

4 Affected Environment, Environmental Consequences, and Mitigation

4.11 Threatened, Endangered, and Protected Species and Habitats

4.11.1 Introduction

This section addresses the potential effects of the No Build and Build Alternatives on federal- and state-protected terrestrial (land)-based and marine-based rare, threatened, or endangered species and their designated critical or priority habitats, including essential fish habitat (EFH). Additionally, it identifies consultation with federal and state agencies and describes required mitigation. This section is supported by **Appendix 4.11, Threatened, Endangered, and Protected Species and Habitats Material**.

4.11.1.1 Regulatory Context

As joint lead agencies for the Cape Cod Bridges Program (Program), the Federal Highway Administration (FHWA) and the Massachusetts Department of Transportation (MassDOT) are required to comply with the federal and state regulatory statutes listed in **Table 4.11-1** for the protection of terrestrial-based and marine-based species and their habitats. Accordingly, consulting with and obtaining approvals from the U.S. Fish and Wildlife Service (USFWS), the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries), and the Massachusetts Division of Fisheries and Wildlife's Natural Heritage and Endangered Species Program (NHESP), as applicable, in coordination with the National Environmental Policy Act review process.

Wildlife and wildlife resources, defined in 16 United States Code (USC) 666b, include birds, fish, mammals, and all other classes of wild animals and all types of aquatic and land vegetation upon which wildlife is dependent. National Oceanic and Atmospheric Administration (NOAA) trust resources are defined as living marine resources and their habitats, including, but not limited to, commercial and recreational fishery resources (marine and estuarine fish and shellfish, including diadromous fish species); endangered and threatened marine species (including diadromous fish species) and their designated critical habitats; marine mammals and marine turtles; marshes, mangroves, seagrass beds, coral reefs, and other coastal habitats; areas identified as EFH; and marine habitats and resources associated with national marine sanctuaries, national marine monuments, and other protected places.¹ Designated critical habitats are areas that contain features essential to the conservation and/or recovery of an Endangered Species Act of 1973 (ESA) listed species and may require special management and protection.² EFH is defined as waters and substrate necessary to fish for spawning, breeding, feeding, or growing to maturity. Included within EFH are Habitat Areas of Particular Concern (HAPC), which are rare, stressed by development, provide important ecological functions for

¹ [NAO 216-123: NOAA Mitigation Policy for Trust Resources](https://www.noaa.gov/organization/administration/noaa-administrative-orders-chapter-216-program-management/nao-216-123-noaa-mitigation-policy-for-trust-resources). <https://www.noaa.gov/organization/administration/noaa-administrative-orders-chapter-216-program-management/nao-216-123-noaa-mitigation-policy-for-trust-resources>

² [National Oceanic and Atmospheric Administration's definition of critical habitat](https://www.fisheries.noaa.gov/national/endangered-species-conservation/critical-habitat#definition-of-critical-habitat). <https://www.fisheries.noaa.gov/national/endangered-species-conservation/critical-habitat#definition-of-critical-habitat>

federally managed species, and/or are especially vulnerable to anthropogenic (or human impact) degradation.³

Table 4.11-1. Federal and State Regulatory Statutes and Requirements

Statute	Regulatory Citation	Description
Federal		
Endangered Species Act of 1973 (ESA)	16 United States Code (USC) 1531-1544; 50 Code of Federal Regulations (CFR) 402	Requires federal agencies to avoid actions that would jeopardize threatened or endangered species or their critical habitats and describes the steps for informal and formal consultation with the U.S. Fish and Wildlife Service (USFWS) for terrestrial and freshwater species or with the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries) for marine species and diadromous fish species [ESA Section 7(a)(2)].
Migratory Bird Treaty Act (MBTA)	16 USC 703-712	Prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species (including any part of the bird, active nests, eggs, or its young) without prior authorization (permit) by USFWS. The regulations governing migratory bird permits are provided in 50 CFR 13 and 21. The list of migratory birds protected under the MBTA, provided as 50 CFR 10.13, was most recently updated in 2023.
Bald and Golden Eagle Protection Act (BGEPA)	16 USC 668-668d	Provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any Bald Eagle [or any Golden Eagle], alive or dead, or any part (including feathers), nest, or egg thereof." The act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb." USFWS enforces the BGEPA and issues permits for incidental take in accordance with 50 CFR 13 and 22.
Fish and Wildlife Coordination Act	16 USC 661-666e	Requires federal agencies to consult with the federal and state agencies responsible for fish and wildlife resource management regarding projects that may affect these resources. For the Cape Cod Bridges Program, these agencies include USFWS, NOAA Fisheries, and the Massachusetts Division of Fisheries and Wildlife's Natural Heritage and Endangered Species Program (NHESP).

³ [National Oceanic and Atmospheric Administration's Habitat Area of Particular Concern within Essential Fish Habitat.](https://www.fisheries.noaa.gov/southeast/habitat-conservation/habitat-areas-particular-concern-within-essential-fish-habitat)
<https://www.fisheries.noaa.gov/southeast/habitat-conservation/habitat-areas-particular-concern-within-essential-fish-habitat>

Statute	Regulatory Citation	Description
Magnuson-Stevens Fishery Conservation and Management Act	16 USC Chapter 38 Section 1801 et seq.	Requires federal agencies to consult with NOAA Fisheries on any action or proposed action authorized, funded, or undertaken by such agency that may adversely affect designated Essential Fish Habitat (EFH) identified under the Magnuson-Stevens Fishery Conservation and Management Act per 50 CFR 600.905 and 600.920.
Marine Mammal Protection Act	16 USC Chapter 31 Sections 1361–1407	Prohibits take or attempted take of any marine mammal species in U.S. waters per 50 CFR 216. Incidental take may occur during non-fishing activities including construction projects if approved by NOAA Fisheries through issuance of permits and authorizations to ensure mitigation measures are implemented to reduce the impact of the activities and keep track of the activities and how they impact protected species.
State		
Massachusetts Endangered Species Act (MESA)	Massachusetts General Law Chapter 131A; 321 Code of Massachusetts Regulations (CMR) 10.00	Protects rare species and their habitats by prohibiting the “Take” of any plant or animal species listed as Endangered, Threatened, or Special Concern by the Natural Heritage and Endangered Species Program. Take is defined as, “to harass, harm, pursue, hunt, shoot, hound, kill, trap, capture, collect, process, disrupt the nesting, breeding, feeding or migratory activity or attempt to engage in any such conduct, or to assist such conduct.” ⁴ Proponents with projects or activities within state-listed species Priority Habitat must file with NHESP for review and approval before project initiation. Projects resulting in a take of MESA species must meet the performance standards for a Conservation and Management Permit (321 CMR 10.23). To do so, an applicant agrees to carry out a Conservation and Management Plan that provides a long-term net benefit to the conservation of the affected MESA-listed species.

Source: Massachusetts Department of Transportation, 2025

4.11.1.2 Methodology and Study Areas

Methodology

MassDOT initiated early Program coordination in 2018 with NHESP and USFWS to identify concerns for federal- and state-protected species. Since June 2023, USFWS, NOAA Fisheries, and the Massachusetts Department of Fish and Game have participated as Cooperating Agencies for the Program. MassDOT

⁴“Take” is capitalized in the MESA and its implementing regulations.

held multiple Cooperating Agencies meetings for the Program in 2023 through 2025, in part to discuss the species protected under the ESA and MESA that the Program would potentially affect.

MassDOT provided Biological Assessments (BA) to USFWS and NOAA Fisheries that detailed potential Program effects on the [federally protected](#) species and provided effects determinations for the terrestrial and marine species protected under the ESA. MassDOT provided an EFH Assessment and Fish and Wildlife Coordination Act (FWCA) Consultation Worksheet to NOAA Fisheries describing potential effects on EFH and trust resources considered under FWCA. The BA for Terrestrial Species, the BA for Marine Species, and the EFH Assessment and FWCA Consultation Worksheet are provided in **Appendix 4.11, Threatened, Endangered, and Protected Species and Habitats Material, Attachments 1, 2, and 3**, respectively.

[As the Program’s preliminary design was further developed, MassDOT coordinated with federal and state agencies to apprise them of Program updates, including refinement of the Project Limits and further assessment of potential effects to species and habitats. **Appendix 4.11** provides updated agency coordination, including updated memoranda and agency correspondence.](#)

[MassDOT conducted three types of assessments in July 2025 to determine the presence or probable absence of ESA-listed bats in the Terrestrial Species Study Area to supplement surveys conducted in October 2023 and August 2024. The assessments consisted of an acoustic survey, inspections of eight different structures for signs of roosting bats, and visual surveys and drone inspections of Sagamore and Bourne Bridges. MassDOT conducted an acoustic survey from July 7 through July 14, 2025, following USFWS methods. MassDOT deployed full-spectrum acoustic bat detectors at a total of 25 sites containing suitable bat habitat throughout the four bridge quadrants of the Terrestrial Species Study Area \(six locations each in the Sagamore North, Sagamore South, and Bourne North quadrants and seven locations in the Bourne South quadrant\). MassDOT conducted structure assessments on July 7 and 8, 2025. Biologists inspected three highway overpasses, containing a total of four bridges and five culvert locations within the Terrestrial Species Study Area. The biologists used flashlights and binoculars to search gaps, crevices, and other locations on the bridge and culvert structures that could provide suitable bat roosting habitat following USFWS methods for surveying bridges and culverts for bat use. MassDOT conducted visual surveys and drone inspections of Sagamore and Bourne Bridges on July 8 and 9, 2025. Biologists completed daytime visual inspections of the exterior and interior vaults of the four bridge abutments of Sagamore and Bourne Bridges following USFWS guidelines for bridge and structure assessments. Additionally, the biologists collected guano samples from each of the four bridge abutments for genetic species identification purposes.](#)

[MassDOT conducted vessel-based surveys in May 2024 to document the location of eelgrass in the Bourne North quadrant.⁵ MassDOT conducted a suitability assessment of potential locations for eelgrass mitigation in July 2025. The boat-based site assessments in Buzzards Bay and Cape Cod Bay were conducted by scientific divers and a drop camera.](#)

⁵ The vessel-based survey was conducted following the Joint Federal Agency Submerged Aquatic Vegetation Survey Guidance for the New England Region Tier 1 Method.

MassDOT conducted updated habitat assessments for terrestrial state-listed plant, insect, and turtle species in May and December 2025 and in May 2026 in and adjacent to areas mapped by the Massachusetts Natural Heritage and Endangered Species Program (NHESP) as Priority Habitat of State-listed Species (Priority Habitat) that are intersected by the Project Limits. Using NHESP guidance, the field assessments consisted of meander surveys within and adjacent to Priority Habitat and additional focal areas associated with the Project Limits to characterize the existing natural communities and habitats present. The types and relative value of each habitat were assessed and documented for the target species identified by NHESP.

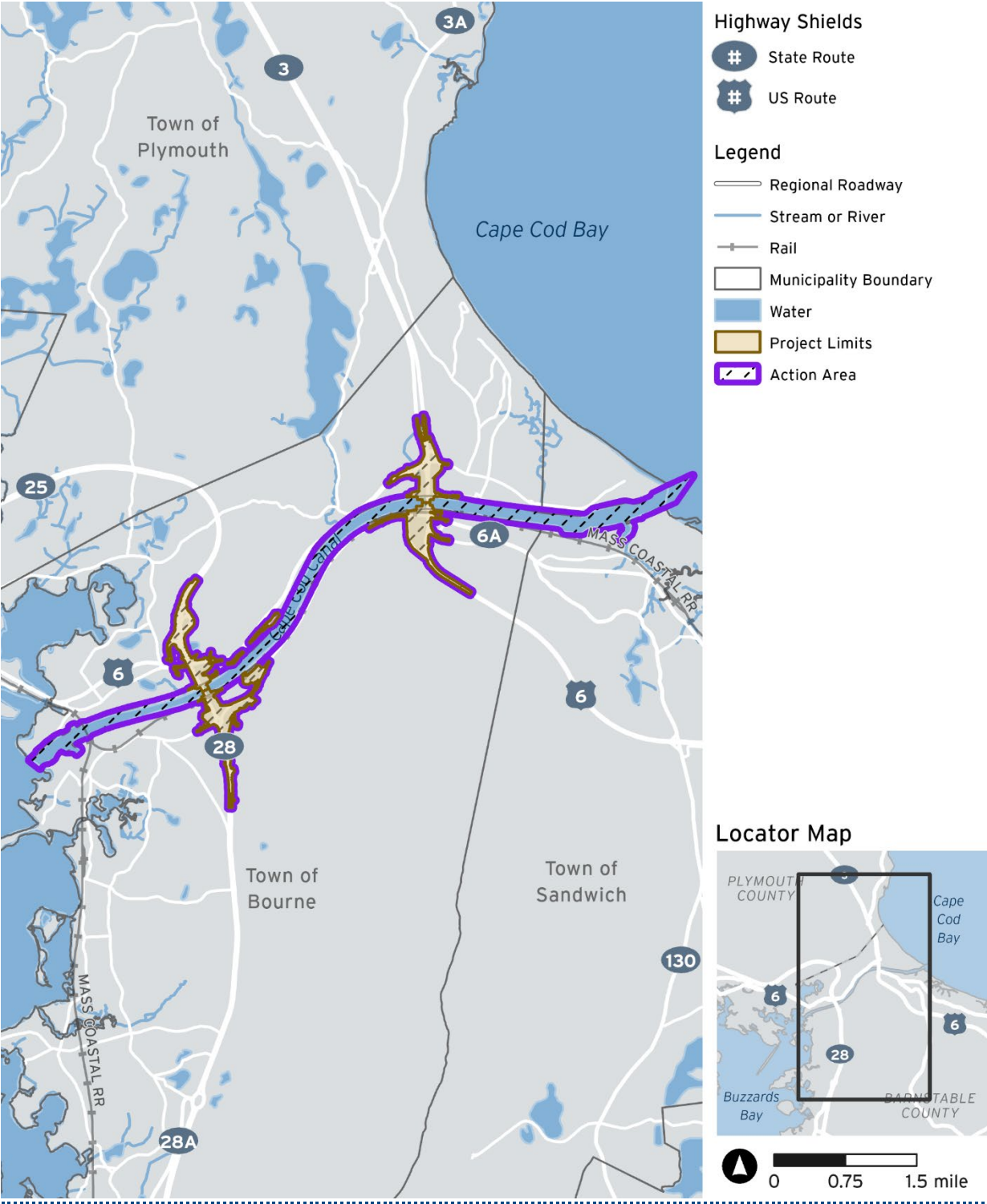
In May 2026, a seasonally appropriate presence/absence field survey, per the NHESP-approved study plan, was conducted for wild lupine within focal areas located in the south quadrant of each bridge. A seasonally appropriate presence/absence field survey for papillose nut-sedge, per the NHESP-approved study plan, will be conducted in July 2026.

Study Areas

MassDOT developed a Terrestrial Species Study Area and Aquatic Species Study Area for the analysis of Program effects on protected species and habitats, presented as **Figure 4.11-1**. Combined, these study areas comprise the Program Action Area, defined by the ESA as “all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action.”⁶ The Action Area encompasses the Project Limits, which comprise the construction footprints of the existing and proposed Sagamore and Bourne Bridges, the interchange approach networks for the highway bridges and shared-use paths, and their surrounding areas of disturbance. In addition, the Action Area extends to include Cape Cod Canal where it connects with Buzzards Bay in the southwest and Cape Cod Bay in the northeast, as well as potential routes of Program vessels to and from ports (not indicated on **Figure 4.11-1**).

⁶ 50 Code of Federal Regulations (CFR) 402.2.

Figure 4.11-1. Terrestrial and Aquatic Species Study Areas



Source: Massachusetts Department of Transportation, [2025](#)

Note: The Terrestrial and Aquatic Species Study Areas together compose the Action Area. The aquatic portions of the Action Area also include potential routes Program vessels may take to and from ports, not indicated on this figure.

4.11.2 Affected Environment

4.11.2.1 Terrestrial Resources

ESA-Protected Species

Table 4.11-2 lists the terrestrial species protected under the ESA that may occur in the Terrestrial Species Study Area, as determined by USFWS.⁷ The Program is within the range of five species listed, proposed, or identified as a candidate for listing by USFWS under the ESA. The BA for Terrestrial Species, provided as **Appendix 4.11, Threatened, Endangered, and Protected Species and Habitats Material, Attachment 1**, contains details on the potential presence of these species in the Terrestrial Species Study Area.

Table 4.11-2. Federally Protected Species Potentially Present in the Terrestrial Species Study Area

Species	Status	Federally Designated Critical Habitat in Study Area?	Description of Habitat
Mammals			
Northern Long-eared Bat (<i>Myotis septentrionalis</i>)	Endangered	No	Wide variety of forested habitats for roosting, foraging, and traveling; adjacent and interspersed non-forested habitat such as emergent wetlands and field edges. Occasionally roost in structures such as barns or sheds (particularly when suitable roost trees are unavailable). Hibernate in caves and mines.
Tricolored Bat (<i>Perimyotis subflavus</i>)	Proposed Endangered	No	Primarily roost among live and dead leaf clusters of live or recently dead deciduous hardwood trees. Often forage in patches adjacent to roosting habitat including forest, fields, and over water. Hibernate in caves and mines.
Reptiles			
Northern red-bellied cooter (<i>Pseudemys rubriventris</i>)/Plymouth red-bellied turtle (<i>Pseudemys rubriventris bangsi</i>) ^[a]	Endangered	No	Coastal plain ponds, river systems, cranberry bogs, and other wetlands in the seaboard lowland section of New England; require unforested, upland habitats with well-drained soils in proximity to aquatic habitat for nesting; female turtles require adequate upland connectivity between aquatic habitat and suitable nest sites.

⁷ U.S. Fish and Wildlife Service. 2024. [Information for Planning and Consultation](https://ipac.ecosphere.fws.gov/). <https://ipac.ecosphere.fws.gov/>

Species	Status	Federally Designated Critical Habitat in Study Area?	Description of Habitat
Plants			
Sandplain Gerardia (<i>Agalinis acuta</i>)	Endangered	No	Open dry grasslands, including roadsides, pine/oak scrub forest openings, and managed cemeteries with native plants species; poor soil conditions and a disturbance regime that provides open and low competition conditions; a hemiparasite often associated with considerable lichen growth and areas of scattered, bare soil where little bluestem (<i>Schizachyrium scoparium</i>) is present.
Insects			
Monarch Butterfly (<i>Danaus plexippus</i>)	Proposed Threatened	No	Healthy and abundant milkweed for migration, breeding, and early life stage development; nectar providing flowers for breeding and migration; clean water sources.

Sources: U.S. Fish and Wildlife Service (USFWS). 2021.

Species Status Assessment (SSA) Report for the Massachusetts Population of the Northern Red-bellied Cooter (*Pseudemys rubriventris*). Version 1.0. U.S. Fish and Wildlife Service Northeast Region. Hadley, MA
<https://iris.fws.gov/APPS/ServCat/DownloadFile/209859>;

USFWS. 2024. [Plymouth red-bellied turtle species account](https://www.fws.gov/species/plymouth-red-bellied-turtle-pseudemys-rubriventris-bangsi). <https://www.fws.gov/species/plymouth-red-bellied-turtle-pseudemys-rubriventris-bangsi>; [Range-wide Indiana Bat and Northern Long-eared Bat Survey Guidelines](https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines). <https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines>; [Sandplain gerardia species account](https://www.fws.gov/species/sandplain-gerardia-agalinis-acuta). <https://www.fws.gov/species/sandplain-gerardia-agalinis-acuta>.

USFWS. n.d. [Northern Long-eared Bat](https://www.fws.gov/species/northern-long-eared-bat-myotis-septentrionalis). <https://www.fws.gov/species/northern-long-eared-bat-myotis-septentrionalis>; [Tricolored Bat](https://www.fws.gov/species/tricolored-bat-perimyotis-subflavus). <https://www.fws.gov/species/tricolored-bat-perimyotis-subflavus>; [Monarch Butterfly](https://www.fws.gov/species/monarch-danaus-plexippus). <https://www.fws.gov/species/monarch-danaus-plexippus>.

^[a] This species was formerly known as Plymouth redbelly turtle (*Pseudemys rubriventris bangsi*).

MassDOT's bat acoustic survey did not detect the presence of the federally endangered northern long-eared bat (*Myotis septentrionalis*), but it did detect the presence of the federally proposed endangered and state endangered tricolored bat (*Perimyotis subflavus*). The overpass bridge and culvert assessments produced no bat sightings or signs of roosting bats, such as guano staining, bat sounds, or distinct odors. As a result, MassDOT determined that these structures are not used by bats. The visual surveys and drone inspection of the Sagamore and Bourne Bridge abutments documented evidence of bat presence inside all four abutments of both bridges. However, the guano genetic analysis results did not indicate the presence of northern long-eared bats or tricolored bats within the abutments.

MESA-Protected Species and Habitats

Table 4.11-3 lists the species protected under MESA that are associated with Priority Habitat in the Terrestrial Species Study Area (Project Limits), as determined by NHESP. The ESA-protected northern long-eared bat, tricolored bat, and northern red-bellied cooter are listed as endangered under MESA.

However, these species do not have Priority Habitats as mapped by NHESP in the Terrestrial Species Study Area. Additionally, NHESP has determined that the Sagamore Bridge site does not contain Priority Habitat for Barrens dagger moth, Buck moth, Herodias underwing moth, Melsheimer's sack bearer, pine barrens macaria, or Pink sallow moth.⁸

Table 4.11-3. State-Protected Species with Priority Habitat in the Terrestrial Species Study Area^[a]

Species	Status	Description of Habitat
Birds		
Peregrine Falcon (<i>Falco peregrinus</i>)	Special Concern	Build nests on rocky cliffs or, more frequently, on tall human-made structures like buildings and bridges.
<u>Least Tern (<i>Sternula antillarum</i>)</u>	<u>Special Concern</u>	<u>Nests on sandy or gravelly beaches periodically scoured by storm tides, resulting in sparse or no vegetation; may also nest on dredge spoils.</u>
<u>Roseate Tern (<i>Sterna dougallii</i>)</u>	<u>Special Concern</u>	<u>Nests on sandy, gravelly, or rocky islands and, less commonly, in small numbers at the ends of long barrier beaches.</u>
<u>Common Tern (<i>Sterna hirundo</i>)</u>	<u>Special Concern</u>	<u>Nests on sandy, gravelly, or cobbly islands amongst scattered vegetation, which is used for cover by chicks; also nests on barrier beaches, salt marshes, small rocky islands, dilapidated docks, purpose-built platforms, and bridge abutments.</u>
Reptiles		
Eastern box turtle (<i>Terrapene carolina</i>)	Special Concern	Dry and moist woodlands, brushy fields, thickets, marsh edges, bogs, swales, fens, stream banks, and well-drained bottomland. Overwinter in upland forests with leaf litter and woody debris.
Insects		
Barrens dagger moth (<i>Acrionicta albarufa</i>) ^[b]	Threatened	Xeric, open pitch pine-scrub oak barrens and scrub oak thickets on sandy soil. Host plants: Scrub oak (<i>Quercus ilicifolia</i>) and occasionally other oak species.
Buck Moth (<i>Hemileuca maia</i>) ^[b]	Special Concern	Xeric, open habitats with extensive scrub oak thickets, particularly sandplain pitch pine-scrub oak barrens. Host plants: scrub oak and occasionally other shrubby oak species.
Frosted elfin (<i>Callophrys irus</i>)	Special Concern	Xeric and open, disturbance-dependent habitats on sandy (occasionally rocky) soil, especially grassy/heath openings in pitch pine-scrub oak barrens, but also similar anthropogenic habitats such as utility line rights-of-way, railways, old sand/gravel pits, and airports. Host Plant: yellow wild indigo (<i>Baptisia tinctoria</i>), wild lupine (<i>Lupinus perennis</i>)
Heath metarranthis (<i>Metarranthis pilosaria</i>)	Special Concern	Sandplain pitch pine-scrub oak barrens and heathlands, as well as acidic swamps and bogs. Host plants: Blueberries and cranberries (<i>Vaccinium</i> spp.) and likely leatherleaf (<i>Chamaedaphne calyculata</i>).

⁸ Leddick, Jesse, MA Division of Fisheries & Wildlife, Correspondence to Massachusetts Department of Transportation, NHESP File No. 23-1184, April 1, 2026.

Species	Status	Description of Habitat
Herodias underwing moth (<i>Catocala herodias</i>) [b]	Special Concern	Xeric, open pitch pine-scrub oak barrens and scrub oak thickets on sandy soil or rocky summits and ridges. Host plant: scrub oak.
Melsheimer's sack bearer (<i>Cicinnus melsheimeri</i>) [b]	Threatened	Sandplain pitch pine-scrub oak barrens, especially scrub oak thickets. It may also be found in shrubby grasslands and heathlands with a component of scrub oak. Host plant: scrub oak.
Pine barrens macaria (<i>Macaria exonerata</i>) [b]	Special Concern	Pitch pine-scrub oak barrens on sandplains and rocky summits and ridges. Host plant: scrub oak.
Pink sallow moth (<i>Psectraglaea carnosa</i>) [b]	Special Concern	Pitch-pine scrub oak barrens and heathlands on sandplains or rocky summits and ridges, acidic bogs and swamps, and occasionally logged areas, old fields, or utility line rights-of-way. Host plant: Lowbush blueberries (<i>Vaccinium angustifolium</i> and <i>V. pallidum</i>) and possibly other blueberry (<i>Vaccinium spp.</i>) species.
Purple tiger beetle (<i>Cicindela purpurea</i>)	Special Concern	Sandy soils (or less often, sandy clay soils) with sparse or patchy vegetative cover, particularly sandplain grasslands and heathlands, as well as open areas within pitch pine-scrub oak barrens.
Scrub euchlaena (<i>Euchlaena madusaria</i>)	Special Concern	Sandplain pitch pine-scrub oak barrens, heathlands, and shrubby grasslands. Host plant: Lowbush blueberries (<i>Vaccinium angustifolium</i> and <i>V. pallidum</i>).
Slender clearwing sphinx moth (<i>Hemaris gracilis</i>)	Special Concern	Pitch pine-scrub oak barrens and heathlands on sandplains or rocky summits and ridges, as well as acidic bogs and swamps. Host plants: Lowbush blueberry (<i>Vaccinium pallidum</i>) and likely other blueberry species.
Plants		
Papillose nut-sedge (<i>Scleria pauciflora</i>)	Endangered	Dry to moist sandy soils of maritime grasslands, pine and oak barrens, disturbed forest openings, and powerline rights-of-way.
Wild lupine (<i>Lupinus perennis</i>)	Special Concern	Dry, sandy, open fields and woodland clearings, including pitch pine-scrub oak barrens and sandplain grass communities. Habitat may also include roadsides, gravel and sand pits, waste areas, and railroad lines, among other disturbed areas.

Sources: Nazdrowicz, N., J. Bowman, and R. Roth. 2008. Population Ecology of the Eastern Box Turtle in a Fragmented Landscape. *Journal of Wildlife Management* 72(3): 745-753; Erb, L. 2012. Eastern Box Turtle Conservation Plan for Massachusetts. Massachusetts Division of Fisheries and Wildlife. Natural Heritage and Endangered Species Program. Westborough, Massachusetts; Ernest, C., and J. Lovich. 2009. *Turtles of the United States and Canada*. Second Edition. The John Hopkins University Press. Baltimore, Maryland; Natural Heritage and Endangered Species Program (NHESP). 2015; [Barrens Dagger Moth \(*Acronicta albarufa*\) Fact Sheet](#). <https://www.mass.gov/doc/barrens-dagger-moth/download>; [Buck Moth \(*Hemileuca maia*\) Fact Sheet](#). <https://www.mass.gov/doc/buck-moth/download>; Frosted elfin (*Callophrys irus*) Fact Sheet. <https://www.mass.gov/info-details/frosted-elfin>. [Heath metarranthis \(*Metarranthis pilosaria*\) Fact Sheet](#). <https://www.mass.gov/doc/heath-metarranthis/download>; [Herodias underwing moth \(*Catocala Herodias*\) Fact Sheet](#). <https://www.mass.gov/doc/herodias-underwing-moth/download>; [Melsheimer's sack bearer \(*Cicinnus melsheimeri*\) Fact Sheet](#). <https://www.mass.gov/doc/melsheimers-sack-bearer/download>; Pine barrens macaria (*Macaria exonerata*) Fact Sheet. <https://www.mass.gov/info-details/pine-barrens-macaria>; Pink sallow moth (*Psectraglaea carnosa*) Fact Sheet. <https://www.mass.gov/info-details/pink-sallow-moth>; Purple tiger beetle

(*Cicindela purpurea*) Fact Sheet. <https://www.mass.gov/info-details/purple-tiger-beetle>; [Scrub euchlaena \(*Euchlaena madusaria*\) Fact Sheet. <https://www.mass.gov/doc/scrub-euchlaena/download>; \[Slender clearwing sphinx moth \\(*Hemaris gracilis*\\) Fact Sheet. <https://www.mass.gov/doc/slender-clearwing-sphinx-moth/download>; Papillose nut-sedge \\(*Scleria pauciflora*\\) Fact Sheet. <https://www.mass.gov/info-details/papillose-nut-sedge>; Wild lupine \\(*Lupinus perennis*\\) Fact Sheet. <https://www.mass.gov/info-details/wild-lupine>.\]\(https://www.mass.gov/doc/slender-clearwing-sphinx-moth/download\)](https://www.mass.gov/doc/scrub-euchlaena/download)

[a] The ESA-protected northern long-eared bat, tricolored bat, and northern red-bellied cooter are listed as endangered under MESA but do not have Priority Habitat as mapped by NHESP in the Terrestrial Species Study Area.

[b] [Not applicable to Sagamore Bridge site.](#)

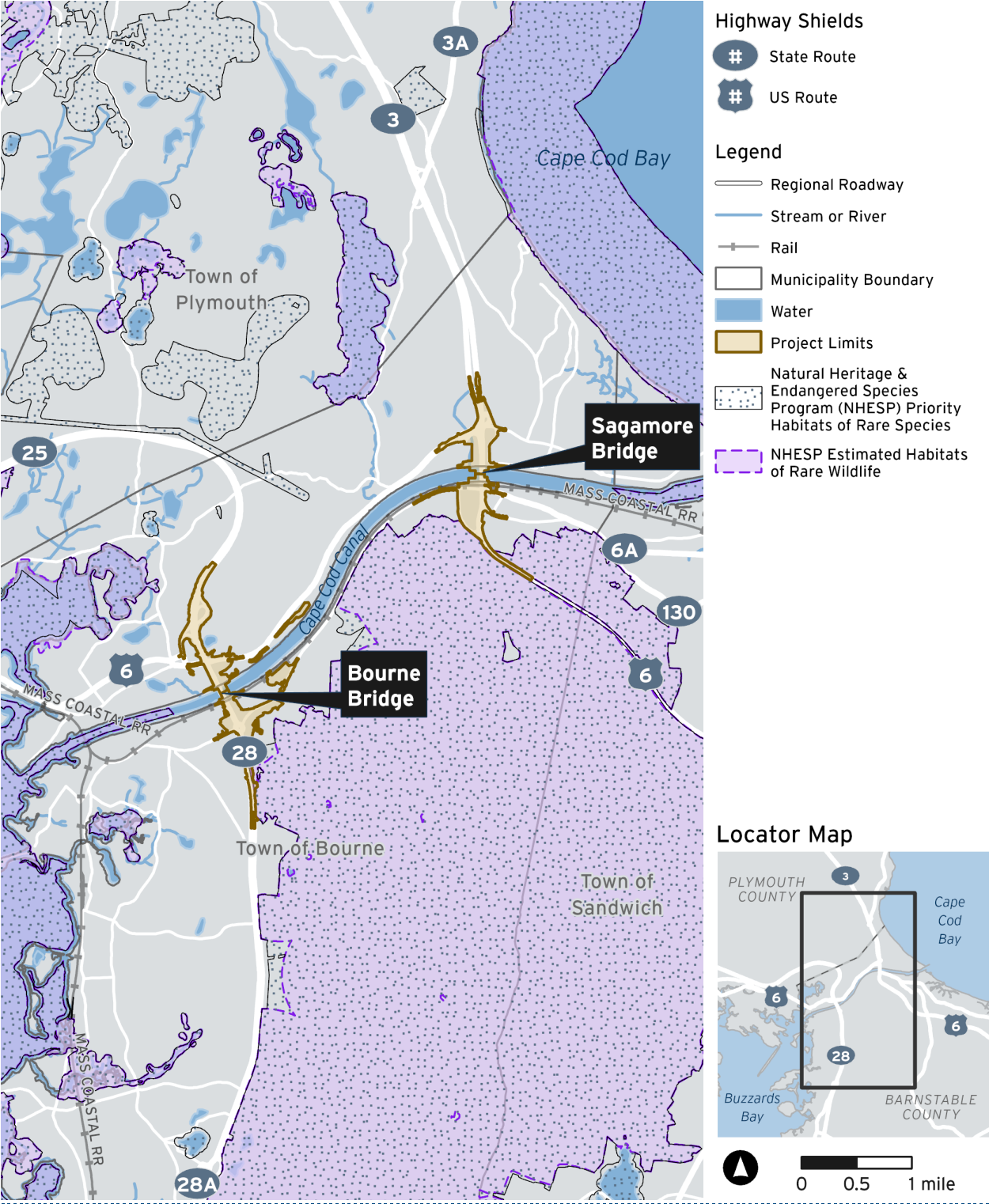
Peregrine Falcons have generally been present at Sagamore and Bourne Bridges every year, and nesting has occurred at both bridges and at a nearby railroad bridge in past years, as recently as 2024.

Figure 4.11-2 identifies locations where the [Project Limits \(and Terrestrial](#) and Aquatic Species Study Areas) overlap Priority and Estimated Habitats for MESA-listed species. Estimated Habitats of Rare Wildlife are a mapped subset of Priority Habitats that pertain to rare wetland-dependent wildlife observed within the last 25 years and documented in the NHESP database.

The undeveloped area within and adjacent to the Terrestrial Species Study Area in the Sagamore South quadrant is primarily composed of maintained road shoulder, edge habitat associated with the pitch pine-oak forest matrix community type, and dry xeric shrubland community maintained within the existing utility right-of-way along U.S. Route 6. Two eastern box turtle road mortalities were previously documented along the southbound shoulder of U.S. Route 6 and reported to NHESP. No additional visual observations of state-listed wildlife or plants have been documented in the Sagamore South quadrant of the Terrestrial Species Study Area.

The undeveloped areas within and adjacent to the Terrestrial Species Study Area in the Bourne South quadrant predominately include maintained road shoulder, edge and outer portions of a large forest block of the pitch pine-oak forest matrix community type contiguous with Joint Base Cape Cod, and smaller inclusions of pitch pine-oak community types typical of the coastal sandplain. No visual observations of state-listed plant or wildlife species have been documented in the Bourne South quadrant of the Terrestrial Species Study Area.

Figure 4.11-2. Natural Heritage and Endangered Species Program Priority and Estimated Habitats in and near the Project Limits



Source: Massachusetts Department of Transportation, 2025

Other Designated Protected Species

As noted in **Table 4.11-1**, migratory birds, including Bald and Golden Eagles, are protected under the Migratory Bird Treaty Act ([MBTA](#)) and Bald and Golden Eagle Protection Act. [Additionally, under the 1988 amendment to the Fish and Wildlife Conservation Act, USFWS is required to identify species of migratory nongame birds that are likely to become candidates for listing under the ESA without additional conservation actions.](#) **Table 4.11-4** lists the migratory birds that may occur in the Terrestrial Species Study Area that are on the [USFWS Birds of Conservation Concern list](#)⁹ or are protected by the Bald and Golden Eagle Protection Act. There are no known Bald Eagle nests in or within 660 feet of the Terrestrial Species Study Area, which is the closest an activity should be conducted relative to a Bald Eagle nest, based on the [USFWS National Bald Eagle Management Guidelines](#).¹⁰ Golden Eagles are not known to breed in the United States east of the Mississippi River,¹¹ and migrating Golden Eagles are rare in Massachusetts.¹²

Table 4.11-4. Birds of Conservation Concern Potentially Present in Terrestrial and Aquatic Species Study Areas

Species	Level of Concern	Breeding Season
American oystercatcher (<i>Haematopus palliatus</i>)	Birds of Conservation Concern	April 15 – August 31
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	Non-Birds of Conservation Concern vulnerable	October 15 – August 31
Black Skimmer (<i>Rynchops niger</i>)	Birds of Conservation Concern	May 20 – September 15
Black-billed Cuckoo (<i>Coccyzus erythrophthalmus</i>)	Birds of Conservation Concern	May 15 – October 10
Blue-winged Warbler (<i>Vermivora cyanoptera</i>)	Birds of Conservation Concern	May 1 – June 30
Bobolink (<i>Dolichonyx oryzivorus</i>)	Birds of Conservation Concern	May 20 – July 31
Canada Warbler (<i>Cardellina canadensis</i>)	Birds of Conservation Concern	May 20 – August 10
Chimney Swift (<i>Chaetura pelagica</i>)	Birds of Conservation Concern	March 15 – August 25
Eastern Whip-poor-will (<i>Antrostomus vociferus</i>)	Birds of Conservation Concern	May 1 – August 20
Kentucky Warbler (<i>Oporornis Formosus</i>)	Birds of Conservation Concern	April 20 – August 20
Least Tern (<i>Sternula antillarum antillarum</i>)	Birds of Conservation Concern	April 25 – September 5
Lesser Yellowlegs (<i>Tringa flavipes</i>)	Birds of Conservation Concern	Breeds elsewhere
Pectoral Sandpiper (<i>Calidris melanotos</i>)	Birds of Conservation Concern	Breeds elsewhere
Prairie Warbler (<i>Setophaga discolor</i>)	Birds of Conservation Concern	May 31 – July 31
Prothonotary Warbler (<i>Protonotaria citrea</i>)	Birds of Conservation Concern	April 1 – July 31
Purple Sandpiper (<i>Calidris maritima</i>)	Birds of Conservation Concern	Breeds elsewhere
Ruddy Turnstone (<i>Arenaria interpres morinella</i>)	Birds of Conservation Concern	Breeds elsewhere
Rusty Blackbird (<i>Euphagus carolinus</i>)	Birds of Conservation Concern	Breeds elsewhere
Saltmarsh Sparrow (<i>Ammodramus caudacuta</i>)	Birds of Conservation Concern	May 15 – September 5
Scarlet Tanager (<i>Piranga olivacea</i>)	Birds of Conservation Concern	May 10 – August 10

⁹ <https://www.fws.gov/sites/default/files/documents/birds-of-conservation-concern-2021.pdf>

¹⁰ https://www.fws.gov/sites/default/files/documents/national-bald-eagle-management-guidelines_0.pdf.

¹¹ Katzner, Todd, B.W. Smith, T.A., Miller, et. al. 2012. Status, Biology, and Conservation Priorities for North America's Eastern Golden Eagle (*Aquila chrysaetos*) population. The Auk. 129(1): 168-176.

¹² Mass Audubon. 2024. [Birds of Prey](#). <https://www.massaudubon.org/nature-wildlife/birds/birds-of-prey>

Species	Level of Concern	Breeding Season
Semipalmated Sandpiper (<i>Calidris pusilla</i>)	Birds of Conservation Concern	Breeds elsewhere
Short-billed Dowitcher (<i>Limnodromus griseus</i>)	Birds of Conservation Concern	Breeds elsewhere
Whimbrel (<i>Numenius phaeopus hudsonicus</i>)	Birds of Conservation Concern	Breeds elsewhere
Willet (<i>Tringa semipalmata</i>)	Birds of Conservation Concern	April 20 – August 5
Wood Thrush (<i>Hylocichla mustelina</i>)	Birds of Conservation Concern	May 10 – August 31

Source: U.S. Fish and Wildlife Service. 2021b. [Birds of Conservation Concern 2021](https://www.fws.gov/sites/default/files/documents/birds-of-conservation-concern-2021.pdf).
<https://www.fws.gov/sites/default/files/documents/birds-of-conservation-concern-2021.pdf>

4.11.2.2 Aquatic Resources

ESA-Protected Species

Aquatic resources include marine habitats in the Aquatic Species Study Area. [Table 4.11-5](#) lists the species protected under the ESA that may occur in the Aquatic Species Study Area as determined by NOAA Fisheries and the NOAA Fisheries ESA Section 7 Mapper.¹³ The Program is within the range of eight species listed by NOAA Fisheries under the ESA, and within Critical Habitat designated for one species. The BA for Marine Species, provided as **Appendix 4.11, Threatened, Endangered, and Protected Species and Habitats Material, Attachment 2**, contains details on the potential presence of these species in the Aquatic Species Study Area.

Table 4.11-5. Federally Protected Species Potentially Present in the Aquatic Species Study Area

Species	Status	Federally Designated Critical Habitat in Study Area?	Description of Habitat
Marine Mammals			
Fin whale (<i>Balaenoptera physalus</i>)	Endangered	No	Deep waters offshore migrating from low latitude breeding grounds in winter to high latitude feeding areas in summer; evidence exists of adult and juvenile wintering areas in Stellwagen Bank and the eastern perimeter of Georges Bank, but individuals may occur at this latitude year-round.
North Atlantic right whale (<i>Eubalaena glacialis</i>)	Endangered	Yes	Occur off Newfoundland, Canada to the Gulf of Mexico; adults and juveniles forage from Maine to Cape Cod, Massachusetts, with most sightings in Massachusetts in spring and summer before their northerly migration, although there is increasing evidence of overwintering in Cape Cod Bay.

¹³ National Oceanic and Atmospheric Administration Fisheries. 2023. [The Greater Atlantic Region ESA Section 7 Mapper](https://www.fisheries.noaa.gov/resource/map/greater-atlantic-region-esa-section-7-mapper).
<https://www.fisheries.noaa.gov/resource/map/greater-atlantic-region-esa-section-7-mapper>

		Federally Designated Critical Habitat in Study Area?	Description of Habitat
Species	Status		
Sea Turtles			
Green Turtle (<i>Chelonia mydas</i>)	Threatened	No	Juveniles and adults migrate north to mid-Atlantic waters at the beginning of June and migrate south at the end of November as water temperatures cool; primarily feed on algae and seagrass.
Kemp's Ridley Turtle (<i>Lepidochelys kempii</i>)	Endangered	No	Primarily found in Gulf of Mexico; however, juveniles and adults migrate north to Nova Scotia and the eastern Atlantic in the spring and migrate south as water temperatures cool. Feed in nearshore waters; omnivores but primarily feed on swimming crabs and crustaceans.
Leatherback Turtle (<i>Dermochelys coriacea</i>)	Endangered	No	Most extensive range of any reptile; migrate north to mid-Atlantic waters in spring as water temperatures increase and migrate south in the fall as water temperatures cool; feed primarily in pelagic waters on jellyfish, siphonophores, pyrosomes, and salps.
Loggerhead Turtle (<i>Caretta caretta</i>)	Threatened	No	Occur in US Atlantic and Gulf of Mexico coastal waters as juveniles and adults. Migrate and forage from south of Cape Cod, Massachusetts to Virginia from the beginning of May to the end of November. Feed primarily on shellfish including whelks and conchs.
Fish			
Atlantic Sturgeon (<i>Acipenser oxyrinchus oxyrinchus</i>)	Threatened, Endangered ^[a]	No	Anadromous, demersal fish. Spawn in freshwater rivers but spend most of life in marine and estuarine waters. May migrate long distances along U.S. coast while in marine waters. Frequently inhabit gravel and sand substrates near bays, inlets, and river mouths to forage. Winter in deeper offshore marine waters.
Shortnose Sturgeon (<i>Acipenser brevirostrum</i>)	Endangered	No	Anadromous, demersal fish. Spawn in freshwater rivers but may also inhabit estuarine and marine waters during portions of life history. May migrate in marine waters between river systems, typically in late spring or late fall months.

Sources: Atlantic Sturgeon Status Review Team. 2007. [2007 Status Review of Atlantic sturgeon \(Acipenser oxyrinchus oxyrinchus\)](#). Report to National Marine Fisheries Service, Northeast Regional Office. February 23, 2007. 174 pp.

National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA Fisheries). 1992. [Recovery Plan for Leatherback Turtles in the U.S. Caribbean, Atlantic, and Gulf of Mexico](#). <https://www.fisheries.noaa.gov/resource/document/recovery-plan-leatherback-turtles-us-caribbean-atlantic-and-gulf-mexico>

NOAA Fisheries. 2008. [Recovery Plan for the Northwest Atlantic Population of the Loggerhead Sea Turtle \(Caretta caretta\)](#). <https://www.fisheries.noaa.gov/resource/document/recovery-plan-northwest-atlantic-population-loggerhead-sea-turtle-caretta-caretta>.

NOAA Fisheries. 2015. [Kemp's Ridley Sea Turtle \(Lepidochelys Kempii\) 5-Year Review: Summary and Evaluation](#).

noaa_17048_DS1.pdf

NOAA Fisheries. 2024. Stock Assessment Report. June 2024. [Fin Whale \(*Balaenoptera physalus*\): Western North Atlantic Stock](#).

NOAA Fisheries. 2024. Stock Assessment Report. November 2024. [North Atlantic Right Whale, Western Atlantic](#). Seminoff, Jeffrey Aleksandr, Camryn D. Allen, George H. Balazs, Peter Howard Dutton, Tomoharu Eguchi, Heather Haas, Stacy A. Hargrove et al. 2015. [Status review of the green turtle \(*Chelonia mydas*\) under the Endangered Species Act](#). <https://www.fisheries.noaa.gov/resource/document/status-review-green-turtle-chelonia-mydass-under-endangered-species-act>

Shortnose Sturgeon Status Review Team. 2010. [A Biological Assessment of shortnose sturgeon \(*Acipenser brevirostrum*\)](#). Report to National Marine Fisheries Service, Northeast Regional Office. November 1, 2010. 417 pp. <https://www.fisheries.noaa.gov/resource/document/biological-assessment-shortnose-sturgeon-acipenser-brevirostrum>

^[a] On February 6, 2012, NOAA Fisheries listed five Distinct Population Segments of Atlantic sturgeon under the Endangered Species Act: the Chesapeake Bay, New York Bight, Carolina, and South Atlantic Distinct Population Segments were listed as endangered; the Gulf of Maine DPS was listed as threatened (77 Federal Register 5880). [77 FR 5880 - Endangered and Threatened Wildlife and Plants; Threatened and Endangered Status for Distinct Population Segments of Atlantic Sturgeon in the Northeast Region - Content Details - 2012-1946](#)

MESA-Protected Species and Habitats

Per NHESP, the federally listed marine species that may occur in the Aquatic Species Study Area, as listed in Table 4.11-5, are also protected under MESA with the same status designations. NHESP also identified the following species protected under MESA that are associated with Priority Habitat in the Aquatic Species Study Area (Project Limits):

- Humpback whale (*Megaptera novaeangliae*), Endangered
- Atlantic hawksbill sea turtle (*Eretmochelys imbricata*), Endangered

NHESP informed MassDOT that, due to the importance of Cape Cod Canal as a foraging and movement corridor for wildlife, NHESP considers the following species relevant to the Program's activities in the canal: fin whale, North Atlantic right whale, Atlantic sturgeon, shortnose sturgeon, Roseate Tern, Common Tern, and Least Tern.^{14,15}

Essential Fish Habitat and NOAA Fisheries Trust Resources

A total of 28 finfish and invertebrate species have designated EFH within the Aquatic Species Study Area. Within this total, there are two types of HAPCs: Inshore Juvenile Atlantic Cod (*Gadus morhua*) and Summer Flounder (*Paralichthys dentatus*). Additionally, there are 16 NOAA trust resources, protected by NOAA Fisheries under the authority of FWCA, with the potential to be present in the Aquatic Species Study Area.¹⁶ Table 4.11-6 lists the species with designated EFH and indicates the

¹⁴ Leddick, J., 2025. Letter from the Massachusetts Division of Fisheries and Wildlife response to the Draft Environmental Impact Report for Cape Cod Bridges Program. [Correspondence] to Secretary Rebecca Tepper of the Massachusetts Environmental Protection Agency Office. October 24, 2025.

¹⁵ The Roseate Tern is also listed as endangered under the ESA; however, USFWS did not list Roseate Tern as a species that may be affected by the Program during ESA Section 7 consultations. Common Tern and Least Tern are not federally listed species.

¹⁶ In the context of FWCA, NOAA trust resources refer to anadromous fish, shellfish, crustaceans, or their habitats that are not managed under a federal fisheries management plan.

occurrence of their various life stages either throughout the Aquatic Species Study Area (A), in only the Sagamore Bridge portion of the Aquatic Species Study Area (S), or in only the Bourne Bridge portion of the Aquatic Species Study Area (B).

Table 4.11-6. Species with Designated Essential Fish Habitat in the Aquatic Species Study Area

Species	Life Stage			
	Eggs	Larvae	Juvenile	Adults/ Spawning Adults
American Plaice (<i>Hippoglossoides platessoides</i>)	S	S	S	S
Albacore Tuna (<i>Thunnus alalunga</i>) ^[†]	—	—	A	—
Atlantic Butterfish (<i>Peprilus triacanthos</i>)	A	B	—	A
Atlantic Cod (<i>Gadus morhua</i>)	A	A	A ^[*]	A
Atlantic Herring (<i>Clupea harengus</i>)	—	S	A	A
Atlantic Mackerel (<i>Scomber scombrus</i>) ^[†]	A	S	A	A
Atlantic Sea Scallop (<i>Placopecten magellanicus</i>)	S	S	S	S
Atlantic Surfclam (<i>Spisula solidissima</i>)	—	—	A	A
Atlantic Wolffish (<i>Anarhichas lupus</i>) ^[†]	A	A	A	A
Black Sea Bass (<i>Centropristis striata</i>)	B	B	A	A
Bluefin Tuna (<i>Thunnus thynnus</i>) ^[†]	—	—	—	A
Bluefish (<i>Pomatomus saltatrix</i>)	—	—	A	A
Little Skate (<i>Leucoraja erinacea</i>)	—	—	A	A
Longfin Inshore Squid (<i>Doryteuthis [Amerigo] pealeii</i>)	B	—	A	A
Northern Shortfin Squid (<i>Illex illecebrosus</i>)	—	—	—	A
Ocean Pout (<i>Macrozoarces americanus</i>)	A	—	S	S
Pollock (<i>Pollachius virens</i>)		S	S	S
Red Hake (<i>Urophycis chuss</i>)	A	A	A	A
Scup (<i>Stenotomus chrysops</i>)	B	B	A	A
Silver Hake (<i>Merluccius bilinearis</i>)	S	S	—	S
Smoothhound Shark Complex (Atlantic Stock)	A	A	A	A
Spiny Dogfish (<i>Squalus acanthias</i>)	—	—	—	A ^[**]
Summer Flounder (<i>Paralichthys dentatus</i>)	—	B	B	A ^[*]
Thorny Skate (<i>Amblyraja radiata</i>)	—	—	S	—
White Hake (<i>Urophycis tenuis</i>)	S	S	S	S
Windowpane Flounder (<i>Scophthalmus aquosus</i>)	A	A	A	A
Winter Flounder (<i>Pseudopleuronectes americanus</i>)	A	A	A	A

Species	Life Stage			
	Eggs	Larvae	Juvenile	Adults/ Spawning Adults
Winter Skate (<i>Leucoraja erinacea</i>)	—	—	A	A
Yellowtail Flounder (<i>Limanda ferruginea</i>)	S	S	A	A

Sources: Evans, N.T., K.H. Ford, B.C. Chase, J.J. Sheppard. 2015. [Recommended Time of Year Restrictions \(TOYs\) for Coastal Alteration Projects to Protect Marine Fisheries Resources in Massachusetts. TR#47-TOY Manuscript-TEXT-4-14-2011.pub](#). Massachusetts Division of Marine Fisheries. April 2011. Revised January 2015.

New England Fishery Management Council (NEFMC). 2017. Omnibus essential fish habitat amendment 2. Volume 2: EFH and Habitat Areas of Particular Concern (HAPC) designation alternatives and environmental impacts. New England Fishery Management Council, Newburyport, and National Marine Fisheries Service, Gloucester, Massachusetts, USA. October 25.

National Oceanic and Atmospheric Administration (NOAA). 1999. Essential Fish Habitat Source Document: Atlantic Mackerel, *Scomber scombrus*, Life History and Habitat Characteristics.

NOAA Fisheries. 2017. Final Amendment 10 to the 2006 consolidated Atlantic highly migratory species fishery management plan: Essential Fish Habitat and environmental assessment. Highly Migratory Species Management Division, Silver Spring, Maryland. 1 September.

Key – A: Present throughout the Aquatic Species Study Area; B: Present in Bourne Bridge Aquatic Species Study Area; S: Present in Sagamore Bridge Aquatic Species Study Area; —: not present.

[†] Species with habitat preferences outside of Cape Cod Canal

[*] Species life stage has a Habitat Area of Particular Concern in the area.

[**] Sagamore Bridge has designated adult female and male, sub-adult female, whereas Bourne Bridge only has adult female designated.

NOAA trust resources include [submerged aquatic vegetation \(SAV\) and shellfish](#). Approximately 2,445 square feet (sf) of [SAV, commonly known as](#) eelgrass (*Zostera marina*), [is present](#) at the Bourne Bridge site. The U.S. Environmental Protection Agency identifies eelgrass as a “special aquatic site,” pursuant to 40 Code of Federal Regulations (CFR) 230 Section 404(b)(1) of the Clean Water Act. The Mid-Atlantic Fishery Management Council has designated eelgrass as an HAPC when overlapped with summer flounder EFH.¹⁷ Refer to **Section 4.9, Wetlands and Floodplains**, for further descriptions of eelgrass, including figures showing its locations at the Bourne Bridge site.

Each of the four Program quadrants contains shellfish habitat [in varying densities](#) between the existing pier and the riprap slope, mainly blue mussels and sporadic American oysters attached to cobble and gravel substrate, [as well as low and medium densities of shellfish attached to riprap along the shoreline](#). Shellfish beds were present during site surveys. **Appendix 4.11, Threatened, Endangered, and Protected Species and Habitats Material, Attachment 3**, provides details of habitat types.

Per the Massachusetts Division of Marine Fisheries ([DMF](#)), the entire Cape Cod Canal is classified as “Prohibited,” which indicates the waters are closed to shellfish harvesting under all conditions, except

¹⁷ Louis A. Chiarella, Assistant Regional Administrator for Habitat Ecosystem Services. Correspondence to David Paulson, Wildlife and Endangered Species Unit Supervisor, MassDOT. February 12, 2025.

for seed gathering for municipal propagation programs under a Massachusetts Division of Marine Fisheries permit.¹⁸

MMPA-Protected Species

As noted in [Table 4.11-1](#), the Marine Mammal Protection Act (MMPA) protects marine mammals in the United States. There are 35 species with potential to occur in the Aquatic Species Study Area. Of those 35 species, the following 11 species were determined to have a regular, common, or uncommon presence likelihood:

- Fin whale
- Humpback whale
- North Atlantic right whale
- Sei whale (*Balaenoptera borealis*)
- Minke whale (*Balaenoptera acutorostrata*)
- Long-finned pilot whale (*Globicephala melas*)
- Atlantic white-sided dolphin (*Lagenorhynchus acutus*)
- White-beaked dolphin (*Lagenorhynchus albirostris*)
- Harbor porpoise (*Phocoena phocoena*)
- Gray seal (*Halichoerus grypus*)
- Harbor seal (*Phoca vitulina*)

The remaining 24 species were determined to have a rare presence likelihood.

4.11.3 No Build Alternative

In the No Build Alternative, baseline conditions would persist for the foreseeable future and there would be no effects on threatened, endangered, and protected species. The U.S. Army Corps of Engineers (USACE) would continue to carry out activities to ensure protection of bats if conducting work on the bridge abutments in coordination with USFWS and would continue to conduct dredging of Cape Cod Canal's navigation channel and other canal maintenance in coordination with NOAA Fisheries.

4.11.4 Build Alternative

In the Build Alternative, effects could occur to federal and state threatened and endangered species, migratory birds, EFH, and marine mammals, as described in the following sections. Further details are provided in the BA for Terrestrial Species, BA for Aquatic Species, and EFH Assessment and FWCA Consultation Worksheet, included as Attachments 1, 2, and 3, respectively, to **Appendix 4.11**,

¹⁸ Massachusetts Division of Marine Fisheries, Shellfish Sanitation and Management map for Cape Cod Canal. [Shellfish Growing Area BB45](#).

Threatened, Endangered, and Protected Species and Habitats Material, and in Appendix 3.2, Construction Approach Technical Report.

4.11.4.1 Effects to Terrestrial Resources

Potential effects to protected species and their habitats primarily consist of habitat alteration [resulting from Program site preparation and construction activities](#). The following sections summarize potential effects to ESA-protected species; MESA-protected species; other protected species, including migratory birds; and FWCA-jurisdictional wildlife resources; [and coordination with federal and state regulatory agencies](#). Refer to **Appendix 4.11, Attachment 1**, for details of land-based construction activities, anticipated effects, [and agency coordination](#).

ESA-Protected Species

[To implement the Build Alternative, MassDOT would acquire properties and demolish existing structures. In addition to the existing bridge abutments, 17 structures would be demolished within the Project Limits. Prior to demolition, MassDOT would inspect the structures. The inspections would follow Massachusetts Division of Fisheries and Wildlife \(MassWildlife\) guidance in developing exclusionary measures to ensure that bats are not present in or are removed from the structures.](#)¹⁹

The Build Alternative would clear approximately 146.86 acres of suitable summer habitat for northern long-eared bats and tricolored bats within the Terrestrial Study Area. However, for both species, no known roost trees are present within or adjacent to the Terrestrial Species Study Area; no maternity colonies have been documented in the Terrestrial Species Study Area; and no winter hibernacula are expected to be affected by the Build Alternative. Further, all proposed tree clearing would be within 1,000 feet of suitable summer roosting habitat that would remain intact. Forested habitat near the Terrestrial Study Area includes the large areas of Camp Edwards and Red Brook Wildlife Management Areas, and smaller parks and forested areas within and adjacent to the Terrestrial Study Area. Refer to **Section 4.6.4.2, Land Alteration Effects**, for further descriptions of the proposed tree clearing and **Appendix 3.2, Construction Approach Technical Report, Attachment 3**, for plans that identify the limits of tree clearing for the proposed work.²⁰

In coordination with USFWS, MassDOT and FHWA determined that no forest clearing activities would occur during the species' summer occupancy period from March 15 to November 30 on the Cape Cod side of Cape Cod Canal and from April 15 to October 31 on the mainland side of Cape Cod Canal. Further, MassDOT would follow Massachusetts Division of Fisheries and Wildlife guidance²¹ for implementing exclusionary measures to ensure bats are not present in, or are removed from,

¹⁹ [Massachusetts Division of Fisheries & Wildlife. 2020. Massachusetts Homeowner's Guide to Bats. \(7th edition\). Homeowners Guide to Bats_2020.pdf](#)

²⁰ The land clearing acreage presented in this section and in **Chapter 4, Section 4.6.4.2**, reflects the most current design and supersedes the acreage presented in the BA for Terrestrial Species, which was submitted to USFWS in April 2025, and the draft Environmental Impact Statement published in November 2025. The anticipated additional tree clearing, however, would not alter the findings and mitigation measures for northern long-eared bats and tricolored bats presented in this section.

²¹ Massachusetts Division of Fisheries & Wildlife. 2020. [Massachusetts Homeowner's Guide to Bats. \(7th edition\). Homeowners Guide to Bats_2020.pdf](#)

structures and bridge abutments, including conducting inspections prior to structure demolition.

Therefore, MassDOT and FHWA have determined that the Build Alternative would be **not likely to adversely affect** northern long-eared bats and tricolored bats. USFWS concurred with this determination on May 2, 2025 (**Appendix 4.11, Attachment 1**).

On December 30, 2025, MassDOT apprised USFWS of an increase in the acreage of suitable bat habitat to be cleared due to the refined limits of the Build Alternative (from 132.14 acres to 146.86 acres). MassDOT determined that by implementing the conservation measures described herein and in the BA for Terrestrial Species, no additional effect to ESA-listed species or critical habitat would occur in a manner or to an extent not previously considered. Therefore, MassDOT's previous determination that the Build Alternative would be not likely to adversely affect northern long-eared bats and tricolored bats would remain valid and reinitiation of ESA consultation would not be required. On January 5, 2026, USFWS acknowledged MassDOT's determination that additional ESA Section 7 consultation regarding the effects of the Program on northern long-eared bats and tricolored bats would not be required. Documentation of coordination with USFWS is provided in **Appendix 4.11, Attachment 1**.

The Terrestrial Species Study Area is outside of the range of known occurrences of the northern red-bellied cooter, and appropriate habitat for the species is not present in the Terrestrial Species Study Area. Therefore, MassDOT and FHWA have determined the Build Alternative would have **no effect** on the northern red-bellied cooter.

No observations of sandplain gerardia were recorded during Build Alternative habitat surveys in 2020, or during additional meander surveys within the Project Limits conducted thereafter to support MESA permitting.^{22,23} Agency correspondence with USFWS and NHESP did not identify concerns for this species in the Terrestrial Species Study Area. Therefore, MassDOT and FHWA have determined that the Build Alternative would have **no effect** on sandplain gerardia.

Suitable habitat for monarch butterflies may occur along the roadsides and other undeveloped, unforested portions of the Terrestrial Species Study Area. Construction of the Build Alternative could cause incidental take of monarch butterflies through vegetation clearing and removal or disturbance of breeding or migration habitat, or through direct mortality of individual butterflies. Following construction completion, cleared areas would be revegetated to the maximum extent possible, using native plant and tree species. Additionally, MassDOT has enrolled in the Nationwide Candidate Conservation Agreement with Assurances for the Monarch Butterfly (CCAA), a voluntary agreement between USFWS, and, among others, state departments of transportation (including MassDOT).²⁴

²² Stantec Consulting Services, Inc. 2020. Bourne and Sagamore Bridge Improvement Projects – Rare, Threatened, and Endangered Species Habitat Assessment. Conducted for Massachusetts Department of Transportation. December 16. MassDOT Project No. 14-33419.

²³ Stantec Consulting Services, Inc. 2026. Cape Cod Bridges Program – 2025 State-listed Species Habitat Assessment Report – Revision 1. Conducted for Massachusetts Department of Transportation. Submitted March 2026. MassDOT Project No. 14-33419.

²⁴ Cardno, Inc. 2020. Nationwide CCAA/CCA (Candidate Conservation Agreement with Assurances/Candidate Conservation Agreement) for Monarch Butterfly on Energy and Transportation Lands. Prepared for The Monarch CCAA/CCA Development Advisory Team and the Energy Resources Center at the University of Illinois at Chicago. March 2020.

Through enrollment in CCAA, MassDOT will implement conservation measures designed to support monarch butterfly breeding and/or foraging on a portion of MassDOT lands, which would result in a net gain of habitat and/or species population numbers. In return for MassDOT’s voluntary conservation measures, USFWS would issue an Enhancement of Survival (EOS) Permit under Section 10(a)(1)(A) of the ESA. The EOS Permit would go into effect as of the listing date of the monarch butterfly, should a listing occur. Under the EOS Permit, incidental take of monarch butterflies would be authorized for the conservation measures and construction activities associated with the Build Alternative.²⁵ Therefore, MassDOT and FHWA have determined that Build Alternative would be **not likely to jeopardize the continued existence** of the monarch butterfly. USFWS concurred with this determination on May 2, 2025 (**Appendix 4.11, Attachment 1**).

MESA-Protected Species and Habitats

The Project Limits intersect NHESP-mapped Priority Habitat of Rare Species as indicated in **Figure 4.11-3** and **Figure 4.11-4**.²⁶ **Table 4.11-7** presents the approximate amount of Priority Habitat within the Project Limits by Program quadrant and program-wide. North of the bridges, the Project Limits do not intersect NHESP-mapped habitats. South of the bridges, the Project Limits intersect small fringe portions of Priority Habitat that are adjacent to the existing major roadway infrastructure, including approximately 1.89 acres of Priority Habitat associated with the Sagamore Bridge and 5.47 acres of Priority Habitat associated with the Bourne Bridge.

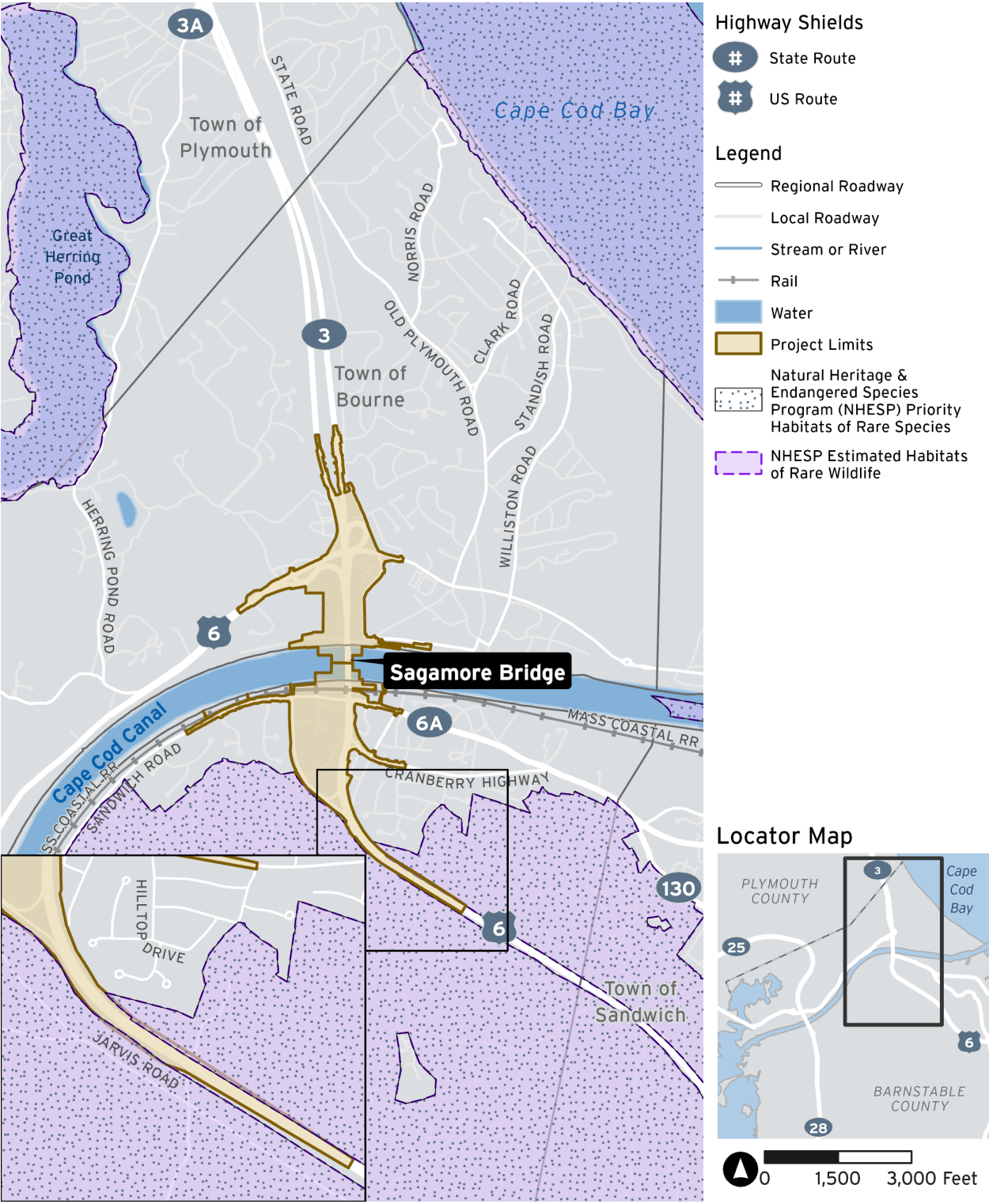
Table 4.11-7. Mapped Rare Species Habitats within the Project Limits

Program Quadrant	Priority Habitat (Acres)
Sagamore North	0
Sagamore South	1.89
Bourne North	0
Bourne South	5.47
Estimated Program-wide Total	7.36

²⁵ The premise of the Candidate Conservation Agreement with Assurances for the Monarch Butterfly (CCAA) is that benefits from implementation of the conservation measures would outweigh the potential adverse effects on monarch butterflies, including injury or death of individuals, resulting from project construction activities.

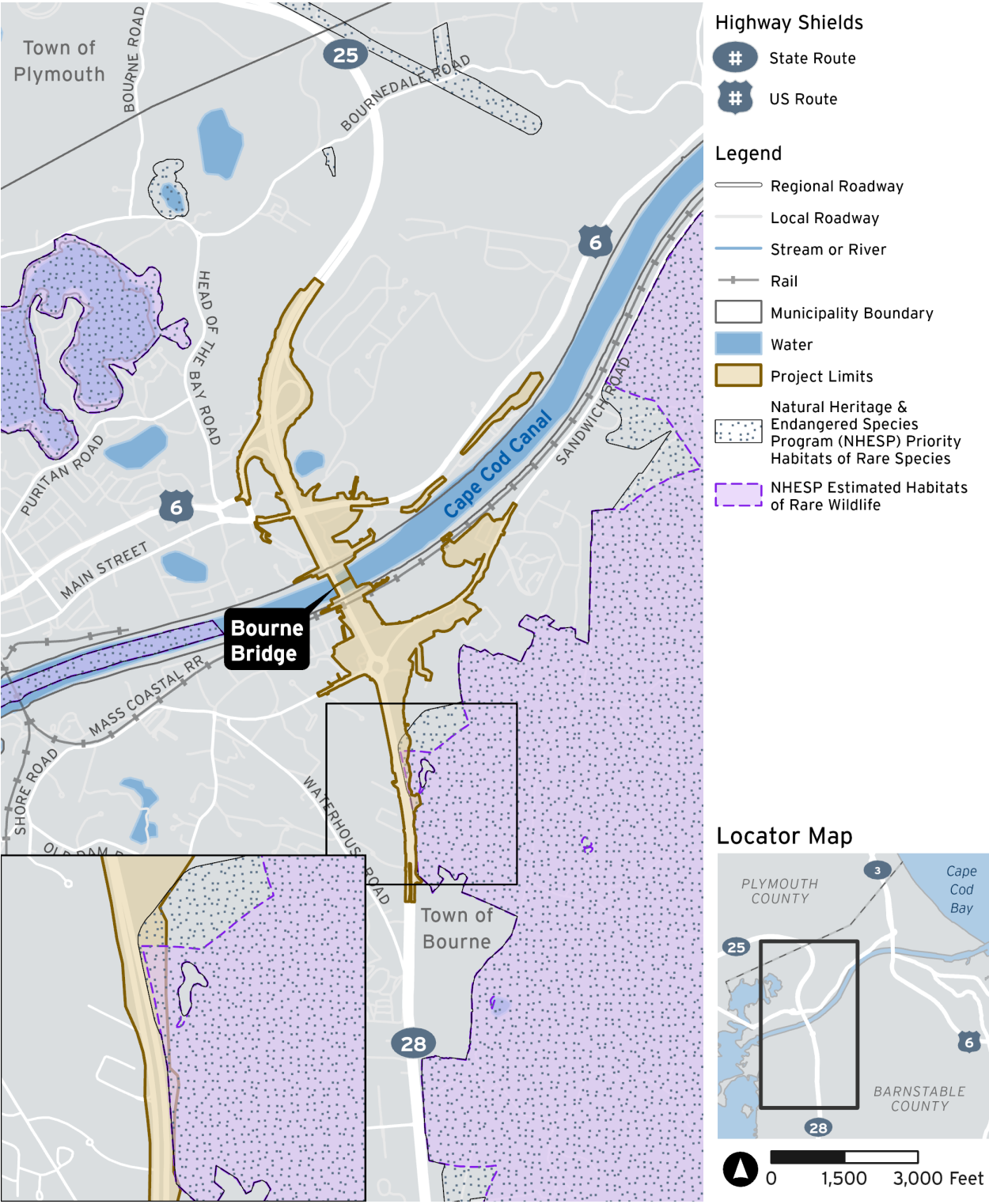
²⁶ **Figure 4.11-3 and Figure 4.11-4 also present the extents of Estimated Habitat in the vicinity of the Project Limits. Estimated Habitat is a subset of Priority Habitat that represents the geographical extent of the habitat of state-listed rare wetlands wildlife and is codified under the Wetlands Protection Act.**

Figure 4.11-3. Natural Heritage and Endangered Species Program Priority and Estimated Habitats in and near the Project Limits (Sagamore South Quadrant)



Source: Massachusetts Department of Transportation, [2025](#)

Figure 4.11-4. Natural Heritage and Endangered Species Program Priority and Estimated Habitats in and near the Project Limits (Bourne South Quadrant)



Source: Massachusetts Department of Transportation, 2025

Potentially suitable habitat for state-listed wildlife and plant species (**Table 4.11-3**) is present in the Terrestrial Species Study Area, and there is potential for unavoidable Program impacts to cause Take of some of these species.

Overall habitat suitability within the Priority Habitat in the Terrestrial Species Study Area is limited and of low quality for the reptile, insect, and plant species listed in **Table 4.11-3**, as follows:

- Eastern box turtle habitat occurs within the Project Limits along the fringe of the mapped Priority Habitat in the Sagamore and Bourne south quadrants.
- Butterfly and moth species and purple tiger beetle habitats are largely restricted to a narrow edge and fringe zone (typically about 10 to 15 feet wide) between the edge of the mowed roadway shoulders and closed-canopy pitch pine-oak forests south of both bridges.
- Papillose nut-sedge and wild lupine habitats are confined to narrow zones along wooded edges and in areas where roadside mowing is less intensive (e.g., behind guardrails). No wild lupine or papillose nut-sedge plants were noted during habitat assessments conducted in 2020 and 2025, and no wild lupine was observed during seasonally appropriate field surveys in May 2026, per the study plan approved by NHESP. Seasonally appropriate field surveys are planned between May and July 2026 to further evaluate the presence of state-listed plants papillose nut-sedge within the Terrestrial Species Study Area associated with Bourne Bridge.

In compliance with MESA, MassDOT filed a MESA Checklist with NHESP to determine whether the Build Alternative would result in a Take, No Take, or conditional No Take of state-listed species (321 CMR 10.00). On April 1, 2026, NHESP issued separate MESA determinations for the Sagamore and Bourne Bridge Projects as follows:

- **Sagamore Bridge Project**
 - NHESP determined that the Sagamore Bridge Project must be conditioned to avoid a Take of the following state-listed terrestrial species: Peregrine Falcon, Least Tern, Common Tern, Roseate Tern, eastern box turtle, and wild lupine. Section 4.11.5.1 identifies the conditions to be implemented to avoid a Take of species.
 - NHESP determined that the Sagamore Bridge Project will not result in a Take of the following state-listed terrestrial species: frosted elfin, purple tiger beetle, scrub euchaena, slender clearwing sphinx moth, or heath metarranthis.
- **Bourne Bridge Project**
 - NHESP determined that the Bourne Bridge Project must be conditioned to avoid a Take of the following state-listed terrestrial species: peregrine falcon, least tern, common tern, and roseate tern. **Section 4.11.5.1** identifies the conditions to be implemented to avoid a Take.
 - NHESP determined that the Bourne Bridge Project will result in a Take of the following state-listed species: papillose nut-sedge, wild lupine, eastern box turtle, buck moth, herodias underwing moth, pine barrens macaria, heath metarranthis, pink swallow moth, scrub euchaena, and slender clearwing sphinx moth.

- NHESP determined that the Bourne Bridge Project will not result in a Take of the following state-listed species: frosted elfin, barrens dagger moth, Melsheimer's sack bearer, or purple tiger beetle.

NHESP has determined that MassDOT will require a Conservation Management Permit for the species that would experience Take due to the Bourne Bridge Project. Further consultation with NHESP will be needed to identify mitigation measures to comply with the permit's performance standards (321 CMR 10.23).

At the request of NHESP, MassDOT developed a protection plan for Peregrine Falcons to avoid Take of this species. The protection plan includes an adaptive management strategy involving baseline monitoring with conservation and mitigation measures, as appropriate and in consultation with NHESP, to reduce impacts on Peregrine Falcons and their associated habitat. To avoid disruption of Peregrine Falcon nesting pairs and chicks during Program construction, MassDOT will continue coordinating closely with NHESP to identify opportunities for incorporating artificial nesting platforms or boxes into the Program's design, to encourage nesting at such alternative locations, and to exclude Peregrine Falcons from nesting on the existing bridges during construction and demolition. Additionally, MassDOT would work with MassWildlife to support seasonal chick banding, as opportunities for banding allow. The protection plan, applicable to both the Sagamore and Bourne Bridge Projects, will be implemented throughout construction of the Program.

Similarly, MassDOT will prepare a protection plan for the eastern box turtle, in consultation with NHESP, to outline an adaptive strategy with conservation and mitigation measures, as appropriate, to avoid and minimize impacts to this species throughout construction of the Program.

The conservation and mitigation measures listed in **Section 4.11.5** pertaining to avoiding and minimizing construction-related turbidity increases in Cape Cod Canal also would minimize impacts on foraging terns within the canal, thereby avoiding a Take.

Other Designated Protected Species

As part of the measures implemented to protect ESA-listed bats, trees would not be cleared between March 15 and November 30 on the Cape Cod side of Cape Cod Canal and from April 15 to October 31 on the mainland side of the canal. These windows encompass the nesting season for migratory birds generally and most of the Birds of Conservation Concern listed in **Table 4.11-4**. The nesting seasons of Prothonotary Warblers and Bald Eagles may extend outside of this window; however, USFWS Information for Planning and Consultation (IPaC) guidance indicates a low probability of prothonotary warbler presence in the Terrestrial Species Study Area during April, when tree clearing could occur.²⁷

If a Bald Eagle nest is documented in or near the Terrestrial Species Study Area, FHWA would follow guidance provided in the National Bald Eagle Management Guidelines to minimize impacts on Bald Eagles.²⁸ Given this approach and the unlikelihood of Golden Eagles occurring in the Terrestrial Species Study Area, the Build Alternative would cause no adverse effect on Bald or Golden Eagles. Based on the

²⁷ U.S. Fish and Wildlife Service (USFWS). 2024. [Information for Planning and Consultation](https://ipac.ecosphere.fws.gov/). <https://ipac.ecosphere.fws.gov/>

²⁸ U.S. Fish and Wildlife Service (USFWS). 2007. National Bald Eagle Management Guidelines. May 2007. [Microsoft Word - Guidelines - June11. 2007.v2.doc](#)

tree clearing restrictions and implementation of guidance to protect eagles, MassDOT and FHWA have determined that the Build Alternative would cause **no adverse effect** on migratory birds.

The Build Alternative would include additional conservation and mitigation measures that would protect migratory birds. Following construction completion, MassDOT would revegetate cleared areas to the maximum extent possible, using native plant species to provide suitable habitat. MassDOT would follow conservation mowing practices in its right-of-way, like following recommended times of year for mowing (October 1 through May 1), to avoid the nesting season for most Birds of Conservation Concern potentially present in the Terrestrial and Aquatic Species Study Areas.

FWCA-Jurisdictional Wildlife Resources

MassDOT requested consultation with USFWS for compliance with FWCA through its submittal of the BA for Terrestrial Species. In addition to the previously cited determinations provided on May 2, 2025, USFWS noted that the Build Alternative would not have any substantial impacts on wildlife resources under its jurisdiction relative to FWCA (**Appendix 4.11, Attachment 1**).

4.11.4.2 Effects to Aquatic Resources

Due to the Program's in-water construction activities, potential effects to protected species, their habitat, and their prey species could include a combination of direct or indirect and temporary or permanent stressors to the surrounding environment. Stressors could include underwater noise, entrapment, changes in water quality/turbidity, benthic disturbance, reduction in fish passage, habitat alteration and/or conversion, and vessel interaction.

The following sections summarize potential effects to ESA-protected species, MESA-protected species, EFH and NOAA Fisheries trust resources, and MMPA-protected resources, including coordination with federal and state regulatory agencies. Refer to **Appendix 4.11, Attachments 2 and 3**, for details of in-water construction activities, anticipated effects, and agency coordination.

ESA-Protected Species

NOAA Fisheries stated that fin whale and North Atlantic right whale presence in Cape Cod Canal would be rare and anomalous.²⁹ Direct effects from Build Alternative construction would not extend beyond Cape Cod Canal. The risk of Build Alternative effects on whales would likely be limited to vessel strikes. The Build Alternative would avoid such effects by implementing the conservation and mitigation measures listed in **Section 4.11.5**. Additionally, MassDOT would follow a Marine Mammal and Sea Turtle Monitoring and Mitigation Plan throughout construction (**Appendix 4.11, Attachment 4**).

Build Alternative vessels would transit through areas designated as North Atlantic right whale critical habitat. However, vessel effects on the physical and biological features of the critical habitat would be too small to be meaningfully measured or detected, and therefore insignificant, or would have no effect. Therefore, MassDOT and FHWA have determined the Build Alternative **may affect but is not**

²⁹ Coordination with NOAA Fisheries and additional details are provided in the BA for Marine Species, provided as **Appendix 4.11, Attachment 2**.

likely to adversely affect fin whales or North Atlantic right whales and North Atlantic right whale critical habitat.

Sea turtles are unlikely to be present in Cape Cod Canal. Literature indicates that most sea turtle sightings in the vicinity of the Aquatic Species Study Area occur in Cape Cod Bay and a lesser amount in Buzzards Bay.³⁰ As with marine mammals, effects on sea turtles would likely be limited to vessel strikes related to Build Alternative vessels. The measures implemented by the Build Alternative to protect marine mammals would reduce the risk for Build Alternative effects on sea turtles. Therefore, MassDOT and FHWA have determined that the Build Alternative **may affect but is not likely to adversely affect** the four sea turtle species listed in [Table 4.11-5](#).

There is a lack of documentation for Atlantic sturgeon or shortnose sturgeon presence in Cape Cod Canal; further, NHESP does not list either species as occurring within the canal.³¹ Sturgeon may be present in Cape Cod Canal during migratory movements; however, their presence is likely to be uncommon and transient. The Build Alternative would implement multiple mitigation measures to avoid or minimize effects on sturgeon, as listed in [Section 4.11.5](#). Additionally, Build Alternative vessel traffic would not be expected to have direct effects on sturgeon. Sturgeon [are benthic feeders and](#) primarily occupy the bottom of the water column and would likely be below the draft of Build Alternative vessels. Therefore, MassDOT and FHWA have determined that the Build Alternative **may affect but is not likely to adversely affect** the Atlantic or shortnose sturgeon.

NOAA Fisheries concurred with the determinations of MassDOT and FHWA pursuant to Section 7 of the ESA regarding the effects of the Build Alternative on ESA-protected species on April 7, 2025 ([Appendix 4.11, Attachment 2](#)).

[Following this initial coordination with NOAA Fisheries' Protected Resources Division, MassDOT conducted additional coordination to provide program updates and seek concurrence with effect assessments regarding the riprap pier protection, sediment sampling, and dredged material disposal options.](#)

[On February 10, 2026, MassDOT provided a technical memorandum to NOAA Fisheries' Protected Resources Division detailing the potential effects of the riprap pier protection system on ESA-listed species and designated critical habitat. Although the proposed pier protection system would increase the amount of net permanent benthic habitat conversion, the BA for Marine Species analyzed the effects of habitat loss in Cape Cod Canal associated with placement of the new bridge piers and removal of the existing piers and concluded that this would not likely adversely affect ESA-listed species. Further, the loss of potential foraging habitat would represent a small fraction of similar available habitat throughout the Action Area. As a result, MassDOT concluded that with application of avoidance and minimization measures described in the BA for Marine Species, the riprap pier protection system would be not likely to adversely affect ESA-listed species or designated critical](#)

³⁰ Halpin, P.N., A.J. Read, E. Fujioka, B.D. Best, B. Donnelly, L.J. Hazen, C. Kot, K. Urian, E. LaBrecque, A. Dimatteo, J. Cleary, C. Good, L.B. Crowder, and K.D. Hyrenbach. 2009. [OBIS-SEAMAP: The world data center for marine mammal, sea bird, and sea turtle distributions. Oceanography 22\(2\):104-115.](#) <https://seamap.env.duke.edu/species/948946>

³¹ Massachusetts Division of Fisheries and Wildlife. 2015. Natural Heritage & Endangered Species Program. [Atlantic Sturgeon | Mass.gov, Shortnose Sturgeon | Mass.gov](#)

habitat or cause effects thereto that were not previously considered. On February 20, 2026, NOAA Fisheries' Protected Resources Division concurred with MassDOT's determination that the design change would not introduce effects larger in scope than those already considered and that reinitiation of consultation would not be necessary.

On April 9, 2026, MassDOT informed NOAA Fisheries of investigatory sediment sampling to be conducted in Cape Cod Canal at the bridge sites to support the proposed dredge program and indicated that the sampling would incorporate the Program's BMPs as stipulated in the initial consultation and would be consistent with the previous determination of not likely to adversely affect ESA-listed threatened or endangered species or their designated critical habitats. On April 20, 2026, NOAA Fisheries acknowledged the Program updates and MassDOT's determination that reinitiation of consultation would not be needed.

On June 1, 2026, MassDOT apprised NOAA Fisheries of the Program's expected dredge material disposal approach, developed in coordination with USACE, and its plan developed in coordination with DMF to place excess existing bridge components at an artificial reef site off the coast of Massachusetts as a beneficial reuse of the materials. Pending the results of sediment sampling, MassDOT is proposing to dispose of dredged sediments from the Sagamore and Bourne Bridge projects at one or two sites within the USACE's Disposal Area Monitoring System. The proposed sites are the Springhill Beach Nearshore Placement site, a feeder berm approximately 2,000 feet offshore of Springhill Beach in Sandwich, Massachusetts, and the Cape Cod Bay Disposal (CCBD) site, approximately 16.5 miles northeast of the Cape Cod Bay entrance to Cape Cod Canal. Additionally, MassDOT proposes to place suitable portions of the deconstructed existing Sagamore and Bourne bridge piers, shoreline riprap, and granite bridge pier facing at the DMF Yarmouth artificial reef site, approximately 2.5 miles off the coast of Yarmouth, Massachusetts, or at another DMF-approved site. MassDOT has determined that the Program's use of the USACE and DMF sites would be covered under the agencies' previously obtained authorizations from NOAA Fisheries and would not be an expansion of the Program requiring additional ESA Section 7 consultation. Vessel transport to and from these sites, however, would be a component of the Proposed Action, as previously described in the BA for Marine Species. During vessel transits, MassDOT would adhere to the conservation and mitigation measures to reduce impacts on federally listed species or critical habitats with potential to occur in the vicinity of the Program, including restricting vessel speeds and having a protected species observer (PSO) onboard vessels from January through May, operating in accordance with the Program's Marine Mammal and Sea Turtle Monitoring and Mitigation Plan. By implementing these measures, MassDOT determined that the vessel use for these material disposal activities would be consistent with the previous determinations of not likely to adversely affect ESA-listed threatened or endangered species or their designated critical habitats and would not require further consultation.

Documentation of agency coordination is provided in **Appendix 4.11, Attachment 2**.

MESA-Protected Species and Habitats

In compliance with MESA, MassDOT filed a MESA Review Checklist with NHESP to determine whether the Build Alternative would result in a Take, No Take, or conditional No Take of state-listed species (321 CMR 10.00). On April 1, 2026, NHESP issued separate determinations for the Sagamore and Bourne Bridge Projects as follows:

- Sagamore Bridge Project: NHESP determined that the Sagamore Bridge Project must be conditioned to avoid a Take of the following state-listed aquatic species: short nose sturgeon, Atlantic sturgeon, fin whale, North Atlantic right whale, humpback whale, Kemp's ridley sea turtle, loggerhead sea turtle, green sea turtle, leatherback, sea turtle, and Atlantic hawksbill sea turtle.
- Bourne Bridge Project: NHESP determined that the Bourne Bridge Project must be conditioned to avoid a Take of the following state-listed aquatic species: short nose sturgeon, Atlantic sturgeon, fin whale, North Atlantic right whale, humpback whale, Kemp's ridley sea turtle, loggerhead sea turtle, green sea turtle, leatherback, sea turtle, and Atlantic hawksbill sea turtle.

Section 4.11.5.2 identifies the conditions to be implemented to avoid a Take.

At the request of NHESP, MassDOT has developed protection plans for whales and sturgeon to provide the Program guidance for avoiding Take of these species under MESA. The species protection plans incorporate the conservation and mitigation measures listed in [Section 4.11.5](#), as requested by NHESP, and would be adhered to throughout construction of the Program.

Accordingly, with implementation of these conditions and the protection plans, the Build Alternative would not cause adverse effects on aquatic MESA-protected aquatic species.

Essential Fish Habitat and NOAA Fisheries Trust Resources

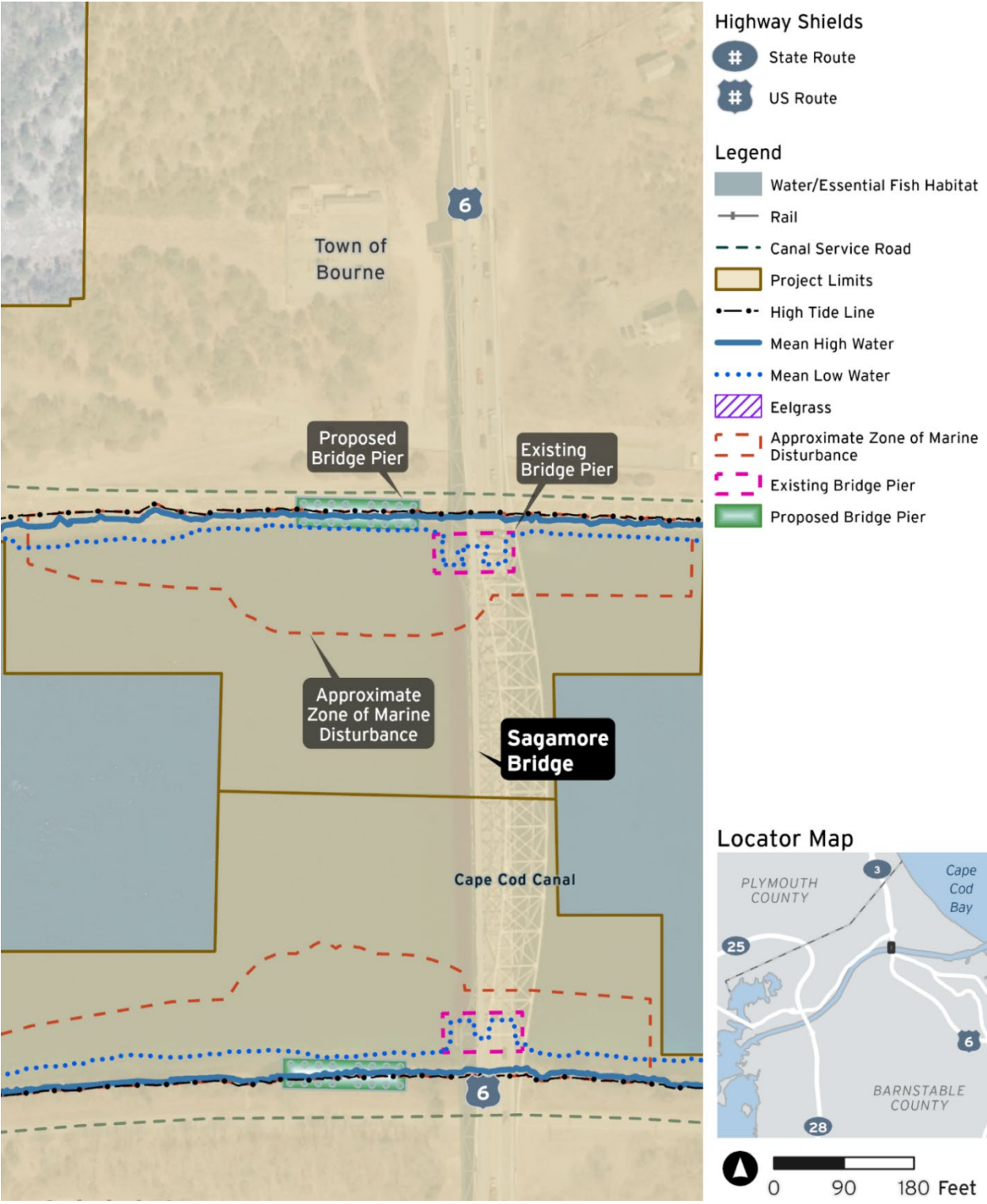
Table 4.11-8 presents estimated direct effects to EFH within the approximate zone of marine disturbance at each bridge site, identified on [Figure 4.11-5 through Figure 4.11-8](#). **Appendix 4.11, Attachment 3**, provides tables identifying estimated effects due to construction components and a breakdown of estimated effects by habitat type.

Table 4.11-8. Estimated Direct Effects to Essential Fish Habitat Within Zones of Marine Disturbance

Program Quadrant	Zone of Marine Disturbance ^a (acres)	Temporary Construction Impacts (acres)	Net Direct Permanent Impacts (acres)
Sagamore North	2.33	0.88	0.98
Sagamore South	2.42	0.95	0.92
Bourne North	2.20	0.93	0.83
Bourne South	2.33	1.01	0.84
Total	9.28	3.77	3.57

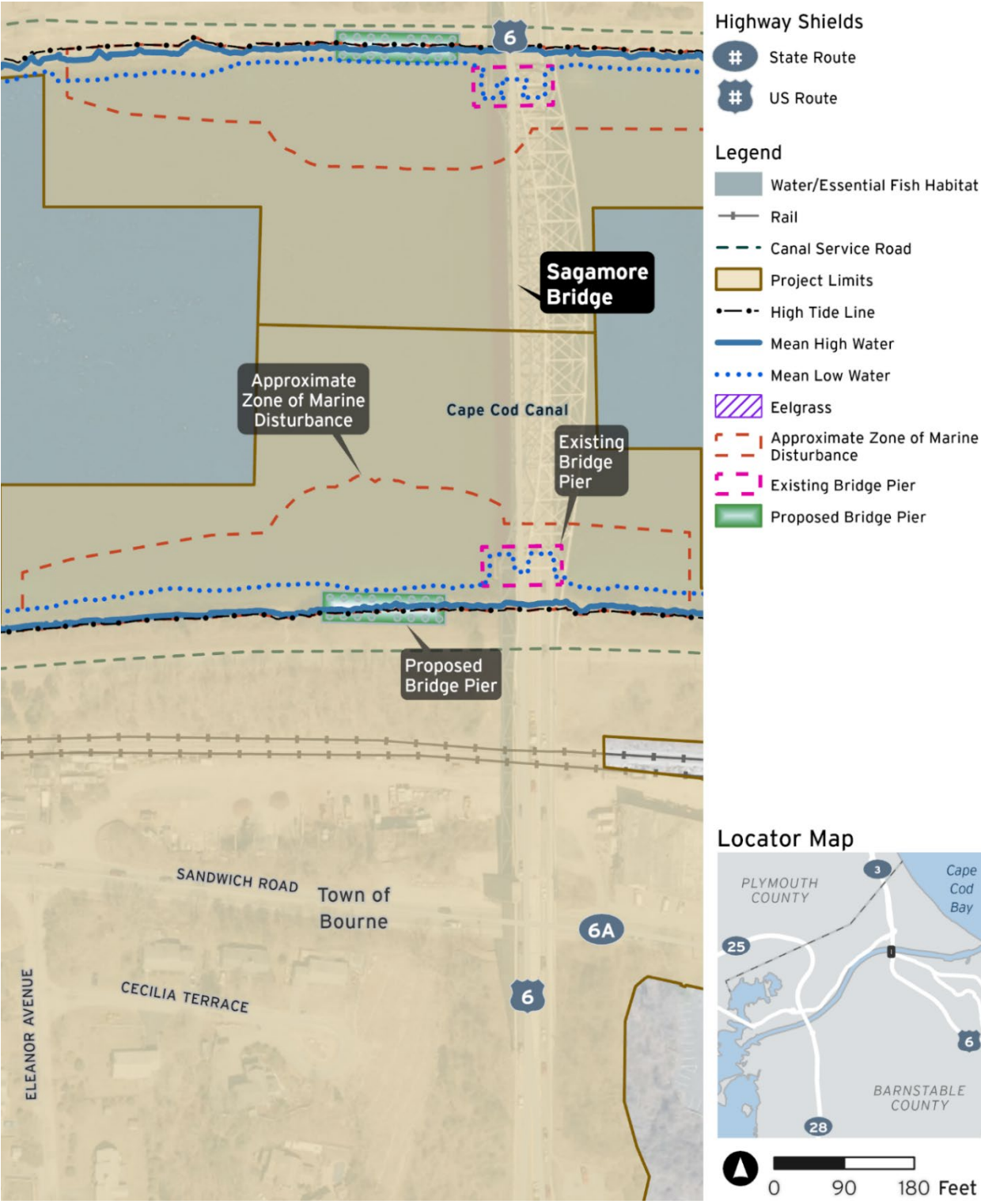
a. The Zone of Marine Disturbance represents the total area where construction and permanent effects on Essential Fish Habitat and Endangered Species Act-listed species foraging habitat could occur.

Figure 4.11-5. Approximate Zone of Marine Disturbance (Sagamore North Quadrant)



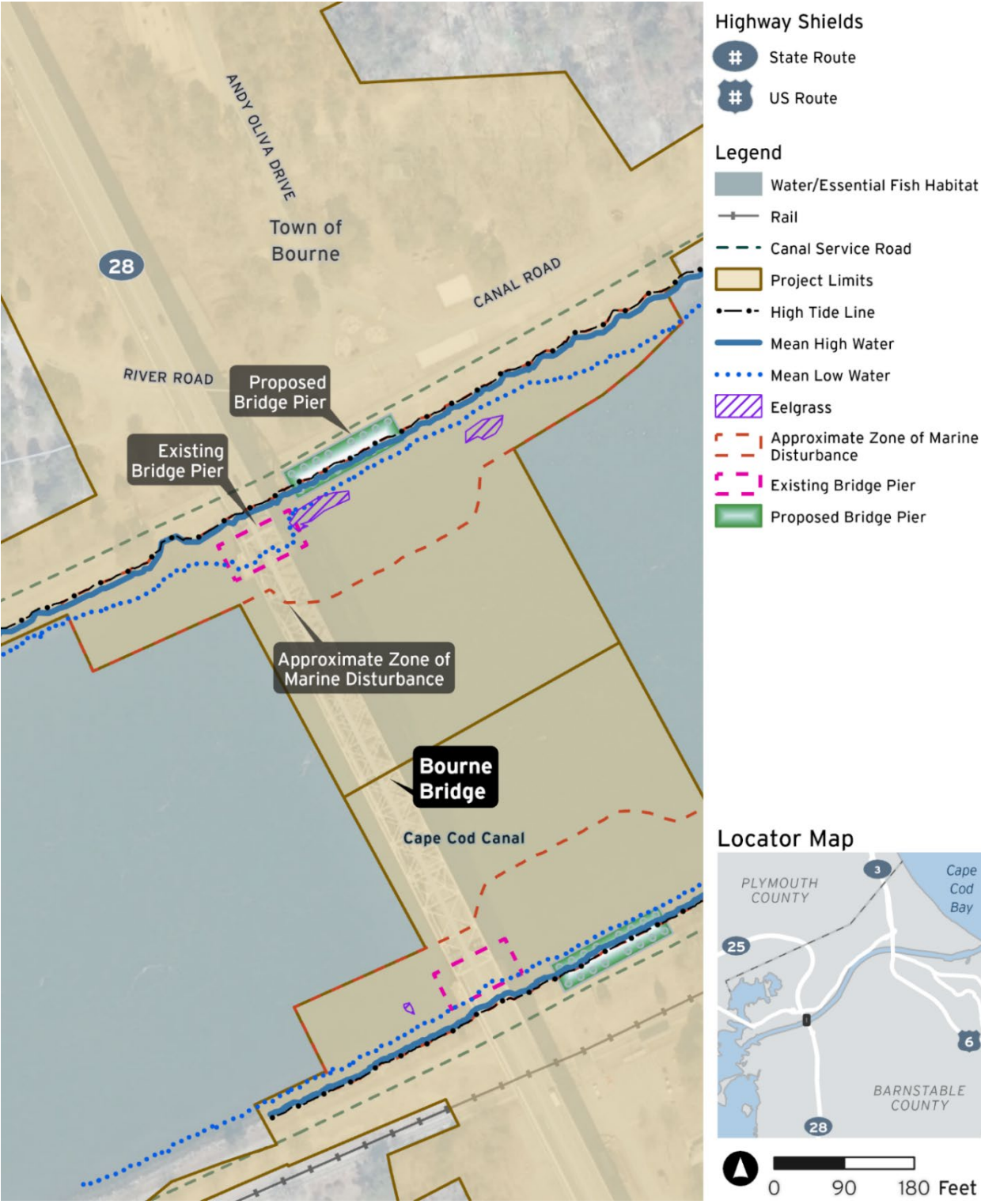
Source: Massachusetts Department of Transportation, 2025

Figure 4.11-6. Approximate Zone of Marine Disturbance (Sagamore South Quadrant)



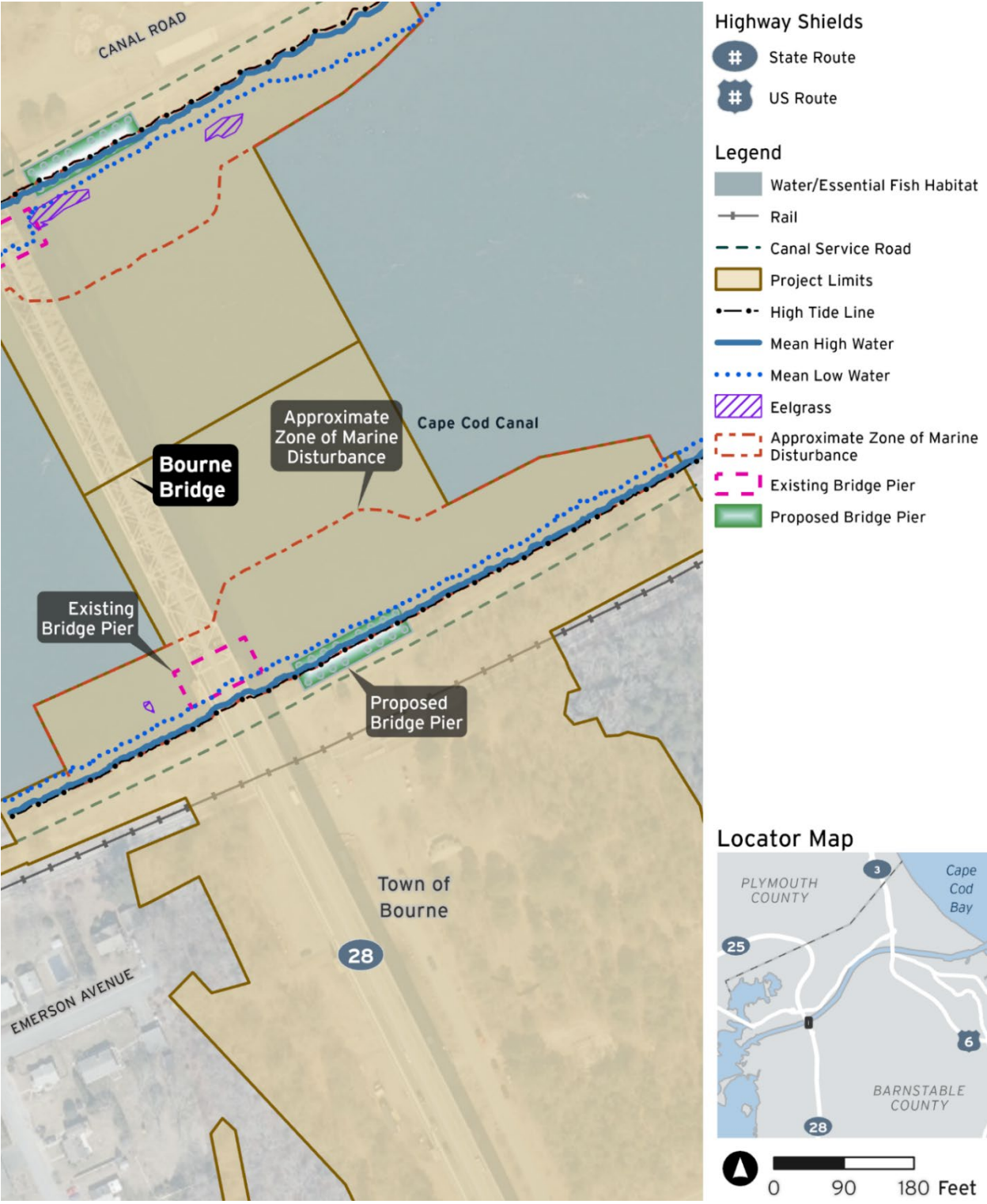
Source: Massachusetts Department of Transportation, 2025

Figure 4.11-7. Approximate Zone of Marine Disturbance (Bourne North Quadrant)



Source: Massachusetts Department of Transportation, 2025

Figure 4.11-8. Approximate Zone of Marine Disturbance (Bourne South Quadrant)



Source: Massachusetts Department of Transportation, 2025

To avoid the early life stage development and spawning seasons of most EFH species and trust resources, the Build Alternative would follow a time-of-year restriction prohibiting in-water construction activities that could cause acoustic effects or turbidity from March 1 through August 31. The early life stages of three species whose spawning timeframes have the potential to overlap work outside of the time-of-year restriction window—Atlantic cod, pollock, and winter flounder—could experience effects if larvae or eggs were to drift into or settle within the Build Alternative footprint from adjacent spawning grounds. Mitigation for these species, listed in [Section 4.11.5.2](#), would minimize effects to individuals, eggs, or larvae using the canal corridor. Additionally, the Build Alternative’s in-water activity would be intermittent across a six-to-eight-year period, allowing for a greater possibility for spawning to occur outside of active construction time periods.

[MassDOT provided details to NOAA Fisheries’ Habitat and Ecosystem Services Division regarding the potential effects of the riprap pier protection system to EFH in a technical memorandum dated February 10, 2026. The total area of intertidal and subtidal EFH that would be converted to riprap or bridge piers would encompass approximately 0.5% of the area encompassed by Cape Cod Canal, representing a minimal effect on EFH in the Aquatic Species Study Area. Additionally, the riprap would provide complex habitat for marine species and hard substrate for growth of NOAA trust resources present within the canal, such as blue mussels \(*Mytilus edulis*\) and Eastern oysters \(*Crassostrea virginica*\). Introduction of the riprap pier protection system would not affect implementation of the construction best management practices \(BMP\) described in the EFH Assessment, nor would it affect MassDOT’s approach to eelgrass mitigation. With application of the avoidance and minimization measures described in the EFH Assessment \(\[Appendix 4.11, Attachment 3\]\(#\)\), MassDOT concluded that the conversion of EFH from coarse sand, shell hash, cobble/gravel, and shellfish reef habitat to riprap would not cause a substantial adverse effect on EFH or NOAA trust resources, and it would not change the anticipated impacts to eelgrass as reported in the EFH Assessment. On March 4, 2026, NOAA Fisheries’ Habitat and Ecosystem Services Division concurred with MassDOT’s determination and offered no additional conservation recommendations provided that the previously identified conservation recommendations and BMPs are incorporated into the Program. Documentation of agency coordination is provided in \[Appendix 4.11, Attachment 3\]\(#\).](#)

The Build Alternative would affect approximately 2,445 sf of SAV present at the Bourne Bridge site: two eelgrass beds, totaling 2,345 sf, are located in the Bourne North quadrant, and one eelgrass bed of 100 sf is located in the Bourne South quadrant. [In a February 12, 2025, letter to MassDOT, NOAA Fisheries provided](#) an EFH Conservation Recommendation that MassDOT monitor the SAV beds with photographic surveys before and after construction, provide the survey results to NOAA Fisheries, and provide compensatory mitigation for effects to eelgrass beds. Documentation of coordination between NOAA Fisheries and MassDOT is provided as [Appendix 4.11, Attachment 3](#).

MassDOT [has developed](#) a plan [to mitigate for potential loss of eelgrass due to Bourne Bridge Project construction activities, per NOAA Fisheries’ conservation recommendations. Based on the results of a suitability assessment of 17 potential locations for eelgrass mitigation in Buzzards Bay and Cape Cod Bay, MassDOT determined that two sites were suitable for potential eelgrass transplantation. However, due to historically low success rates of eelgrass transplant projects in Massachusetts, where DMF restoration projects have resulted in an average 52% success rate across sites after two planting](#)

attempts and five years of monitoring.³² MassDOT dismissed eelgrass transplantation as a viable option and considered alternative methods of mitigation.

To satisfy the state's mitigation requirements, the Massachusetts Department of Environmental Protection (MassDEP) and DMF are continuing to evaluate MassDOT's proposal to provide funding to DMF for an eelgrass research project or for DMF's eelgrass seed collection program at the Cat Cove Marine Laboratory in Salem, Massachusetts, and/or provide conservation moorings. Any transfer of compensatory mitigation funds would be accomplished via a Memorandum of Agreement between MassDOT and DMF. MassDOT will meet USACE's mitigation requirements through the purchase of credits from USACE's Massachusetts In-lieu Fee Program. MassDOT is finalizing its compensatory mitigation plan for unavoidable Bourne Bridge Project-related loss of eelgrass with USACE through the Clean Water Act Section 404 permitting process. Permitting is anticipated to be complete by October 2026.

MMPA-Protected Species

As previously described, the Build Alternative could result in vessel strikes of marine mammals. Underwater noise from Build Alternative construction has the potential to cause harassment, in the form of behavioral or injurious effects, of marine mammals. MassDOT has developed a Marine Mammal and Sea Turtle Monitoring and Mitigation Plan that incorporates monitoring protocols, operational procedures, and BMPs to limit the potential for an incidental Take of marine mammals and sea turtles and minimize potential effects on marine mammals and sea turtles protected under the ESA and the MMPA. (Appendix 4.11, Attachment 4). MassDOT has determined that by implementing the monitoring program and conservation measures outlined in the Marine Mammal and Sea Turtle Monitoring and Mitigation Plan, the Program would adequately limit the potential for an incidental Take of marine mammals protected under the MMPA. MassDOT has therefore concluded that neither an Incidental Harassment Authorization (IHA) nor a Letter of Authorization (LOA) is necessary to pursue under the MMPA.

On April 29, 2026, MassDOT provided the Marine Mammal and Sea Turtle Monitoring and Mitigation Plan to NOAA Fisheries and requested that the agency review the plan. MassDOT has committed to notifying NOAA Fisheries prior to construction start and coordinating with the agency through the duration of the Program's in-water construction activities as needed.

Appendix 4.11, Attachment 4 provides documentation of coordination.

4.11.5 Mitigation

This section identifies measures MassDOT would incorporate through the construction of the Build Alternative to protect terrestrial and aquatic resources. With the implementation of these proposed conservation and mitigation measures, and the Build Alternative construction methods described in **Appendix 3.2, Construction Approach Technical Report**, the Build Alternative would not be expected

³² Massachusetts Division of Marine Fisheries. In-Lieu Fee Program. 2024. [Elgrass Restoration Project \(IL01\) 2023 Final Report](https://www.mass.gov/doc/eelgrass-restoration-project-final-report-2023/download). 18 pp. <https://www.mass.gov/doc/eelgrass-restoration-project-final-report-2023/download>

to cause adverse permanent or construction-related effects on threatened, endangered, and protected species or EFH. [Further details on proposed mitigation measures and BMPs are included in Appendix 4.11, Attachments 1, 2, 3, and 4.](#)

As previously cited, MassDOT is coordinating with USACE and NOAA Fisheries to identify the most effective compensatory mitigation approach for anticipated effects to eelgrass.

4.11.5.1 Terrestrial Resources

[Protection Measures](#)

MassDOT would implement the following mitigation measures to protect terrestrial resources:

- Trees would not be cleared during the summer occupancy period for bats and typical nesting season for migratory birds, defined as March 15 to November 30 on the Cape side of Cape Cod Canal and April 15 to October 31 on the mainland side of Cape Cod Canal.
- Trees would not be cleared within 0.25-miles of known bat hibernacula and/or known bat roost trees during the pup season (June 1 through August 15).
- Inspections of structures and bridge abutments would be conducted prior to demolition, and pending the proposed demolition method and timing, entry points would be sealed in the late summer period and before the start of the hibernation period to prevent potential bat entry during the winter. Methods would follow MassWildlife's guidance.³³
- Conservation mowing practices would be used on a portion of MassDOT lands, including MassDOT rights-of-way, to protect monarch butterflies and butterfly habitat, as part of enrollment in CCAA.
- Cleared areas would be revegetated following construction completion to the maximum extent possible, using native plant species to provide suitable habitat for bat species, pollinators, and other native species.

[As described in Section 4.11.4.1, MassDOT would implement the Peregrine Falcon Protection Plan and Eastern Box Turtle Protection Plan to avoid impacts to these species and their habitat. Additionally, the conservation and mitigation measures listed in Section 4.11.5.2 for avoiding and minimizing construction-related turbidity increases in Cape Cod Canal would moderate impacts on foraging terns within the canal. As applicable, MassDOT would verify the protection measures for avoiding a Take, in accordance with NHESP's conditions.](#)

[In accordance with NHESP's conditions to avoid a Take of state-listed terrestrial species, including peregrine falcons, least tern, common tern, roseate tern, and eastern box turtle, MassDOT would implement the following through completion of the Program:](#)

- [Seed and plantings not maintained as lawn shall be native to Bourne County, as identified in the current version of The Vascular Plants of Massachusetts: A County Checklist.](#)³⁴

³³ [Bats in the Home | Mass.gov](https://www.mass.gov/info-details/bats-in-the-home). <https://www.mass.gov/info-details/bats-in-the-home>

³⁴ https://grownativemass.org/sites/default/files/documents/MA_Vascular_Plants_County_Checklist-1stRev.pdf

- Seed mixes used to restore or stabilize soils shall not include state-listed species.³⁵
- No work or alteration of the soil, surface, or vegetation shall occur outside the limits of work unless approved in writing in advance by MassWildlife.
- Prior to work start, MassDOT shall consult with MassWildlife to refine protection measures identified in the Peregrine Falcon Protection Plan, including obtaining MassWildlife approval in writing.

Mitigation Measures for Unavoidable Impacts

As indicated in Section 4.11.4.1, NHESP determined that the Bourne Bridge Project will result in a Take of 10 state-listed terrestrial species; the Bourne Bridge Project will therefore require a Conservation Management Permit. MassDOT will further consult with NHESP to develop mitigation that provides a net benefit to comply with the performance standards required for issuance of the permit (321 CMR 10.23).

4.11.5.2 Aquatic Resources

Protection Measures

MassDOT would implement the following mitigation measures and BMPs to protect aquatic resources:

- In-water construction activities (excluding vessel traffic) would be confined to the Cape Cod Canal, which will allow for early detection of ESA-listed species through regular communication with canal operators and users during in-water construction activities.
- In-water construction activities with the potential to cause acoustic or turbidity effects would be prohibited from March 1 through August 31.³⁶ Dredging outside of cofferdams would not occur from March 1 through August 31 of any year. Once cofferdams are installed, work within the cofferdams could occur at any time of year.
- Clamshell buckets would be used for dredging to the maximum extent practicable and dredging equipment speeds would be slow and cautious, following USACE excavation guidance.
- Vessels traveling within Cape Cod Canal and between Cape Cod Canal, Buzzards Bay, Cape Cod Bay, and supply ports would operate at speeds not to exceed 10 knots (unless higher speeds are necessary to maintain safe vessel maneuverability).³⁷
- A fisheries biologist, trained observer, or protected species observer would be present on vessels and at construction sites during cofferdam construction, in accordance with the Marine Mammal and Sea Turtle Monitoring and Mitigation Plan (**Appendix 4.11, Attachment 4**). The protected species observer would maintain the authority to stop work if a protected species is observed in the construction area.

³⁵ <https://www.mass.gov/info-details/list-of-endangered-threatened-and-special-concern-species>

³⁶ The Biological Assessment for Terrestrial Species also includes this mitigation measure to protect terrestrial species.

³⁷ The Biological Assessment for Terrestrial Species also includes this mitigation measure to protect terrestrial species.

- Equipment soft starts or ramp-ups following NOAA Fisheries guidance would be required for in-water, sound-producing construction activities, such as impact and vibratory pile driving.
- Dolphins and bollards would be used to anchor construction vessels rather than repetitive barge spudding.
- Cushion blocks would be used during impact pile driving and, when feasible, vibratory driving or rotary drilling would be used to drive piles to refusal instead of impact driving.
- Cofferdams, fabricated from steel sheet piling, would be used to allow in-the-dry construction of the new bridge piers and demolition of the existing bridge pier columns. Diver surveys would be conducted to confirm cofferdams are clear before dewatering.

As described in Section 4.11.4.2, MassDOT would implement the Marine Mammal and Sea Turtle Monitoring and Mitigation Plan, the Atlantic and Shortnose Sturgeon Protection Plan, and the Whale Protection Plan throughout the duration of in-water work. The plans incorporate monitoring protocols, operational procedures, and BMPs to avoid and minimize potential effects on marine mammals and sea turtles.

In accordance with NHESP's conditions to avoid a Take of state-listed aquatic species, including sturgeon, whales, and sea turtles, MassDOT shall consult with MassWildlife to refine protection measures identified in the Atlantic and Shortnose Sturgeon Protection Plan and the Whale Protection Plan, including obtaining MassWildlife approval in writing prior to work start.

Mitigation Measures for Unavoidable Impacts

As described in Section 4.11.4.2, for unavoidable Bourne Bridge Project-related loss of eelgrass, MassDOT is continuing to develop a plan with MassDEP and DMF to meet the state's mitigation requirements. Additionally, MassDOT has developed a plan with USACE to meet federal compensatory mitigation via an In-lieu Fee payment; the details of which will be finalized with USACE through the Section 404 permitting process.