastal Zone Management (CZM) and National Oceanic and Atmospheric Administration (NOAA)	These data were created by combining the Cape Cod Bay disposal site created by CZM and active disposal sites (Cape Cod Canal, Cleveland Ledge, and Massachusetts Bay) selected from the dumping grounds data layer extracted from NOAA's Electronic Navigational Charts (ENC) Direct to GIS web portal.
Anchorage Areas	Massachusetts Office of Geographic and Environmental Information (MassGIS)/CZM and NOAA	This layer was created by combining an anchorage berth dataset digitized from NOAA nautical charts by MassGIS/CZM and selected anchorage areas extracted from NOAA's ENC Direct to GIS web portal.
Automatic Identification System (AIS)	Stellwagen Bank National Marine Sanctuary (raw data)	This dataset documents the density of vessel tracks during 2008 in the Massachusetts ocean management planning area for commercial vessels greater than 299 tons. CZM digitized polygons from this dataset to represent areas where greater than 50 vessels were recorded over the duration of the year 2008 in a 250 x 250-meter grid cell.
Bathymetry	CZM	These data represent a mosaic of bathymetric datasets of waters off the coast of Massachusetts derived from the most current and accurate sources, including U.S. Geological Survey (USGS) Open File Reports, NOAA Estuarine Bathymetry, and the NOAA Coastal Relief Model. Contour lines for display and analysis were derived from these data.
Cable Areas	NOAA	Cable areas in Massachusetts were extracted from NOAA's ENC Direct to GIS web portal.

Datalayer Name	Originator	Description
Cables	CZM	To create this layer, the CZM datasets, "Harwich Port to Nantucket Harbor electric supply cable (National Grid Nantucket Cable No. 1), Nantucket Sound, Massachusetts, 2005" and "Hyannis to Nantucket Harbor electric supply cable (National Grid Nantucket Cable No. 2), Nantucket Sound, Massachusetts, 2005," were combined with cables CZM digitized from NOAA nautical charts.
Colonial Nesting Waterbirds	Massachusetts Division of Fisheries and Wildlife (DFW), Natural Heritage and Endangered Species Program (NHESP)	These sites represent areas where more than 100 pairs of the following species of colonial nesting waterbirds were observed during surveys in 1994 and 2006: Common Terns, Least Terns, Roseate Terns, Arctic Terns, Leach's Storm-petrels, Double-crested Cormorants, Herring Gulls, Great Black-backed Gulls, Laughing Gulls, Black Skimmers, Great Egrets, Snowy Egrets, Cattle Egrets, Little Blue Herons, Black-crowned Night Herons, and Glossy Ibis. The Important Habitat areas are the nesting sites buffered 0.3 nautical miles.
Commercial Fisheries Activity	Massachusetts Division of Marine Fisheries (DMF)	These data represent areas important to Massachusetts commercial fisheries in terms of fishing effort and landings value. These data were derived from DMF fishermen catch reports, Standard Atlantic Fisheries Information System dealer transaction reports, and National Marine Fisheries Service vessel trip reports. The fishing effort and landings value from all sources were combined and reclassified into top 25%, middle 50%, and bottom 25%. For the ocean management plan, high commercial fishing areas by effort and value were extracted.
Eelgrass	Massachusetts Department of Environmental Protection (DEP) Wetlands Conservancy Program (WCP)	The DEP eelgrass layer was produced from data collected, using similar methodologies, in 2001 and 1995. DEP staff interpreted 1:20,000 aerial photography at low tide during summer months (high eelgrass biomass) to delineate eelgrass polygons and then field-verified the polygons. Since this dataset incorporates other seagrass species which are found outside of the planning area, eelgrass polygons were extracted for use in the ocean management plan.
Ferry Routes	Massachusetts Department of Transportation (MassDOT)	This layer is the MassDOT dataset, "Ferry Routes" (updated December 2008).
Fin Whales	NOAA National Centers for Coastal Ocean Science (NCCOS)	This dataset is drawn from a NOAA NCCOS report that characterizes cetacean sightings for the years 1970-2005 in the southern Gulf of Maine. The report includes records from dedicated aerial surveys and other platforms, and bias from uneven allocation of survey effort (temporally or spatially) was corrected using a sighting-per-unit-effort (SPUE) algorithm. SPUE values for each 5 x 5 minute grid cell were then interpolated spatially. The resulting interpolations were classified into quantiles and exported as filled contour polygon shapefiles. NOAA binned the data into five classes, and NHESP biologists and CZM extracted the top two classes to represent "core" habitat.

Datalayer Name	Originator	Description
Fisheries Resources	DMF	This dataset was derived from the DMF Resource Assessment Trawl Survey collected from 1978-2007. To create this layer, 22 species were selected for consideration. See the fisheries work group report for the description of the methodology used to identify high, medium, and low categories. For the ocean management plan, high resource areas were extracted.
Gas Pipelines	CZM	CZM acquired original engineering plans to create these data.
Hard/Complex Bottom	CZM	Hard/complex bottom is seafloor that is characterized by any combination of the following: 1) areas of exposed bedrock or concentrations of boulder, cobble, or other similar hard bottom distinguished from surrounding unconsolidated sediments, 2) a morphologically rugged seafloor characterized by high variability in bathymetric aspect and gradient, or 3) man-made structures, such as artificial reefs, wrecks, or other functionally equivalent structures that provide additional suitable substrate for development of hard bottom biological communities. On a project-specific basis, proponents will be responsible for the data and analysis to delineate hard/complex bottom, pursuant to Secretary scoping requirements in the MEPA process. Guidance will be developed by the EEA Ocean Team to further define this SSU and how it should be identified by proponents on a project-specific basis. Issues to be addressed will include descriptions of scale, biogenic reefs, definitions of terms (e.g. cobble), biological communities with vertical relief, and energetic stability. Hard/complex seafloor serves as refuge and nursery areas for a variety of life stages of demersal species. Various substrates are conducive to the development of biological communities which add to seafloor complexity, including colonizing algae, sponges, cnidarians, mollusks, bryozoans, polycheate worms, and tunicates. These communities in turn further support a diverse assemblage of fish, echinoderms, and crustaceans. For the ocean management plan, EEA created a map of hard/complex bottom by combining three data sources. First, a statewide bathymetry data set was created by combining the highest resolution bathymetric data sets available and then calculating rugosity, a measure of bathymetric heterogeneity. Highly rugose areas were then combined with seafloor delineated as hard bottom in USGS interpreted seafloor maps. Finally, the combination of these two data sets were added to points coded as hard bottom in an augmented usSEABED sediment database. The resultant map is representative of hard/complex bottom, in that it is based upon the highest resolution data available, and a specific project may obtain higher resolution data for project planning purposes.

Datalayer Name	Originator	Description
Humpback Whales	NCCOS	This dataset is drawn from a NOAA NCCOS report that characterizes cetacean sightings for the years 1970-2005 in the southern Gulf of Maine. The report includes records from dedicated aerial surveys and other platforms, and bias from uneven allocation of survey effort (temporally or spatially) was corrected using a sighting-per-unit-effort (SPUE) algorithm. SPUE values for each 5 x 5 minute grid cell were then interpolated spatially. The resulting interpolations were classified into quantiles and exported as filled contour polygon shapefiles. NOAA binned the data into five classes and NHESP biologists and CZM extracted the top two classes to represent "core" habitat.
Inactive Disposal Sites	NOAA	These data were extracted from NOAA's ENC Direct to GIS web portal.
Intertidal Flats	DEP-WCP	This dataset originated with the Massachusetts DEP and is part of a broader wetlands dataset. Wetland areas were interpreted from 1:12,000 scale, stereo color-infrared photography by staff at UMASS Amherst and then field checked by DEP-WCP. A WCP consultant scanned completed interpretations and converted them into rectified polygons and lines using standard photogrammetric techniques. WCP GIS staff performed final quality control. Intertidal flat polygons were extracted for use in the ocean management plan.
Land Use and Land Cover	NOAA, National Park Service (NPS), and U.S. Fish and Wildlife Service (FWS)	This dataset was created by combining reclassified National Oceanic and Atmospheric Administration Coastal Change Analysis Program (C-CAP) data, the National Park Service's Cape Cod National Seashore data layer, and the U.S. Fish and Wildlife Service's National Wildlife Refuges dataset. CZM grouped the C-CAP data into three classes (from more to less developed): high and medium intensity developed; low intensity developed, open spaces developed, cultivated land, and pasture/hay; and all other land use and land cover classes. The Cape Cod National Seashore and National Wildlife Refuges were overlaid on the reclassified C-CAP data as the least developed land cover class, and these four classes were displayed. The data were clipped to within a half mile of the coast.
Leach's Storm-Petrels	DFW/ NHESP	Leach's Storm-petrel is a state-listed endangered species that breeds at two locations in Massachusetts (Nomans Land Island and Penikese Island) as observed by DFW biologists. The Important Habitat areas are these breeding areas buffered 0.3 nautical miles.

Datalayer Name	Originator	Description
Long-tailed Ducks	Massachusetts Audubon Society (Mass Audubon) and NHESP	This dataset originated with MassAudubon with additional analysis by the NHESP. MassAudubon provided radio telemetry data from Long-tailed Ducks tagged in Nantucket Sound, and from this data MA NHESP developed the spatial representation of their core habitat. The core habitat represented in the planning area includes night-time concentration areas north of Nantucket and the area of concentrated commutes to the south of Nantucket. Long-tailed Ducks have a unique winter behavior where they make a daily "commute" from Nantucket Sound, where they concentrate in particular areas at night, across Nantucket Island to Nantucket Shoals, where they disperse to feed during the day. Because this behavior and Long-tailed Duck spatial distribution on Nantucket Shoals is being studied, the plan does not indicate core habitat for Long-tailed Ducks south of the planning area.
Massachusetts Aeronautics Commission (MAC) Aviation Buffers	CZM	CZM created this layer by buffering a 10,000-foot radius around the MassDOT "Airports" (current as of June 2006) data layer.
MMTA Recreational Fishing and Boating Survey	Massachusetts Marine Trades Association (MMTA)	This data layer represents recreational fishing and boating areas identified by MMTA in the Massachusetts ocean management planning area. MMTA marked NOAA charts with boat routes, recreational fishing areas, recreational boating areas, and sail boat race areas as specified by MMTA members.
National Register of Historic Places (NRHP)	NPS	This dataset contains the locations and basic attributes of sites, buildings, objects, structures, and districts listed on the National Register of Historic Places (NRHP). *NOTE: Only properties LISTED prior to the date of this dataset ("beginning of 2007") are contained in this layer. Properties determined eligible, pending nomination, or pending owner objection do not appear in this dataset.
North Atlantic Right Whales	NCCOS	This dataset is drawn from a NOAA NCCOS report that characterizes cetacean sightings for the years 1970-2005 in the southern Gulf of Maine. The report includes records from dedicated aerial surveys and other platforms, and bias from uneven allocation of survey effort (temporally or spatially) was corrected using a sighting-per-unit-effort (SPUE) algorithm. SPUE values for each 5 x 5 minute grid cell were then interpolated spatially. The resulting interpolations were classified into quantiles and exported as filled contour polygon shapefiles. NOAA binned the data into five classes and NHESP biologists and CZM extracted the top two classes to represent "core" habitat.
Pilot Boarding Areas	CZM	Representatives from state pilot associations (Boston Harbor Pilot Association and Northeast Pilots Association) provided the center coordinate of five pilot boarding areas in the Massachusetts ocean management planning area. The Boston Harbor pilot boarding area was buffered by a nautical mile radius, and the remaining four pilot boarding areas were buffered by a 0.5 nautical mile radius.

Datalayer Name	Originator	Description
Potential Tidal Resources	CZM	ADCIRC Coastal Circulation and Storm Surge Model is a system of computer programs for solving time dependent, free surface circulation and transport problems in two and three dimensions. The model was used by Applied Science Associates to provide an estimate of the maximum tidal currents experienced in the Massachusetts ocean management planning area during a tidal cycle. All areas with a current speed exceeding 2.75 knots were selected and isolated.
Precautionary Areas	NOAA	These data were extracted from NOAA's ENC Direct to GIS web portal.
Proposed New England Marine Renewable Energy Center (MREC) Test Area	CZM	CZM digitized the MREC proposed area for renewable energy research and projects from coordinates provided by MREC.
Proposed Tidal Energy Project Areas	CZM	This dataset shows the general locations of proposed tidal energy sites in the Massachusetts ocean management planning area from relevant Federal Energy Regulatory Commission (FERC) preliminary permit applications.
Public Open Spaces	MassGIS	This dataset was extracted from the MassGIS "Protected and Recreational OpenSpace" (last updated October 2009) data layer. Generally, sites within one quarter of a mile from the coast were selected, although in some instances parcels farther away from the coast were included due to local topography. This layer was then reviewed to select those polygons with the greatest feasibility of viewing the Massachusetts ocean management planning area. Parcels with no public access were removed.
Recreational Fishing Areas	DMF	This data layer represents the recreational fisheries identified in the Massachusetts ocean management planning area from the DMF Massachusetts Ocean Planning Recreational Fishing Effort Survey. The field study was designed to collect information about recreational fisheries in four regions in Massachusetts state waters. To create this later, polygons drawn on recreational fishing maps developed by DMF were digitized.
Regional Planning Agencies	MassGIS	This dataset was extracted from MassGIS's Regional Planning Agencies (RPAs) (last updated December 2007) data layer. CZM extracted the RPAs adjacent to the Massachusetts ocean management planning area.
Roseate Terns	DFW/ NHESP	This dataset represents documented Roseate Tern breeding, staging (presence of 100 or more individuals), and foraging areas. The breeding and staging sites were identified and mapped by DFW/NHESP biologists and buffered 0.3 nautical miles. Within the foraging areas, DFW/NHESP biologists identified core foraging areas based upon scientific literature to represent the most important foraging areas in the mapped breeding and staging areas. NHESP biologists and CZM extracted the breeding, staging, and critical foraging areas as Roseate Tern core habitat.

Datalayer Name	Originator	Description
Rugosity	CZM	Rugosity is a measure of terrain roughness and is indicative of the amount of habitat available for colonization by epibenthic organisms and shelter and foraging area for mobile organisms. For this dataset, CZM calculated rugosity with an algorithm developed by Sappington et al. 2005 that measures vector dispersion in three dimensions. CZM then reclassified those areas greater than one standard deviation from the mean as "high" rugosity.
Separation Zone	NOAA	Traffic separation zones were extracted from NOAA's ENC Direct to GIS web portal.
Shipping Lanes	CZM	CZM digitized traffic lanes, shipping channels, and recommended routes from current NOAA charts.
Special Concern Terns	DFW/ NHESP	The core habitats delineated for three tern species (Common, Least, and Arctic, all of which are state-listed as species of special concern) include documented breeding, staging (presence of 100 or more pairs), and foraging areas. The breeding and staging sites have been indentified and mapped by DFW/NHESP biologists. These sites were buffered 0.3 nautical miles. Within the foraging areas, DFW/NHESP biologists identified core foraging areas based upon scientific literature to represent the most important foraging areas in the mapped breeding and staging areas. NHESP biologists and CZM extracted the breeding, staging, and critical foraging areas as core habitat.
Surficial Sediments	CZM and DMF	Sediment data from the USGS publication, *usSEABED: Atlantic Coast Offshore Surficial Sediment Data Release* (USGS Data Series 118) were augmented by seafloor sediment data from DMF lobster surveys, DMF trawl surveys, EPA/EMAP grab samples, MWRA grab samples and SPI data, National Coastal Assessment grab samples, and USGS Open File Reports. The data points were converted to Thiessen polygons to create a surficial sediment map, resulting in the following four categories: muddy, sandy, gravelly, and hard bottom. Note that the distribution of points in the aggregate dataset is not uniform- this causes polygons to differ in size and shape throughout Massachusetts waters.
Vessel Monitoring System (VMS)	NMFS Northeast Regional Office	VMS data are collected by NMFS to track fishing vessel activity for law enforcement (closed areas), safety, and scientific study. This dataset documents the density of fishing vessels from September 1, 2007, to September 1, 2008, using the VMS records available for that period. CZM digitized polygons from this dataset to represent areas where greater than 25 vessels were recorded in a 250 x 250-meter grid cell over the duration of the year.

Appendix 3 - Wind Energy Screening

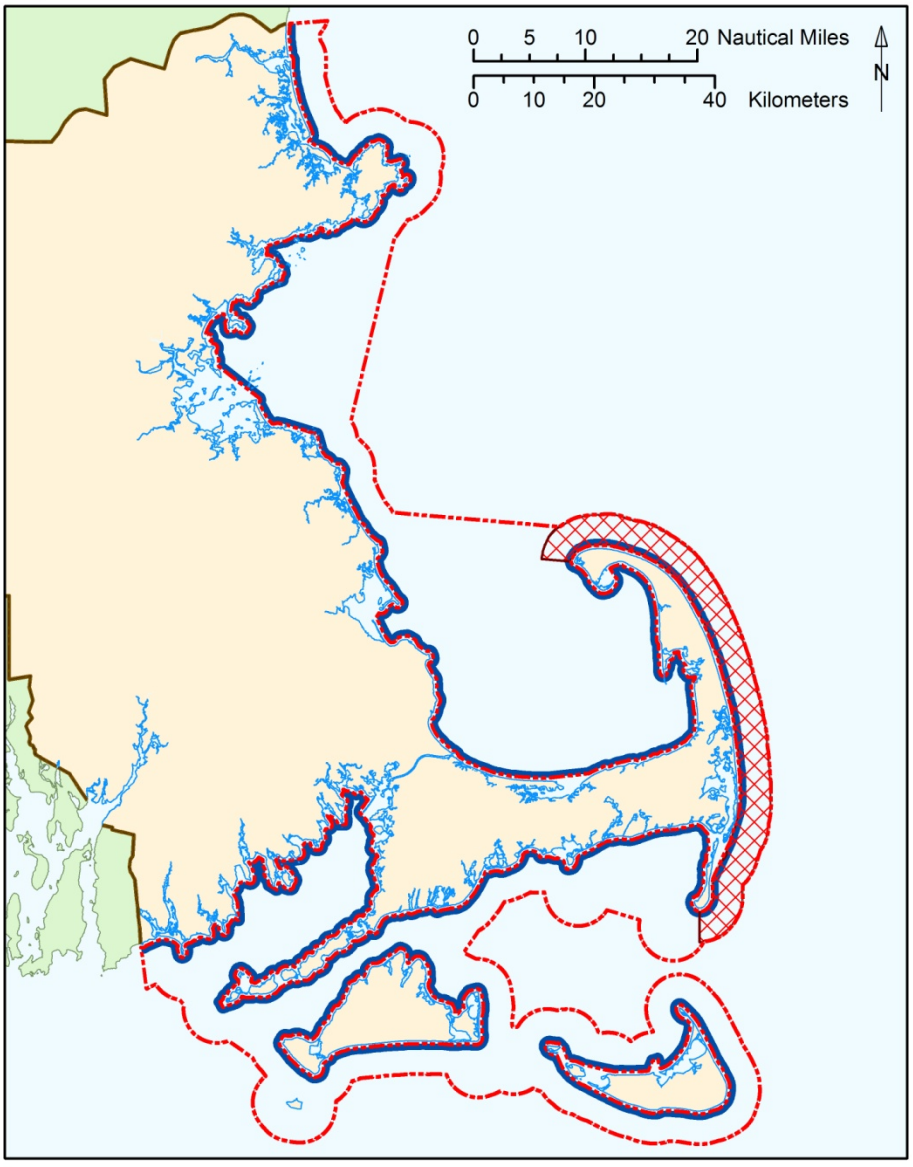
Two proposed Wind Energy Areas were identified based on the presence of a suitable wind resource and water depth, and the absence of conflict with other uses or sensitive resources, as derived through an environmental screening process that applied exclusionary criteria listed below in Table 1 (likely significant impact to incompatible uses or to uses and resources protected by law). Constraint criteria were also developed to identify uses and resources subject to potential impacts; these criteria were applied during the consideration of the relative suitability of potential sites and the designation of final sites. In addition, to the maximum extent feasible these areas were located at least one mile offshore to minimize conflicts with near-shore activity and reduce visual impacts.

Table 1. Exclusionary factors for renewable energy areas

Category	Exclusionary Criteria
Buffer from development and near-coast activities	Areas within 1 mile of shoreline (MLW) of inhabited land
High concentrations of marine avifauna	Core nesting, staging, and critical foraging areas for Roseate Tern
	Special Concern (Arctic, Least, and Common) Tern critical habitat areas
	Long-Tail Duck important habitat
	Colonial water birds important nesting habitat areas
High concentrations of whales	North Atlantic Right Whale core habitat area
Water-dependent marine uses	Coast Guard-designated navigation areas (shipping channels and traffic lanes, precautionary areas, anchorage areas, pilot boarding areas)
	Ferry routes
	Areas of high commercial fishing effort and value
	Direct transit navigation routes for shipping and fishing
Regulated airspace	FAA/MAC designated buffers

After screening to identify potential sites using the exclusionary criteria, EEA considered the overall weight of existing information (including qualitative data, data used in the compatibility assessment, and stakeholder input and public comment). Some areas that passed the screening criteria (which were developed on a use-by-use basis using individual data layers) are characterized by high levels of overall use and/or natural resources. EEA closely examined such areas to determine if the cumulative effect of existing uses and/or natural resources would result in a higher or lower level of compatibility and/or conflict with existing uses or natural resources. This review, which removed a number of areas from further consideration, is described in the following figures (through page 19).

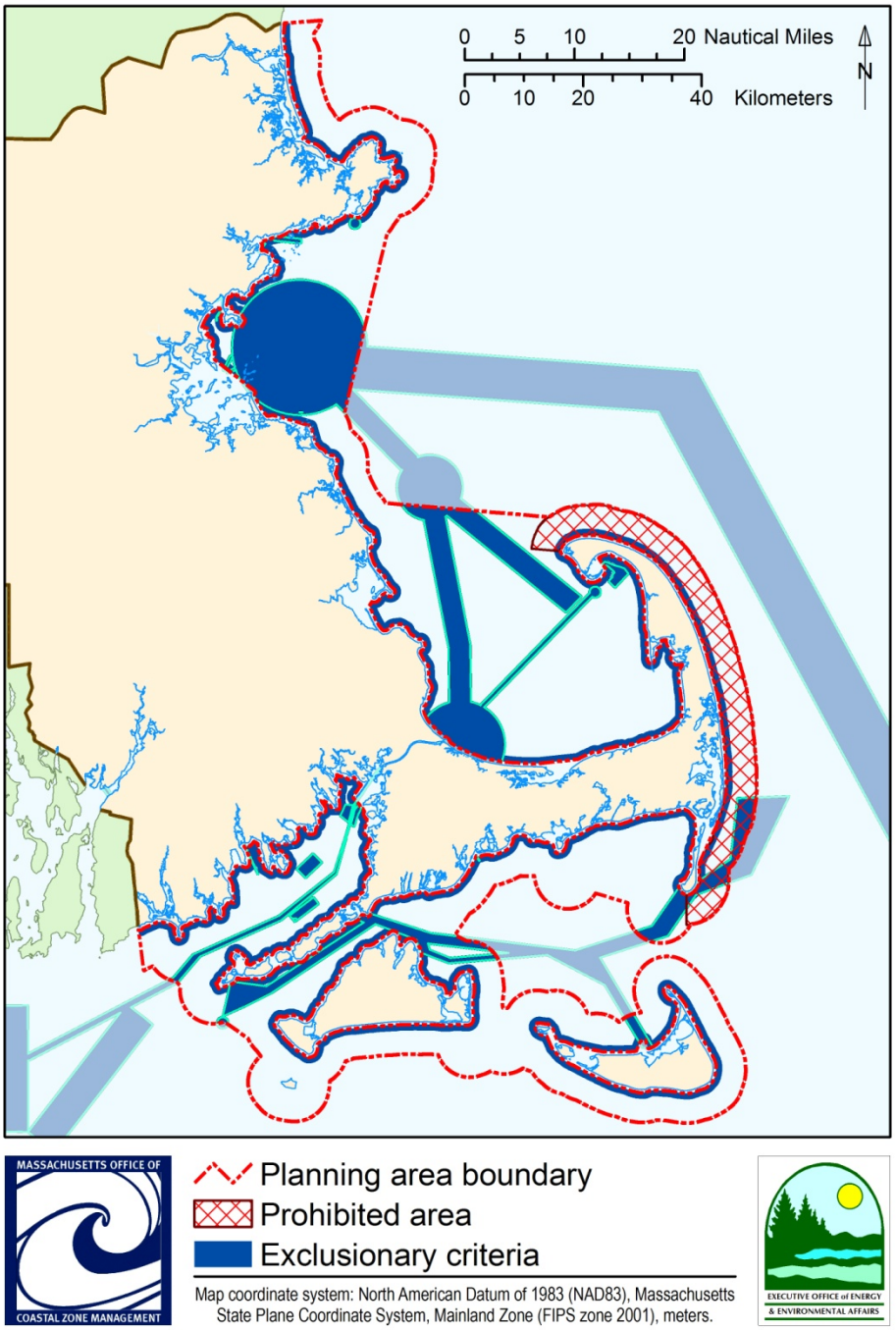
Figure Appendix 3-1 Exclusionary criteria



Based on compatibility considerations (see draft plan, Appendix 2), exclusionary criteria were used to identify commercial-scale wind energy areas. This map illustrates the following criteria:

- One mile from inhabited shoreline

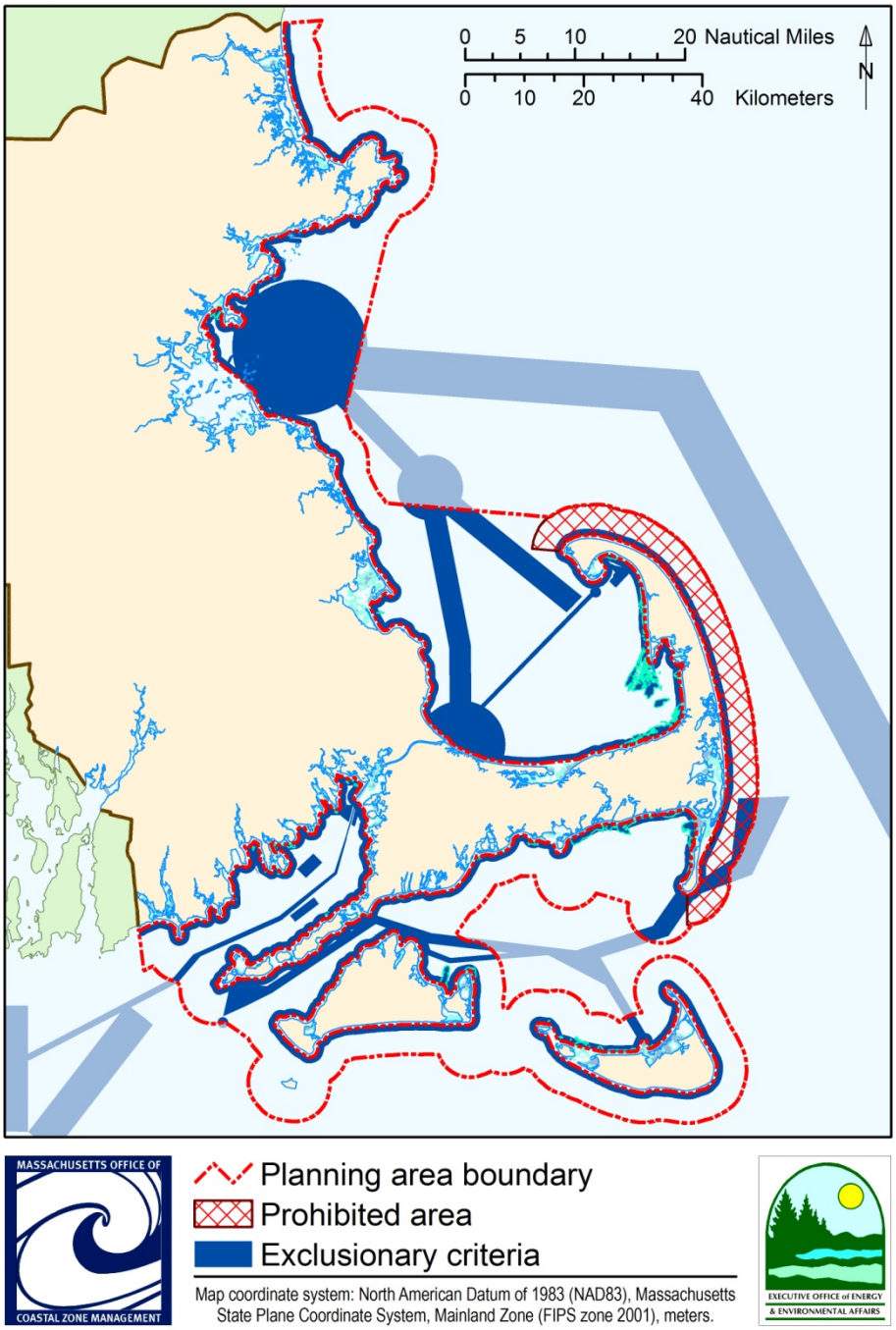
Figure Appendix 3-2 Exclusionary criteria



Based on compatibility considerations, exclusionary criteria were used to identify commercial-scale wind energy areas. This map illustrates the following criteria:

- One mile from inhabited shoreline
- Coast Guard-designated navigation areas (shipping channels and traffic lanes, precautionary areas, anchorage areas, pilot boarding areas) (highlighted)

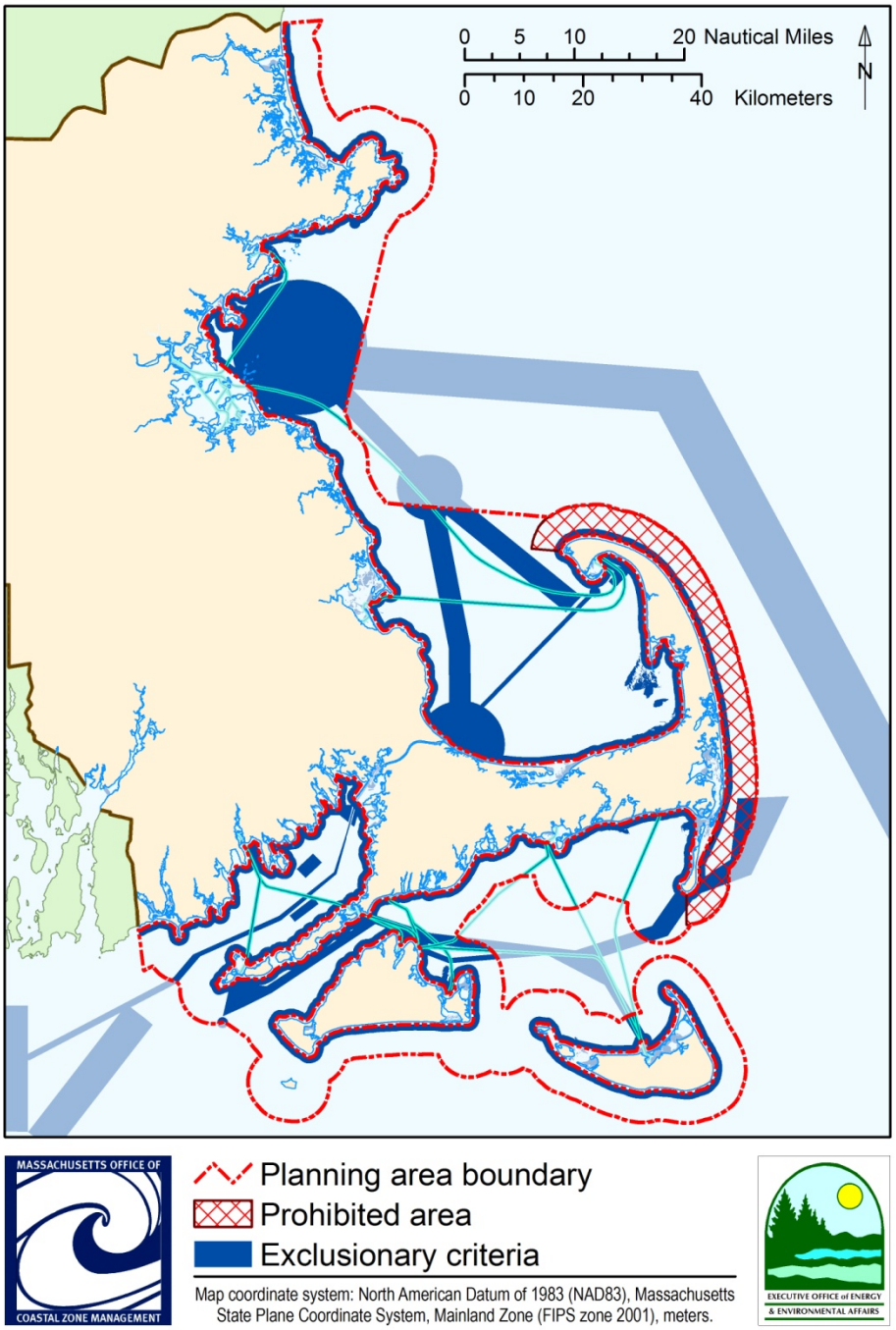
Figure Appendix 3-3 Exclusionary criteria



Based on compatibility considerations, exclusionary criteria were used to identify commercial-scale wind energy areas. This map illustrates the following criteria:

- One mile from inhabited shoreline
- Coast Guard-designated navigation areas (shipping channels and traffic lanes, precautionary areas, anchorage areas, pilot boarding areas)
- Eelgrass and intertidal flats (highlighted)

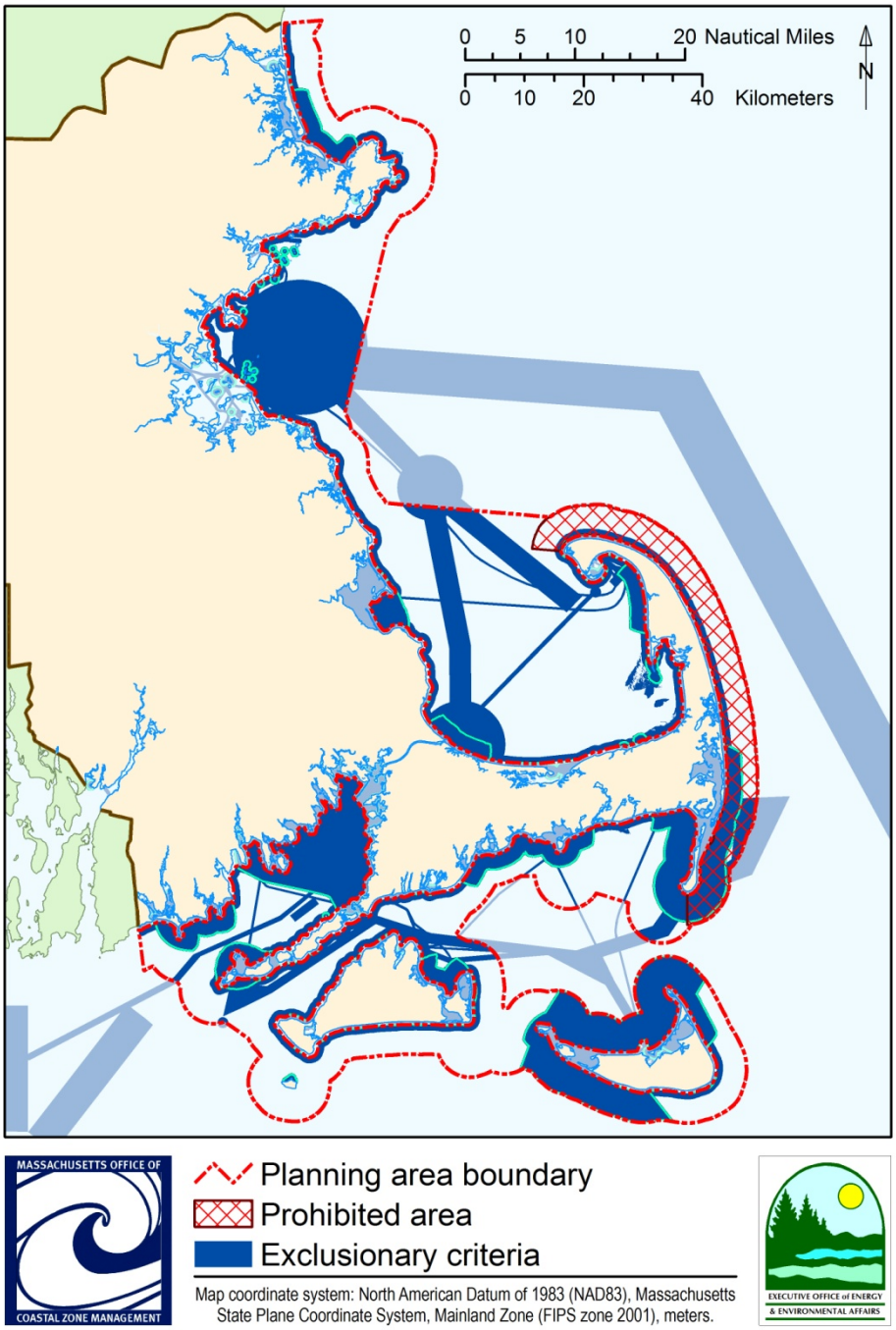
Figure Appendix 3-4 Exclusionary criteria



Based on compatibility considerations, exclusionary criteria were used to identify commercial-scale wind energy areas. This map illustrates the following criteria:

- One mile from inhabited shoreline
- Coast Guard-designated navigation areas (shipping channels and traffic lanes, precautionary areas, anchorage areas, pilot boarding areas)
- Eelgrass and intertidal flats
- Ferry routes (highlighted)

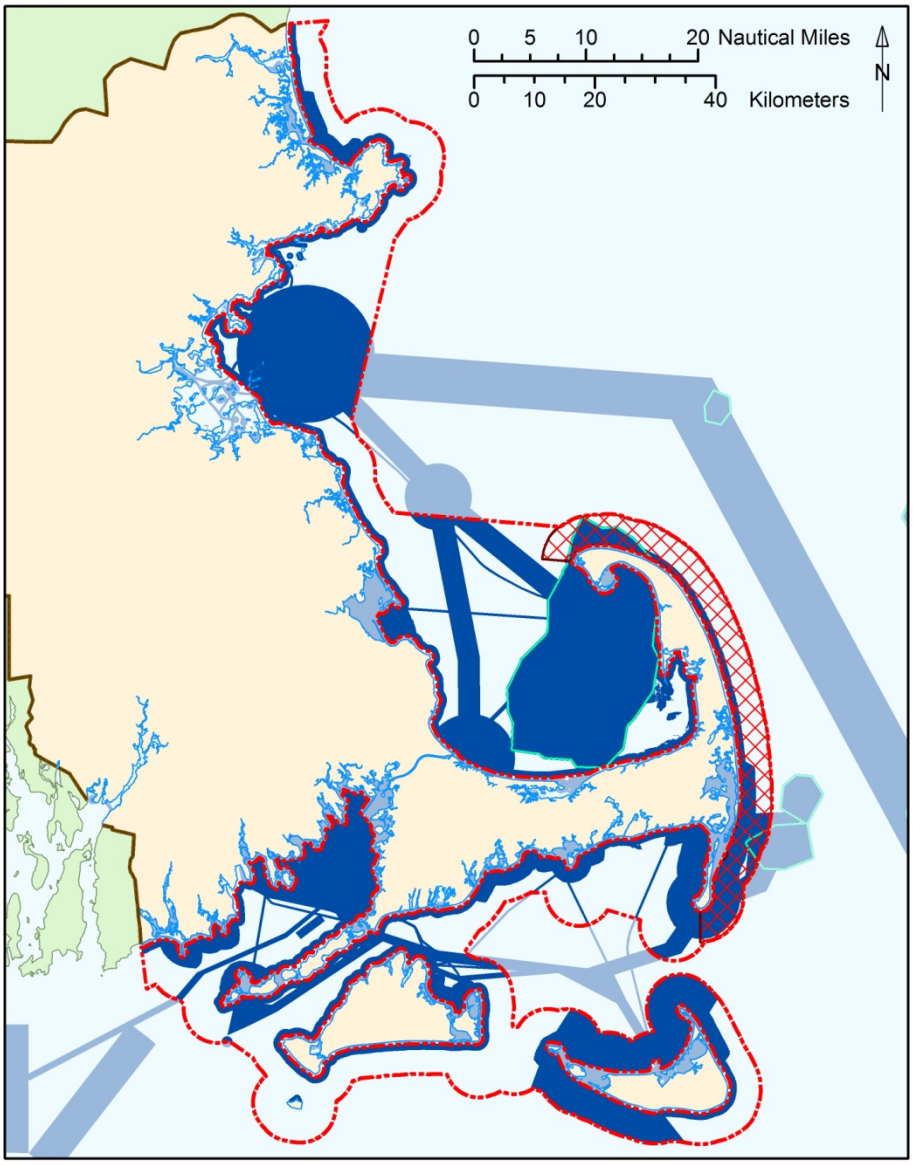
Figure Appendix 3-5 Exclusionary criteria



Based on compatibility considerations, exclusionary criteria were used to identify commercial-scale wind energy areas. This map illustrates the following criteria:

- One mile from inhabited shoreline
- Coast Guard-designated navigation areas (shipping channels and traffic lanes, precautionary areas, anchorage areas, pilot boarding areas)
- Eelgrass and intertidal flats
- Ferry routes
- High concentrations of avian resources: nesting, staging, and critical foraging areas for Roseate Tern; nesting, staging, and core foraging areas for special concern tern species (Arctic, Least, Common); Long-tailed Duck; colonial coastal waterbirds (highlighted)

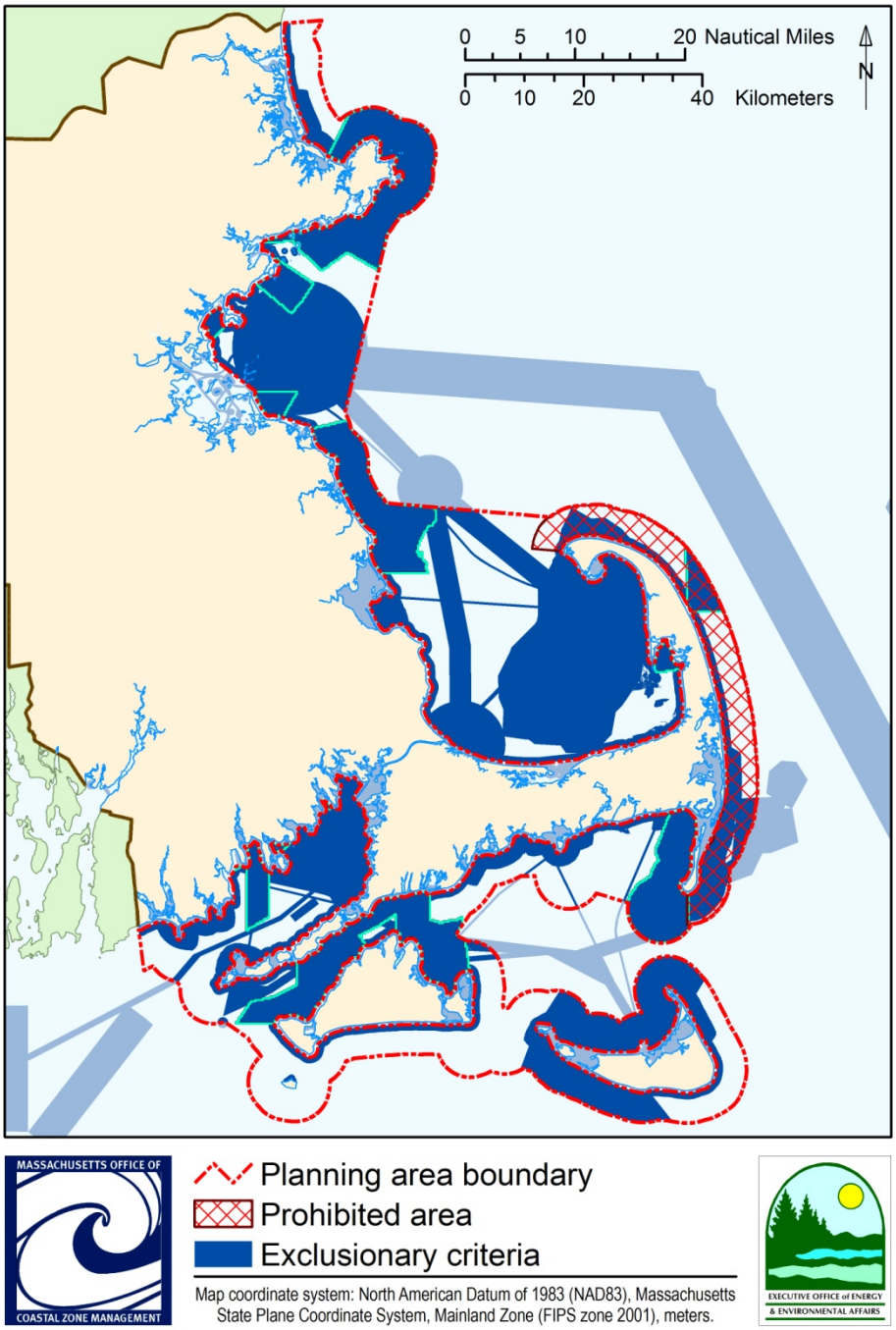
Figure Appendix 3-6 Exclusionary criteria



Based on compatibility considerations, exclusionary criteria were used to identify commercial-scale wind energy areas. This map illustrates the following criteria:

- One mile from inhabited shoreline
- Coast Guard-designated navigation areas (shipping channels and traffic lanes, precautionary areas, anchorage areas, pilot boarding areas)
- Eelgrass and intetidal flats
- Ferry routes
- High concentrations of avian resources: nesting, staging, and critical foraging areas for Roseate Tern; nesting, staging, and core foraging areas for special concern tern species (Arctic, Least, Common); Long-tailed Duck; colonial coastal waterbirds
- High concentrations of whale populations: North Atlantic Right Whale core habitat (highlighted)

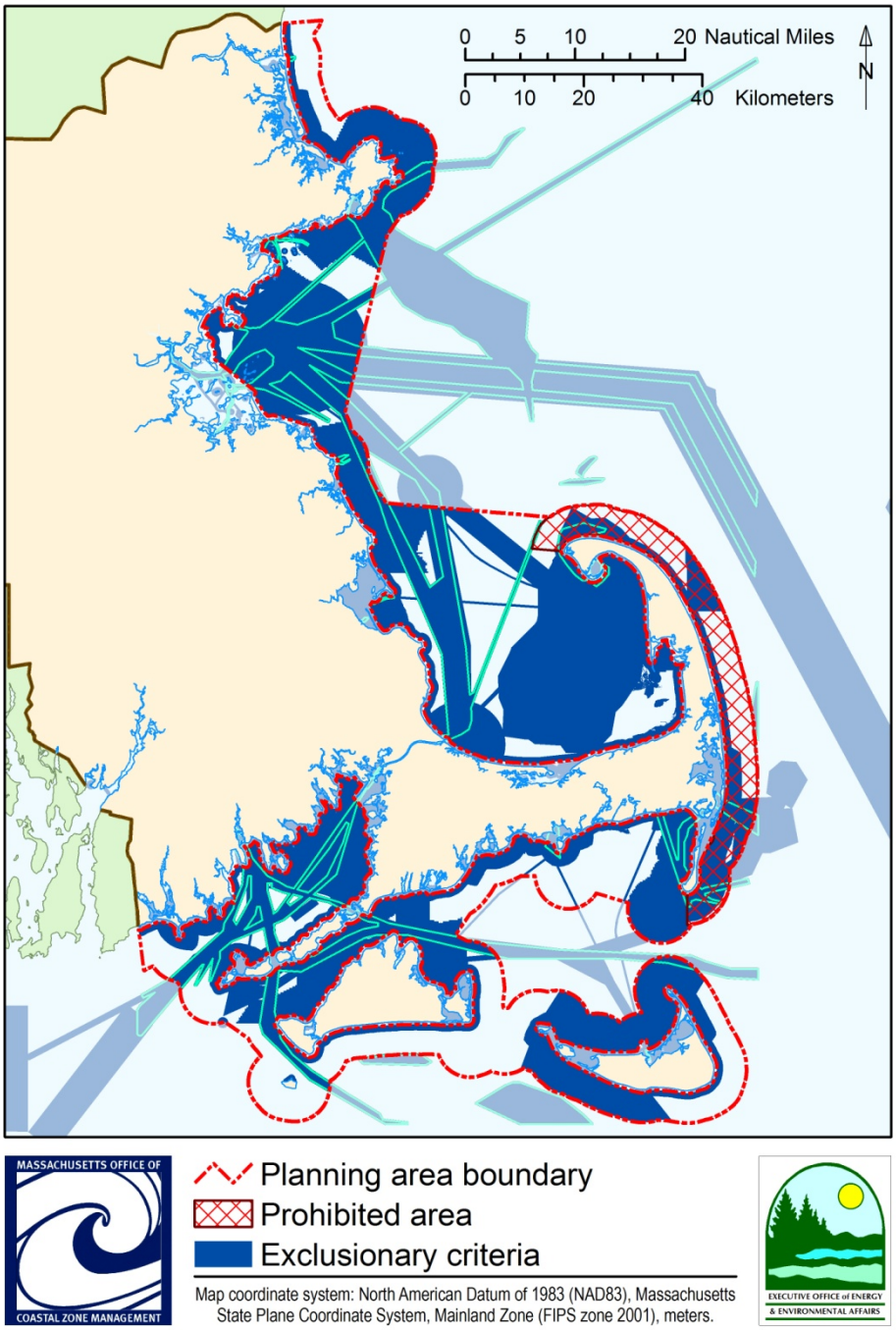
Figure Appendix 3-7 Exclusionary criteria



Based on compatibility considerations, exclusionary criteria were used to identify commercial-scale wind energy areas. This map illustrates the following criteria:

- One mile from inhabited shoreline
- Coast Guard-designated navigation areas (shipping channels and traffic lanes, precautionary areas, anchorage areas, pilot boarding areas)
- Eelgrass and intertidal flats
- Ferry routes
- High concentrations of avian resources: nesting, staging, and critical foraging areas for Roseate Tern; nesting, staging, and core foraging areas for special concern tern species (Arctic, Least, Common); Long-tailed Duck; colonial coastal waterbirds
- High concentrations of whale populations: North Atlantic Right Whale core habitat
- Areas of significant commercial fishing effort and value: high fishing activity by effort and value (highlighted)

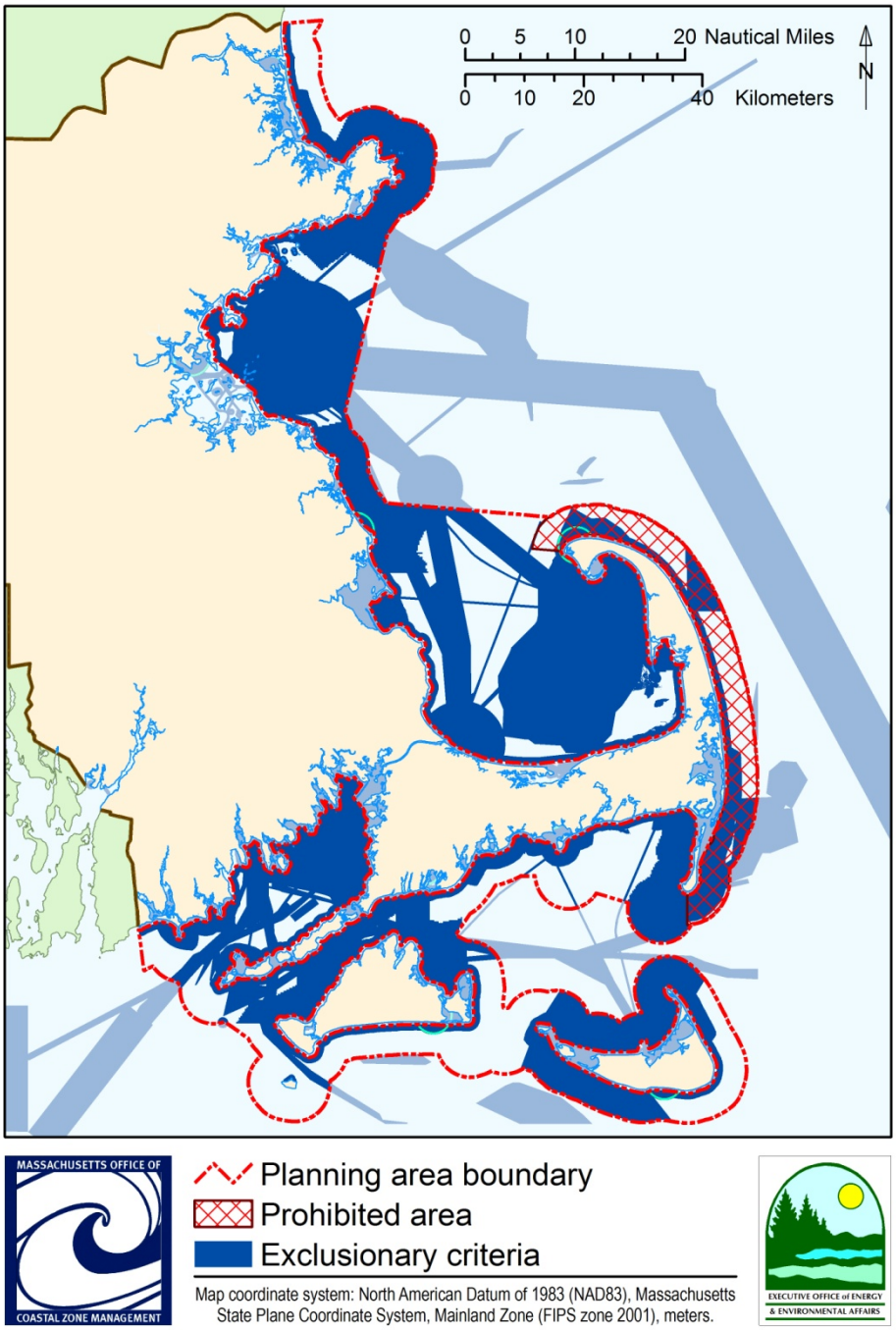
Figure Appendix 3-8 Exclusionary criteria



Based on compatibility considerations, exclusionary criteria were used to identify commercial-scale wind energy areas. This map illustrates the following criteria:

- One mile from inhabited shoreline
- Coast Guard-designated navigation areas (shipping channels and traffic lanes, precautionary areas, anchorage areas, pilot boarding areas)
- Eelgrass and intertidal flats
- Ferry routes
- High concentrations of avian resources: nesting, staging, and critical foraging areas for Roseate Tern; nesting, staging, and core foraging areas for special concern tern species (Arctic, Least, Common); Long-tailed Duck; colonial coastal waterbirds
- High concentrations of whale populations: North Atlantic Right Whale core habitat
- Areas of significant commercial fishing effort and value: high fishing activity by effort and value
- Direct transit navigation routes for shipping and fishing: AIS, VMS (highlighted)

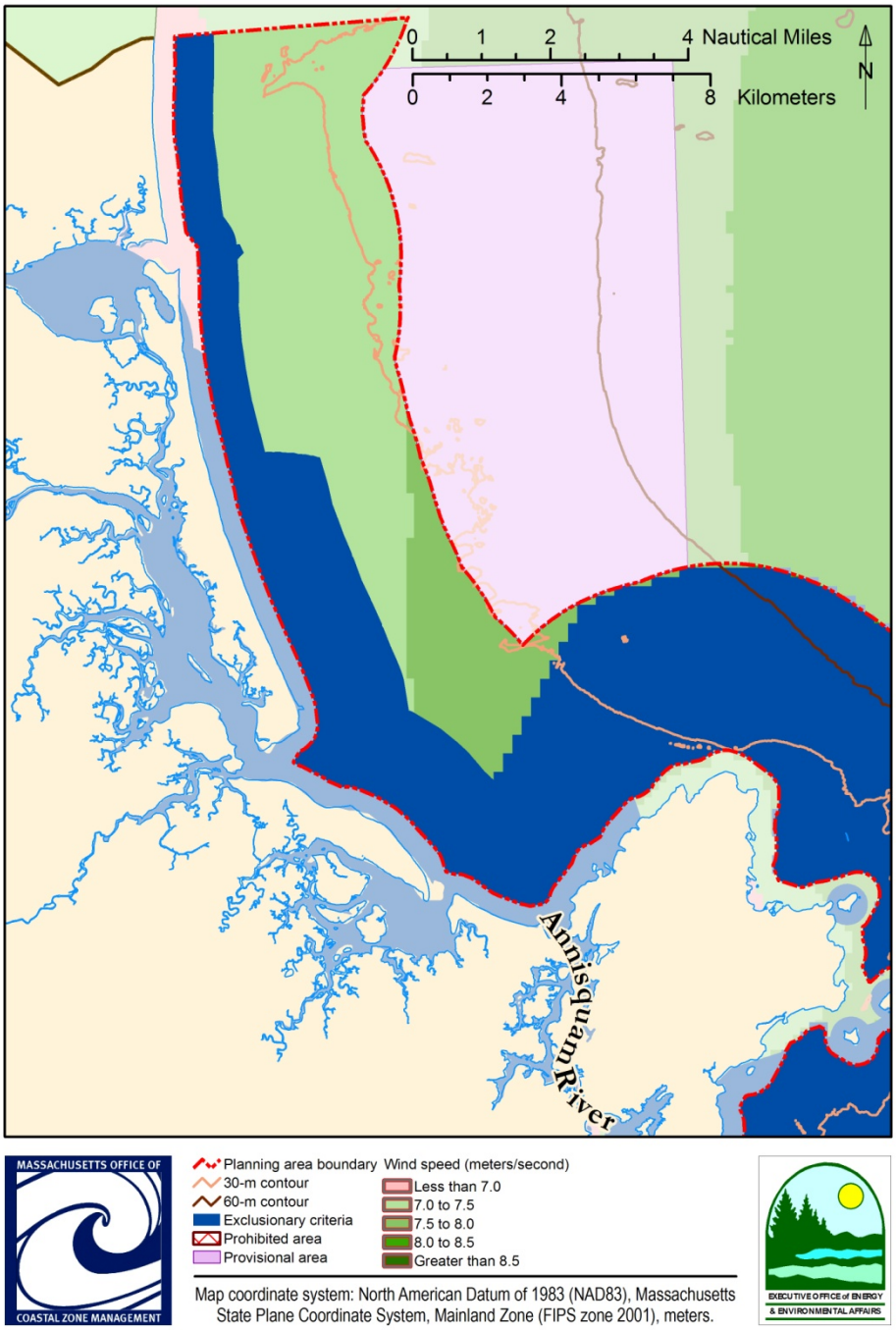
Figure Appendix 3-9 Exclusionary criteria



Based on compatibility considerations, exclusionary criteria were used to identify commercial-scale wind energy areas. This map illustrates the following criteria:

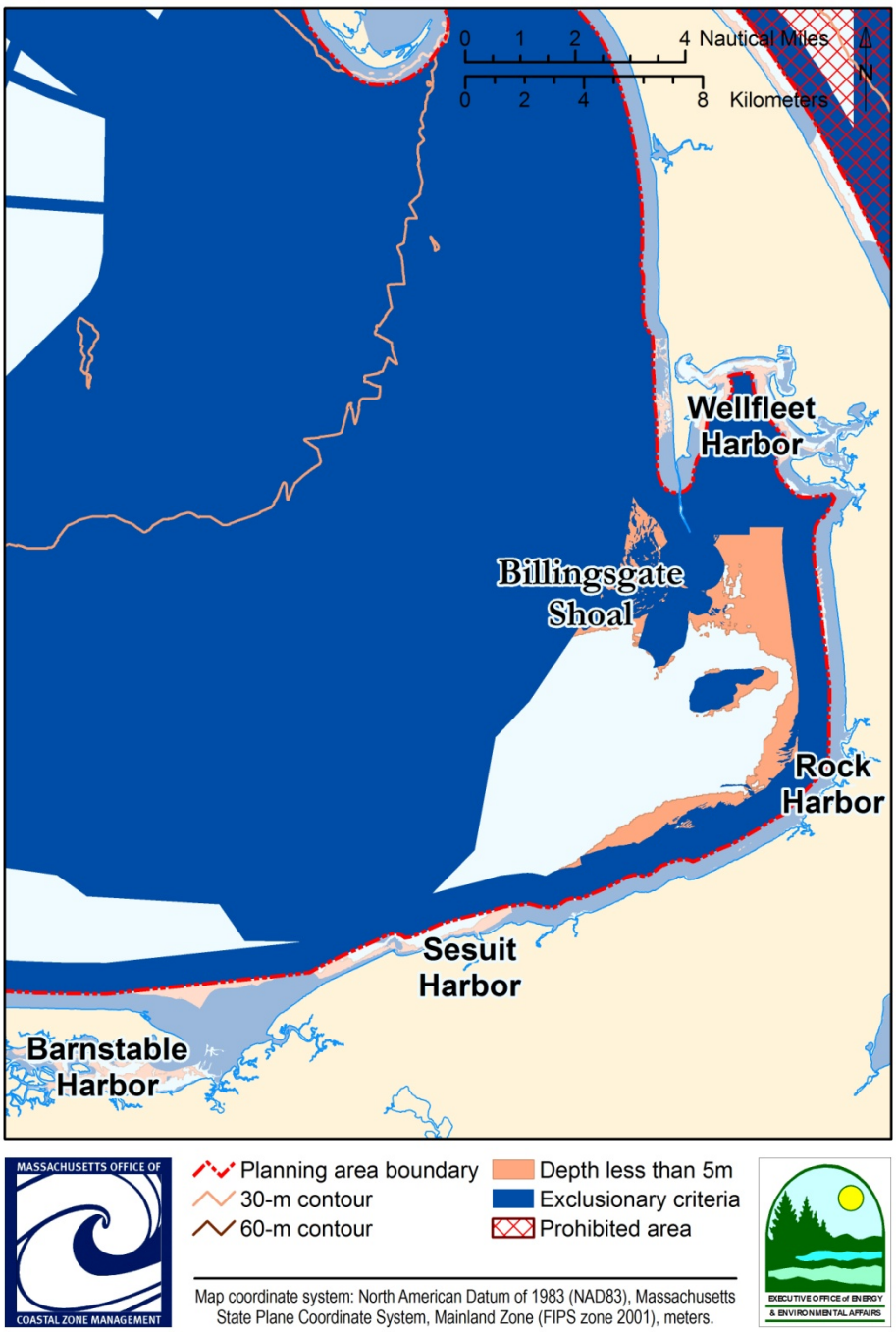
- One mile from inhabited shoreline
- Coast Guard-designated navigation areas (shipping channels and traffic lanes, precautionary areas, anchorage areas, pilot boarding areas)
- Eelgrass and intertidal flats
- Ferry routes
- High concentrations of avian resources: nesting, staging, and critical foraging areas for Roseate Tern; nesting, staging, and core foraging areas for special concern tern species (Arctic, Least, Common); Long-tailed Duck; colonial coastal waterbirds
- High concentrations of whale populations: North Atlantic Right Whale core habitat
- Areas of significant commercial fishing effort and value: high fishing activity by effort and value
- Direct transit navigation routes for shipping and fishing: AIS, VMS
- Regulated airspace (highlighted)

Figure Appendix 3-10 Exclusionary criteria



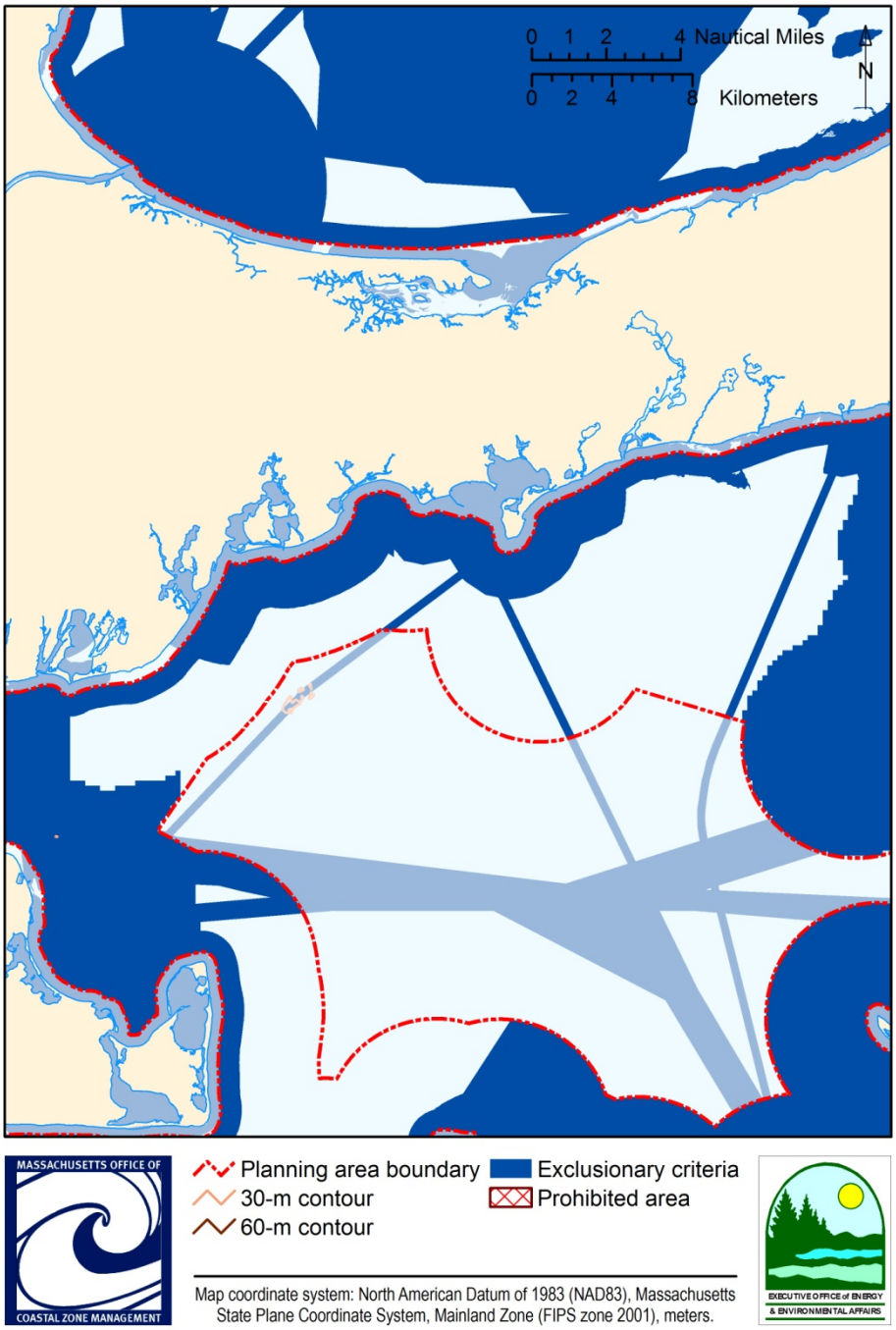
Once the exclusionary criteria were mapped, EEA further evaluated areas of the coast based upon consideration of other issues not included in the exclusionary criteria. In the area north of Cape Ann, the amount of recreational traffic entering the planning area through the Annisquam and Merrimack Rivers and using this corridor, the lower potential wind energy resulting from a wind shadow effect of Cape Ann, and potential issues associated with connecting to the power grid combined to make this area less favorable for the development of commercial-scale wind energy projects.

Figure Appendix 3-11 Exclusionary criteria



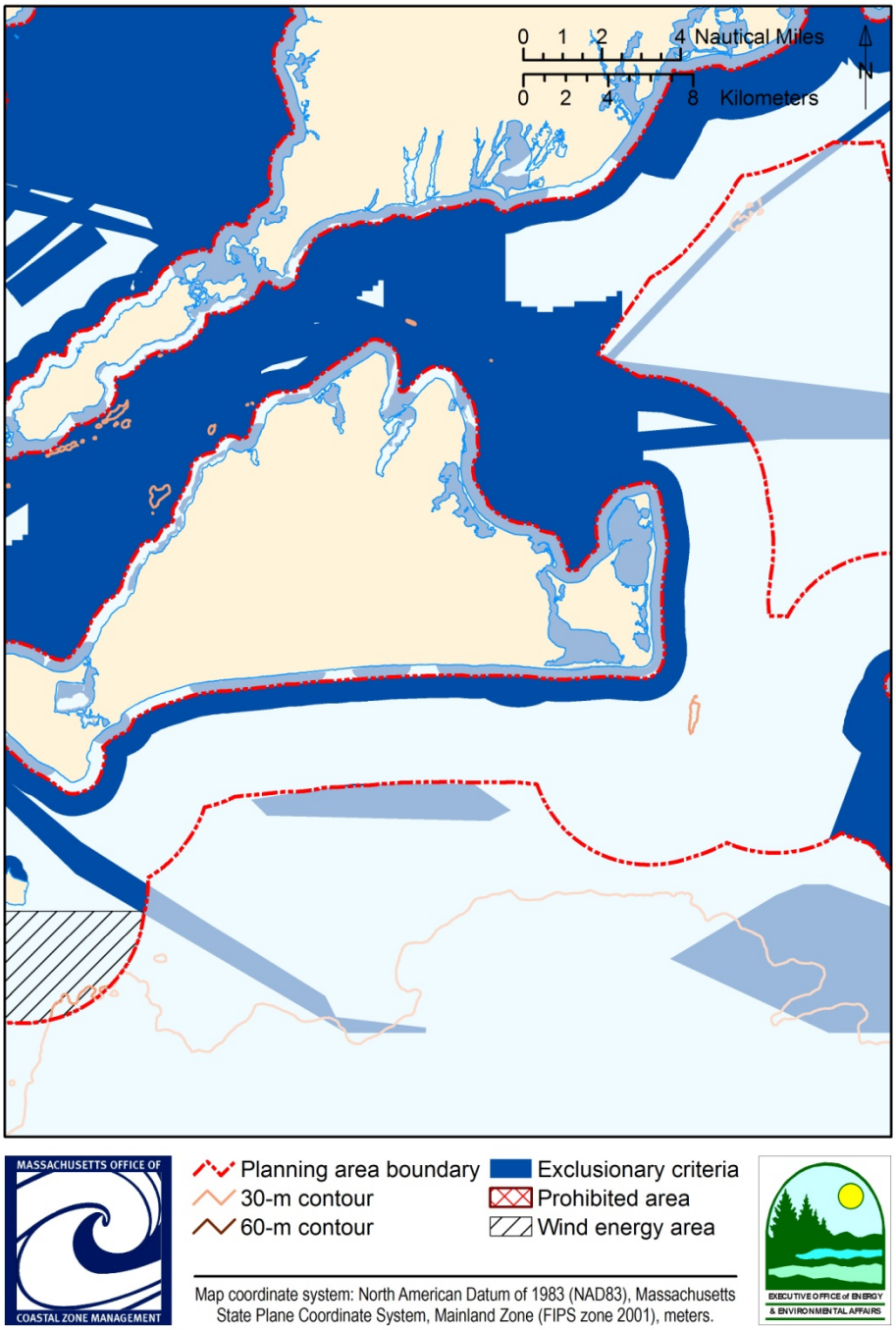
In the southeast portion of Cape Cod Bay, the combination of the one mile buffer, proximity to four main harbors, shallow depths, and presence of Billingsgate Shoal (an important recreational destination) made this area not favorable for the development of commercial-scale wind energy projects.

Figure Appendix 3-12 Exclusionary criteria



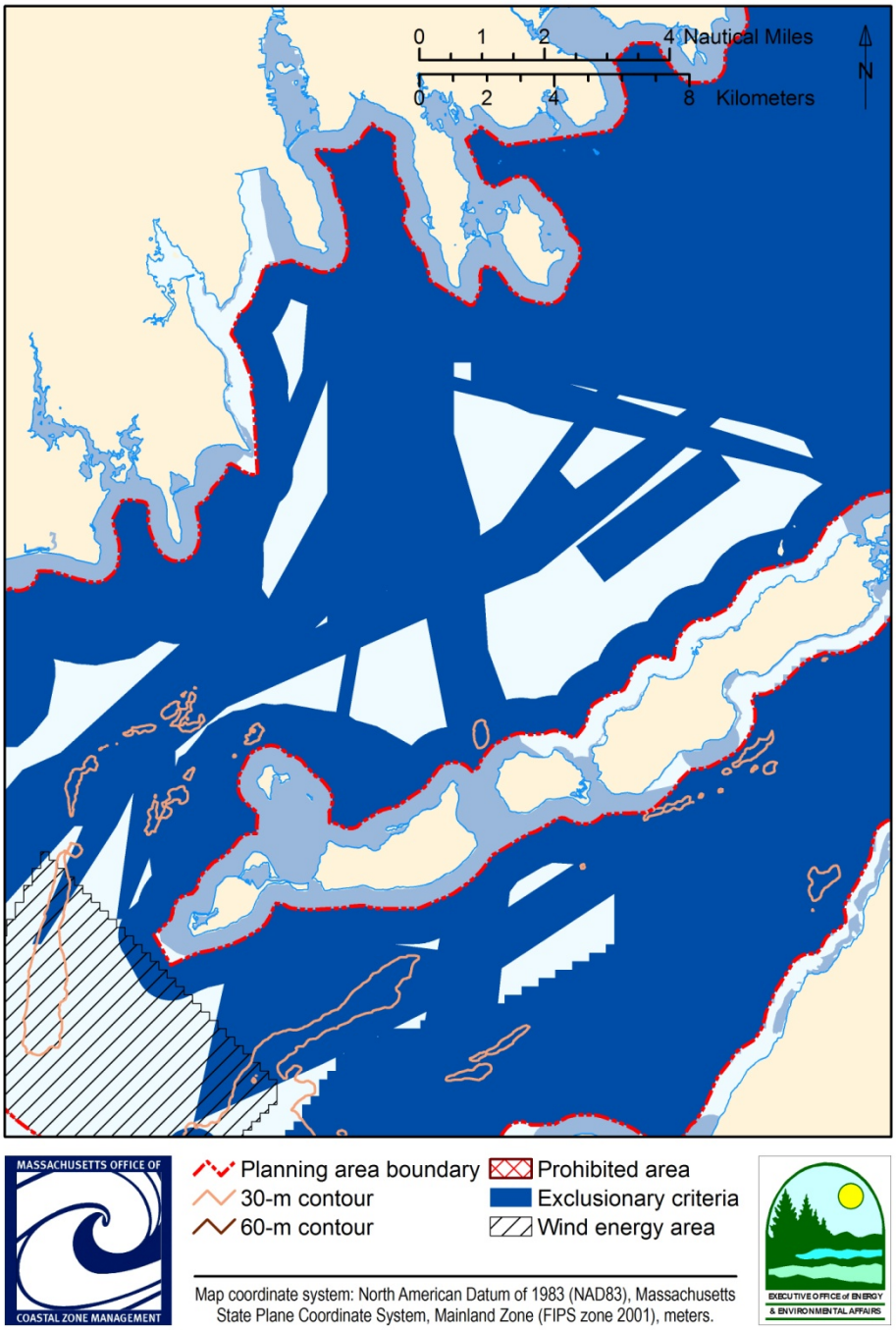
In state waters within Nantucket Sound, the one mile buffer, ferry activity, and the potential for cumulative impacts of a commercial-scale project in state waters in addition to the Cape Wind project in federal waters made this area not favorable for the development of commercial-scale wind energy projects.

Figure Appendix 3-13 Exclusionary criteria



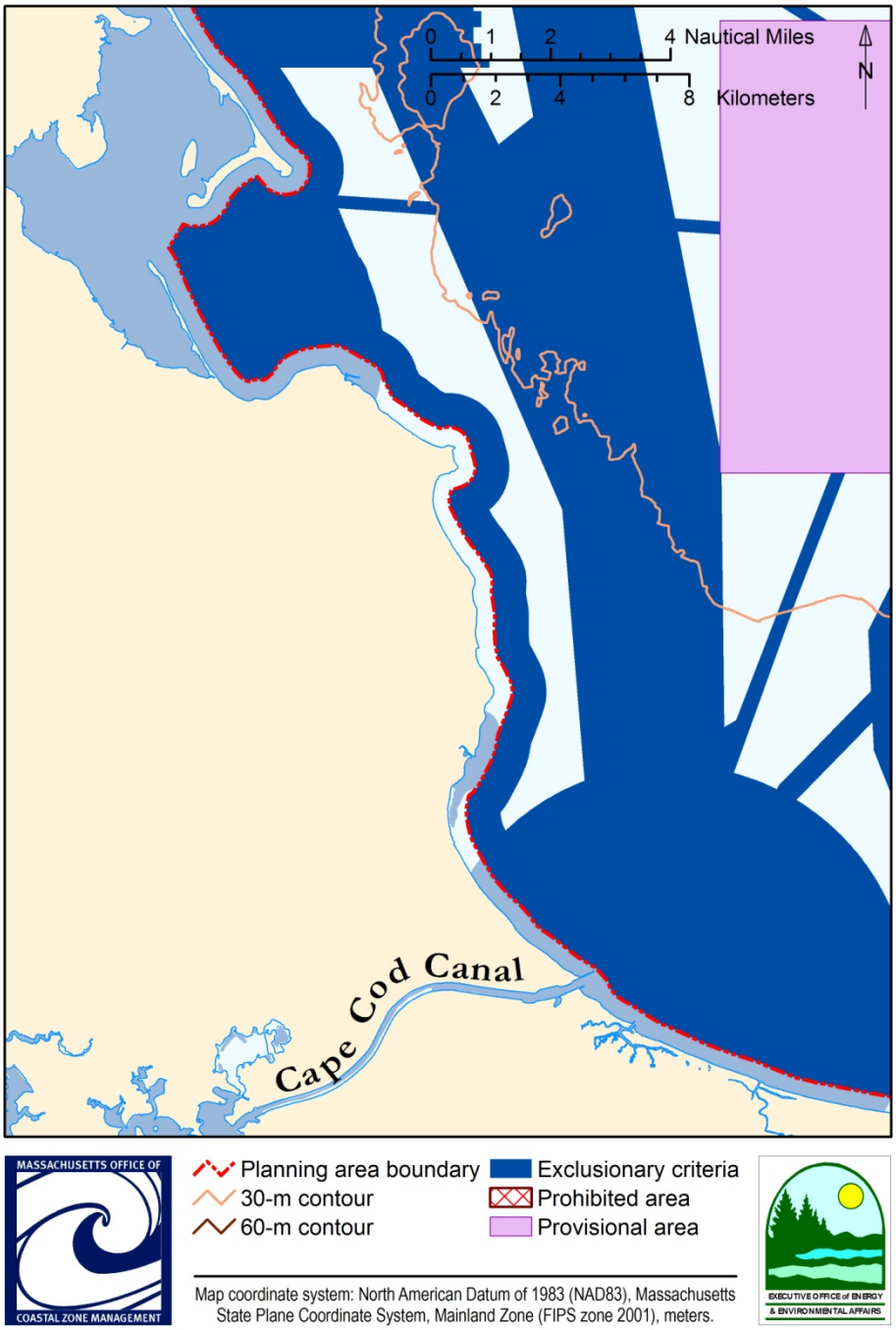
In the area south of West Tisbury and Edgartown, proximity to Martha's Vineyard, as expressed at public meetings during the development of the draft plan, and visibility from a much larger populated area than potential alternative sites that also pass exclusionary criteria resulted in this area being considered as not suitable for development of commercial-scale wind energy. This area is potentially suitable for community wind.

Figure Appendix 3-14 Exclusionary criteria



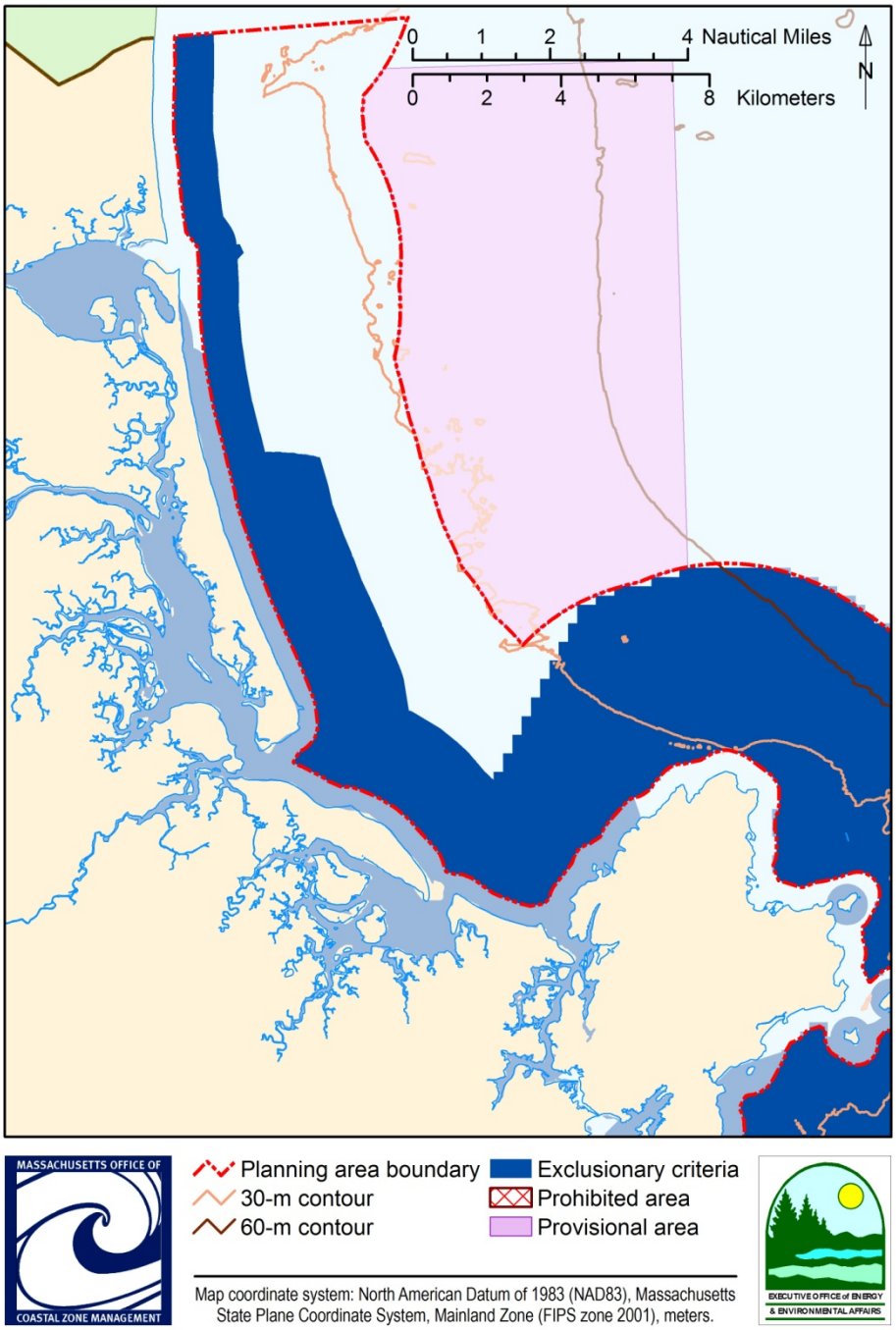
In Buzzards Bay, the significantly constrained geography of the embayment and the relative concentration of existing uses (including shipping channels, anchorages, recreational fishing and boating) and high value resources including SSUs combined to make this area not suitable for commercial-scale wind energy development.

Figure Appendix 3-15 Exclusionary criteria



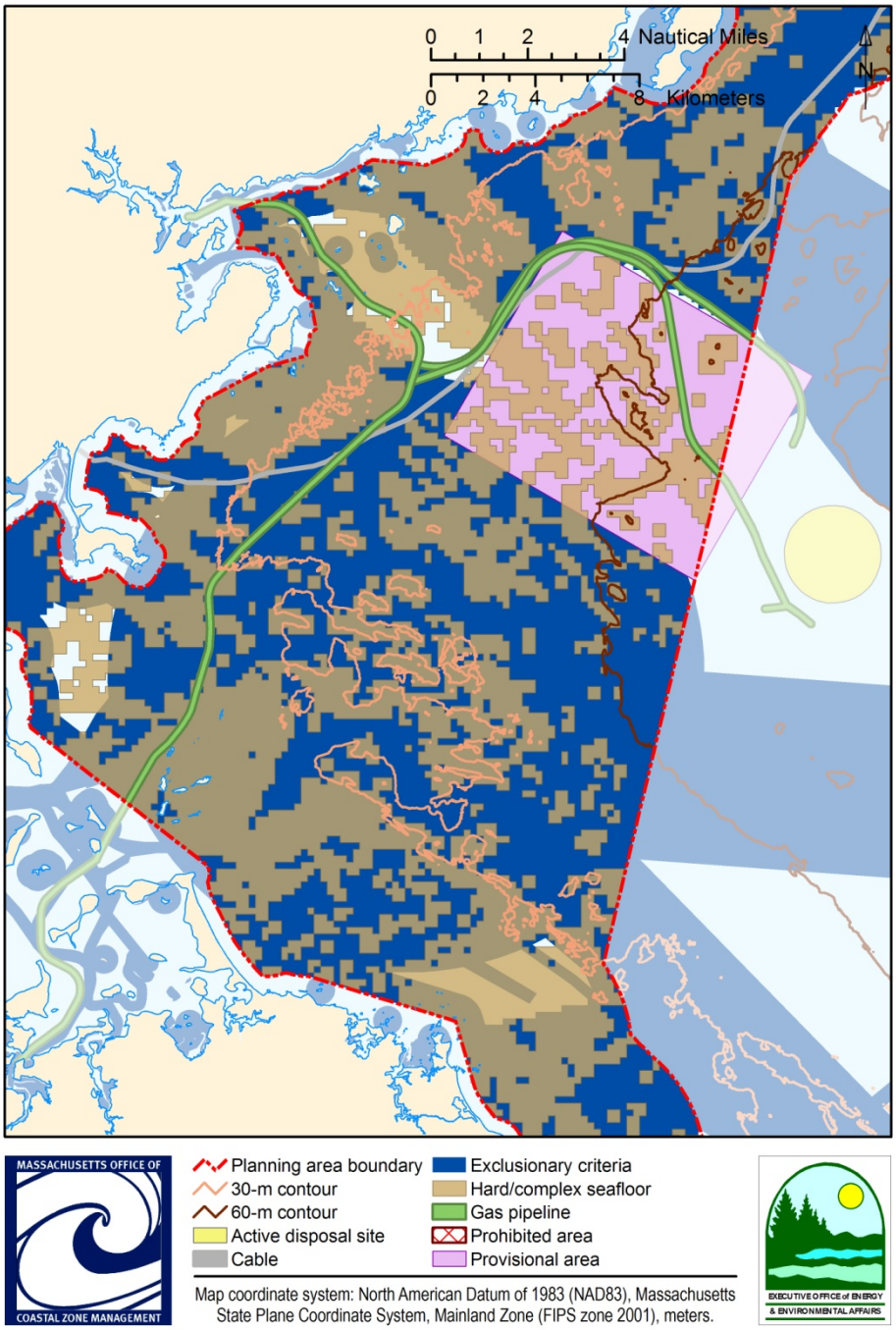
In the area offshore Plymouth and Duxbury, the linear nature and relatively confined space of the area outside of exclusionary criteria, and the boating connection to the Cape Cod Canal, combined to render this area unsuitable for commercial-scale wind energy development.

Figure Appendix 3-16 Exclusionary criteria



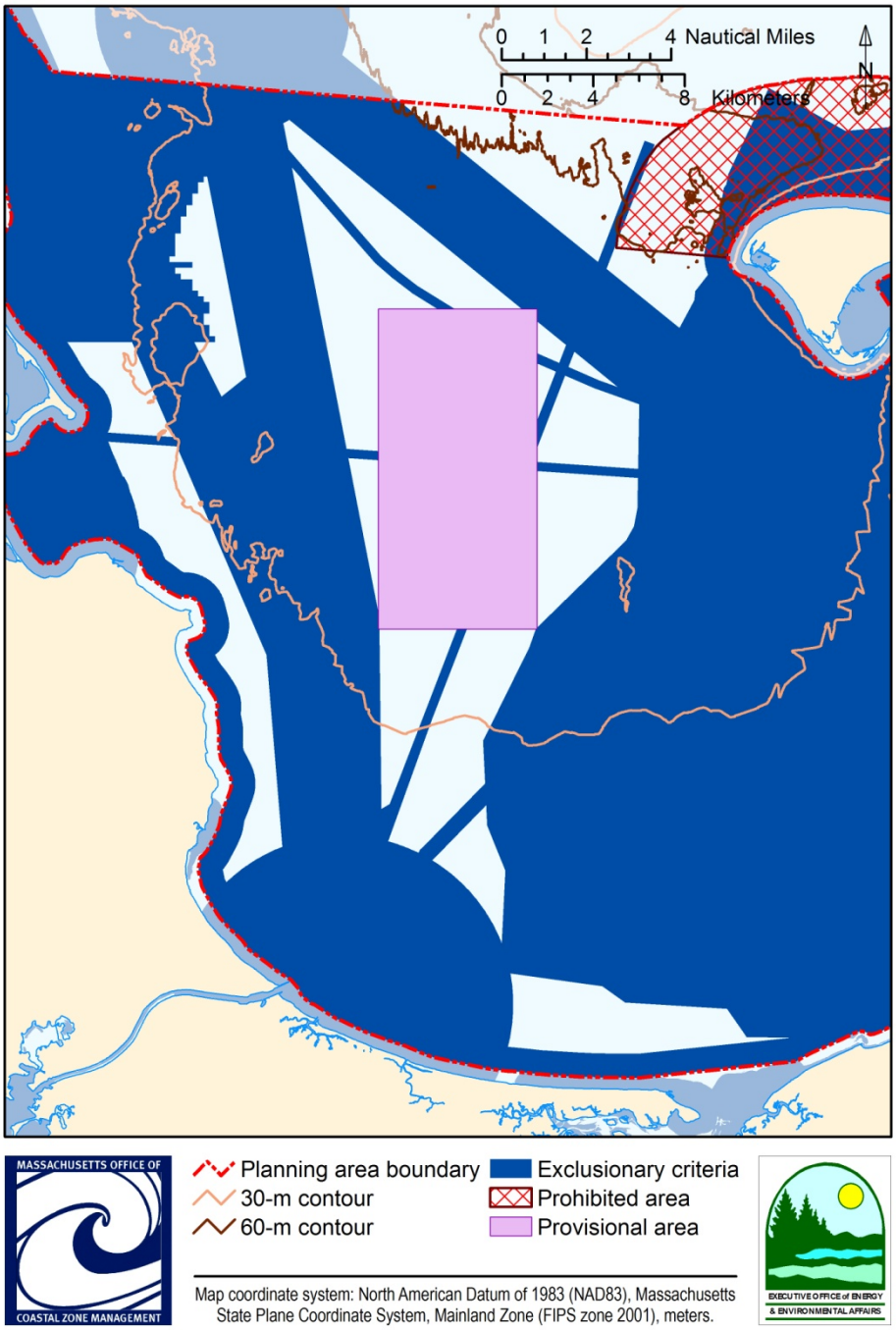
Provisional areas passed the evaluative steps described previously but were not as desirable as the designated areas. P1, the provisional area north of Cape Ann was delineated based on its avoidance of Annisquam-related vessel traffic and its inferred sub-bottom and slope (favorable to wind turbine installation). The area in state waters that was incorporated in the draft plan's designation of P1 was removed on further review. Depth in federal waters is not suitable for first-generation monopile technology.

Figure Appendix 3-17 Exclusionary criteria



Provisional areas passed the evaluative steps described previously but were not as desirable as the designated areas. P2, the provisional area south of Gloucester was delineated based on the potential to co-locate with existing industrial uses (LNG terminals, cables, pipelines), but does include significant constraints because of its depth, sub-bottom geology, and preponderance of human uses. Depth is not suitable for first-generation monopile technology.

Figure Appendix 3-18 Exclusionary criteria



Provisional areas passed the evaluative steps described previously but were not as desirable as the designated areas. P3, the provisional area in Cape Cod Bay was delineated based on the potential to minimize visual issues, but is constrained by the pattern of human use and its depth. Depth in federal waters is not suitable for first-generation monopile technology.

Visual

The Ocean Management Plan does not incorporate data that quantifies the visual impacts of wind energy facilities, but the plan recognizes the importance of such information, and addresses it in three ways.

First, potential commercial sites were screened using a 1-mile buffer from populated areas, based on the Oceans Act direction to consider the "proximity to the shoreline."

Second, visual impacts were considered during the site-screening process, whereby sites with smaller visual impacts (i.e., further from populated areas/land) and/or within the viewshed of fewer people were judged to have lesser visual impact than those closer to populated areas or within sight of large numbers of people. The renewable energy areas near Cuttyhunk and Nomans Land Island were judged to have lesser visual impact, as they are both relatively far from established population centers. Cuttyhunk has fewer than 100 year-round residents, while the renewable energy area designated in the plan is approximately 7.5 miles from Aquinnah and Westport, the closest significant population centers (turbine visibility is directly related to distance offshore—see Figure Appendix 3-19, which illustrates the effect of distance). Nomans Land has no year-round residents and is approximately 5.5 miles from Aquinnah. That said, the ocean management plan recognizes that the island area is considered to be a place of special scenic value, where the connection to the surrounding seascape provides important social, cultural and economic benefits. Impacts to the surrounding viewshed should be carefully assessed and minimized during the development and review of individual projects. However, from a statewide perspective, the ocean plan achieves the objective of minimizing visual impacts by locating the largest facilities as far away from as many people as possible.

Last, the final plan provides additional information that will assist project-specific review of potential visual impacts associated with a wind energy facility. Further refinement of the assessment of visual issues would appropriately take place during consideration of a particular development proposal, as turbine density, layout, other project-specific factors, and the particular characteristics of affected sites within a project's viewshed all must be taken into consideration. The general pattern of development on lands within a project's viewshed could occur through an assessment of land cover, such as illustrated in Figure Appendix 3-20, which was created by combining reclassified National Oceanic and Atmospheric Administration Coastal Change Analysis Program (C-CAP) data, the National Park Service's Cape Cod National Seashore data layer, and the U.S. Fish and Wildlife Service's National Wildlife Refuges dataset (the C-CAP data were binned into three classes representing more to less development, and combined with the Cape Cod National Seashore and National Wildlife Refuge data to illustrate four general classes of land cover within half a mile of the coast). Potential visual impacts to important public spaces and open space, cultural and historical resources, and other identified sites would all depend on an understanding of a proposed project layout. See Figure Appendix 3-21 for an overview of

sites on the National Register of Historic Places and public open spaces, overlaid upon the land cover data illustrated in Figure Appendix 3-20, which illustrates sites at which specific visual assessments might be required. Identification of the exact inventory of such sites that would have to be assessed would be related to a specific project, but the information portrayed in these figures would be included in such a review.

Additional Data Received

Several datasets were provided during the development of the draft management plan and during the public review period, with a request that these datasets be considered for incorporation into the process of identifying appropriate locations for renewable energy. Data on fishing effort and avifauna resources on Martha's Vineyard were developed in the Spring and Summer of 2009 and provided to EEA. These datasets and their potential utility are described below.

Commercial fishing

Commercial fishermen from Martha's Vineyard provided maps representing fishing effort from island harbors. Working with the Martha's Vineyard Commission, paper charts were provided to the fisherman who then identified fishing grounds and travel routes. These maps were similar to other representational information that EEA collected from fishermen in other parts of the coast during the development of the draft plan. In the ocean management plan, EEA relied on the commercial fishing analysis performed by the fisheries work group because this analysis provided statewide information obtained through a single methodology. For future ocean management efforts, as described in the science framework (see Volume 2 of the ocean management plan), EEA intends on acquiring information such as was provided by Martha's Vineyard fishermen, to help augment the fisheries work group analysis. This type of information, particularly if it identifies gear types used and/or target species, can better inform assessment of potential project compatibility issues and impacts and screening for potential sites for particular types of development, assuming its methodology is sufficiently robust and appropriately designed.

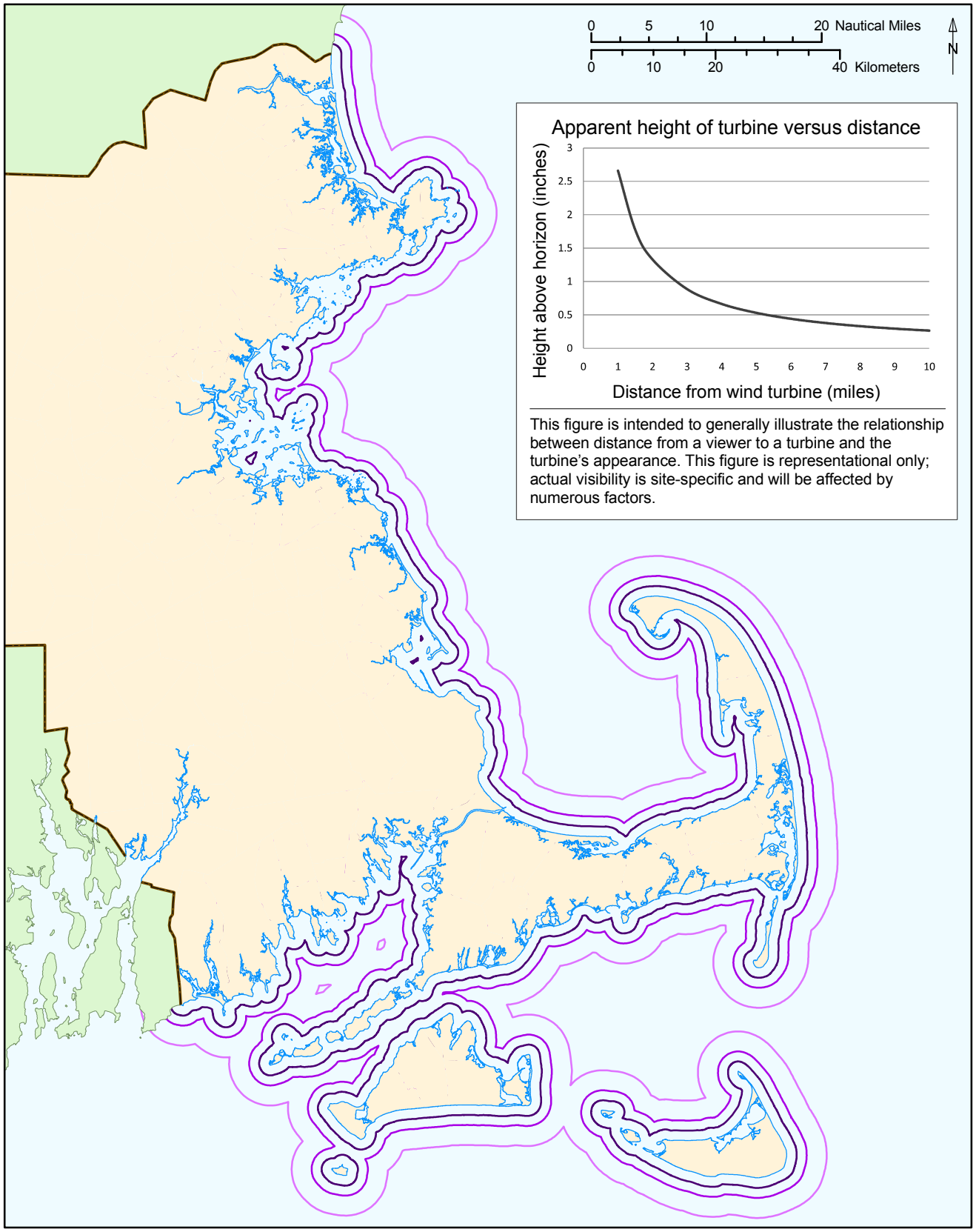
Avifauna

Comments from the Martha's Vineyard Commission and subsequent conversations with representatives of the birding community on Martha's Vineyard expressed concern with certain avifauna issues which they felt should have been addressed by the ocean management plan. The Martha's Vineyard Commission comment letter identified fall migration routes for raptors, sea ducks, and small passerines, and spring migration routes for gulls, gannets, loons, and razorbills as specific issues of concern, and included maps illustrating these migration routes (along with other

information including the results of Christmas Bird Counts, log records from island birders, and other similar information).

Similar to the commercial fishing information discussed above, EEA recognizes the importance of information related to avifauna for ocean management. For bird species incorporated into the ocean management plan, a critical consideration was to identify those species that were potentially at risk of population-level impacts from wind development in the planning area. The species that were considered as special, sensitive, or unique in the ocean management plan included those that are federally and/or state listed as endangered or threatened species, or (in the case of long-tailed ducks) known to have a significant portion of their population using a discrete portion of the planning area. Other species may be common in portions of the planning area, but may not have as sizeable a proportion of their population potentially at risk, are not listed as endangered or threatened, and/or may not be known to congregate every year in specific locations. Additionally, Christmas Bird Counts can confirm that large numbers of birds are seen in a particular area and thus that such an area has important habitat features, but such efforts are not intended to identify the geographic boundaries of these habitats, particularly extending into the water. Information such as that provided by the Martha's Vineyard Commission would be important during review of specific projects and can help identify and target species and specific locations for further survey work for use in specific project review and for future ocean planning efforts.

Figure Appendix 3-19 Relationship between distance and visibility



MASSACHUSETTS OFFICE OF COASTAL ZONE MANAGEMENT

1-mile buffer[1]

2-mile buffer[1]

4-mile buffer[1]

Data source: [1]Massachusetts Office of Coastal Zone Management.

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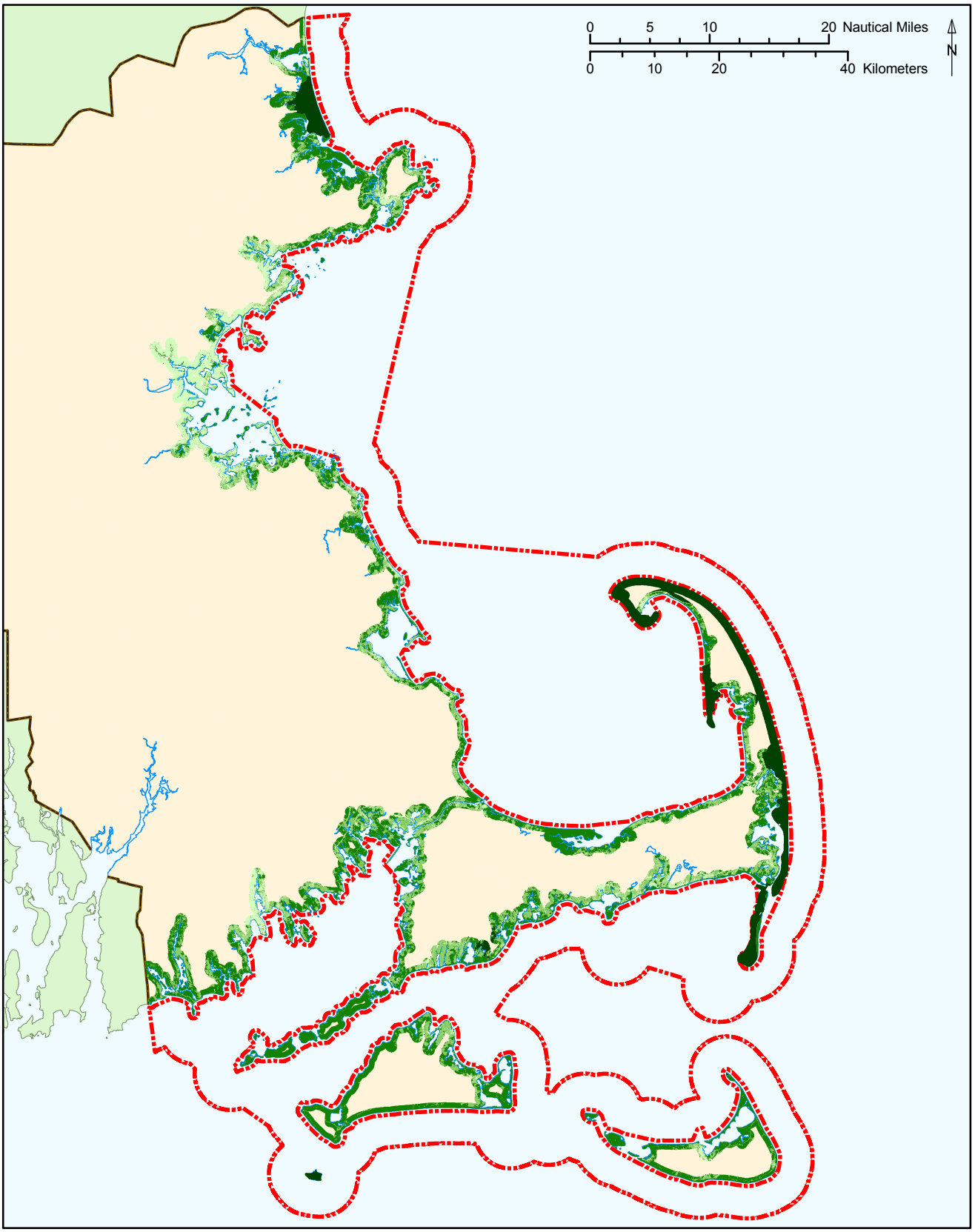
Map coordinate system: North American Datum of 1983 (NAD83), Massachusetts State Plane Coordinate System, Mainland Zone (FIPS zone 2001), meters.

Figure Appendix 3-20 Land use and land cover along the Massachusetts coast



MASSACHUSETTS OFFICE OF COASTAL ZONE MANAGEMENT

Massachusetts ocean management planning area boundary[1]

Land use and land cover[2,3,4]

Less developed — More developed

Data sources: [1]Massachusetts Office of Coastal Zone Management, [2]National Oceanic and Atmospheric Administration Coastal Change Analysis Program (C-CAP) data reclassified by the Massachusetts Office of Coastal Zone Management, [3]National Park Service, [4]U.S. Fish and Wildlife Service.

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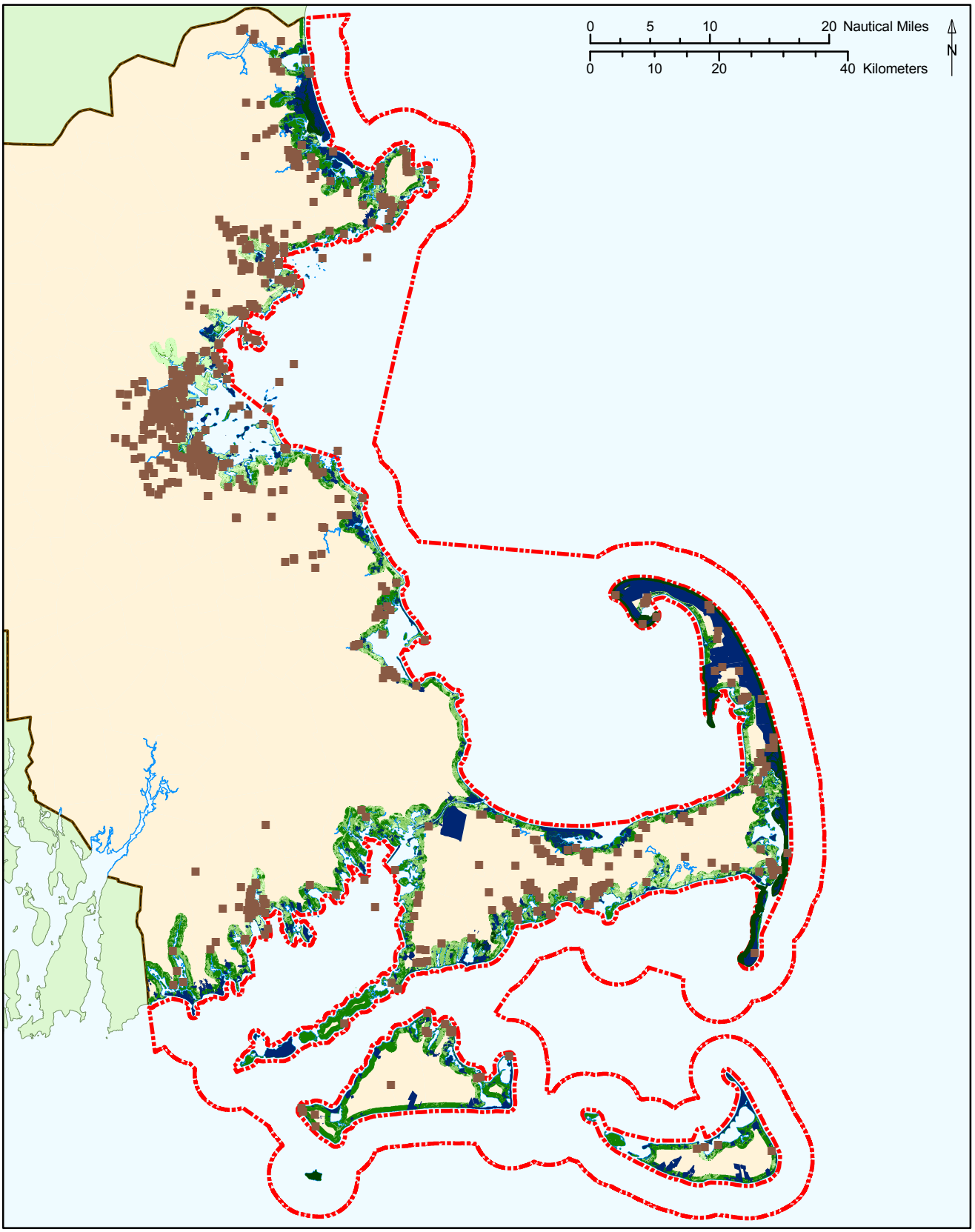
Map coordinate system: North American Datum of 1983 (NAD83), Massachusetts State Plane Coordinate System, Mainland Zone (FIPS zone 2001), meters.

Figure Appendix 3-21 National Register of Historic Places and open space combined with land use and land cover



MASSACHUSETTS OFFICE OF COASTAL ZONE MANAGEMENT

Massachusetts ocean management planning area boundary[1]

National Register of Historic Places[2,*]

Public open space with views of planning area[3,*]

Land use and land cover[2,4,5]

Less developed — More developed

Data sources: [1]Massachusetts Office of Coastal Zone Management, [2]National Park Service, [3]Massachusetts Office of Geographic and Environmental Information (MassGIS), [4]National Oceanic and Atmospheric Administration Coastal Change Analysis Program (C-CAP) data reclassified by the Massachusetts Office of Coastal Zone Management, [5]U.S. Fish and Wildlife Service.
*This information is presented for planning purposes only. Particular sites to be evaluated would be identified on a project-specific basis.

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Map coordinate system: North American Datum of 1983 (NAD83), Massachusetts State Plane Coordinate System, Mainland Zone (FIPS zone 2001), meters.

Appendix 4 - Description of Special, Sensitive, or Unique Species and Habitats

Chapter 2 of the Massachusetts Ocean Management Plan designates the special, sensitive, or unique species and habitats, pursuant to the Oceans Act. The following table describes these species and habitats and briefly summarizes the process of identifying their mapped extent. As described in the table, the data sources for these special, sensitive, or unique resources vary, and certain of these existing data sets are the responsibility of state agencies (e.g., the Massachustts Division of Fisheries and Wildlife [DFW] Natural Heritage and Endangered Species Program [NHESP], Division of Marine Fisheries [*MarineFisheries*], Massachusetts Office of Coastal Zone Management [CZM]). As part of the implementation of the plan, the Executive Office of Energy and Environmental Affairs (EEA) will work with these agencies to ensure continued data collection as appropriate, and to identify future needs regarding state agency data and research (see the science framework in Volume 2 for additional information). Certain of these datasets are from sources outside of Massachusetts state government. EEA will coordinate with the originators of such data to maximize the utility of data collection and analysis efforts for ocean management planning purposes.

Special, Sensitive, or Unique Area (SSU)	Description
North Atlantic Right Whale Core Habitat Fin Whale Core Habitat Humpback Whale Core Habitat	Areas of core whale habitat by species, represented as concentrations in abundance distributions based on datasets from the NOAA National Centers for Coastal Ocean Science report that characterizes cetacean sightings for the years 1970-2005 in the southern Gulf of Maine. The report includes records from dedicated aerial surveys and other platforms. Bias from uneven allocation of survey effort (temporally or spatially) was corrected using a sighting-per-unit-effort (SPUE) algorithm. SPUE values for each 5 x 5 minute grid cell were then interpolated spatially. The resulting interpolations were classified into quantiles and exported as filled contour polygon shapefiles. See the report1 for additional information. NOAA binned the data into five classes, and the top two classes were extracted to represent "core" habitat for each of these three species.

Special, Sensitive, or Unique Area (SSU)	Description
Roseate Tern Core Habitat	Areas of "core" Roseate Tern habitat, represented as breeding, staging, and critical foraging areas based on a dataset from the MA Division of Fisheries and Wildlife Natural Heritage and Endangered Species Program (DFW/NHESP)that represents documented Roseate Tern breeding, staging (presence of 100 or more individuals), and foraging areas. The breeding and staging sites were identified and mapped by DFW/NHESP biologists and buffered 0.3 nautical miles. Within the foraging areas, DFW/NHESP biologists identified core foraging areas based upon scientific literature to represent the most important foraging areas in the mapped breeding and staging areas. The breeding, staging, and critical foraging areas were extracted as Roseate Tern core habitat.
Special Concern Tern Core Habitat	Areas of "core" special concern tern habitat, represented as breeding, staging, and critical foraging areas based on a dataset from the DFW/NHESP. The core habitats delineated for three tern species (Common, Least, and Arctic, which are state-listed as species of special concern) include documented breeding, staging (presence of 100 or more pairs), and foraging areas. The breeding and staging sites have been indentified and mapped by DFW/NHESP biologists. These sites were buffered 0.3 nautical miles. Within the foraging areas, DFW/NHESP biologists identified core foraging areas based upon scientific literature to represent the most important foraging areas in the mapped breeding and staging areas. The breeding, staging, and critical foraging areas were extracted as core habitat.
Leach's Storm-Petrel Important Habitat	Areas of important Leach's Storm-petrel habitat, represented as breeding, staging, and critical foraging areas based on dataset from the MA DFW/NHESP. Leach's Storm-petrel is a state-listed endangered species that breeds at two locations in Massachusetts (Nomans Land Island and Penikese Island) as observed by DFW biologists. The Important Habitat areas are these breeding areas buffered 0.3 nautical miles.
Long-tailed Duck Important Habitat	Areas of important habitat for Long-tailed Ducks, represented as concentrations in abundance distributions based on a dataset that originated with Mass Audubon with additional analysis by NHESP. Mass Audubon provided radio telemetry data from Long-tailed Ducks tagged in Nantucket Sound, and from this data MA NHESP developed the spatial representation of their core habitat. The core habitat represented in the planning area includes night-time concentration areas north of Nantucket and the area of concentrated commutes to the south of Nantucket. Long-tailed Ducks have a unique winter behavior where they make a daily "commute" from Nantucket Sound, where they concentrate in particular areas at night, across Nantucket Island to Nantucket Shoals, where they disperse to feed during the day. Because this behavior and Long-tailed Duck spatial distribution on Nantucket Shoals is being studied, the plan does not indicate core habitat for long-tail ducks south of the planning area.

Special, Sensitive, or Unique Area (SSU)	Description
Colonial Waterbirds Important Nesting Habitat	Areas of important nesting sites for colonial nesting waterbirds, based on dataset that originated from the MA DFW/NHESP. These sites represent areas where more than 100 pairs of the following species of colonial nesting waterbirds were observed during surveys in 1994 and 2006: Common Terns, Least Terns, Roseate Terns, Arctic Terns, Leach's Storm-petrels, Double-crested Cormorants, Herring Gulls, Great Black-backed Gulls, Laughing Gulls, Black Skimmers, Great Egrets, Snowy Egrets, Cattle Egrets, Little Blue Herons, Black-crowned Night Herons, and Glossy Ibis. The Important Habitat areas are the nesting sites buffered 0.3 nautical miles.
Areas of hard/complex seafloor	Areas of hard/complex seafloor, characterized as any combination of the following: 1) areas of exposed bedrock or concentrations of boulder, cobble, or other similar hard bottom distinguished from surrounding unconsolidated sediments, 2) a morphologically rugged seafloor characterized by high variability in bathymetric aspect and gradient, or 3) man-made structures, such as artificial reefs, wrecks, or other functionally equivalent structures that provide additional suitable substrate for development of hard bottom biological communities. On a project-specific basis, proponents may be responsible for the data and analysis to delineate hard/complex bottom, pursuant to Secretary scoping requirements in the MEPA process. Guidance will be developed by the EEA Ocean Team to further define this SSU and how it should be identified by proponents on a project-specific basis. Issues to be addressed will include descriptions of scale, biogenic reefs, definitions of terms (e.g. cobble), biological communities with vertical relief, and energetic stability. For the ocean management plan, EEA created a map of hard/complex bottom by combining three data sources. First, a statewide bathymetry data set was created by combining the highest resolution bathymetric data sets available and then calculating rugosity, a measure of bathymetric heterogeneity. Highly rugose areas were then combined with seafloor delineated as hard bottom in USGS interpreted seafloor maps. Finally the combination of these two data sets were added to points coded as hard bottom in an augmented usSEABED sediment database. The resultant map is representative of hard/complex bottom, in that it is based upon the highest resolution data available, and a specific project may obtain higher resolution data for project planning purposes.
Eelgrass	Areas that support communities of rooted eelgrass (Zostera marina) as represented by a dataset from the Massachusetts Department of Environmental Protection (DEP) Wetlands Conservancy Program. The DEP eelgrass layer was produced from data collected, using similar methodologies, in 2001 and 1995. DEP staff interpreted 1:20,000 aerial photography at low tide during summer months (high eelgrass biomass) to delineate eelgrass polygons and then field-verified the polygons. Since this dataset incorporates other seagrass species which are found outside of the planning area, eelgrass polygons were extracted for use in the ocean management plan.

Special, Sensitive, or Unique Area (SSU)	Description
Intertidal flats	Areas of broad intertidal flats that are exposed at extremely low tides and inundated at high tides, as represented by dataset from the Massachusetts DEP that is part of a broader wetlands dataset. Wetland areas were interpreted from 1:12,000 scale, stereo color-infrared photography by staff at UMASS Amherst and then field checked by Department of Environmental Protection (DEP) Wetlands Conservancy Program (WCP). A WCP consultant scanned completed interpretations and converted them into rectified polygons and lines using standard photogrammetric techniques. WCP GIS staff performed final quality control. Intertidal flat polygons were extracted for use in the ocean management plan.
Important fish resource areas	Areas of high importance to commercial and recreational fisheries as represented by a dataset from the Massachusetts Division of Marine Fisheries (DMF) based on Resource Assessment Trawl Survey collected from 1978-2007. To create this layer, 22 species were selected for consideration. See the fisheries work group report for the description of the methodology used to identify high, medium, and low categories. For the ocean management plan, high resource areas were extracted.

[1] NOAA National Centers for Coastal Ocean Science (NCCOS) 2006. An Ecological Characterization of the Stellwagen Bank National Marine Sanctuary Region: Oceanographic, Biogeographic, and Contaminants Assessment. Prepared by NCCOS's Biogeography Team in cooperation with the National Marine Sanctuary Program. Silver Spring, MD. NOAA Technical Memorandum NOS NCCOS 45. 356 pp.

Color Figures/Maps

Figure 2-1 Management areas

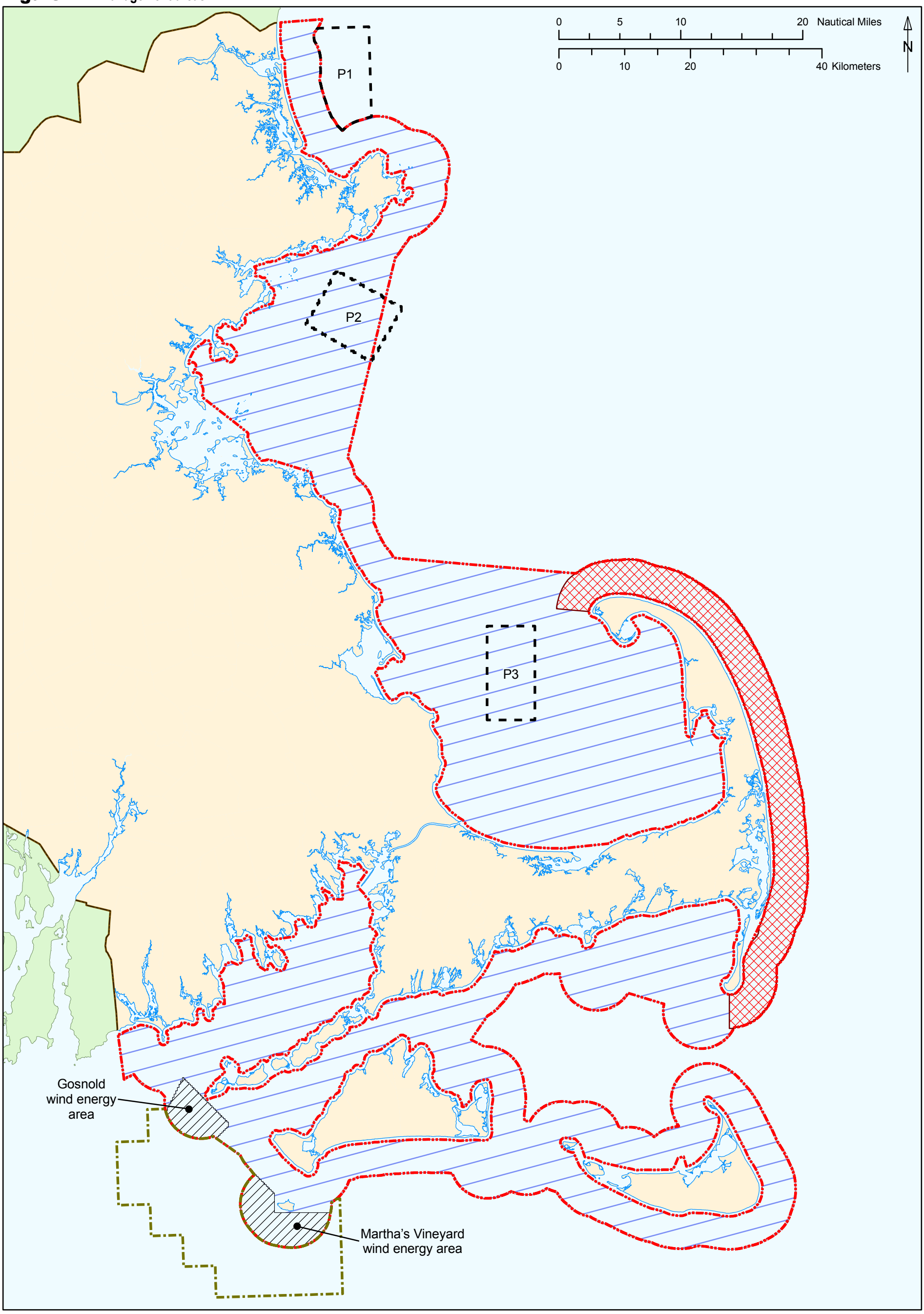
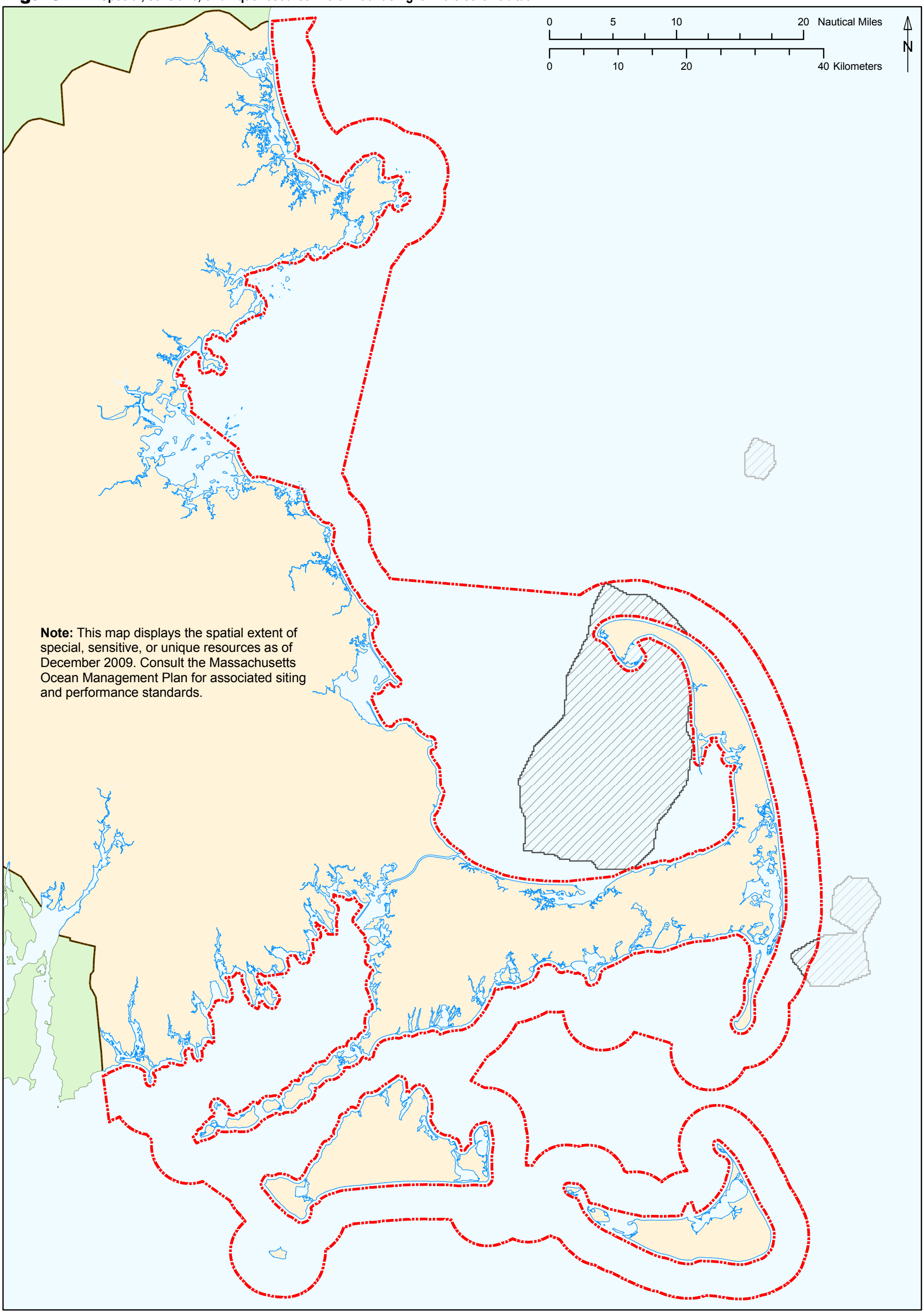


Figure 2-2 Special, sensitive, or unique resource: North Atlantic right whale core habitat



MASSACHUSETTS OFFICE OF COASTAL ZONE MANAGEMENT

Massachusetts ocean management planning area boundary[1]

North Atlantic right whale core habitat[2]

Data sources: [1]Massachusetts Office of Coastal Zone Management, [2]National Oceanic and Atmospheric Administration (NOAA) National Centers for Coastal Ocean Science (NCCOS) 2006. An Ecological Characterization of the Stellwagen Bank National Marine Sanctuary Region: Oceanographic, Biogeographic, and Contaminants Assessment. Prepared by NCCOS's Biogeography Team in cooperation with the National Marine Sanctuary Program. Silver Spring, MD. NOAA Technical Memorandum NOS NCCOS 45. 356 pp.

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Map coordinate system: North American Datum of 1983 (NAD83), Massachusetts State Plane Coordinate System, Mainland Zone (FIPS zone 2001), meters.

Figure 2-3 Special, sensitive, or unique resource: humpback whale core habitat

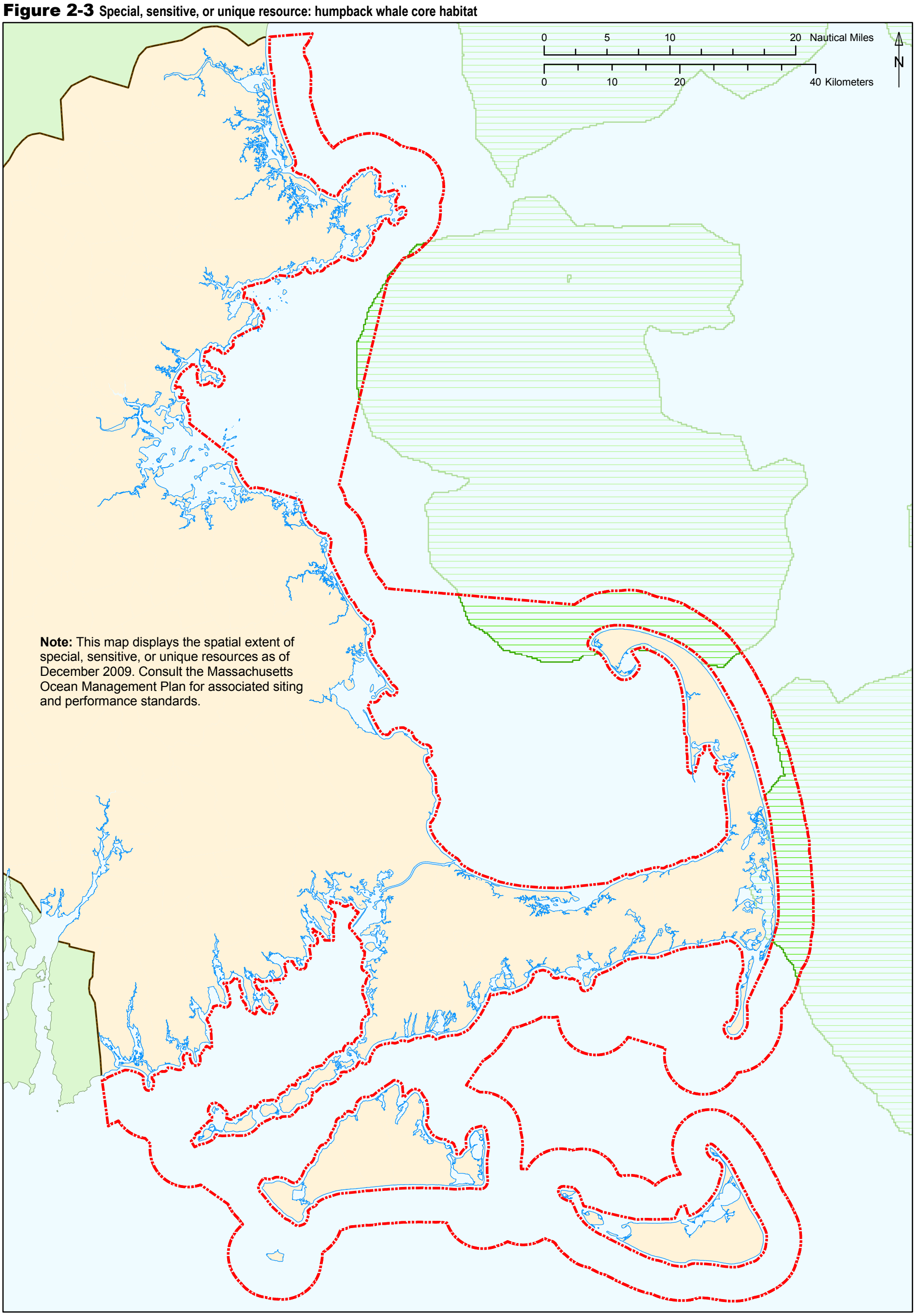


Figure 2-4 Special, sensitive, or unique resource: fin whale core habitat

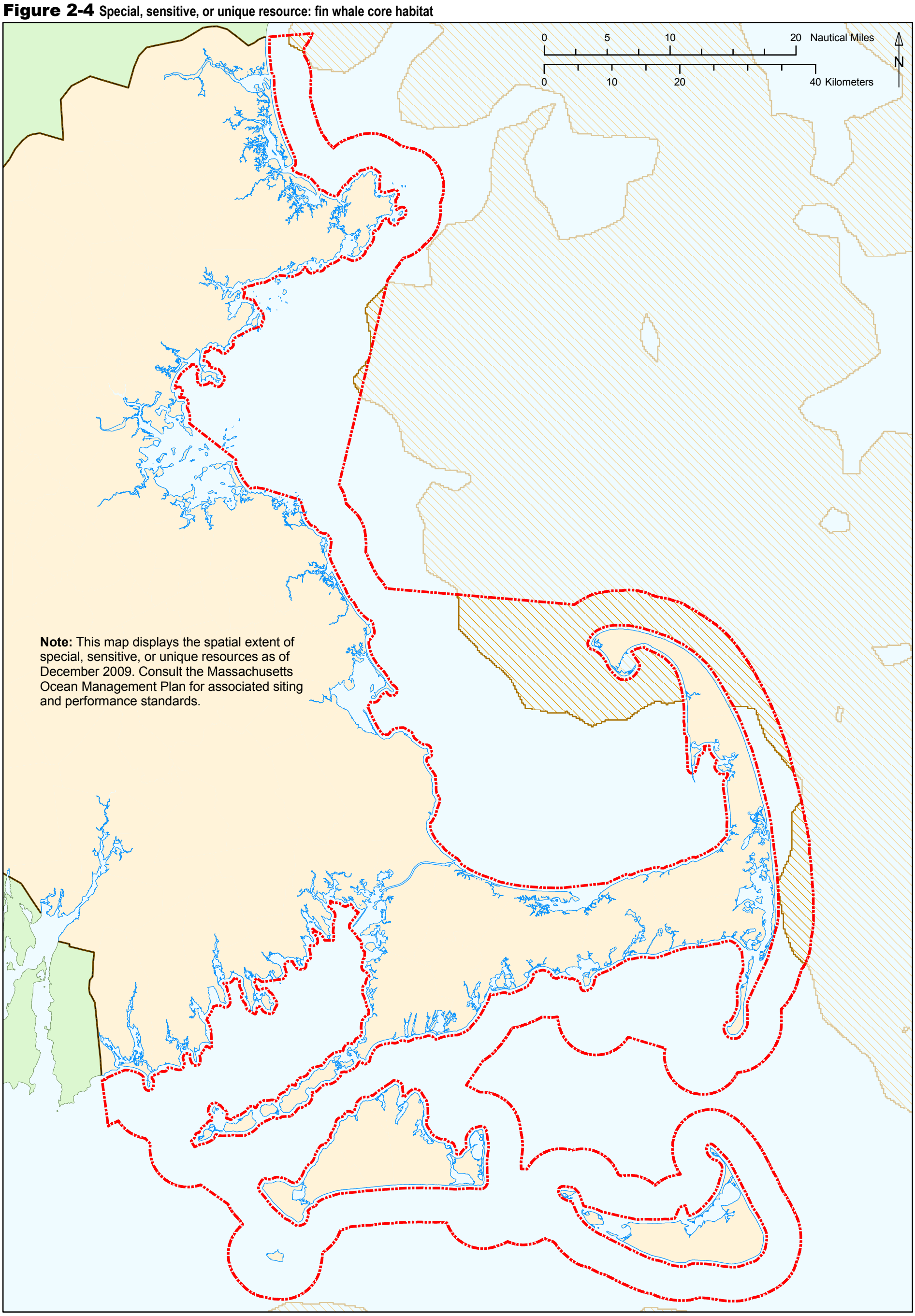
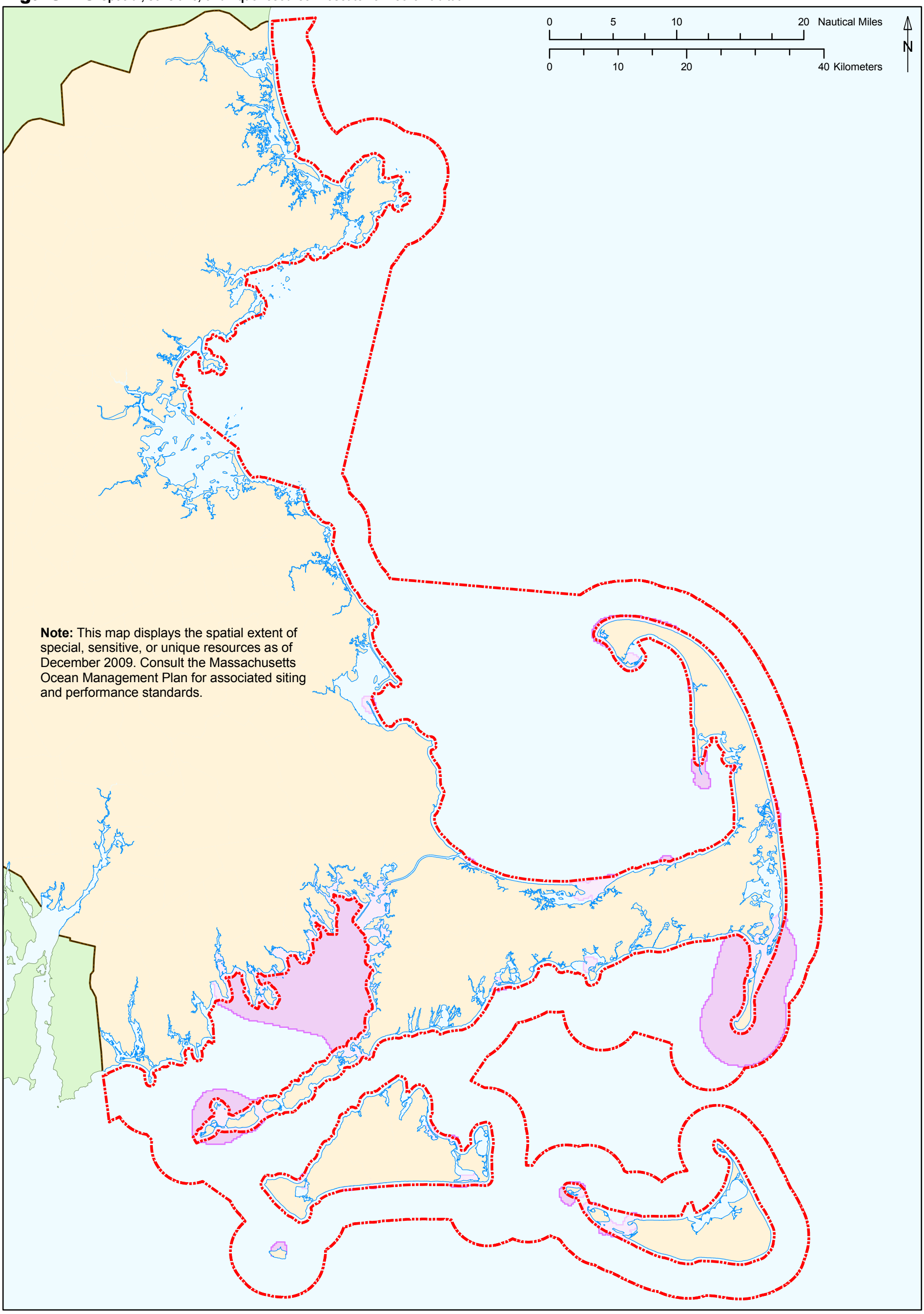


Figure 2-5 Special, sensitive, or unique resource: Roseate Tern core habitat



MASSACHUSETTS OFFICE OF COASTAL ZONE MANAGEMENT

Massachusetts ocean management planning area boundary[1]

Roseate Tern core habitat[2]

Data sources: [1]Massachusetts Office of Coastal Zone Management, [2]Massachusetts Division of Fisheries and Wildlife, Natural Heritage and Endangered Species Program.

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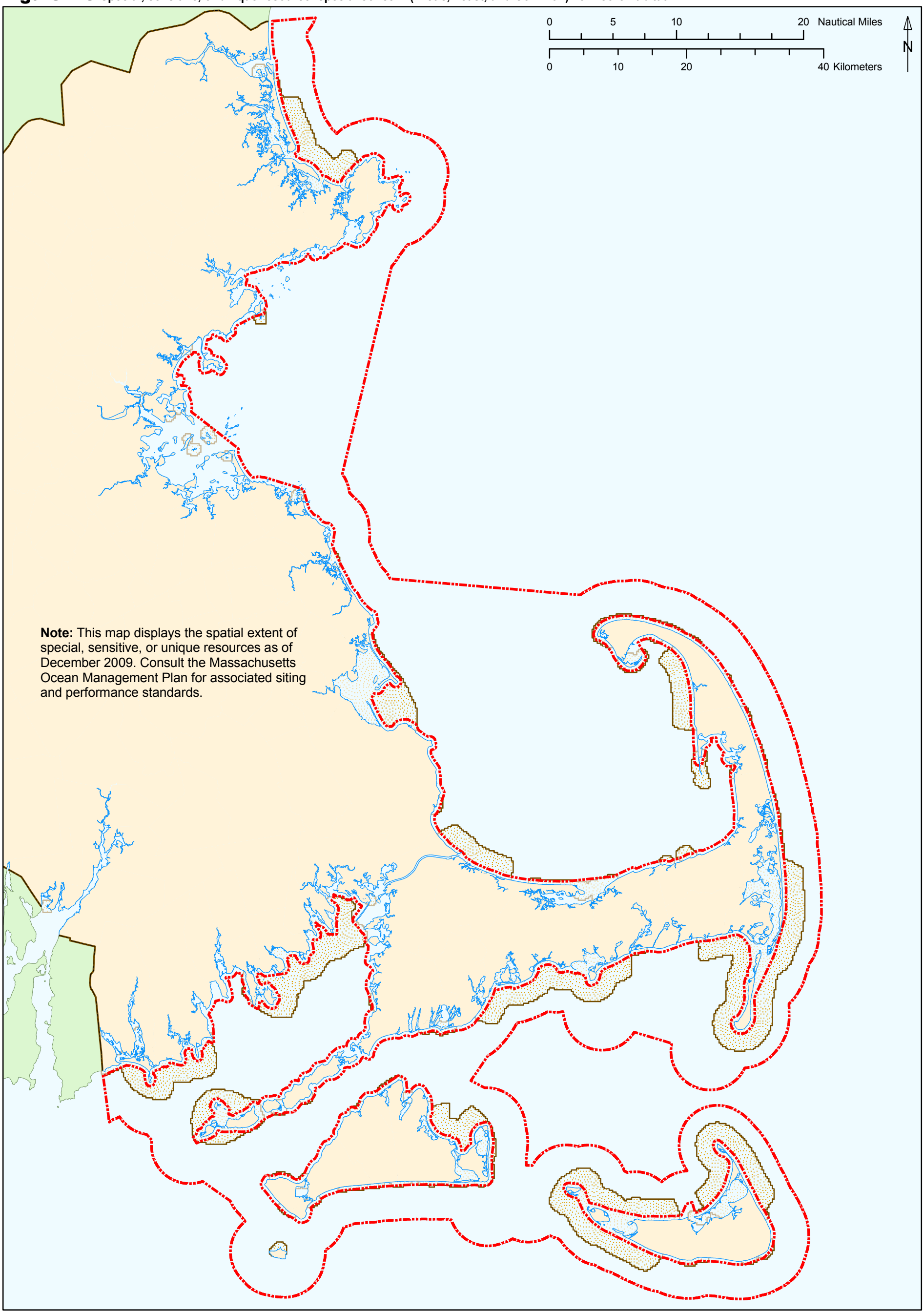
Map coordinate system: North American Datum of 1983 (NAD83), Massachusetts State Plane Coordinate System, Mainland Zone (FIPS zone 2001), meters.

Figure 2-6 Special, sensitive, or unique resource: special concern (Arctic, Least, and Common) Tern core habitat



MASSACHUSETTS OFFICE OF COASTAL ZONE MANAGEMENT

Massachusetts ocean management planning area boundary[1]

Special concern (Arctic, Least, and Common) Tern core habitat[2]

Data sources: [1]Massachusetts Office of Coastal Zone Management, [2]Massachusetts Division of Fisheries and Wildlife, Natural Heritage and Endangered Species Program.

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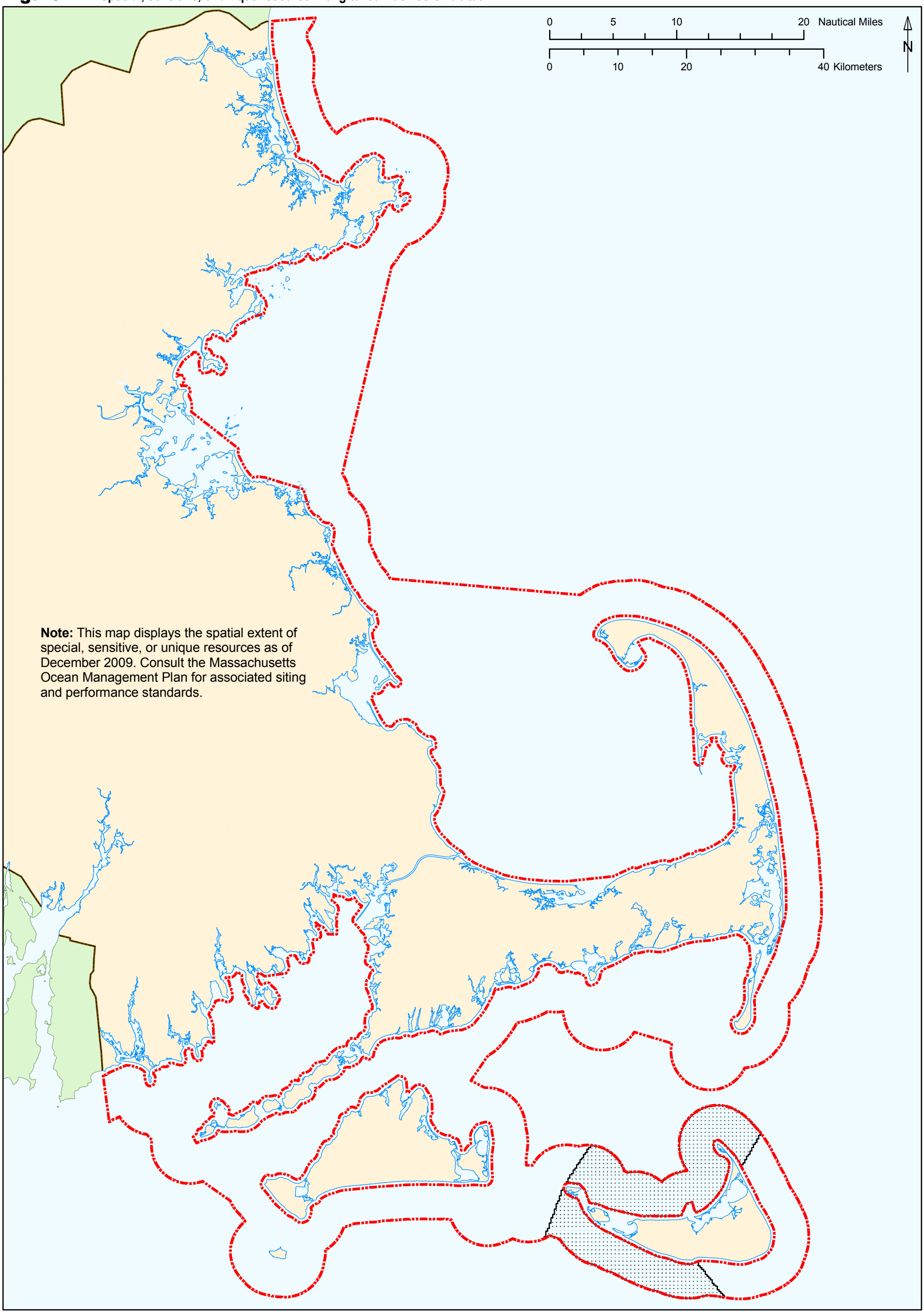
Map coordinate system: North American Datum of 1983 (NAD83), Massachusetts State Plane Coordinate System, Mainland Zone (FIPS zone 2001), meters.

Figure 2-7 Special, sensitive, or unique resource: Long-tailed Duck core habitat



MASSACHUSETTS OFFICE OF COASTAL ZONE MANAGEMENT

Massachusetts ocean management planning area boundary[1]

Long-tailed Duck core habitat[2,3]

Data sources: [1]Massachusetts Office of Coastal Zone Management, [2]Massachusetts Audubon Society, [3]Massachusetts Division of Fisheries and Wildlife, Natural Heritage and Endangered Species Program.

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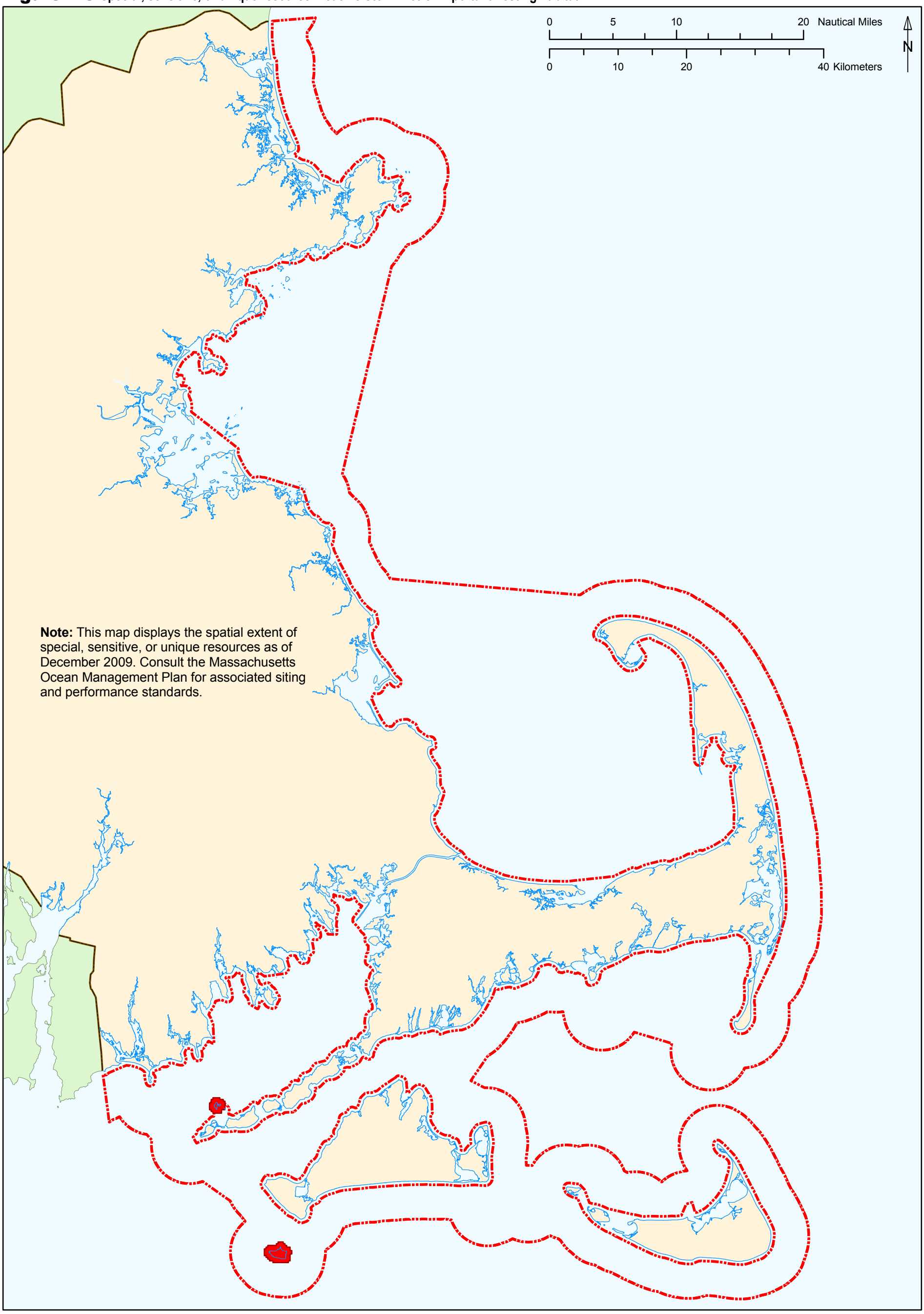
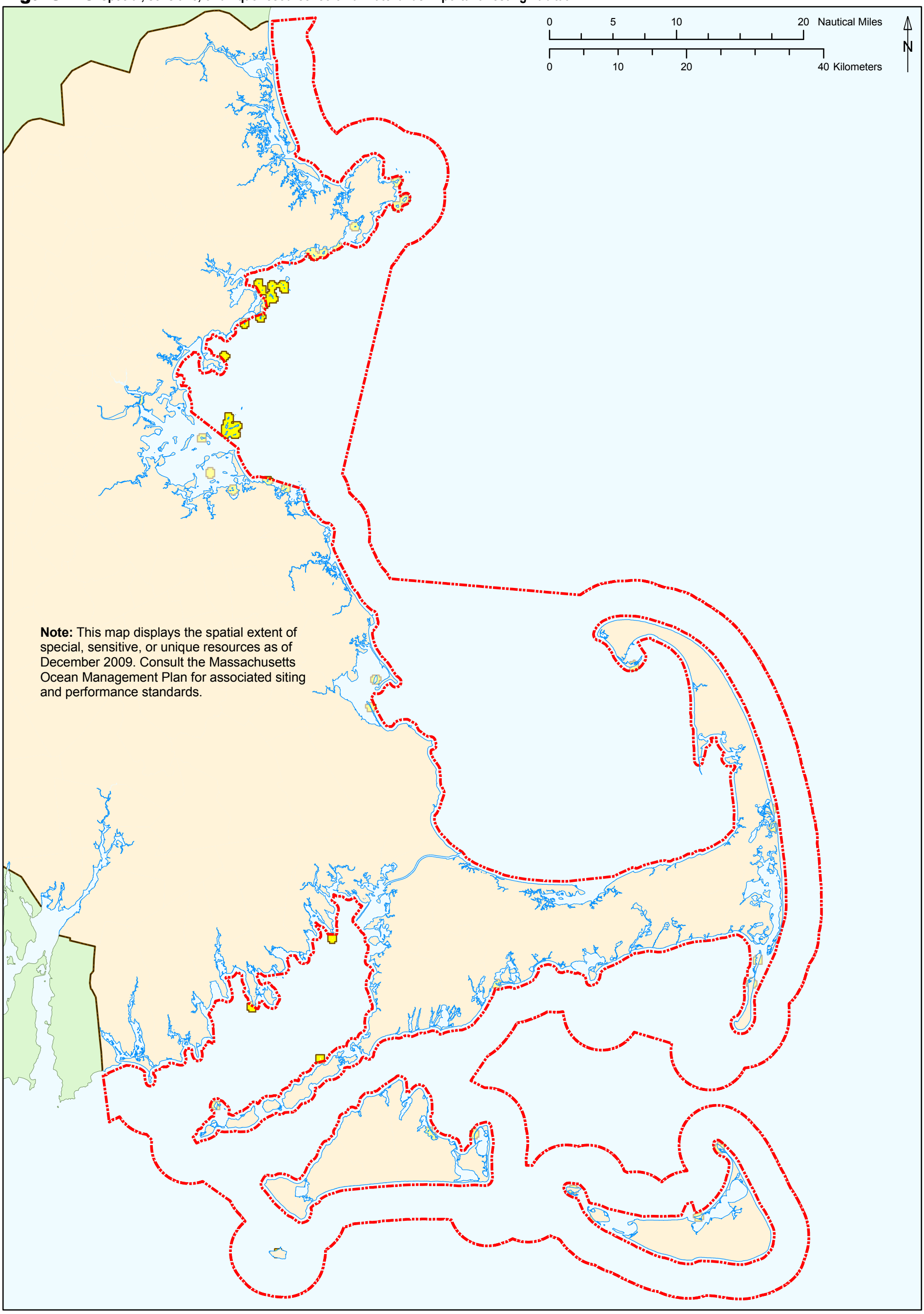
Map coordinate system: North American Datum of 1983 (NAD83), Massachusetts State Plane Coordinate System, Mainland Zone (FIPS zone 2001), meters.

Figure 2-8 Special, sensitive, or unique resource: Leach's Storm-Petrel important nesting habitat



Map coordinate system: North American Datum of 1983 (NAD83), Massachusetts State Plane Coordinate System, Mainland Zone (FIPS zone 2001), meters.

Figure 2-9 Special, sensitive, or unique resource: colonial waterbirds important nesting habitat



MASSACHUSETTS OFFICE OF COASTAL ZONE MANAGEMENT

Massachusetts ocean management planning area boundary[1]

Colonial waterbirds important nesting habitat[2]

Data sources: [1]Massachusetts Office of Coastal Zone Management, [2]Massachusetts Division of Fisheries and Wildlife, Natural Heritage and Endangered Species Program.

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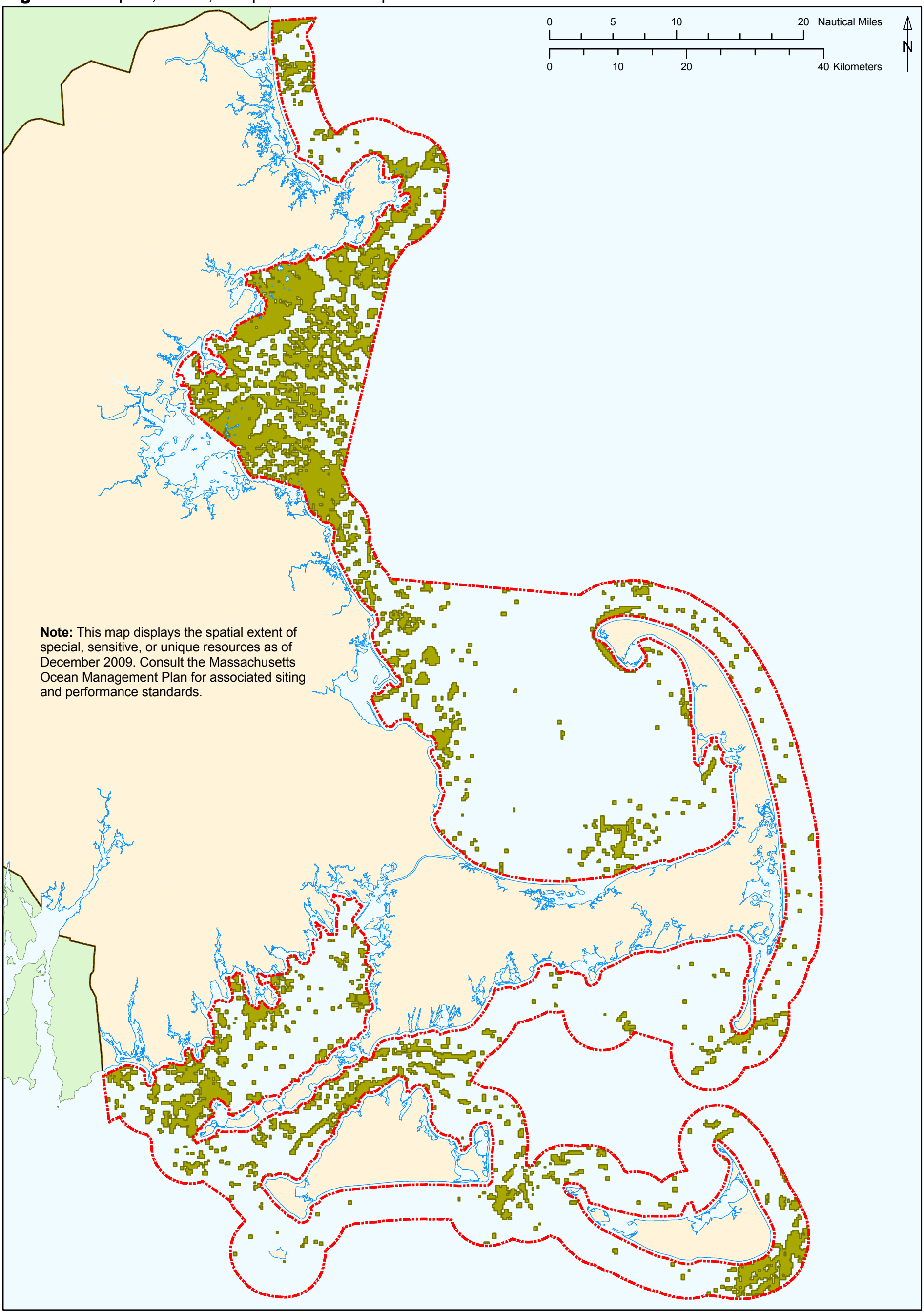
Map coordinate system: North American Datum of 1983 (NAD83), Massachusetts State Plane Coordinate System, Mainland Zone (FIPS zone 2001), meters.

Figure 2-10 Special, sensitive, or unique resource: hard/complex seafloor



MASSACHUSETTS OFFICE OF COASTAL ZONE MANAGEMENT

Massachusetts ocean management planning area boundary[1]

Hard/complex seafloor[1]

Data source: [1]Massachusetts Office of Coastal Zone Management.

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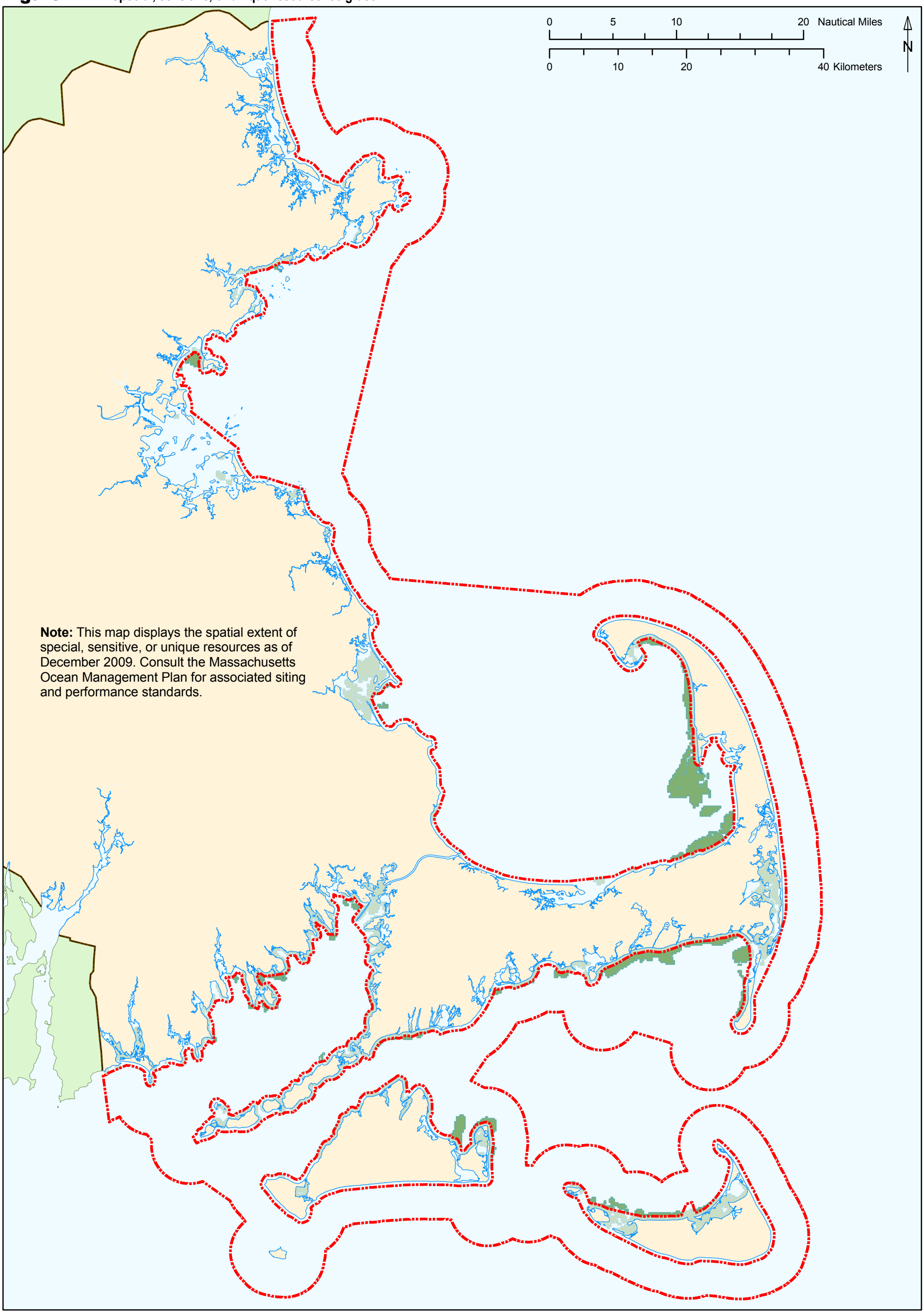
Map coordinate system: North American Datum of 1983 (NAD83), Massachusetts State Plane Coordinate System, Mainland Zone (FIPS zone 2001), meters.

Figure 2-11 Special, sensitive, or unique resource: eelgrass



MASSACHUSETTS OFFICE OF COASTAL ZONE MANAGEMENT

Massachusetts ocean management planning area boundary[1]

Eelgrass[2]

Data sources: [1]Massachusetts Office of Coastal Zone Management, [2]Massachusetts Department of Environmental Protection, Wetlands Conservancy Program.

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Map coordinate system: North American Datum of 1983 (NAD83), Massachusetts State Plane Coordinate System, Mainland Zone (FIPS zone 2001), meters.

Figure 2-12 Special, sensitive, or unique resource: intertidal flats

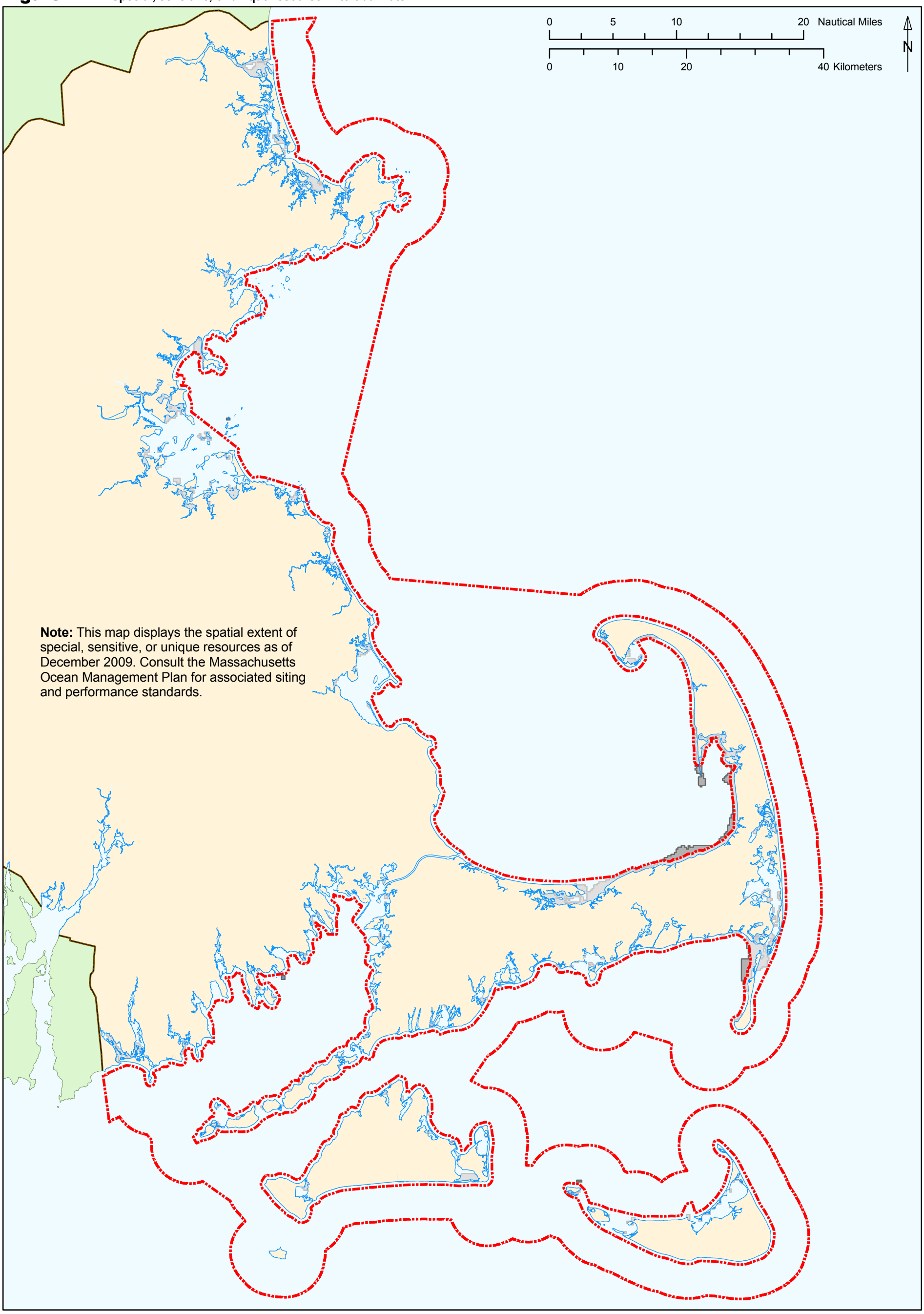
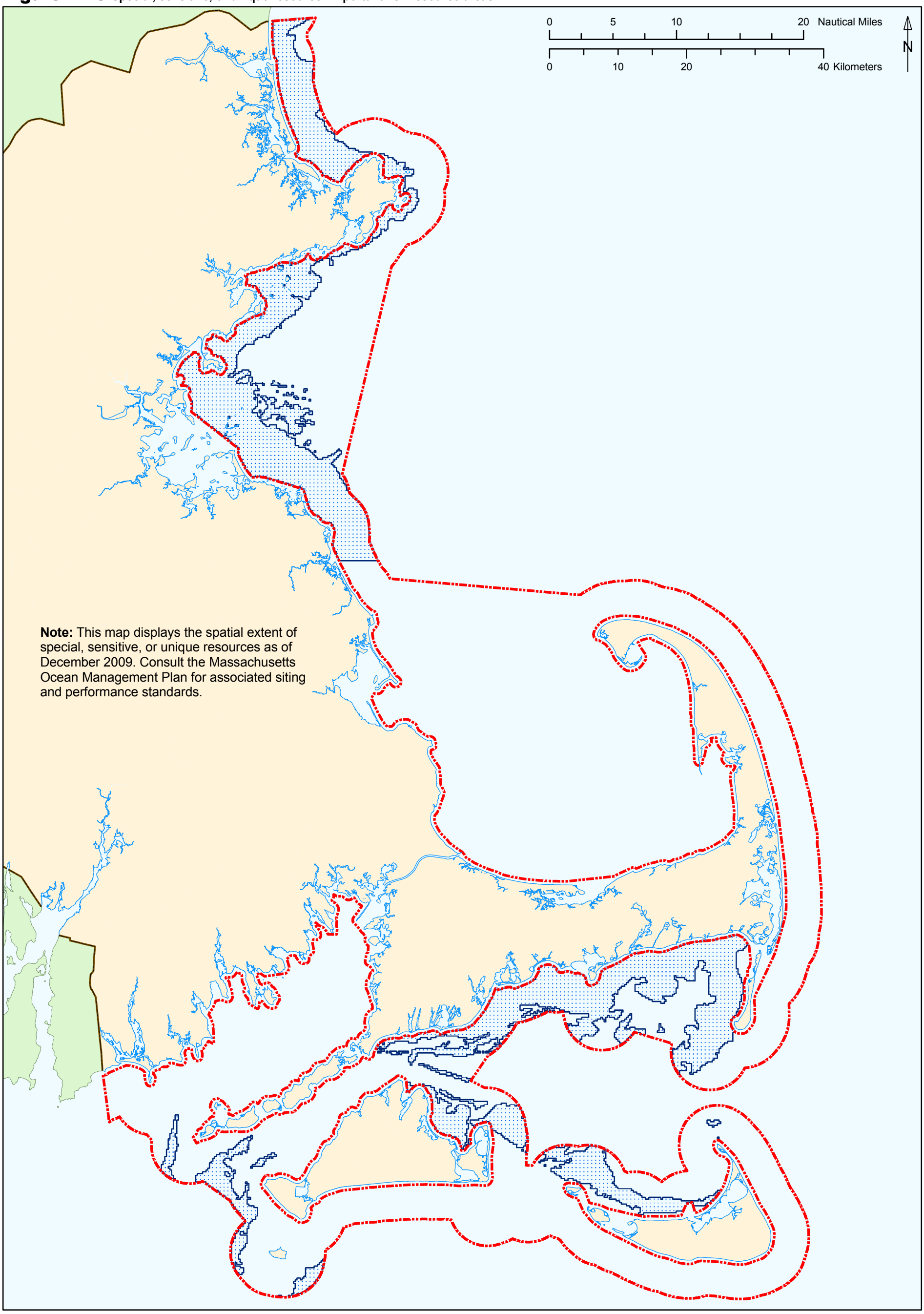


Figure 2-13 Special, sensitive, or unique resource: important fish resource areas



MASSACHUSETTS OFFICE OF COASTAL ZONE MANAGEMENT

Massachusetts ocean management planning area boundary[1]

Important fish resource areas[2]

Data sources: [1]Massachusetts Office of Coastal Zone Management, [2]Massachusetts Division of Marine Fisheries.

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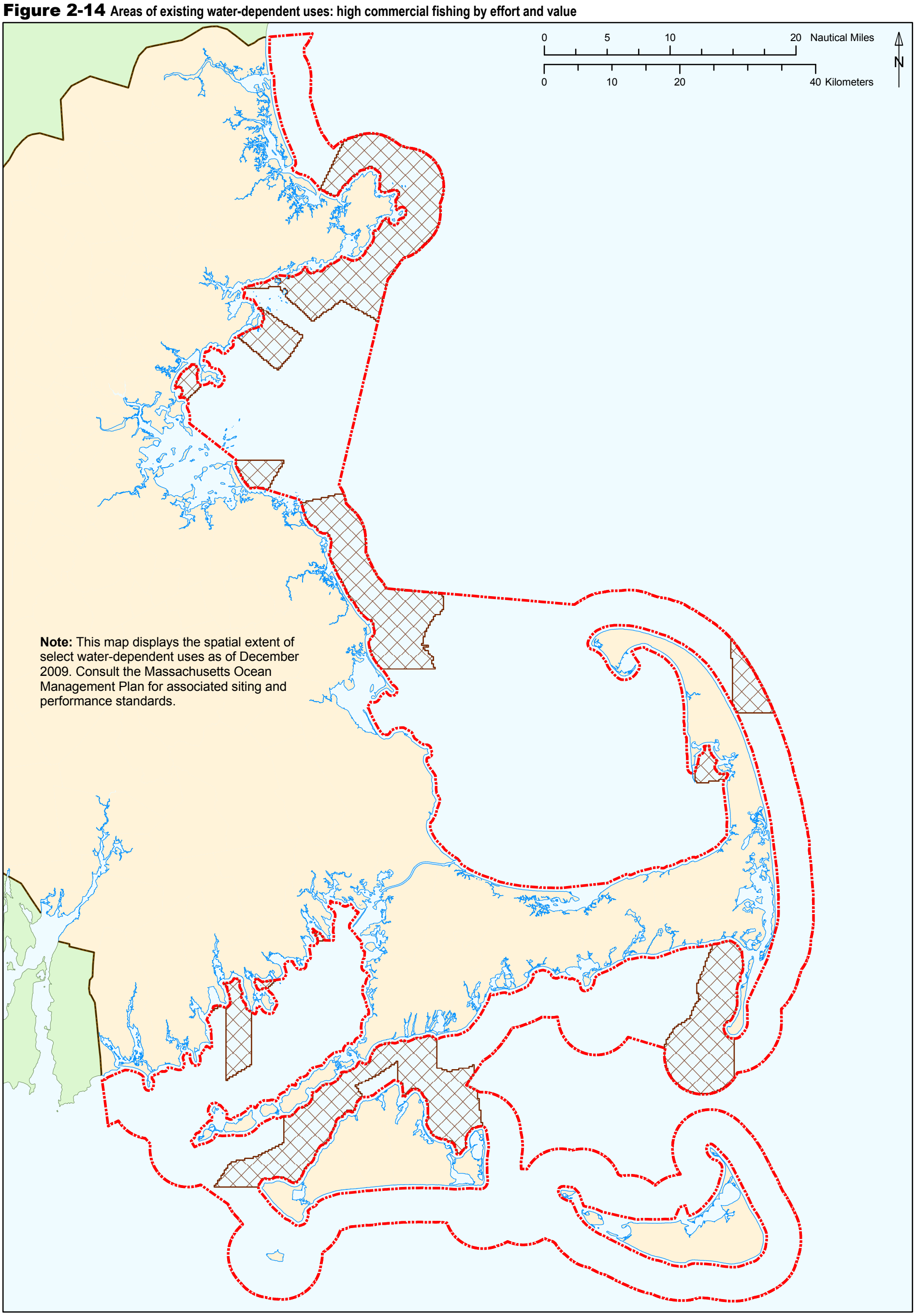
Map coordinate system: North American Datum of 1983 (NAD83), Massachusetts State Plane Coordinate System, Mainland Zone (FIPS zone 2001), meters.

Figure 2-14 Areas of existing water-dependent uses: high commercial fishing by effort and value



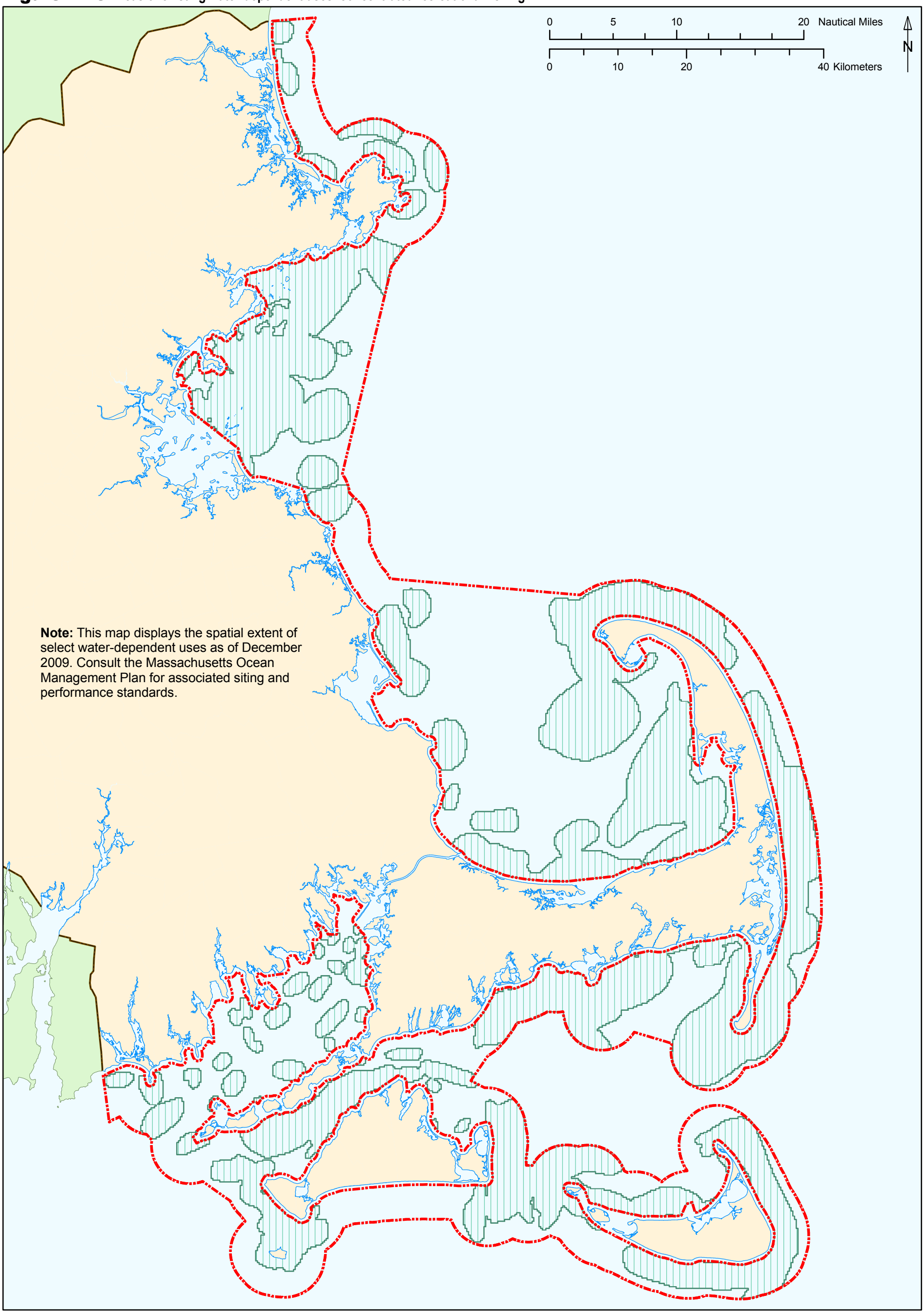
Massachusetts ocean management planning area boundary[1]

High effort and value commercial fishing[2]

Data sources: [1]Massachusetts Office of Coastal Zone Management, [2]Massachusetts Division of Marine Fisheries.

Map coordinate system: North American Datum of 1983 (NAD83), Massachusetts State Plane Coordinate System, Mainland Zone (FIPS zone 2001), meters.

Figure 2-15 Areas of existing water-dependent uses: concentrated recreational fishing



MASSACHUSETTS OFFICE OF COASTAL ZONE MANAGEMENT

Massachusetts ocean management planning area boundary[1]

Concentrated recreational fishing[2]

Data sources: [1]Massachusetts Office of Coastal Zone Management, [2]Massachusetts Division of Marine Fisheries.

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Map coordinate system: North American Datum of 1983 (NAD83), Massachusetts State Plane Coordinate System, Mainland Zone (FIPS zone 2001), meters.

Figure 2-16 Areas of existing water-dependent uses: concentrated commerce and commercial fishing traffic

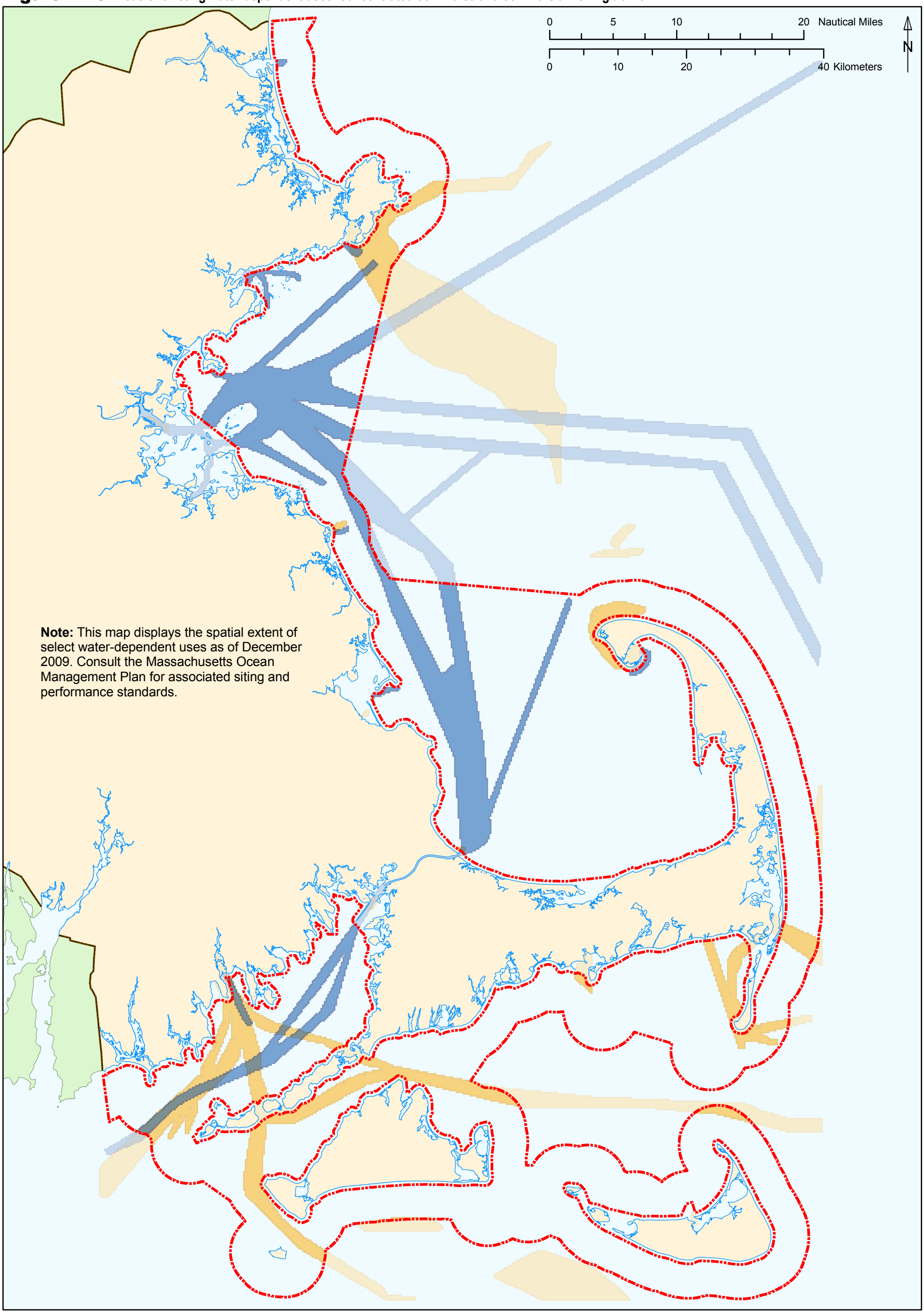
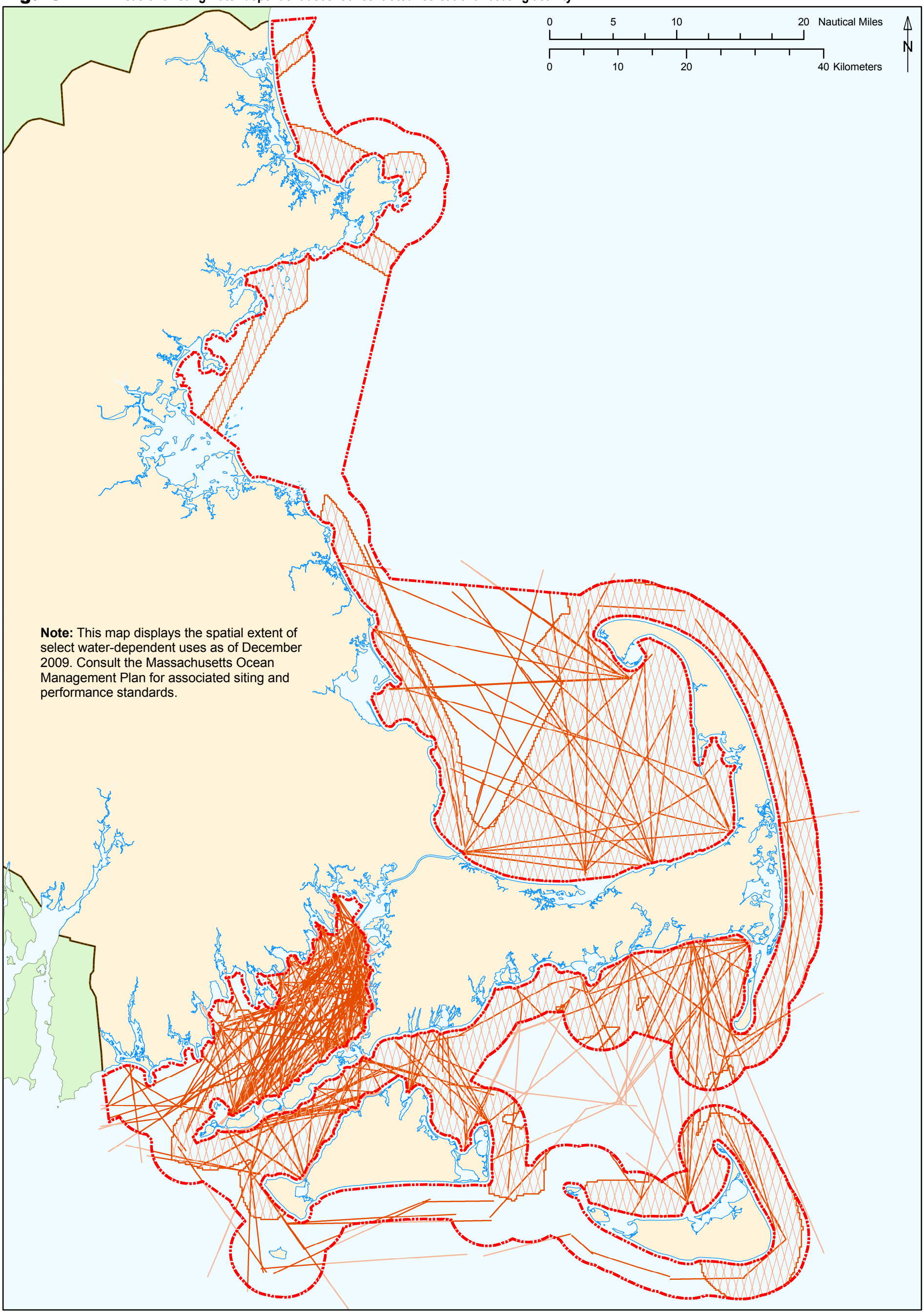


Figure 2-17 Areas of existing water-dependent uses: concentrated recreational boating activity



MASSACHUSETTS OFFICE OF COASTAL ZONE MANAGEMENT

Massachusetts ocean management planning area boundary[1]

Concentrated recreational boating activity[2]

Concentrated recreational boating routes[2]

Data sources: [1]Massachusetts Office of Coastal Zone Management, [2]Massachusetts Marine Trades Association.

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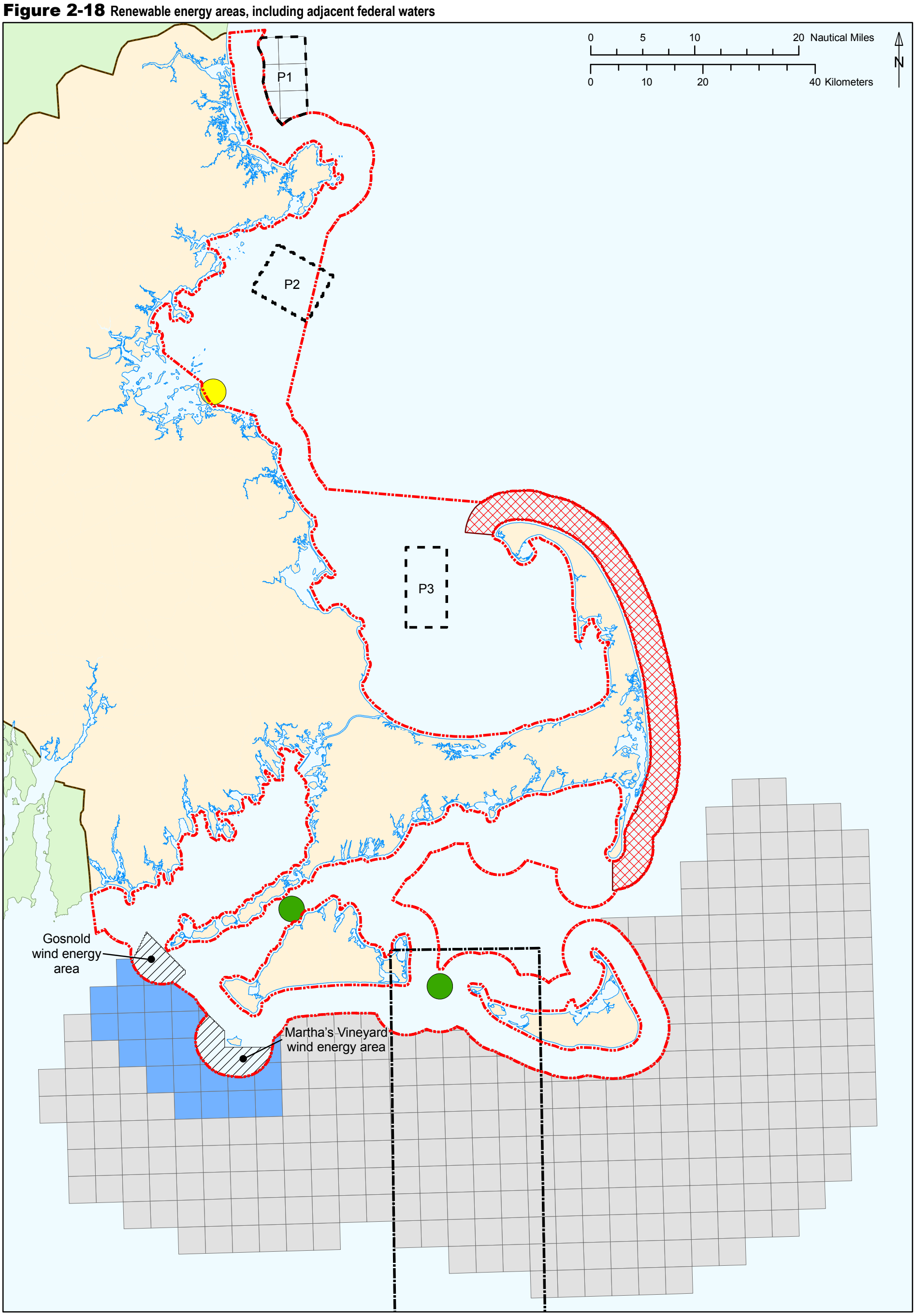
Map coordinate system: North American Datum of 1983 (NAD83), Massachusetts State Plane Coordinate System, Mainland Zone (FIPS zone 2001), meters.

Figure 2-18 Renewable energy areas, including adjacent federal waters

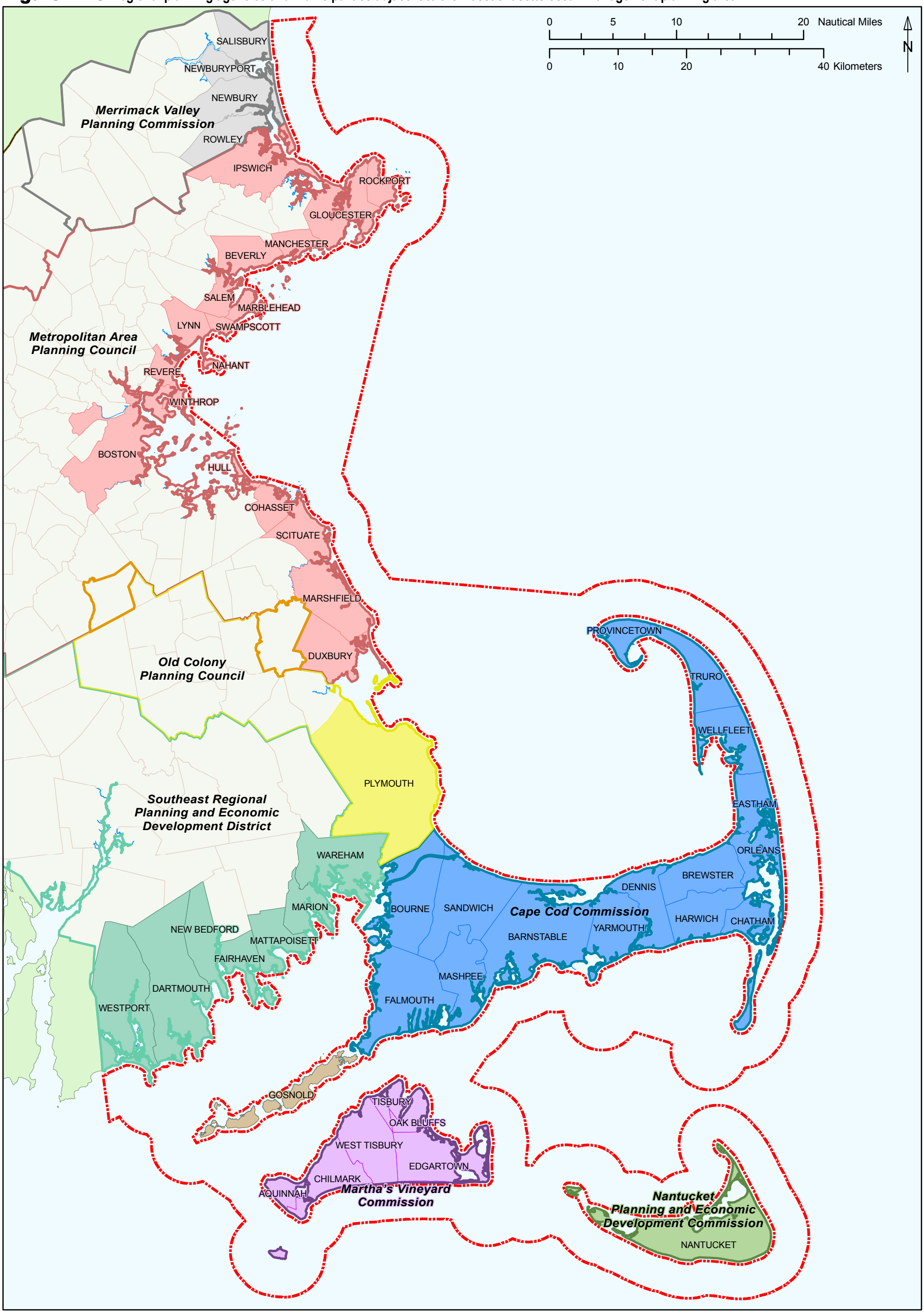


Massachusetts ocean management planning area boundary[1]
Hull project[1]
Potentially suitable for deepwater sites[1]
Prohibited area[1]
Proposed for screening and feasibility analysis[1]
Proposed New England Marine Renewable Energy Center test area[1]
Proposed tidal energy project area[1]
Provisional area[1]
Wind energy areas[1]

Data source: [1]Massachusetts Office of Coastal Zone Management.

Map coordinate system: North American Datum of 1983 (NAD83), Massachusetts State Plane Coordinate System, Mainland Zone (FIPS zone 2001), meters.

Figure 2-19 Regional planning agencies and municipalities adjacent to the Massachusetts ocean management planning area



MASSACHUSETTS OFFICE OF COASTAL ZONE MANAGEMENT

Massachusetts ocean management planning area boundary[1]

Regional planning agencies[2]

- Cape Cod Commission (CCC)
- Martha's Vineyard Commission (MVC)
- Merrimack Valley Planning Commission (MVPC)
- Metropolitan Area Planning Council (MAPC)
- Nantucket Planning and Economic Development Commission (NPEDC)
- Old Colony Planning Council (OCPC)
- Southeast Regional Planning and Economic Development District (SRPEDD)
- Belongs to both MAPC & OCPC

Data sources: [1]Massachusetts Office of Coastal Zone Management, [2]Massachusetts Office of Geographic and Environmental Information (MassGIS).

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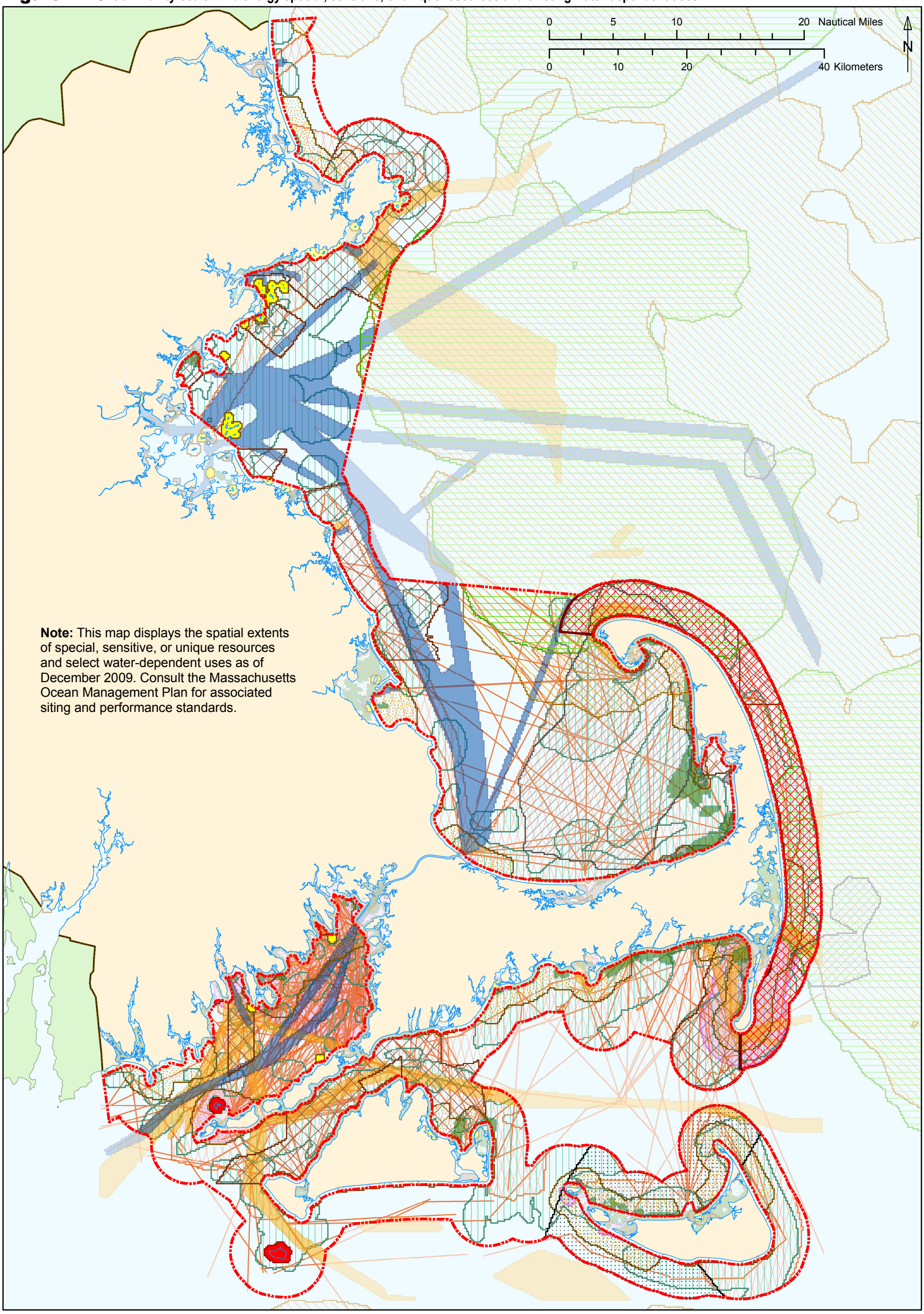
Map coordinate system: North American Datum of 1983 (NAD83), Massachusetts State Plane Coordinate System, Mainland Zone (FIPS zone 2001), meters.

Figure 2-20 Community-scale wind energy special, sensitive, or unique resources and existing water-dependent uses



MASSACHUSETTS OFFICE OF COASTAL ZONE MANAGEMENT

- Massachusetts ocean management planning area boundary[1]
- Colonial waterbirds important nesting habitat[2]
- Concentrated commerce traffic, as indicated by Automatic Identification System (AIS) data[3]
- Concentrated commercial fishing traffic, as indicated by Vessel Monitoring System (VMS) data[4]
- Concentrated recreational boating activity[5]
- Concentrated recreational boating routes[5]
- Eelgrass[6]
- Fin whale core habitat[7]
- High effort and value commercial fishing[8]
- Humpback whale core habitat[7]
- Intertidal flats[6]
- Leach's Storm-Petrel important nesting habitat[2]
- Long-tailed Duck core habitat[2,9]
- North Atlantic right whale core habitat[7]
- Prohibited area[1]
- Roseate Tern core habitat[2]
- Special concern (Arctic, Least, and Common) Tern core habitat[2]

Data sources: [1]Massachusetts Office of Coastal Zone Management, [2]Massachusetts Division of Fisheries and Wildlife, Natural Heritage and Endangered Species Program, [3]Stellwagen Bank National Marine Sanctuary, [4]National Marine Fisheries Service Northeast Regional Office, [5]Massachusetts Marine Trades Association, [6]Massachusetts Department of Environmental Protection, Wetlands Conservancy Program, [7]National Oceanic and Atmospheric Administration (NOAA) National Centers for Coastal Ocean Science (NCCOS) 2006. An Ecological Characterization of the Stellwagen Bank National Marine Sanctuary Region: Oceanographic, Biogeographic, and Contaminants Assessment. Prepared by NCCOS's BiogeographyTeam in cooperation with the National Marine Sanctuary Program. Silver Spring, MD. NOAA Technical Memorandum NOS NCCOS 45. 356 pp., [8]Massachusetts Division of Marine Fisheries, [9]Massachusetts Audubon Society.

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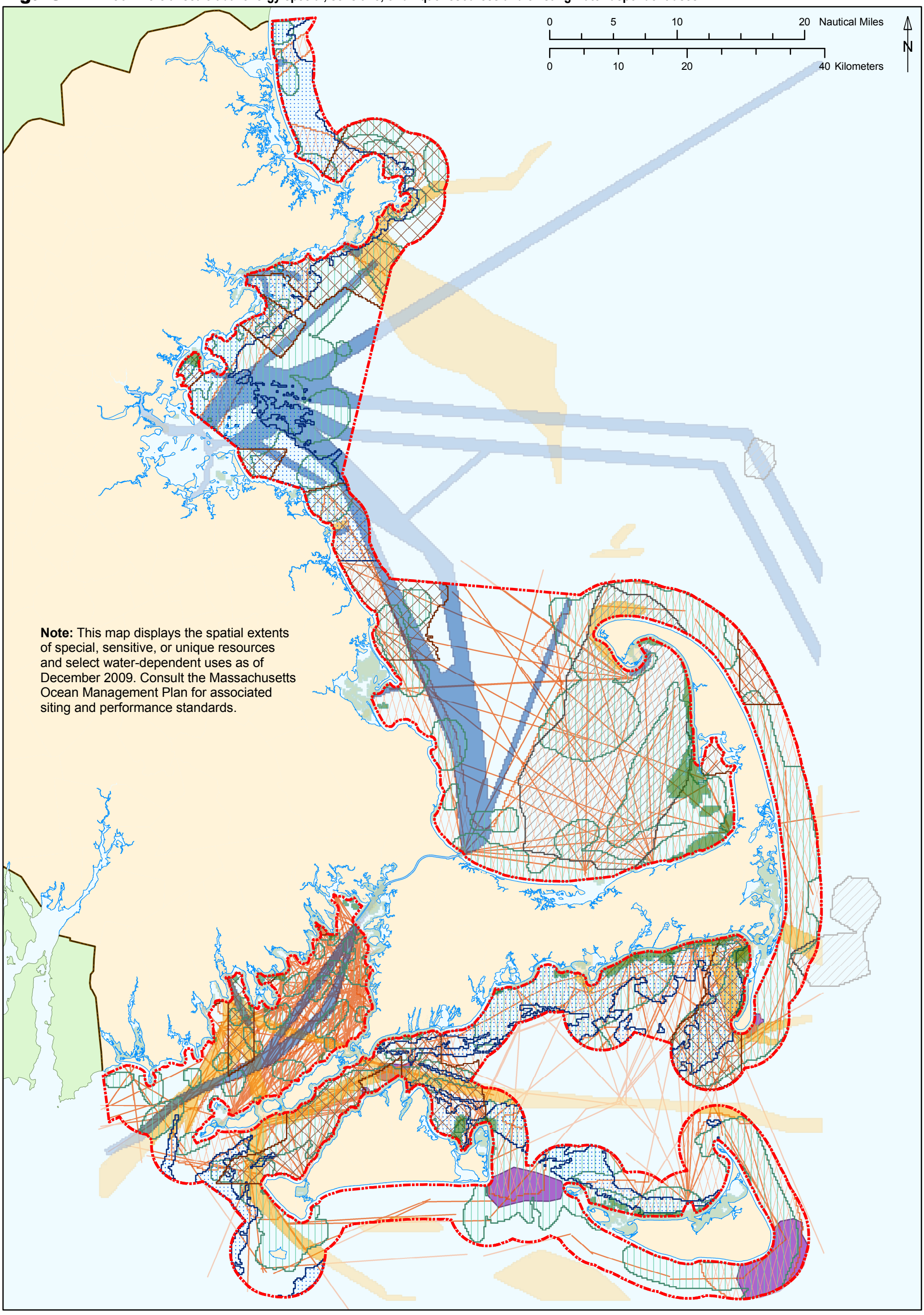
Map coordinate system: North American Datum of 1983 (NAD83), Massachusetts State Plane Coordinate System, Mainland Zone (FIPS zone 2001), meters.

Figure 2-21 Commercial-scale tidal energy special, sensitive, or unique resources and existing water-dependent uses



MASSACHUSETTS OFFICE OF COASTAL ZONE MANAGEMENT

- Massachusetts ocean management planning area boundary[1]
- Concentrated commerce traffic, as indicated by Automatic Identification System (AIS) data[2]
- Concentrated commercial fishing traffic, as indicated by Vessel Monitoring System (VMS) data[3]
- Concentrated recreational boating activity[4]
- Concentrated recreational boating routes[4]
- Concentrated recreational fishing[5]
- Eelgrass[6]
- High effort and value commercial fishing[5]
- Important fish resource areas[5]
- North Atlantic right whale core habitat[7]
- Potential tidal resources[1]

Data sources: [1]Massachusetts Office of Coastal Zone Management, [2]Stellwagen Bank National Marine Sanctuary, [3]National Marine Fisheries Service Northeast Regional Office, [4]Massachusetts Marine Trades Association, [5]Massachusetts Division of Marine Fisheries, [6]Massachusetts Department of Environmental Protection, Wetlands Conservancy Program, [7]National Oceanic and Atmospheric Administration (NOAA) National Centers for Coastal Ocean Science (NCCOS) 2006. An Ecological Characterization of the Stellwagen Bank National Marine Sanctuary Region: Oceanographic, Biogeographic, and Contaminants Assessment. Prepared by NCCOS's Biogeography Team in cooperation with the National Marine Sanctuary Program. Silver Spring, MD. NOAA Technical Memorandum NOS NCCOS 45. 356 pp.

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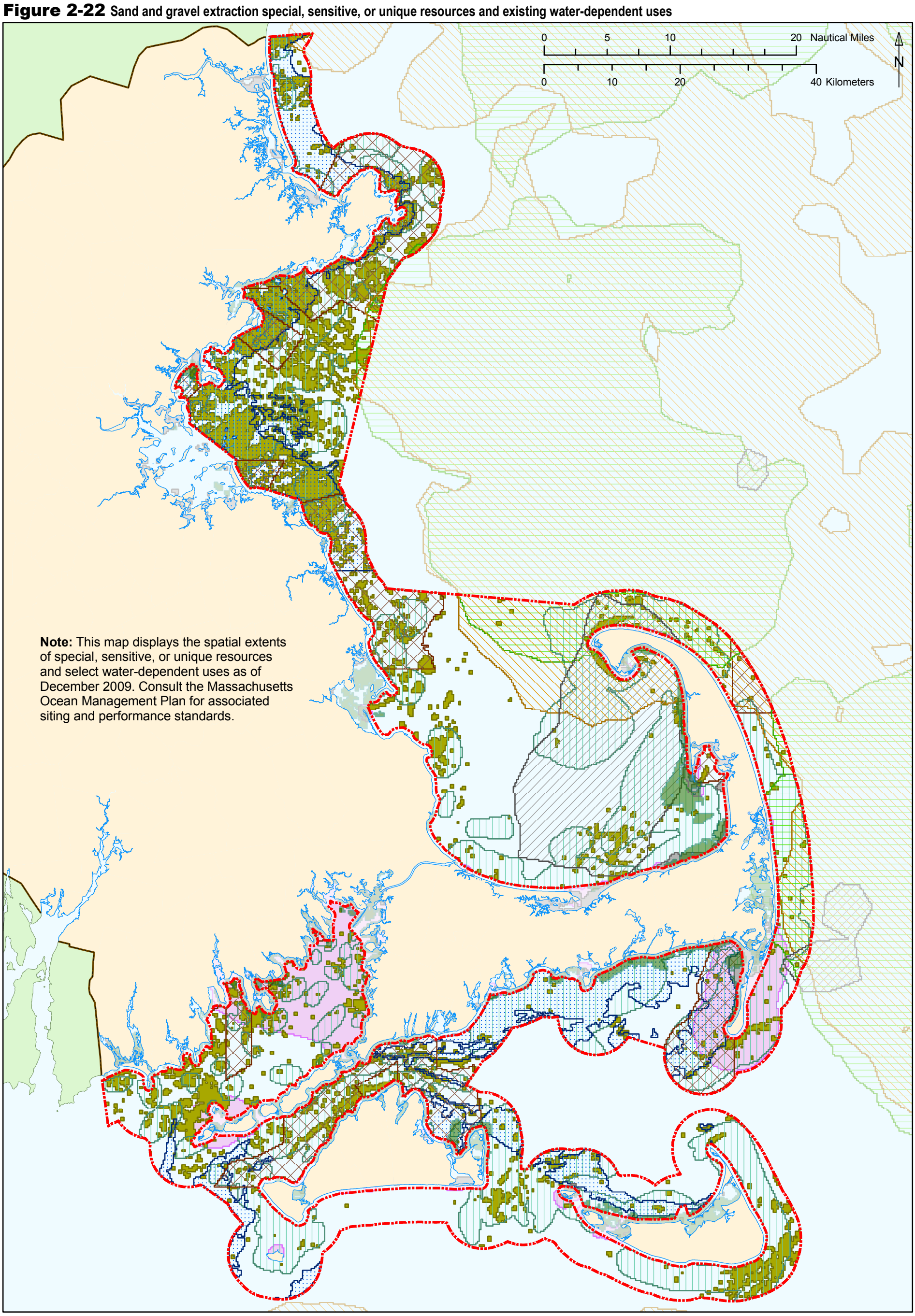
Map coordinate system: North American Datum of 1983 (NAD83), Massachusetts State Plane Coordinate System, Mainland Zone (FIPS zone 2001), meters.

Figure 2-22 Sand and gravel extraction special, sensitive, or unique resources and existing water-dependent uses



MASSACHUSETTS OFFICE OF COASTAL ZONE MANAGEMENT

- Massachusetts ocean management planning area boundary[1]
- Concentrated recreational fishing[2]
- Eelgrass[3]
- Fin whale core habitat[4]
- Hard/complex seafloor[1]
- Humpback whale core habitat[4]
- High effort and value commercial fishing[2]
- Important fish resource areas[2]
- Intertidal flats[3]
- North Atlantic right whale core habitat[4]
- Roseate Tern core habitat[5]

Data sources: [1]Massachusetts Office of Coastal Zone Management, [2]Massachusetts Division of Marine Fisheries, [3]Massachusetts Department of Environmental Protection, Wetlands Conservancy Program, [4]National Oceanic and Atmospheric Administration (NOAA) National Centers for Coastal Ocean Science (NCCOS) 2006. An Ecological Characterization of the Stellwagen Bank National Marine Sanctuary Region: Oceanographic, Biogeographic, and Contaminants Assessment. Prepared by NCCOS's Biogeography Team in cooperation with the National Marine Sanctuary Program. Silver Spring, MD. NOAA Technical Memorandum NOS NCCOS 45. 356 pp., [5]Massachusetts Division of Fisheries and Wildlife, Natural Heritage and Endangered Species Program.

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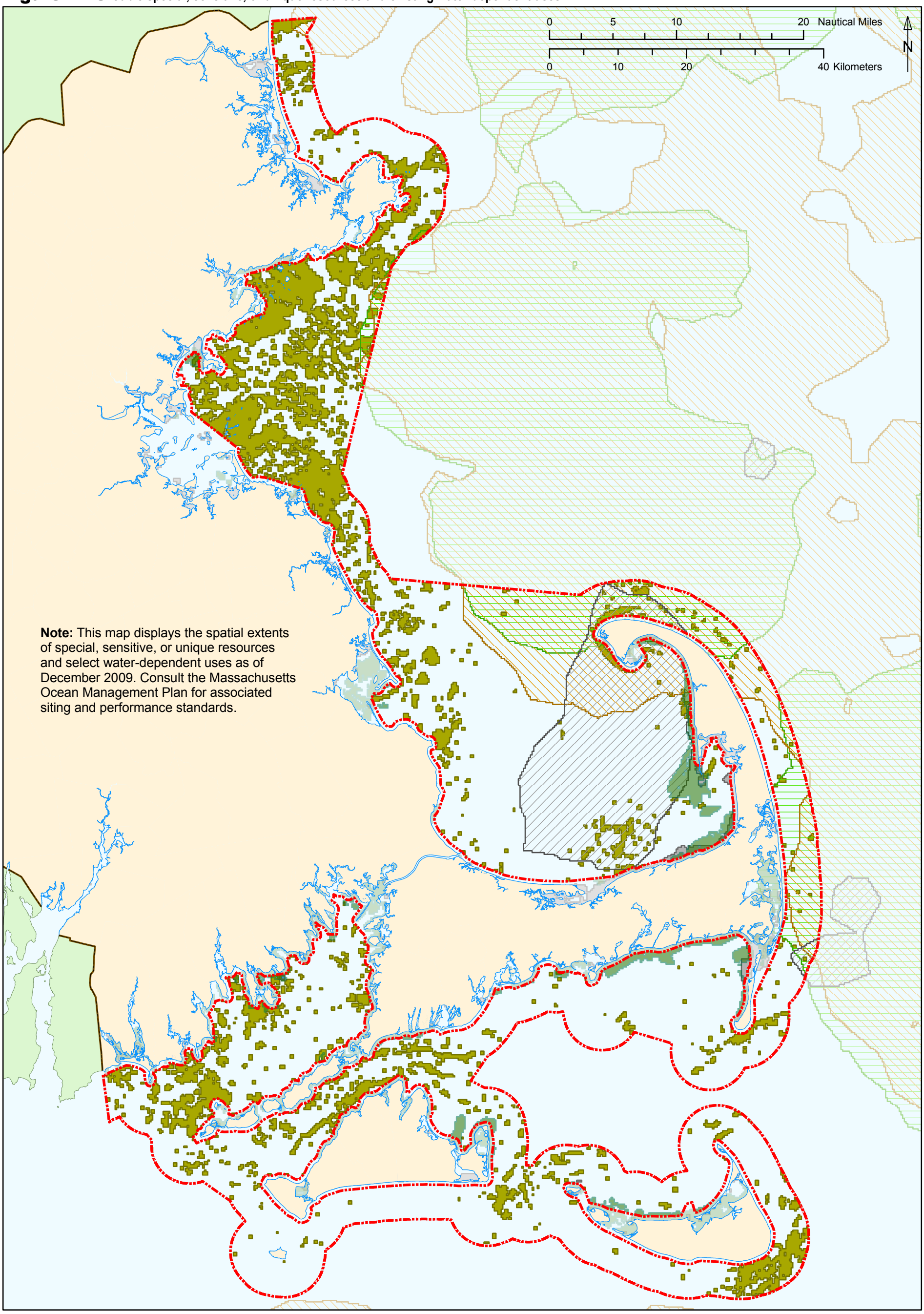
Map coordinate system: North American Datum of 1983 (NAD83), Massachusetts State Plane Coordinate System, Mainland Zone (FIPS zone 2001), meters.

Figure 2-23 Cable special, sensitive, or unique resources and existing water-dependent uses



MASSACHUSETTS OFFICE OF COASTAL ZONE MANAGEMENT

- Massachusetts ocean management planning area boundary[1]
- Eelgrass[2]
- Fin whale core habitat[3]
- Hard/complex seafloor[1]
- Humpback whale core habitat[3]
- Intertidal flats[2]
- North Atlantic right whale core habitat[3]

Data sources: [1]Massachusetts Office of Coastal Zone Management, [2]Massachusetts Department of Environmental Protection, Wetlands Conservancy Program, [3]National Oceanic and Atmospheric Administration (NOAA) National Centers for Coastal Ocean Science (NCCOS) 2006. An Ecological Characterization of the Stellwagen Bank National Marine Sanctuary Region: Oceanographic, Biogeographic, and Contaminants Assessment. Prepared by NCCOS's Biogeography Team in cooperation with the National Marine Sanctuary Program. Silver Spring, MD. NOAA Technical Memorandum NOS NCCOS 45. 356 pp.

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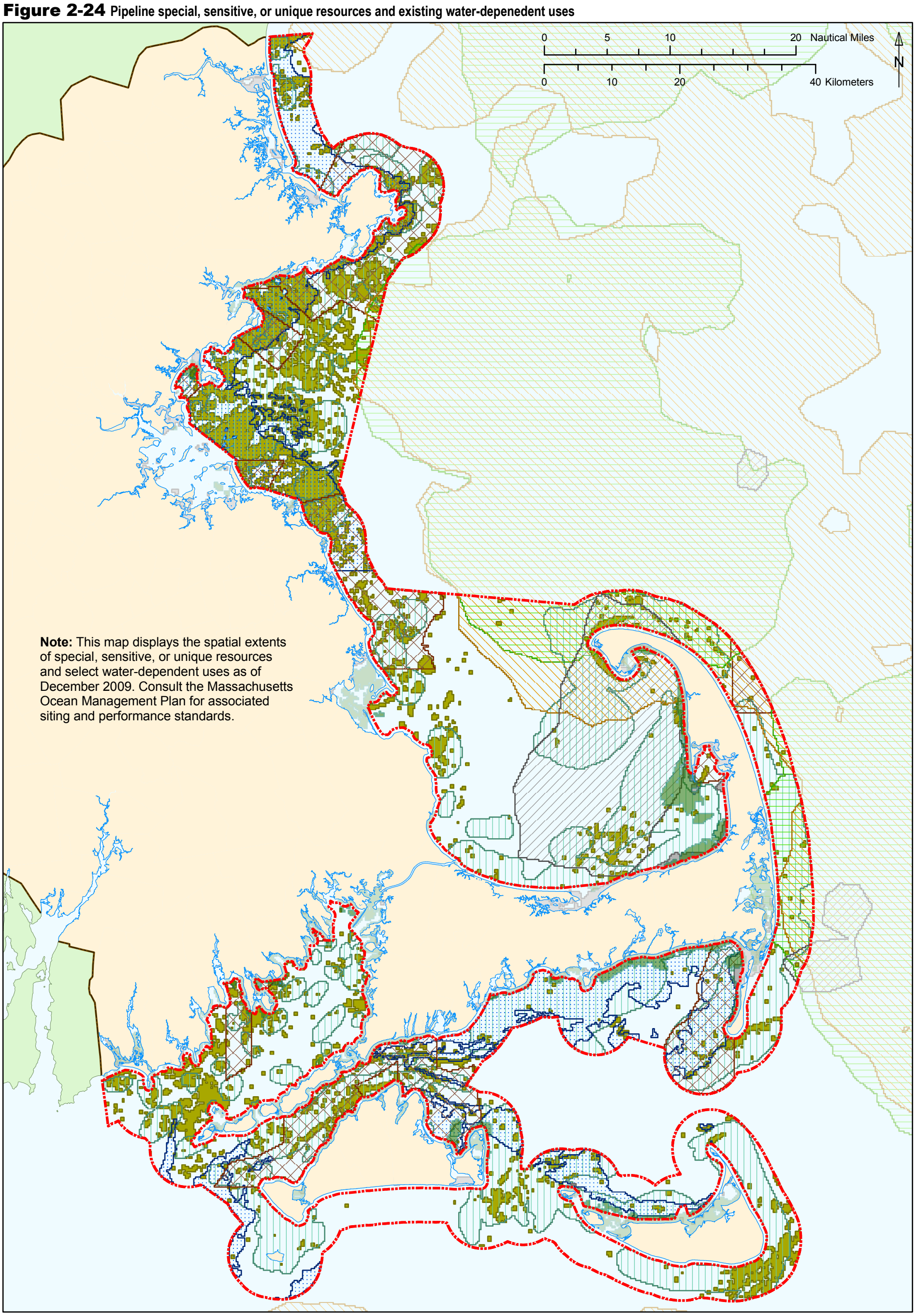
Map coordinate system: North American Datum of 1983 (NAD83), Massachusetts State Plane Coordinate System, Mainland Zone (FIPS zone 2001), meters.

Figure 2-24 Pipeline special, sensitive, or unique resources and existing water-depenedent uses



MASSACHUSETTS OFFICE OF COASTAL ZONE MANAGEMENT

- Massachusetts ocean management planning area boundary[1]
- Concentrated recreational fishing[2]
- Eelgrass[3]
- Fin whale core habitat[4]
- Hard/complex seafloor[1]
- High effort and value commercial fishing[2]
- Humpback whale core habitat[4]
- Important fish resource areas[2]
- Intertidal flats[3]
- North Atlantic right whale core habitat[4]

Data sources: [1]Massachusetts Office of Coastal Zone Management, [2]Massachusetts Division of Marine Fisheries, [3]Massachusetts Department of Environmental Protection, Wetlands Conservancy Program, [4]National Oceanic and Atmospheric Administration (NOAA) National Centers for Coastal Ocean Science (NCCOS) 2006. An Ecological Characterization of the Stellwagen Bank National Marine Sanctuary Region: Oceanographic, Biogeographic, and Contaminants Assessment. Prepared by NCCOS's Biogeography Team in cooperation with the National Marine Sanctuary Program. Silver Spring, MD. NOAA Technical Memorandum NOS NCCOS 45. 356 pp.

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Map coordinate system: North American Datum of 1983 (NAD83), Massachusetts State Plane Coordinate System, Mainland Zone (FIPS zone 2001), meters.