

# Kent's Point Conservation Area Environmental Assessment

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February 21, 2025



**LEC Environmental Consultants, Inc.**

12 Resnik Road, Suite 1  
Plymouth, MA 02360  
508-746-9491

*[www.lecenvironmental.com](http://www.lecenvironmental.com)*



February 21 2025

**Email** [jjannell@town.orleans.ma.us]

Orleans Conservation Commission  
19 School Road  
Orleans, MA 02653

**Re: Environmental Assessment  
Kent’s Point Conservation Area  
38 Keziah’s Lane  
Orleans, Massachusetts**

[LEC File #: TOO\24-307.01]

Dear Members of the Commission:

LEC Environmental Consultants, Inc., (LEC) is pleased to provide this Environmental Assessment (EA) for the Kent’s Point Conservation Area. The EA has been completed in accordance with the Commission’s “Scope of Services for an Environmental Assessment of Kent’s Point Conservation Area,” based on LEC’s wildlife habitat evaluations, discussions with Conservation staff and the Commission liaison group, Conservation Commission meetings, and the December 16, 2024 Public Workshop and ensuing public comments. The draft EA was reviewed at the February 18, 2025 Conservation Commission meeting.

Thank you for the opportunity to provide the EA. If you should require any additional information, please don't hesitate to contact LEC.

Sincerely,

**LEC Environmental Consultants, Inc.**

Brian T. Madden  
Senior Wildlife/Wetland Scientist

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## 1. Introduction

The Town of Orleans purchased the 27.7± acre Kent's Point property on October 24, 1988, under the care and custody of the Conservation Commission. At the time, the property contained Charlotte A. Kent's single-family dwelling and ancillary structures in active use within the easterly end (point) of the parcel, accessed via a long driveway. The structures remained until demolition of the final buildings in 1999.

Prior to acquisition of the property, an Environmental Assessment was prepared by IEP, Inc., dated September 1988, for the Orleans Conservation Trust (1988 EA).

In June 1995, a *Kent's Point Conservation Area Management Plan* was prepared by The Compact of Cape Cod Conservation Trusts, Inc., providing guidelines for conservation and passive recreation uses. The *Kent's Point Conservation Area Management Plan* was updated on October 27, 2015, superseding the 1995 Management Plan, through development and coordination with the 2015 Kent's Point Task Force.

As stated within the Conservation Commission's "Scope of Services for an Environmental Assessment of Kent's Point Conservation Area" (Scope of Services), public use of the conservation area has increased, especially during the recent pandemic (2020-on). The Commission retained LEC to perform the Environmental Assessment (EA) and:

1. Appraise the conservation value, biodiversity and current natural functioning of the site.
2. Evaluate public use impacts on the resource(s).
3. Help organize and hold a Public Workshop on the Assessment effort.
4. Recommend steps to improve the long-term management of the area for conservation and public use.

LEC attended the Kickoff Meeting with Conservation staff and the Conservation Commission Liaison Group on October 3, 2024, before commencing file review and site evaluations. LEC attended the November 5, 2024 and December 3, 2024 Conservation Commission meetings to provide updates and discuss next steps along with a follow-up meeting on November 13, 2024, with the Conservation staff and the Commission Liaison Group. The Public Workshop meeting was held on December 16, 2024, with a 30-day public comment period thereafter. Public comments were reviewed and contemplated during preparation of this assessment.

## 2. Field Assessment Methodology

LEC conducted site evaluations on the following days in fall 2024:

- October 10, 2024 (preliminary site reconnaissance: 1:30 p.m.-4:00 p.m.)
- October 18, 2024 (2:00 p.m.-4:00 p.m., spring tide conditions; 10/17 super full moon)
- October 24, 2024 (7:00 a.m.-11:00 a.m.; 7:03 a.m. sunrise) / GPS-survey
- November 6, 2024 (2:30 p.m.-5:30 p.m.; 4:27 p.m. sunset)
- November 25, 2024 (2:00 p.m.-4:00 p.m.)
- December 10, 2024 (drone flyover)

During the site evaluations, LEC documented existing site conditions, public uses, habitat cover types, biodiversity, topography, hydrology, and soil characteristics to ascertain potential wildlife species utilization, thus complementing direct wildlife observations. The site evaluations were conducted during a range of tidal conditions, including spring tide conditions following an October 17, 2024 super full moon. October 24, 2024 and November 6, 2024 site evaluations were conducted within one hour of sunrise and sunset, respectively, to maximize wildlife habitat observations and target times when certain species are typically more active. LEC utilized professional standards, principles outlined within MassDEP's *Wildlife Habitat Protection Guidance* (March 2006), and guidelines established by the Cape Cod Commission (CCC) for completion of a Natural Resource Inventory set forth in the current *Wildlife and Plant Habitat Technical Bulletin* to conduct site evaluations. Cape Cod was declared to be within Level 1 – Mild Drought as of Nov. 1, 2024.

During the site evaluations, LEC (Brian Madden) canvassed the site to document habitat cover types present, while noting any unique habitat features, actual wildlife habitat utilization, and evidence of the presence of wildlife, including avian vocalizations and wildlife signs (calls/sounds, tracks, scat, burrows, browse marks, nests, feathers, bone fragments, etc.); however, it is important to note that limited evaluations such as this cannot comprehensively document all species utilizing the site. Representative photographs are included (**Attachment A**).

Concurrent with wildlife habitat evaluations, LEC reviewed existing shoreline and Coastal Bank conditions to assess coastal resiliency and susceptibility to coastal erosion.

Pertinent reference materials were also reviewed in conjunction with the site evaluations, including but not limited to USGS Topographic Maps, FEMA Flood Insurance Rate Maps, USDA NRCS Web Soil Survey, MassGIS Orthoimagery and data layers, Area of Critical Environmental Concern (ACEC) mapping, [www.historicaerials.com](http://www.historicaerials.com), 15<sup>th</sup> Edition of the *Massachusetts Natural Heritage Atlas* (effective August 1, 2021), BioMap (November 2022),

2015 Massachusetts State Wildlife Action Plan (SWAP), Orleans's *Habitat of Potential Regional or Statewide Importance* map, MassAudubon's Important Bird Areas (IBAs), and CCC GIS.

**3. Existing Conditions**

The 27.7± acre Kent's Point Conservation Area is a narrow, finger-like upland peninsula of land that extends easterly into the Pleasant Bay estuary system. Specific abutting saltwater bodies include Meetinghouse River, known as The River, to the south/southeast and east; Kescayogansett or Lonnie's River to the south/southwest, Kescayogansett or Lonnie's Pond to the southwest/west, and Frost Fish Cove to the north/northeast. Fringing Salt Marsh and/or Coastal Beach occurs along the shoreline along with eroding and non-eroding Coastal Bank.

Single-family residential properties located off Keziah's Lane abut to the north, northeast, and northwest. Public access to the Kent's Point Conservation Area is gained from Monument Road via a combination of Frost Fish Lane and Keziah's Lane into a parking lot within the northwesterly portion of the property. As currently configured, the circular parking area includes twenty (20) designated parking spaces. Two (2) parking spaces for physically challenged visitors are located within the interior (central) portion of the property, accessed via the former driveway that also functions as the main walking trail, continuing out to the point / former Charlotte Kent homestead before looping back. An informational kiosk is located at the parking area.

A network of walking trails extends from the parking area, including the (former) driveway, northerly Cove Trail, and southerly River Trail, connecting to a beach trail, as depicted below and on **Attachment B**, as GPS survey-located by LEC. Access to and along the water is provided at various locations, including a ramp/boardwalk and wooden and concrete stairs inset into the slope within the easterly point. A section of the trail within the easterly point, as depicted on **Attachment B**, has been closed within recent years due to erosion. **Attachment B** also depicts unauthorized trails that have been established in recent years (described further below).



Benches are located along the trails, some of which are shown on the trail map above and/or depicted on **Attachment B**. Signage within the interior of the property is limited to a handful of signs, including “Park Boundary” signs identifying the northerly property line, one (1) “Fragile Bank Keep Off” sign along the River Trail, “Trail Closed Due to Erosion” sign, and a few “Stay on the Trails Avoid Ticks and Poison Ivy” signs.

### 3.1 **Habitat Cover Types / Vegetational Communities**

The majority of the upland is occupied by forested habitat conditions, while the former homestead area within the easterly point contains early successional habitat/field conditions, as described below. Coastal habitats / Resource Areas (i.e., Salt Marsh, Coastal Beach) are described under Section 4.0.

An isolated Freshwater Wetland is also located immediately off-site to the north on #45 & #55 Keziah's Lane, approximately 175± feet east of the parking area. The boundary to the Freshwater Wetland immediately abuts a portion of Kent's Point's northerly property line defined by a split rail fence. The wetland is occupied by moderately dense shrubs primarily consisting of highbush blueberry (*Vaccinium corymbosum*) and winterberry (*Ilex verticillata*) with interior pockets of herbaceous vegetation. While not mapped as a Potential Vernal Pool (PVP) by MassGIS and observed to be primarily dry during the fall evaluations, the isolated Freshwater Wetland appears to hold seasonal standing water based on water marks and staining.

The following identifies dominant species within forested upland and early successional habitat/field; however, does not represent a complete plant inventory since the evaluations occurred in the fall when some species cannot be identified.

#### Forested Upland

The Forested Upland extending across the site is relatively typical of pine-oak communities (“Pine-Oak Woodlands”) found across Cape Cod; however, invasive vegetation is prevalent within select areas, as described below.

The majority of the Forested Upland is occupied by a moderately closed to partially open canopy dominated by black oak (*Quercus velutina*), white oak (*Quercus alba*), scarlet oak (*Quercus coccinea*), black cherry (*Prunus serotina*), pitch pine (*Pinus rigida*), and eastern red cedar (*Juniperus virginiana*) trees along with sporadic, isolated eastern white pine (*Pinus strobus*) and poplar (*Populus deltoides*). Invasive black locust (*Robinia pseudoacacia*) and Norway maple (*Acer platanoides*) trees are also present within the easterly point (former homestead area). Eastern red cedar trees form a near monoculture grove abutting portions of the River Trail, north of Lonnie's River. Mature trees within the forested upland are generally 8-24± inches at diameter breast height (dbh) and stand 30-50± feet in height. The forested upland contains ample dead standing trees (snags) with moderate deadfall and organic leaf litter (off-trail).

The understory is composed of bush honeysuckle (*Lonicera* sp.), highbush blueberry, arrowwood (*Viburnum dentatum*), nannyberry (*Viburnum lentago*), black huckleberry (*Gaylussacia baccata*), bayberry (*Morella pensylvanica*), privet (*Ligustrum* sp.), groundsel tree (*Baccharis halimifolia*), staghorn sumac (*Rhus typhina*), multiflora rose (*Rosa multiflora*), winged euonymus (*Euonymus alatus*), and autumn olive (*Elaeagnus umbellata*) shrubs and saplings from the overstory and isolated American holly (*Ilex opaca*), along with common greenbrier (*Smilax rotundifolia*) and Asiatic bittersweet (*Celastrus orbiculata*) entanglements.

Seedlings, lowbush blueberry (*Vaccinium angustifolium*), bracken fern (*Pteridium aquilinum*), Pennsylvania sedge (*Carex pensylvanica*), poison ivy (*Toxicodendron radicans*), dewberry (*Rubus flagellaris*), wavy hair grass (*Deschampsia flexuosa*), garlic mustard (*Alliaria petiolata*), ground ivy (*Glechoma hederacea*), and English ivy (*Hedera helix*) occupy the groundcover.

As GPS-located by LEC and represented on **Attachment C**, the westerly portion of the site is dominated by invasive species, primarily in the understory, comprising approximately 7.7± acres. Dense bush honeysuckle thickets currently occupy these areas (former open fields), forming monocultures with minimal vegetative diversity. Invasive winged euonymus, autumn olive, and multiflora rose occur sporadically. Furthermore, invasive Asiatic bittersweet vines and poison ivy, English ivy, Virginia creeper (*Parthenocissus quinquefolia*), and common greenbrier vines are prevalent within the westerly portion of the site, encasing (choking) trees. The westerly/southwesterly portion of the site occupied by the dense bush honeysuckle thickets and other intermingled invasive species were former fields as evident in historic aerial images and identified as overgrown fields and meadows within the 1988 EA and 1995 Management Plan.

Invasive Asiatic bittersweet entanglements are present within and around the parking area along with mugwort (*Artemisia vulgaris*), blackberry (*Rubus allegheniensis*), sweet pepperbush (*Clethra alnifolia*), oak saplings, and catalpa (*Catalpa speciosa*).

Invasive black locust and Norway maple trees also occur within the easterly point (former homestead area) as mentioned above, in addition to remnant ornamental spruce (*Picea* sp.) trees and lilac (*Syringa* sp.) shrubs. Asiatic bittersweet and Japanese honeysuckle (*Lonicera japonica*) are also present in this area.

#### Early Successional Habitat / Field

The interior of the loop trail system within the easterly point (former homestead) contains early successional habitat/field conditions (0.3± acres), including, but not limited to orchard grass (*Dactylis glomerata*), Pennsylvania sedge, dewberry, raspberry (*Rubus ideaus*), goldenrods (*Solidago* sp.), common greenbrier, and Asiatic bittersweet amongst eastern red cedar, black locust, oak, and spruce trees. As observed on November 6, 2024, the area is typically mowed annually in early November, thereby maintaining the early successional habitat/field conditions.

### 3.2 Soils and Topography

According to the NRCS Web Soil Survey (**Attachment D**), the upland portions of Kent's Point are mapped as Carver coarse sands. The Carver soil series are excessively drained and formed via outwash plains and moraines. The westerly/southwesterly Salt Marsh is mapped as Ipswich-Pawcatuck-Matunuck complex, very frequently flooded tidal marshes composed of muck and mucky peat.

Topography on-site gradually descends from the parking lot nearly 30± feet to the south/southwest towards Lonnie's River/Pond and off-site to the east towards the Freshwater Wetland. A 10-20± foot topographic break occurs along Lonnie's River. A long, traversing ridge, 20-30± feet in height, extends in a west-east direction forming a saddle, descending to Salt Marsh to the north and south. Immediately east of the two (2) centrally located parking spaces, the ridge subtly dips before ascending to the easterly headland (point) and former Charlotte Kent homestead site.

## 4. Wetland Resource Areas

On-site Wetland Resource Areas include Salt Marsh, Coastal Beach, Coastal Bank, Coastal Dune, and Land Subject to Coastal Storm Flowage protected under the *Massachusetts Wetlands Protection Act* ("WPA", M.G.L. c. 131 ss. 40) and its implementing *Regulations* (310 C.M.R. 10.00), and the Town of Orleans *Wetlands By-Law (Chapter 160)* and *Wetland Regulations (Chapter 196A)*. An off-site Freshwater Wetland and Land Under Water (associated with coastal waterbodies/waterways) immediately abut. Lonnie's River also contains "Banks of or Land under the Ocean, Ponds, Streams, Rivers, Lakes or Creeks that Underlie Anadromous/Catadromous" ("Fish Run") protected under 310 CMR 10.35 of the WPA Regulations.

### 4.1 Salt Marsh

A narrow band of Salt Marsh generally fringes around the shoreline from Frost Fish Cove on the north side to Lonnie's Pond within the southwesterly portion of the property. The southeasterly shoreline contains variable patches of Salt Marsh amongst Coastal Beach and access points to the water as evident within Photographs (**Attachment A**). Wider Salt Marsh habitat is present at the mouth of Lonnie's River/Pond and two marsh coves along the southerly shoreline. A semi-enclosed, interior Salt Marsh pocket is also located off-site, abutting the southwesterly portion of the property and tidally connected to Lonnie's Pond.

Narrow footpaths (unauthorized or informal trails) through the Salt Marsh are present abutting Frost Fish Cove and Lonnie's Pond and within the south-central Salt Marsh as evident in the Photographs (**Attachment A**) and *Trail Map (Attachment B)*.

Salt Marsh vegetation is primarily occupied by salt meadow cord grass (*Spartina patens*) and salt marsh cord grass (*Spartina alterniflora*) along with intermittent sea blite (*Suada linearis*), glasswort (*Salicornia* sp.), salt brush (*Atriplex* sp.), spike grass (*Distichlis spicata*), and sea lavender (*Limonium carolinianum*), in addition to groundsel tree shrubs along the upper edges of the marsh. Dead eastern red cedar snags are also present along the upper fringes of the Salt Marsh at the mouth of Lonnie's River/Pond. Invasive common reed (*Phragmites australis*) was observed within a portion of the off-site semi-enclosed, interior Salt Marsh pocket abutting the southwesterly portion of the property and Lonnie's Pond.

#### 4.2 Coastal Beach

Coastal Beach extends along the southerly/southwesterly shoreline and a couple pockets along the east point abutting the River Point in areas where Salt Marsh vegetation is absent. The Coastal Beach is mostly composed of fine sand with small cobbles and rocks.

#### 4.3 Coastal Bank

Coastal Bank occurs along the shoreline, upgradient of coastal water bodies: Frost Fish Cove (north), Meetinghouse River (east and southeast/south), Lonnie's River (south/southwest), and Lonnie's Pond (southwest/west). Coastal Bank conditions vary across the property from well-vegetated, relatively stable embankments (i.e., Lonnie's Pond, immediately west of Lonnie's River, and Frost Fish Cove) to moderately steep and vertical, exposed, eroding slopes with overhanging vegetation along the southerly and easterly shoreline.

Vegetated sections of the Coastal Bank are occupied by upland species listed above along with rugosa rose (*Rosa rugosa*) found along Frost Fish Cove and scotch broom (*Cytisus scoparius*) occurring on the south-facing, easterly point (headland) where a set of stairs previously existed.

Coastal Bank erosion is most prominently displayed on the southerly face of the easterly point (headland) with a vertical, exposed slope 10-20± feet in height. Variable Coastal Bank erosion continues in a westerly direction with descending and undulating topography and further to the north, along the northeast face of the easterly point (headland), abutting a concrete set of stairs inset into the embankment. Moderately steep, exposed, and vertical Coastal Bank conditions with overhanging vegetation occur along sinuous Lonnie's River. Exposed root systems to mature trees are prevalent along the eroding Coastal Bank. Additional discussion on coastal erosion is detailed under Section 7.

As defined under 310 CMR 10.30 of the WPA Regulations, Coastal Bank is the *seaward face or side of any elevated landform, other than a coastal dune, which lies at the landward edge of a coastal beach, land subject to tidal action, or other wetland*. The top of the Coastal Bank is defined by MassDEP's Wetlands Program Policy 92-1: Coastal Banks based on the slope in

relation to the Flood Zone elevation (see below). A detailed topographic survey would be required to determine an accurate top of Coastal Bank boundary; however, boundary sections, most notably coincident with eroding conditions, are clearly evident in the field.

**4.4 Coastal Dune**

A small Coastal Dune mound (< 3,000 square feet in size) is present upgradient of Salt Marsh at the mouth of Lonnie's River/Pond. The slightly elevated landform is not inundated by tides and occupied by dunal sediments and vegetation consisting of American beachgrass (*Ammophila breviligulata*), seaside goldenrod (*Solidago sempevirens*), switchgrass (*Panicum virgatum*), bayberry, groundsel tree, and eastern red cedar.

**4.5 Land Subject to Coastal Storm Flowage**

Land Subject to Coastal Storm Flowage (LSCSF) is coincident with the Flood Zone elevations described below.

**5. Resource Mapping**

As referenced above and detailed below, pertinent reference materials were reviewed, including FEMA Flood Insurance Rate Maps, 15<sup>th</sup> Edition of the *Massachusetts Natural Heritage Atlas* (effective August 1, 2021), Area of Critical Environmental Concern (ACEC) mapping, and BioMap (November 2022).

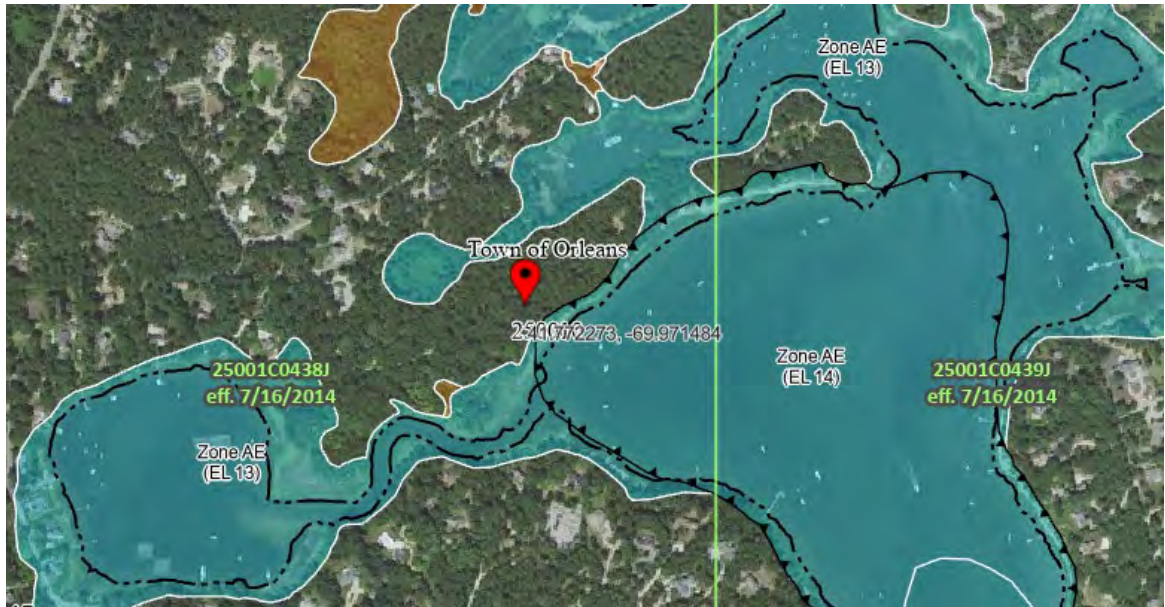
**5.1 Flood Zone**

According to the July 16, 2014 FEMA Flood Insurance Rate Map (FIRM) for Barnstable County (Map Numbers 25001C0438J & 25001C04391J) and depicted below and on **Attachment E**, Flood Zone AE (El. 13) extends off Lonnie's Pond/River, Meetinghouse River to the east, and Frost Fish Cove. Flood Zone AE (El. 14) extends onto the southerly/southwesterly portion of the property abutting the larger embayment of Meetinghouse River. Flood Zone AE (El. 14) also defines the "Limit of Moderate Wave Action". Flood Zone AE (El. 13 & 14) are *Special Flood Hazard Areas (SFHAs) Subject to Inundation by the 1% Annual Chance Flood*.

As mapped by FEMA, Flood Zone AE (El. 13) extends inland onto lower-lying portions of the property in two specific areas: 1) west of Frost Fish Cove, connecting to the off-site isolated Freshwater Wetland and 2) within the aforementioned "dip" in topography located between the two (2) centrally located parking spaces and easterly point (headland).

Remaining portions of the property are primarily located within Zone X, *Areas determined to be outside the 0.2% annual chance floodplain*.

As Flood Zone elevations are dictated by actual topography, a detailed topographic survey would be required to determine accurate Flood Zone boundaries (and LSCSF).



5.2 **Rare Species**

According to the 15<sup>th</sup> Edition of the Massachusetts *Natural Heritage Atlas* (effective August 1, 2021) published by the Natural Heritage & Endangered Species Program (NHESP) and depicted on **Attachment F**, mapped Priority Habitat of Rare Species Estimated Habitat of Rare Wildlife (EH 1364) or Priority Habitat of Rare Species (PH 2157) extends around the perimeter of the shoreline along Lonnie’s River, Meetinghouse River, and a portion of Frost Fish Cove, largely coincident with the approximated Salt Marsh boundary.

The Priority/Estimated Habitat is known to be mapped for the state-listed “Threatened” Northern Diamond-backed Terrapin (*Malaclemys terrapin*). The Terrapin inhabits Salt Marshes, often bordering on quiet, salt or brackish tidal waters, and associated mud flats, shallow bays, coves, and tidal estuaries. Terrapins remain in these coastal habitats with the exception of females that venture onto adjacent sandy, dry, open-canopy, upland areas for nesting. The River is known to support a Terrapin population. Kent’s Point does not currently support viable nesting habitat due to the lack of open sandy areas and open canopy conditions within the forested upland interior. Habitat restoration, including establishment of nesting habitat, has more recently occurred within the Orleans Conservation Trust Henson’s Cove property (formerly White’s Lane), and Braddocks Way, located 500+ feet north of the Kent’s Point Conservation Area.

State-listed common and least terns (*Sterna hirundo* and *Sterna antillarum*) are also known to forage within the Pleasant Bay estuary system.

State-listed rare species are protected under the *Massachusetts Endangered Species Act* (MESA) and implementing Regulations (321 CMR 10.00).

### 5.3 Area of Critical Environmental Concern

Portions of the Kent's Point Conservation Area are located within the Pleasant Bay Area of Critical Environmental Concern (ACEC). The boundary to the ACEC follows a 100-foot buffer (inland) to the 10-foot contour line. The approximated ACEC boundary is depicted on **Attachment G**; however, dependent upon actual surveyed topographic contours.

The Pleasant Bay ACEC includes approximately 9,240 acres of Salt Marshes, tidal flats, islands, salt and freshwater ponds, rivers, bays, and barrier beaches; covering portions of Orleans (72%), Chatham (24%), Harwich (4%), and Brewster (<1%). The Pleasant Bay ACEC hosts a rich biodiversity of marine/aquatic and terrestrial wildlife and plant life. In addition to wildlife habitat and fisheries protection, the diverse ecosystems provide important flood control, storm damage prevention, water quality protection, and recreation opportunities. All the waters in the Pleasant Bay ACEC are classified as ORWs. ORWs are waters, such as vernal pools and public water supplies and tributaries that are protected by the most stringent standards because they constitute an outstanding resource as determined by their socio-economic, recreational, ecological, and/or aesthetic values.

### 5.4 BioMap

MassWildlife and The Nature Conservancy, with support from the Executive Office of Energy and Environmental Affairs, released the newly updated BioMap tool in November 2022, to guide strategic protection and stewardship of lands and waters that are the most important for conserving biological diversity in Massachusetts. BioMap conservation targets are organized into two main elements: Core Habitat and Critical Natural Landscape (CNL). Core Habitat *identifies key areas that are critical for the long-term persistence of rare species, exemplary natural communities, and resilient ecosystems across the Commonwealth*. Critical Natural Landscape *identifies larger natural landscape blocks that are minimally impacted by development, as well as buffers to core habitats and coastal areas, both of which enhance connectivity and resilience*.

According to *BioMap* MassGIS data layers, as depicted on **Attachment H**, Core Habitat and Critical Natural Landscape (CNL) extend onto the property.

Core Habitat (Rare Species Core) specifically follows the NHESP Priority/Estimated Habitat mapping.

The mapped CNL is associated with two sub-blocks; Tern Foraging Habitat and Coastal Adaption Areas. The CNL Tern Foraging Habitat block includes Frost Fish Cove and Meetinghouse River, extending to Lonnie's River. As mentioned above, state-listed common and least terns are known

to forage within the Pleasant Bay estuary system. The CNL Coastal Adaption Areas block generally includes Salt Marshes and other habitats along the coast that support unique and important habitat, rare species, and intact coastal ecosystems of global significance that also absorb storm surges, protecting inland infrastructure and property. The CNL Coastal Adaption Areas block follows areas immediately upgradient of the FEMA Flood Zone boundary, excluding higher topographic portions of the property.

## 6. Wildlife/Wildlife Habitat

Portions of the Property provide important food, shelter, breeding, migratory, and overwintering habitat for wildlife species. However, wildlife habitat functions may be limited by the extent of invasive species (i.e., dense bush honeysuckle thickets) and recreational use of the site.

The following reviews wildlife species that are likely to utilize the Property based on existing habitat conditions, complementing LEC's direct wildlife observations; however, it is important to note that LEC's site evaluations were limited in duration and conducted in October-December, outside of significant portions of the active season for most species, and partially during drought conditions. Further wildlife studies would certainly refine the species list and distribution.

### Mammals

Mammals likely to utilize the Property, or portions thereof, include but are not limited to white-tailed deer (*Odocoileus virginianus*), eastern coyote (*Canis latrans*), red fox (*Vulpes vulpes*), fisher (*Martes pennanti*), raccoon (*Procyon lotor*), skunk (*Mephitis mephitis*), eastern cottontail (*Sylvilagus floridanus*), gray squirrel (*Sciurus carolinensis*), eastern chipmunk (*Tamias striatus*), deer mice (*Peromyscus* sp.), meadow voles (*Microtus* sp.), and/or common mole (*Scalopus aquaticus*).

Gray Squirrel, eastern chipmunk, eastern cottontail, and deer mice were observed on-site. Eastern cottontail habitat utilization appeared to be more limited to the dense bush honeysuckle thickets.

The property may also provide summer foraging and sheltering habitat for various bats; eight (8) bats have been documented within the nearby Cape Cod National Seashore (CCNS). The most common bat documented within the CCNS is the big brown bat (*Eptesicus fuscus*). The property occurs within the range of the state and federally listed Northern Long-Eared Bat (NLEB, *Myotis septentrionalis*) and Tricolored Bat (TCB, *Perimyotis subflavus*), two species that face extinction due to the range-wide impacts of white-nose syndrome that has decimated bat populations. As such, the U.S. Fish and Wildlife Service (USFWS) has developed protection measures to conserve remaining bats within the NLEB and TCB ranges.

### Birds

Interior, forested upland portions of the property may provide habitat for various year-round, migrant, and breeding avian species, including but not limited to mourning dove (*Zenaida macroura*), gray catbird (*Dumetella carolinensis*), chipping sparrow (*Spizella passerina*), song sparrow (*Melospiza melodia*), black-capped chickadee (*Poecile atricapillus*), tufted titmouse (*Baeolophus bicolor*), house wren (*Troglodytes aedon*), American goldfinch (*Spinus tristis*), common yellowthroat (*Geothlypis trichas*), eastern towhee (*Pipilo erythrophthalmus*), blue jay (*Cyanocitta cristata*), northern cardinal (*Cardinalis cardinalis*), tree swallow (*Tachycineta bicolor*), American robin (*Turdus migratorius*), American crow (*Corvus brachyrhynchos*), red-bellied woodpecker (*Melanerpes carolinus*), downy woodpecker (*Picoides pubescens*), northern flicker (*Colaptes auratus*), brown creeper (*Certhia americana*), and/or white-breasted nuthatch (*Sitta carolinensis*). Yellow-rumped warblers (*Setophaga coronata*), golden-crowned kinglets (*Regulus satrapa*) and red-breasted nuthatches (*Sitta canadensis*) are likely present during the winter months.

The coastal waters around Kent's Point provide excellent habitat for various shorebirds and waterfowl. Frost Fish Cove provides a unique sheltered backwater for winter waterfowl, including, but not limited to bufflehead (*Bucephala albeola*), common eider (*Somateria mollissima*), common loons (*Gavia immer*), and red-breasted mergansers (*Mergus serrator*); and wading species, such as great blue herons (*Ardea herodias*), great egret (*Ardea alba*), and snowy egret (*Egretta thula*).

Ample foraging habitat for osprey (*Pandion haliaetus*) within the waterbodies/waterways surrounding Kent's Point is abundant. A nesting platform was installed adjacent to Lonnie's Pond in the spring of 2022 by the Friends of Lonnie's Pond (FoLP) Association. Based on MassGIS property lines, the platform appears to be located within the Kent's Point Conservation Area. To date, the platform has not yet been utilized by ospreys.

LEC did observe a red-tailed hawk (*Buteo jamaicensis*) perched on the opposite side of Lonnie's River (off-site) on a large dead standing tree (snag). Additional raptors that may utilize the property include red-shouldered hawk (*Buteo lineatus*), Cooper's hawk (*Astur cooperi*), broad-winged hawk (*Buteo platypterus*), and great-horned owl (*Bubo virginianus*).

Shallow nest cavities (not in use) were observed within the vertical, exposed Coastal Banks on both the south-facing easterly point (headland) and minimally along the northeast face, immediately proximate to the set of concrete stairs. The nest cavities were likely created by belted kingfisher (*Megaceryle alcyon*) and/or bank swallow (*Riparia riparia*).

While the property and surrounding area has not been specifically identified as Important Bird Area (IBA) by MassAudubon, the Pleasant Bay ACEC is known to provide important habitat for a host of resident and migratory birds, shorebirds, and waterfowl.

The Kent's Point Conservation Area has been identified as a Cornell University eBird Hotspot with ninety (90) species observed (**Attachment I**).

Reptiles/Amphibians

While not specifically observed by LEC during the fall site evaluations, the property may provide habitat for the following snakes: eastern garter snake (*Thamnophis sirtalis*), milk snake (*Lampropeltis triangulum*), and northern black racer (*Coluber constrictor*); amphibians: eastern red-backed salamander (*Plethodon cinereus*), and American toad (*Anaxyrus americanus*).

Should the off-site Freshwater Wetland function as a Vernal Pool and maintain the requisite hydrology to support amphibian breeding and larval development, the site may provide upland terrestrial (overwintering) habitat for wood frogs (*Lithobates sylvaticus*), spotted salamanders (*Ambystoma maculatum*), and/or spring peepers (*Pseudacris crucifer*). The 1988 EA identified reports of wood frogs and spring peepers from the site.

The 1988 EA also identified the Eastern Box Turtle (*Terrapene carolina*) as a past sited resident species of the property. No evidence was observed to suggest the species remains on-site and the site is not mapped by NHESP as Priority/Estimated Habitat for the Eastern Box Turtle; however, potential habitat does exist on-site in the form of forested uplands functioning for feeding, breeding, migratory, sheltering, and over-wintering habitat requirements.

Fisheries

The coastal waters around Kent's Point are known to support a wide range of fisheries. Lonnie's River functions as part of the Town's most important anadromous fish run for alewives and blueback herring spawning in Pilgrim Lake.

**7. Erosion**

Both coastal and inland erosion have been observed on-site, as further described below.

Inland

Inland erosion is associated with surface water runoff, primarily in response to rain events where soil is detached, carried away, and deposited in other locations. On-site, a few trails with descending topography are susceptible to and experience the conveyance of surface water resulting in erosion and sedimentation. Steeper topography can result in increased flow velocities and increased erosion. Soil compaction may limit surface water infiltration, thereby dispersing flow downhill. Inland erosion has exposed root systems along various walking trails, creating

tripping hazards. Wood chips have been added to a few trails for stabilization purposes and have been observed to be moderately effective, but require periodic maintenance.

Two notable inland erosion locations are described further below.

One area includes a trail intersection upgradient of the off-site Freshwater Wetland (see photo to right). The Cove Trail runs parallel to the northerly property line and off-site Freshwater Wetland before turning nearly 90° and ascending to the south in a relatively straight line where inset wooden steps are located. Under existing conditions, surface water flows down the relatively straight path/steps, resulting in minimal erosion and sedimentation entering the edge of the Freshwater Wetland.



Inland erosion often overlaps with coastal erosion, where paths with descending topography extend adjacent to Coastal Banks (i.e., sections of the River Trail) and/or or meet up with the Coastal Beach. In select areas (see photo to left), inland erosion and the conveyance of surface water down compacted trails exacerbates coastal erosion, further destabilizing Coastal Banks that are already susceptible

to wind and wave damage, and compounded by unauthorized trail use.

### Coastal

As described above, coastal erosion occurs along the southerly and easterly shoreline. Coastal Bank erosion is most evident on the south-facing easterly point (headland) with a vertical, exposed slope 10-20± feet in height. Large trees and root systems have toppled over the eroded embankment, while others with exposed root systems remain precariously perched. Variable Coastal Bank erosion continues in a westerly direction with descending and undulating topography. The south-facing Coastal Bank erosion is coincident with the FEMA-mapped Flood Zone AE (El. 14) and “Limit of Moderate Wave Action”, where wave heights are expected between 1.5 and 3 feet. While the southerly Coastal Bank remains the most exposed shoreline, changes to tidal flow in the Pleasant Bay estuary system certainly influence erosion patterns over

time along with the frequency and intensity of storms. As noted in the 1995 Management Plan, *erosion potential on the south bank is considerable, due to the fetch of Little Pleasant Bay, exposure to the southeast (direction of many storms) and magnified tidal ranges, the bank seems relatively stable. Erosion from boat traffic, vegetation clearing or uncontrolled foot traffic on the steep, sandy bank seems a more immediate concern.*

Coastal Bank erosion is also prominent along the northeast-facing, easterly point (headland), abutting the aforementioned set of concrete stairs inset into the embankment. Bank/vegetation overhang is pronounced in this location.

Moderately steep, exposed, and vertical Coastal Bank conditions with overhanging vegetation occur on-site along the meandering Lonnie's River. Exposed root systems to mature trees and other vegetation is prevalent north of Lonnie's River.

Representative photographs of coastal erosion are included within **Attachment A**.

## 8. Land Use Observations

The following reviews LEC's observations related to recreational use of the property and biodiversity (vegetation and wildlife).

### Recreational Use

As described in the Scope of Services, public use of the Kent's Point Conservation Area has noticeably increased in recent years. In this time, a number of unauthorized trails have been established and/or more frequently utilized, including additional connections between the main driveway, Cove Trail, and/or River Trail and footpaths through the Salt Marsh on the south side and within Frost Fish Cove. The southwesterly portion of the property has experienced a myriad of new unauthorized trails, including footpaths extending through the Salt Marsh abutting Lonnie's Pond/River. These unauthorized new trails are depicted within photographs (**Attachment A**) and the *Trail Map* (**Attachment B**).

Split rail fencing has been installed to discourage unauthorized passage, most notably along the River Trail where split rail fencing was installed upgradient of and parallel to the Coastal Bank to deter passage over the embankment. The split rail fencing generally appears to be moderately effective with prior paths on/over the Coastal Bank now infilling with vegetation; however, signs of passage around fence end points were observed.

Unauthorized foot traffic on/over the Coastal Bank along the south-facing easterly point (headland) appears to have ceased due to the steepness of the slope caused by natural erosion.

Additional water access points have also been established and/or expanded over longer periods of time along the southerly shoreline, often resulting in the constriction of Salt Marsh. This includes portions of the Salt Marsh located west of the Beach Trail as depicted on the attached photographs (**Attachment A**), *Trail Map* (**Attachment B**), and the photo below.



As observed by LEC, the majority of the public use of the property included people walking dogs, often in groups. Most dogs were off leash. On occasion, dogs were observed to be off trail and/or separated from owners.

The Cape Cod Commission (CCC) conducted a traffic count between July 29, 2024 and August 6, 2024. Results are included within **Attachment J**. Peak volumes occurred on Saturday, August 3, 2024, between 9:00 a.m.-10:00 a.m., when fifty-eight (58) cars were counted, and Sunday, August 4, 2024, between 10:00 a.m.-11:00 a.m., when fifty-six (56) cars were counted. It should be noted that the counts are not necessarily reflective of use of the property, but access into the parking lot as the 20-car parking spaces currently dictate availability.

### Biodiversity

#### Vegetative

Factoring in natural succession, existing vegetative biodiversity remains similar in some respects to that documented in the 1988 EA with notable exceptions, primarily including the conversion of: 1) the overgrown fields and meadows within the south/southwesterly portion of the property to forested uplands with an understory dominated by dense (invasive) bush honeysuckle thickets and a proliferation of invasive vine entanglements encasing trees; and 2) “Lawn Community” associated with the former homestead location to maintained Early Successional/Field Habitat conditions.

Bush honeysuckle was identified in the 1988 EA as an observed plant species (**Attachment A**); however, was not mentioned in the description of the “Overgrown Fields and Meadows” and/or “Pine-Oak Woodlands.” Under existing conditions, the dense bush honeysuckle thickets often form a monoculture, outcompeting other native species, thereby minimizing vegetative biodiversity. The invasive vine entanglements threaten the health and vigor of the mature trees located within the south/southwesterly portion of the property. Similarly, while bittersweet was mentioned in the 1988 EA as an observed plant species (**Attachment A**), the report did not mention any significant vine entanglements.

A small population of little ladies' tresses (*Spiranthes tuberosa*) was identified in the 1988 EA, and mentioned in the 1995 Management Plan, as being an uncommon orchid that was found on-site. At the time, *S. tuberosa* was listed on the “Watch List” (April 1988) published by NHESP. *S. tuberosa* remains on NHESP's Plant Watch List, which is an unofficial, non-regulatory list of plants of known or suspected conservation concern that NHESP is interested in tracking. *S. tuberosa* is typically found within anthropogenic (manmade or disturbed habitats), grassland, meadows and fields, and openings within woodlands. LEC's site evaluations were conducted outside of the flowering period for *S. tuberosa* and it is not clear whether the species remains on-site.

LEC documented vegetative composition along three (3) transect lines moving west-east across the property within representative habitat conditions; three (3) plots per transect (**Attachment K**).

### Wildlife

The 1988 EA listed twenty-four (24) birds and eight (8) mammals observed on-site via the field survey work (dates/times not listed), including at least eight (8) bird species associated with the coastal waters. The identified species may continue to utilize portions of the property under existing conditions to varying degrees, as observed by LEC and/or ascertained via habitat conditions.

As noted above, LEC's site evaluations were limited in nature and conducted in October-December, excluding significant portions of the active season for most species. Similarly, the 1988 EA's field surveys appear limited in nature with mentions that further field investigations would expand species lists. To LEC's knowledge, comprehensive year-long wildlife studies have not been performed on-site. Therefore, it is difficult to compare and analyze wildlife biodiversity from 1988 (baseline) to current conditions without comprehensive empirical data. However, a brief review of scientific literature indicates that recreational uses of conservation lands can affect wildlife habitat and utilization.

## 9. Recommendations

The following recommendations include concepts and measures to foster the long-term protection of natural resources on-site while balancing continued public use and enjoyment of this unique property. The recommendations are based on LEC's review of existing site conditions, land use observations, while taking into consideration pertinent public comments.

Should policy changes be considered, LEC would recommend that sufficient empirical/quantitative data is collected and analyzed to inform policy action and address questions raised related to issues such as carrying capacity. This may include conducting supplemental comprehensive wildlife studies in the spring and summer to document all species, activity, and distribution along with a full plant inventory from observations throughout the growing season.

### Unauthorized Trail Abandonment / Habitat Protection

As described above, the establishment and/or use of unauthorized trails has increased over recent years, mostly notably within the southwesterly portion of the property, including footpaths extending through the Salt Marsh abutting Lonnie's Pond/River.

Under existing conditions, the north-central portion of the property (2±acres) that provides a direct habitat connection between Frost Fish Cove and the off-site Freshwater Wetland represents possibly the most secluded and unfragmented forested upland area on-site, despite two single-family dwellings located to the north and the Cove Trail to the south. Secondly, the interior ridge (saddle) traversing the central portion of the property in between the Cove Trail and main driveway trail also provides a significant forested upland habitat block, but is bifurcated by an established connecting trail.

Excluding the above, the property does not maintain large, unfragmented habitat areas that are not currently utilized by recreational use. Therefore, eliminating use of the unauthorized trails within the southwesterly portion of the site represents a substantial opportunity to meaningfully isolate and protect upwards of 4.5± acres of contiguous habitat, including forested upland, Coastal Dune, and Salt Marsh abutting Lonnie's Pond/River. While the forested upland does contain a dense bush honeysuckle understory, the thickets do provide some level of wildlife protection (escape cover), while discouraging intrusion by recreational use. LEC recommends implementing measures that will deter access to this portion of the property (see below). The recommended prescriptive habitat protection through recreational exclusion will encourage wildlife utilization.

Eliminating the footpaths through the Salt Marsh system abutting Lonnie's Pond/River, within Frost Fish Cove, and along the south side of the property (west of the Beach Trail), will also serve to protect these sensitive Resource Areas and Salt Marsh interests/functions (i.e., protection of

marine fisheries and wildlife habitat, prevention of pollution, ground water supply, and storm damage prevention). Intact Salt Marsh systems are more resistant to erosion and dissipate wave energy, thereby providing a buffer that reduces wave damage, especially important on the southerly shoreline. Limiting recreational access through the Salt Marsh will serve to foster the protection of coastal water quality for fishing, shellfishing, swimming, and boating in the Pleasant Bay estuary system by promoting Salt Marsh interests/functions.

Unauthorized trail abandonment and habitat protection can be facilitated via installation of additional split rail fencing and signage (see below), along with other measures, including the strategic placement of logs and deadfall to deter access, while providing wildlife habitat benefits.

Absent of policy changes, keeping recreational users and dogs on authorized trails is paramount to the protection of wildlife and wildlife habitat (off-trail).

Reassessment of trails and layout in future years in relation to eroding Coastal Bank conditions to determine whether additional trail abandonment and/or relocation is prudent along with necessary public safety and protection measures.

#### Signage / Education

Aside from the kiosk at the parking area, property information and/or signage is limited within the interior of the property. Additional signage along established trails can function to inform the public, or reinforce the fact, why certain portions of the property are off-limits, protected areas, etc. Signage and/or markers with QR codes related to property rules and regulations, site history, Wetland Resource Areas, habitats, flora, and/or fauna may be informative to users as well.

#### Drainage / Runoff Improvements

The following measures to address inland erosion through drainage / runoff improvements can be undertaken with minimal effort to better manage and control surface water runoff, including, but not limited to the following:

- Restoring or establishing vegetation to absorb water and reduce erosion.
- Slight reconfiguration of trails to minimize longer straightaways on descending slopes where runoff velocity increases, exacerbating erosion/sedimentation.
- Incorporation of water bars (diagonal channels or bumps, often made of wood or rock) to break up flow paths and divert water off-trail).
- Creation of shallow vegetated swales or basins (i.e., country drainage) for surface runoff collection to promote infiltration.
- Addition of natural mulch/wood chips, shredded bark, pine straw, etc., to trails.

All measures are essentially intended to slow down the flow of surface runoff and redirect towards stable, vegetated areas and/or low topographic areas.

Incorporation of one or more of these measures upgradient of the off-site Freshwater Wetland and along sections of the River Trail upgradient of eroding Coastal Banks are of particular importance.

#### Trail Stability / Safety

The above-referenced drainage / runoff improvement measures serve to minimize erosion/sedimentation and stabilize trails. Following drainage / runoff improvements, exposed root systems (tripping hazards) may be addressed via adding soil material, stone, and/or mulch/wood chips, etc., for trail stabilization. At this time, hardeners or other hardscape solutions are not warranted and run counter to the rural nature of the property.

LEC observed a few locations where snags (dead standing trees) are located immediately along trails. Removal of these snags is recommended for public safety. Cut deadfall can be re-used on-site to reinforce trail abandonment, while also functioning as wildlife habitat.

#### Invasive Species Management

Large scale invasive species management of the dense shrub honeysuckle thickets and habitat restoration within the westerly portion of the property would certainly provide tremendous wildlife habitat benefits; however, such efforts can be costly, labor intensive, and require significant long-term commitments to ensure success. Furthermore, habitat restoration and conversion to grassland (or similar habitats) may be incompatible with current recreational uses and/or create new challenges to balance the protection of natural resources and public use/enjoyment. As mentioned above, while the dense bush honeysuckle understory does limit vegetative and wildlife biodiversity, the thickets do provide some level of wildlife protection (escape cover), while deterring recreational encroachment.

As noted above, invasive and nuisance vines have been observed to be encasing and choking mature, native trees within the westerly portion of the site. Vine management to promote the health and vigor of native trees may be achievable through minimal efforts and is relatively cost-effective. Invasive Asiatic bittersweet or nuisance vines intertwined with native trees can be managed through selective hand removal where feasible or cutting the vine at ground level, applying appropriate herbicide treatment to the cut stem (i.e., manual injection, cut and wipe, or similar, non-foliar application), and leaving the cut vine in place until desiccated, thereby avoiding damage to the native species. Follow-up monitoring and management with adaptive strategies would be necessary to ensure successful treatment.

Monitoring of invasive species to ensure no further proliferation or expansion in future years would be prudent to address a pressing issue sooner rather than later.

Vista Pruning

Under existing conditions, a number of benches along the trails maintain partially obstructed views of adjoining waterbodies/waterways. Similarly, the existing boardwalk/ramp extending from the central two (2) parking spaces contains encroaching vegetation that leaves the feature uninviting.

Formal establishment of a vegetative management plan with specific goals/objectives, cutting restrictions, time-of-year considerations, etc., for vista pruning at designated view areas would be helpful to ensure that scenic views are maintained from authorized trails for public enjoyment, including those with limited mobility.

Shoreline Protection

Shoreline protection measures to mitigate on-going coastal erosion may include, but not limited to:

- Sand/Bank nourishment.
- Soft stabilization measures (i.e., coir logs, envelopes, nourishment, vegetative plantings).
- Sand drift fencing.
- Living Shoreline/Salt Marsh Enhancement/Restoration (via protected, stabilized coastal edge of natural materials such as plants, sand, and/or rock to provide wildlife habitat and function for coastal resilience).

These measures are generally not meant as long-term solutions, but interim measures to temporarily abate or slow erosion processes. Each option requires comprehensive analysis, planning, engineering/design, and permitting before implementation with varying costs (often significant).

As coastal erosion is not currently threatening the elimination of public use of the property as a whole, LEC would not recommend implementation of these shoreline protection measures at this point, but these options could be evaluated for future consideration.

Coastal Erosion / Storm Monitoring

Coastal erosion and storm effects should continue to be monitored in future years after significant coastal storm events to evaluate changes in site conditions and/or vulnerable areas, including flood prone areas (i.e., the portion of the main, central trail within the Flood Zone extending out to the easterly point). Access to the easterly point (headland) is not currently in jeopardy, but future monitoring is advisable to determine whether proactive measures are warranted.

As stated above, reassessment of trails and layout in response to eroding Coastal Bank conditions will be necessary to determine whether additional trail abandonment and/or relocation is critical along with necessary public safety and protection measures.

Miscellaneous

Other recommended wildlife habitat enhancement measures may include the following:

- Establishment of a diverse wildflower garden within the interior loop trail within the easterly point to benefit pollinator species, including the incorporation of milkweed species (*Asclepias* sp.) that benefit the Monarch Butterfly (*Danaus plexippus*), a species that has been considered for listing under the Endangered Species Act (ESA) and is currently identified as a “Candidate” species.
- Installation of bird and bat boxes.

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**10. Summary**

The Kent's Point Conservation Area represents an invaluable public open space asset for the Town of Orleans. The Property's unique geography, surrounding coastal habitats, and setting within the Pleasant Bay estuary system create an ecologically significant parcel of land.

LEC has recommended the above-referenced environmental recommendations to promote the protection of natural resources, while balancing continued public use and enjoyment, in addition to encouraging further review and discussion to inform future land use decisions.

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**Attachment A**

Photographs



Photos 1 and 2: Westerly (above) and easterly (below) drone/aerial views of Kent's Point.





Photos 3 and 4: Easterly view of Kent's Point, looking towards easterly point/headland; two (2) centrally-located parking spaces and ramp/boardwalk along with Salt Marsh patches and Coastal Beach conditions evident below.





Photos 5 and 6: Northerly view of Coastal Bank, Coastal Beach, and Salt Marsh habitats along easterly point/headland.





Photos 7 and 8: Easterly view of Coastal Bank, Coastal Beach, and Salt Marsh habitats along easterly point/headland.



(southeasterly point /headland; Coastal Bank erosion)



Photos 9 and 10: Northerly (above) and northwesterly (below) views of Coastal Bank, Coastal Beach, and Salt Marsh habitats along easterly point/headland.





Photos 11 and 12: Southerly (above) and southeasterly (below) view of unauthorized trails extending through Salt Marsh within Frost Fish Cove.





Photos 13 and 14: Westerly (above) and northerly (below) view of southerly shoreline, including the Beach Trail and unauthorized trail extending westerly through the Salt Marsh.





Photo 15: Westerly of westerly portion of property looking towards Lonnie's Pond; Lonnie's River located to south and parking area to north.



Photo 16: Easterly view of southwesterly/westerly portion of property from Lonnie's Pond.



Photos 17 and 18: Invasive and nuisance vegetation within westerly forested upland.





Photos 19 and 20: Typical vinal entanglements encasing mature trees.



Photo 21: Early successional habitat conditions within easterly point (former homestead area).



Photos 22 and 23: Off-site Freshwater Wetland; abutting (on-site) Cove Trail evident above.





Photos 24 and 25: Coastal Bank erosion along south-facing easterly point.





Photos 26 and 27: Coastal Bank erosion along south-facing easterly point.





Photos 28 and 29: Coastal Bank erosion along east-facing easterly point adjacent to concrete stairs.





Photos 30 and 31: Coastal Bank erosion within south-central location adjacent to the River Trail.





Photos 32 and 33: Eroding Coastal Bank conditions along Lonnie's River.





Photos 34 and 35: Unauthorized trails within southwesterly portion of property, including Salt Marsh.





Photos 36 and 37: Unauthorized trail through Salt Marsh within south-central portion of property.





Photos 38 and 39: Unauthorized trail through Salt Marsh within Frost Fish Cove.





Photo 40: Representative snag public safety hazard abutting trail (River Trail).



Photo 41: Representative exposed root systems/tripping hazard within trail (Cove Trail).



Photos 42 and 43: Bench/sitting areas with partially obstructed vistas along River Trail.





Photo 44: Ramp/boardwalk with encroaching vegetation.



Photo 45: Bench/sitting area with partially obstructed vistas along Cove Trail.












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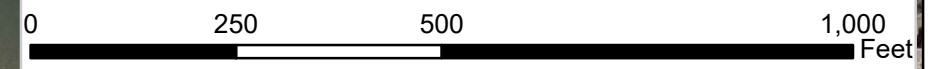
**Attachment B**

Trail Map, Prepared by LEC, Dated February 4, 2025



**Legend**

-  Property Line
-  Main Trail (former driveway)
-  Trail
-  Beach Trail
-  Closed Trail
-  Unauthorized Trail
-  ADA Parking
-  Ramp/Boardwalk
-  Bench
-  Salt Marsh
-  Freshwater Wetland



**Trails Map**

Kent's Point Conservation Area  
Orleans, Massachusetts



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**Attachment C**

Invasive Species Map, Prepared by LEC, Dated February 4, 2025

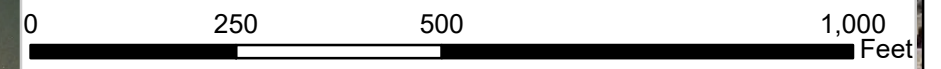


2023 Aerial Orthophoto acquired from the Office of Geographic Information (MassGIS) website.



### Legend

- Property Line
- Main Trail (former driveway)
- Trail
- Beach Trail
- Closed Trail
- Unauthorized Trail
- ADA Parking
- Ramp/Boardwalk
- Bench
- Freshwater Wetland
- Invasive Species



LEC Environmental Consultants, Inc.

Plymouth, MA  
508.746.9491  
www.lecenvironmental.com

## Invasive Species Map

Kent's Point Conservation Area  
Orleans, Massachusetts



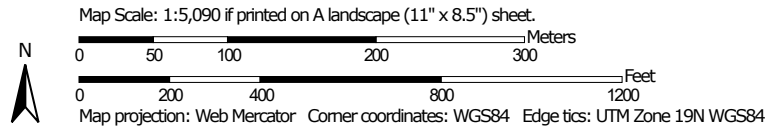
February 4, 2025

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**Attachment D**


Soils Map

Soil Map—Barnstable County, Massachusetts  
(Soils Map)



## MAP LEGEND

### Area of Interest (AOI)

 Area of Interest (AOI)

### Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

### Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

### Water Features



Streams and Canals

### Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

### Background



Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service  
Web Soil Survey URL:  
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Barnstable County, Massachusetts  
Survey Area Data: Version 23, Sep 17, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 10, 2022—Jun 30, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
53A	Freetown muck, ponded, coastal lowland, 0 to 1 percent slopes	2.9	2.2%
66A	Ipswich - Pawcatuck - Matunuck complex, 0 to 2 percent slopes, very frequently flooded	3.5	2.6%
252B	Carver coarse sand, 3 to 8 percent slopes	31.3	23.2%
252C	Carver coarse sand, 8 to 15 percent slopes	39.9	29.6%
252D	Carver coarse sand, 15 to 35 percent slopes	2.0	1.5%
263B	Carver-Hinesburg loamy coarse sands, undulating	0.3	0.2%
263C	Carver-Hinesburg loamy coarse sands, rolling	0.1	0.1%
607	Water, saline	54.9	40.7%
<b>Totals for Area of Interest</b>		<b>135.0</b>	<b>100.0%</b>

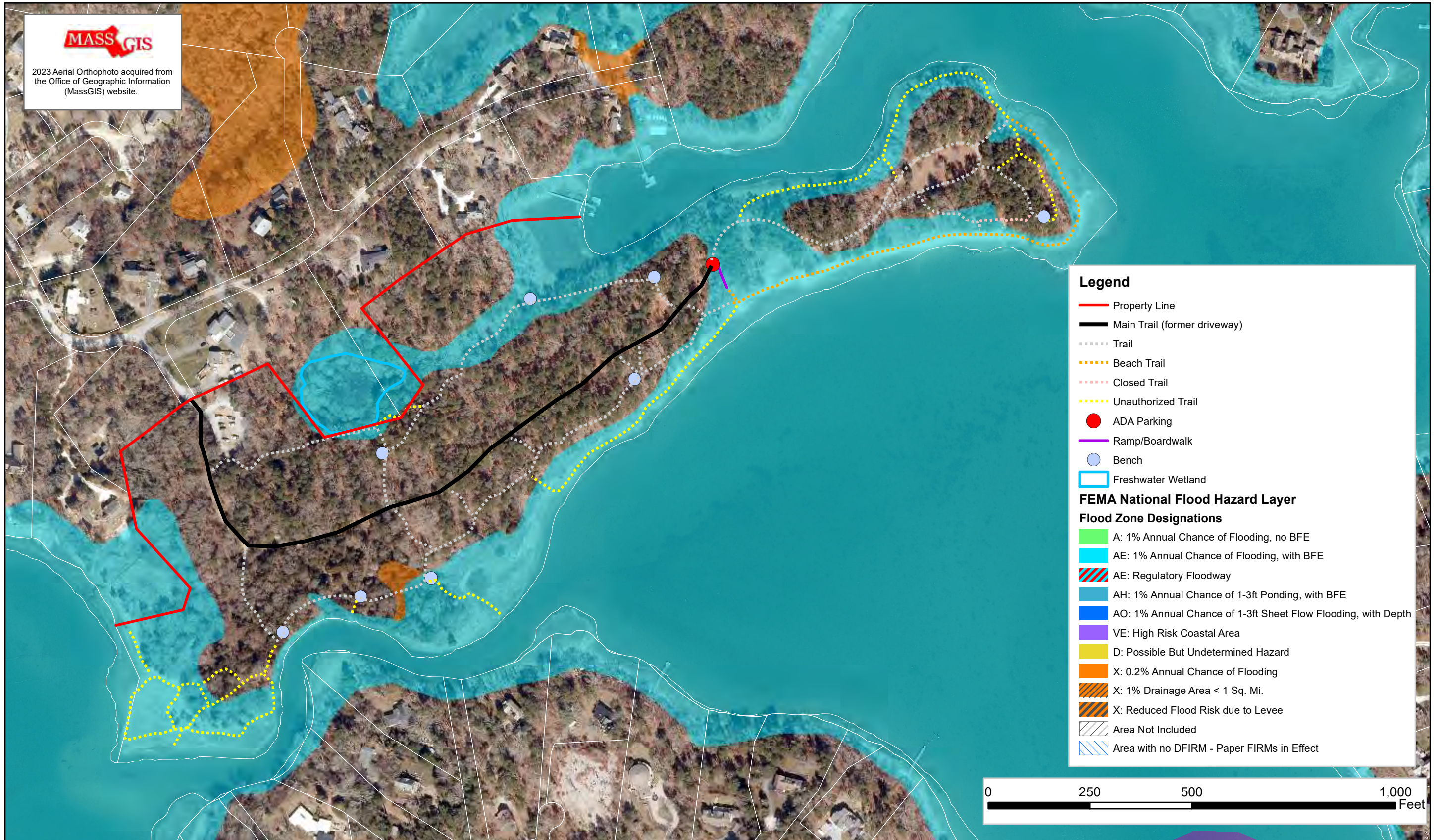
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**Attachment E**

FEMA Map

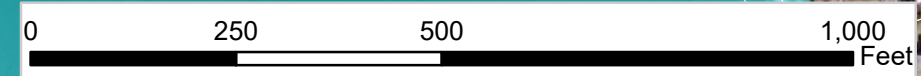


2023 Aerial Orthophoto acquired from the Office of Geographic Information (MassGIS) website.



### Legend

- Property Line
  - Main Trail (former driveway)
  - Trail
  - Beach Trail
  - Closed Trail
  - Unauthorized Trail
  - ADA Parking
  - Ramp/Boardwalk
  - Bench
  - Freshwater Wetland
- ### FEMA National Flood Hazard Layer
- #### Flood Zone Designations
- A: 1% Annual Chance of Flooding, no BFE
  - AE: 1% Annual Chance of Flooding, with BFE
  - AE: Regulatory Floodway
  - AH: 1% Annual Chance of 1-3ft Ponding, with BFE
  - AO: 1% Annual Chance of 1-3ft Sheet Flow Flooding, with Depth
  - VE: High Risk Coastal Area
  - D: Possible But Undetermined Hazard
  - X: 0.2% Annual Chance of Flooding
  - X: 1% Drainage Area < 1 Sq. Mi.
  - X: Reduced Flood Risk due to Levee
  - Area Not Included
  - Area with no DFIRM - Paper FIRMs in Effect



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Plymouth, MA  
508.746.9491  
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## FEMA Map

Kent's Point Conservation Area  
Orleans, Massachusetts



February 4, 2025

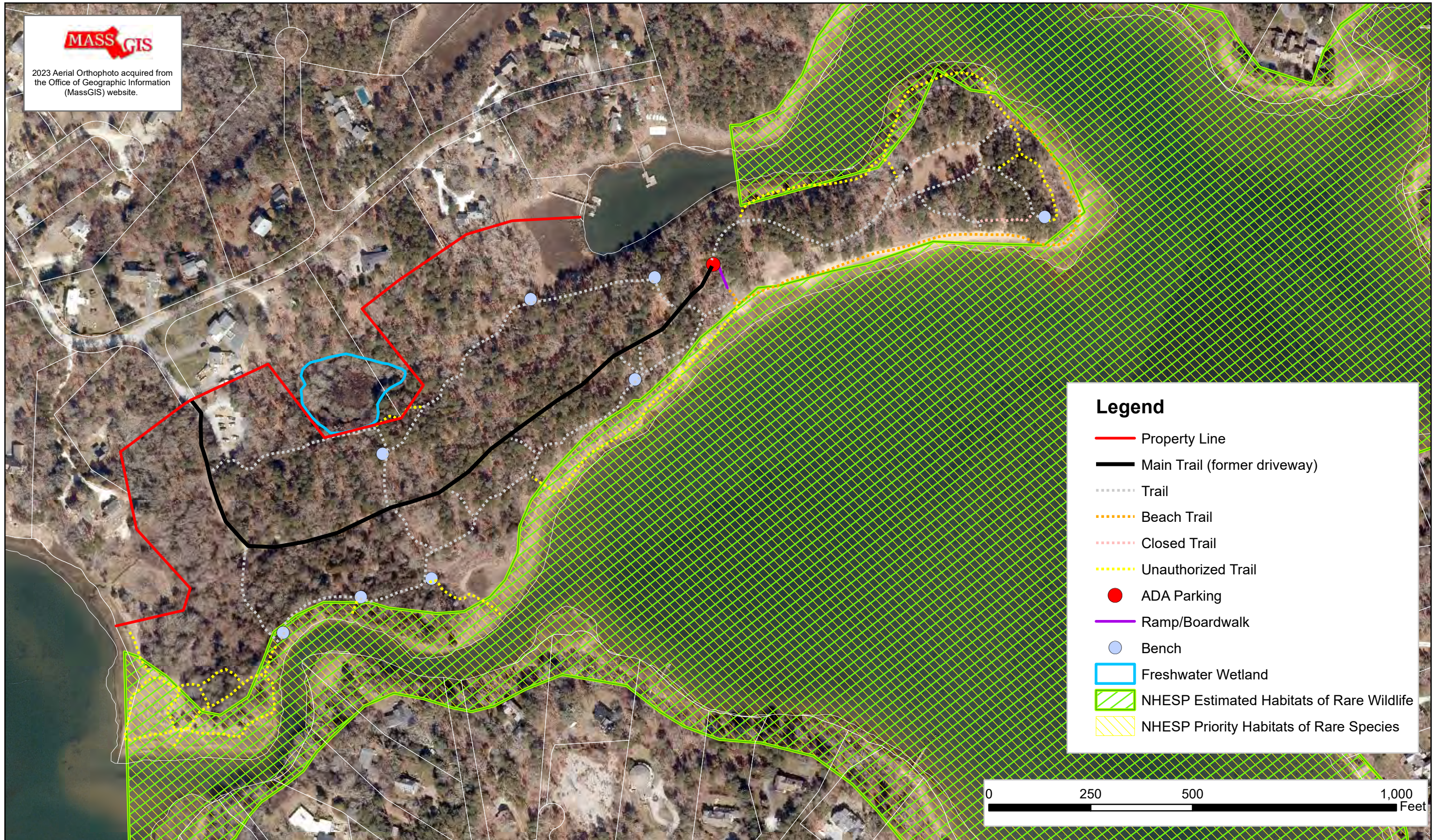
---

**Attachment F**

NHESP Map

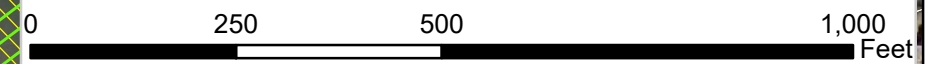


2023 Aerial Orthophoto acquired from the Office of Geographic Information (MassGIS) website.



### Legend

- Property Line
- Main Trail (former driveway)
- Trail
- Beach Trail
- Closed Trail
- Unauthorized Trail
- ADA Parking
- Ramp/Boardwalk
- Bench
- Freshwater Wetland
- NHESP Estimated Habitats of Rare Wildlife
- NHESP Priority Habitats of Rare Species



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www.lecenvironmental.com

## NHESP Map

Kents Point Conservation Area  
Orleans, Massachusetts



February 4, 2025

---

**Attachment G**

ACEC Map



2023 Aerial Orthophoto acquired from the Office of Geographic Information (MassGIS) website.



### Legend

- Property Line
- Main Trail (former driveway)
- Trail
- Beach Trail
- Closed Trail
- Unauthorized Trail
- ADA Parking
- Ramp/Boardwalk
- Bench
- Freshwater Wetland
- ACEC

0 250 500 1,000 Feet



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## ACEC Map

Kents Point Conservation Area  
Orleans, Massachusetts



February 4, 2025

---

**Attachment H**

BioMap

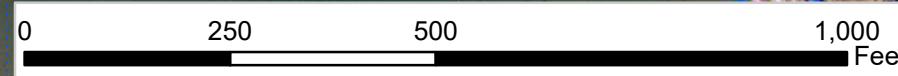


2023 Aerial Orthophoto acquired from the Office of Geographic Information (MassGIS) website.



**Legend**

- Property Line
- Main Trail (former driveway)
- Trail
- Beach Trail
- Closed Trail
- Unauthorized Trail
- ADA Parking
- Ramp/Boardwalk
- Bench
- Freshwater Wetland
- BioMap Core Habitat
- BioMap Critical Natural Landscape



LEC Environmental Consultants, Inc.

Plymouth, MA  
508.746.9491  
www.lecenvironmental.com

# BioMap

Kents Point Conservation Area  
Orleans, Massachusetts



February 4, 2025

---

**Attachment I**

eBird Hotspot List



Change Region

# Kent's Point Conservation Area

Barnstable, Massachusetts, United States



HOTSPOT NAVIGATION

## Bird List

Updated ~14 seconds ago

90  
All Years

0  
This Year

0  
This Month


Last Observed

First Observed

High Count



Custom Time Period ▼

SPECIES NAME	COUNT	DATE ▼	OBSERVER	LOCATION
1. <b>Common Eider</b> <i>Somateria mollissima</i>	6	7 Dec 2024	Anonymous eBirder	Kent's Point Conservation Area <span style="color: green; font-weight: bold;">■</span>
2. <b>Mallard</b> <i>Anas platyrhynchos</i>	1	3 Dec 2024	Brandi Sikorski	Kent's Point Conservation Area
3. <b>Bufflehead</b> <i>Bucephala albeola</i>	60	3 Dec 2024	Brandi Sikorski	Kent's Point Conservation Area
4. <b>Hooded Merganser</b> <i>Lophodytes cucullatus</i>	12	3 Dec 2024	Brandi Sikorski	Kent's Point Conservation Area
5. <b>Common Loon</b> <i>Gavia immer</i>	1	3 Dec 2024	Brandi Sikorski	<a href="#">Kent's Point Conservation Area</a>
6. <b>Great Blue Heron</b> <i>Ardea herodias</i>	1	3 Dec 2024	Brandi Sikorski	Kent's Point Conservation Area
7. <b>Belted Kingfisher</b> <i>Megasceryle alcyon</i>	2	3 Dec 2024	Brandi Sikorski	Kent's Point Conservation Area
8. <b>Blue Jay</b> <i>Cyanocitta cristata</i>	2	3 Dec 2024	Brandi Sikorski	Kent's Point Conservation Area
9. <b>American Crow</b> <i>Corvus brachyrhynchos</i>	4	3 Dec 2024	Brandi Sikorski	Kent's Point Conservation Area

10.	<b>Common Raven</b> <i>Corvus corax</i>	1	3 Dec 2024	Brandi Sikorski	Kent's Point Conservation Area
11.	<b>Black-capped Chickadee</b> <i>Poecile atricapillus</i>	13	3 Dec 2024	Brandi Sikorski	Kent's Point Conservation Area
12.	<b>Tufted Titmouse</b> <i>Baeolophus bicolor</i>	2	3 Dec 2024	Brandi Sikorski	Kent's Point Conservation Area
13.	<b>Hermit Thrush</b> <i>Catharus guttatus</i>	1	3 Dec 2024	Brandi Sikorski	Kent's Point Conservation Area
14.	<b>Dark-eyed Junco</b> <i>Junco hyemalis</i>	1	3 Dec 2024	Brandi Sikorski	Kent's Point Conservation Area
15.	<b>White-throated Sparrow</b> <i>Zonotrichia albicollis</i>	2	3 Dec 2024	Brandi Sikorski	Kent's Point Conservation Area
16.	<b>Northern Cardinal</b> <i>Cardinalis cardinalis</i>	1	3 Dec 2024	Brandi Sikorski	Kent's Point Conservation Area
17.	<b>American Black Duck</b> <i>Anas rubripes</i>	13	30 Nov 2024	B. Watcher	Kent's Point Conservation Area
18.	<b>Ring-billed Gull</b> <i>Larus delawarensis</i>	12	30 Nov 2024	B. Watcher	Kent's Point Conservation Area 
19.	<b>American Herring Gull</b> <i>Larus smithsonianus</i>	5	30 Nov 2024	B. Watcher	Kent's Point Conservation Area
20.	<b>Downy Woodpecker</b> <i>Dryobates pubescens</i>	1	30 Nov 2024	B. Watcher	Kent's Point Conservation Area
21.	<b>Red-breasted Nuthatch</b> <i>Sitta canadensis</i>	1	30 Nov 2024	B. Watcher	Kent's Point Conservation Area
22.	<b>Double-crested Cormorant</b> <i>Nannopterum auritum</i>	1	18 Aug 2024	Michele Burnat	Kent's Point Conservation Area
23.	<b>Gray Catbird</b> <i>Dumetella carolinensis</i>	1	18 Aug 2024	Michele Burnat	Kent's Point Conservation Area
24.	<b>Laughing Gull</b> <i>Leucophaeus atricilla</i>	10	17 Aug 2024	Matt Sanda	Kent's Point Conservation Area

25.	<b>Great Black-backed Gull</b> <i>Larus marinus</i>	3	17 Aug 2024	Matt Sanda	Kent's Point Conservation Area
26.	<b>Green Heron</b> <i>Butorides virescens</i>	3	17 Aug 2024	Matt Sanda	Kent's Point Conservation Area
27.	<b>Osprey</b> <i>Pandion haliaetus</i>	1	17 Aug 2024	Matt Sanda	Kent's Point Conservation Area
28.	<b>Bald Eagle</b> <i>Haliaeetus leucocephalus</i>	1	17 Aug 2024	Matt Sanda	Kent's Point Conservation Area
29.	<b>Great Crested Flycatcher</b> <i>Myiarchus crinitus</i>	1	15 Aug 2024	James Boughton	Kent's Point Conservation Area
30.	<b>Common Tern</b> <i>Sterna hirundo</i>	1	13 Aug 2024	David Halm	Kent's Point Conservation Area
31.	<b>Red-tailed Hawk</b> <i>Buteo jamaicensis</i>	1	13 Aug 2024	David Halm	Kent's Point Conservation Area
32.	<b>Northern Flicker</b> <i>Colaptes auratus</i>	1	13 Aug 2024	David Halm	Kent's Point Conservation Area
33.	<b>American Goldfinch</b> <i>Spinus tristis</i>	2	13 Aug 2024	David Halm	Kent's Point Conservation Area
34.	<b>Carolina Wren</b> <i>Thryothorus ludovicianus</i>	1	12 Aug 2024	Erik Zilinek	Kent's Point Conservation Area
35.	<b>Song Sparrow</b> <i>Melospiza melodia</i>	1	12 Aug 2024	Erik Zilinek	Kent's Point Conservation Area
36.	<b>Hairy Woodpecker</b> <i>Dryobates villosus</i>	1	11 Aug 2024	kathy and matt mccoey	Kent's Point Conservation Area
37.	<b>Eastern Wood-Pewee</b> <i>Contopus virens</i>	1	11 Aug 2024	kathy and matt mccoey	Kent's Point Conservation Area
38.	<b>Chipping Sparrow</b> <i>Spizella passerina</i>	6	9 Jul 2024	Ryan Hoy	Kent's Point Conservation Area
39.	<b>Eastern Phoebe</b> <i>Sayornis phoebe</i>	1	27 Jun 2024	Bill Rugg	Kent's Point Conservation Area
40.	<b>Pine Warbler</b> <i>Setophaga pinus</i>	1	27 Jun 2024	Bill Rugg	Kent's Point Conservation Area

41.	<b>Red-bellied Woodpecker</b> <i>Melanerpes carolinus</i>	X	3 Jun 2024	Scott Silver	Kent's Point Conservation Area
42.	<b>Veery</b> <i>Catharus fuscescens</i>	X	3 Jun 2024	Scott Silver	Kent's Point Conservation Area 
43.	<b>American Robin</b> <i>Turdus migratorius</i>	X	3 Jun 2024	Scott Silver	Kent's Point Conservation Area
44.	<b>Cedar Waxwing</b> <i>Bombycilla cedrorum</i>	X	3 Jun 2024	Scott Silver	Kent's Point Conservation Area
45.	<b>Baltimore Oriole</b> <i>Icterus galbula</i>	X	3 Jun 2024	Scott Silver	Kent's Point Conservation Area
46.	<b>Northern Parula</b> <i>Setophaga americana</i>	1	2 Jun 2024	Janet Greenwood	Kent's Point Conservation Area
47.	<b>Common Grackle</b> <i>Quiscalus quiscula</i>	3	26 May 2024	Nate Graham	Kent's Point Conservation Area
48.	<b>Red-winged Blackbird</b> <i>Agelaius phoeniceus</i>	1	3 May 2024	Brandi Sikorski	Kent's Point Conservation Area
49.	<b>Red-breasted Merganser</b> <i>Mergus serrator</i>	1	1 Dec 2023	Tom Younkin	Kent's Point Conservation Area
50.	<b>House Finch</b>  <i>Haemorhous mexicanus</i>	2	1 Dec 2023	Tom Younkin	Kent's Point Conservation Area
51.	<b>Yellow-rumped Warbler</b> <i>Setophaga coronata</i>	5	1 Dec 2023	Tom Younkin	Kent's Point Conservation Area
52.	<b>White-breasted Nuthatch</b> <i>Sitta carolinensis</i>	1	10 Sep 2023	Michelle Horowitz	Kent's Point Conservation Area
53.	<b>Mourning Dove</b> <i>Zenaida macroura</i>	1	8 Jul 2023	Erik Zilinek	Kent's Point Conservation Area
54.	<b>Great Egret</b> <i>Ardea alba</i>	1	8 Jul 2023	Erik Zilinek	Kent's Point Conservation Area
55.	<b>Red-eyed Vireo</b> <i>Vireo olivaceus</i>	1	8 Jul 2023	Erik Zilinek	Kent's Point Conservation Area
56.	<b>Yellow Warbler</b> <i>Setophaga petechia</i>	1	8 Jul 2023	Erik Zilinek	Kent's Point Conservation Area

57.	<b>Wild Turkey</b> <i>Meleagris gallopavo</i>	1	6 Jun 2023	Philip Kyle	Kent's Point Conservation Area
58.	<b>Fish Crow</b> <i>Corvus ossifragus</i>	1	6 Jun 2023	Philip Kyle	Kent's Point Conservation Area
59.	<b>Brown-headed Cowbird</b> <i>Molothrus ater</i>	1	6 Jun 2023	Philip Kyle	Kent's Point Conservation Area
60.	<b>Common Yellowthroat</b> <i>Geothlypis trichas</i>	2	6 Jun 2023	Philip Kyle	Kent's Point Conservation Area
61.	<b>Sharp-shinned Hawk</b> <i>Accipiter striatus</i>	1	31 May 2023	Anonymous eBirder	Kent's Point Conservation Area 
62.	<b>Canada Goose</b> <i>Branta canadensis</i>	1	31 May 2023	Michele Burnat	Kent's Point Conservation Area
63.	<b>Yellow-crowned Night Heron</b> <i>Nyctanassa violacea</i>	1	31 May 2023	Michele Burnat	Kent's Point Conservation Area  
64.	<b>Common Goldeneye</b> <i>Bucephala clangula</i>	1	21 Feb 2023	Tom Younkin	Kent's Point Conservation Area
65.	<b>Great Horned Owl</b> <i>Bubo virginianus</i>	1	21 Feb 2023	Tom Younkin	Kent's Point Conservation Area
66.	<b>Brown Creeper</b> <i>Certhia americana</i>	1	21 Feb 2023	Tom Younkin	Kent's Point Conservation Area
67.	<b>Eastern Towhee</b> <i>Pipilo erythrophthalmus</i>	1	21 Feb 2023	Tom Younkin	Kent's Point Conservation Area
68.	<b>Mute Swan</b> <i>Cygnus olor</i> *	2	15 Feb 2023	Leigh McBride	Kent's Point Conservation Area
69.	<b>Bonaparte's Gull</b> <i>Chroicocephalus philadelphia</i>	2	1 Dec 2022	Tom Younkin	Kent's Point Conservation Area
70.	<b>Winter Wren</b> <i>Troglodytes hiemalis</i>	1	1 Dec 2022	Tom Younkin	Kent's Point Conservation Area
71.	<b>Lesser Black-backed Gull</b> <i>Larus fuscus</i>	1	25 Nov 2022	Tom Younkin	Kent's Point Conservation Area

72.	<b>Forster's Tern</b> <i>Sterna forsteri</i>	1	31 Oct 2022	Tom Younkin	Kent's Point Conservation Area
73.	<b>Golden-crowned Kinglet</b> <i>Regulus satrapa</i>	2	31 Oct 2022	Tom Younkin	Kent's Point Conservation Area
74.	<b>Black-bellied Plover</b> <i>Pluvialis squatarola</i>	1	20 Oct 2022	Dave C.	Kent's Point Conservation Area
75.	<b>Blue-headed Vireo</b> <i>Vireo solitarius</i>	1	20 Oct 2022	Dave C.	Kent's Point Conservation Area
76.	<b>Palm Warbler</b> <i>Setophaga palmarum</i>	2	20 Oct 2022	Dave C.	Kent's Point Conservation Area
77.	<b>Tree Swallow</b> <i>Tachycineta bicolor</i>	15	3 Sep 2022	Michele Burnat	Kent's Point Conservation Area
78.	<b>Spotted Sandpiper</b> <i>Actitis macularius</i>	1	27 Aug 2022	Elizabeth Packer	Kent's Point Conservation Area
79.	<b>Red-shouldered Hawk</b> <i>Buteo lineatus</i>	1	22 Aug 2022	Erik Zilinek	Kent's Point Conservation Area
80.	<b>European Starling</b> *	2	28 Dec 2021	Fred Pratt	Kent's Point Conservation Area
81.	<b>Eastern Bluebird</b> <i>Sialia sialis</i>	1	27 Nov 2021	Jonathan Franklin	Kent's Point Conservation Area
82.	<b>House Sparrow</b> *	1	1 Aug 2021	Geraldine Shannon	Kent's Point Conservation Area
83.	<b>Eastern Kingbird</b> <i>Tyrannus tyrannus</i>	2	24 Jul 2021	Ben Thyng	Kent's Point Conservation Area
84.	<b>Ovenbird</b> <i>Seiurus aurocapilla</i>	1	5 Jun 2021	Michael Giaquinto	Kent's Point Conservation Area
85.	<b>Yellow-bellied Sapsucker</b> <i>Sphyrapicus varius</i>	1	20 Dec 2020	Warren Mumford	Kent's Point Conservation Area  
86.	<b>Least Sandpiper</b> <i>Calidris minutilla</i>	1	29 Aug 2020	Erik Zilinek	Kent's Point Conservation Area
87.	<b>Snowy Egret</b> <i>Egretta thula</i>	1	26 Aug 2020	Erik Zilinek	Kent's Point Conservation Area

88.	<b>Cooper's Hawk</b> <i>Astur cooperii</i>	1	2 Aug 2020	Erik Zilinek	Kent's Point Conservation Area
89.	<b>Barn Swallow</b> <i>Hirundo rustica</i>	1	2 Aug 2020	Erik Zilinek	Kent's Point Conservation Area
90.	<b>Broad-winged Hawk</b> <i>Buteo platypterus</i>	1	28 Jun 2020	Erik Zilinek	Kent's Point Conservation Area

## HYBRIDS (1)

	<b>Mallard x American Black Duck (hybrid)</b> <i>Anas platyrhynchos x rubripes</i>	1	30 Nov 2024	B. Watcher	Kent's Point Conservation Area
--	---	---	-------------	------------	--------------------------------

## ADDITIONAL TAXA (5)

	swallow sp. <i>Hirundinidae sp.</i>	X	3 Jun 2024	Scott Silver	Kent's Point Conservation Area
	gull sp. <i>Larinae sp.</i>	2	17 Oct 2023	Diana Humple	Kent's Point Conservation Area
	cormorant sp. <i>Phalacrocoracidae sp.</i>	200	17 Oct 2023	Diana Humple	Kent's Point Conservation Area
	Accipitrine hawk sp. (former Accipiter sp.) <i>Aerospiza/Tachyspiza/Accipiter/Astur sp.</i>	1	20 Oct 2022	Dave C.	Kent's Point Conservation Area
	shorebird sp. <i>Charadriiformes sp. (shorebird sp.)</i>	1	12 Sep 2020	benny albro	Kent's Point Conservation Area



## Explore

Species Maps  
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Explore Hotspots  
Search photos and sounds

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Cornell University

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**Attachment J**

Cape Cod Commission Traffic Count

# Cape Cod Commission

3225 Main Street  
Barnstable, MA 02630

[www.capecodcommission.org](http://www.capecodcommission.org)



CAPE COD  
COMMISSION

Site Code: 6445

Location: Kents Port Conservation

Town: Orleans

Counter AP-21

Start Date: 7/29/2024

End Date: 8/6/2024

	7/29/2024	7/29/2024	7/30/2024	7/31/2024	8/1/2024	8/2/2024	Weekday Average	8/3/2024	8/4/2024	Week Average
Time	Monday	Tuesday	Wednesday	Thursday	Friday			Saturday	Sunday	
12:00 AM	*	0	0	0	0	0	0	0	0	0
1:00	*	0	0	0	0	0	0	0	0	0
2:00	*	0	0	0	0	0	0	0	0	0
3:00	*	0	0	0	0	0	0	0	0	0
4:00	*	0	0	0	0	0	0	0	0	0
5:00	*	1	2	2	3	2	2	3	2	2
6:00	*	9	13	8	12	10	10	11	10	10
7:00	*	9	13	16	18	14	14	15	12	14
8:00	*	21	26	31	27	26	26	31	31	28
9:00	*	40	29	45	34	37	37	58	40	40
10:00	33	29	31	27	36	31	31	38	56	35
11:00	46	35	36	21	28	33	33	26	39	33
12:00 PM	37	20	31	27	17	26	26	36	28	28
1:00	18	16	20	14	21	18	18	20	31	20
2:00	25	24	18	7	14	18	18	23	17	18
3:00	44	23	33	12	16	26	26	19	28	25
4:00	27	28	31	24	18	26	26	16	24	24
5:00	29	31	23	11	16	22	22	22	27	23
6:00	21	16	14	11	8	14	14	13	15	14
7:00	9	16	6	4	6	8	8	8	4	8
8:00	0	2	3	1	2	2	2	3	1	2
9:00	0	1	2	0	0	1	1	0	0	0
10:00	0	0	1	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0
Total	289	321	332	261	276			342	365	
Percent	13.2%	14.7%	15.2%	11.9%	12.6%			15.6%	16.7%	
AM Peak	11:00	9:00	11:00	9:00	10:00			9:00	10:00	
Volume	46	40	36	45	36			58	56	
PM Peak	3:00	5:00	3:00	12:00 PM	1:00			12:00 PM	1:00	
Volume	44	31	33	27	21			36	31	

Cloudy  
67°

Fair  
80°

Fair  
73°

Fair  
85°

Fair  
84°

Fair  
85°

Cloudy  
83°

# Cape Cod Commission

3225 Main Street  
Barnstable, MA 02630

[www.capecodcommission.org](http://www.capecodcommission.org)



CAPE COD  
COMMISSION

Site Code: 6445  
Location: Kents Port Conservation  
Town: Orleans  
Counter AP-21

Start Date: 7/29/2024  
End Date: 8/6/2024

Time	8/5/2024	8/6/2024	8/7/2024	8/8/2024	8/9/2024	Weekday Average	8/10/2024	8/11/2024	Week Average
	Monday	Tuesday	Wednesday	Thursday	Friday		Saturday	Sunday	
12:00 AM	0	0	*	*	*	0	*	*	0
1:00	0	0	*	*	*	0	*	*	0
2:00	0	0	*	*	*	0	*	*	0
3:00	0	0	*	*	*	0	*	*	0
4:00	0	1	*	*	*	0	*	*	0
5:00	2	5	*	*	*	4	*	*	4
6:00	17	13	*	*	*	15	*	*	15
7:00	25	12	*	*	*	18	*	*	18
8:00	44	11	*	*	*	28	*	*	28
9:00	50	42	*	*	*	46	*	*	46
10:00	41	*	*	*	*	41	*	*	41
11:00	34	*	*	*	*	34	*	*	34
12:00 PM	22	*	*	*	*	22	*	*	22
1:00	17	*	*	*	*	17	*	*	17
2:00	12	*	*	*	*	12	*	*	12
3:00	12	*	*	*	*	12	*	*	12
4:00	20	*	*	*	*	20	*	*	20
5:00	31	*	*	*	*	31	*	*	31
6:00	19	*	*	*	*	19	*	*	19
7:00	5	*	*	*	*	5	*	*	5
8:00	0	*	*	*	*	0	*	*	0
9:00	0	*	*	*	*	0	*	*	0
10:00	1	*	*	*	*	1	*	*	1
11:00	0	*	*	*	*	0	*	*	0
<b>Total</b>	<b>352</b>	<b>84</b>	<b>0</b>	<b>0</b>	<b>0</b>		<b>0</b>	<b>0</b>	
<b>Percent</b>	<b>80.7%</b>	<b>19.3%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>		<b>0.0%</b>	<b>0.0%</b>	
AM Peak	9:00	9:00							
Volume	50	42							
PM Peak	5:00								
Volume	31								
<b>AD Total</b>						<b>639</b>			

FAIR  
84

RAW  
71

---

**Attachment K**

Vegetative Transect-Plots

## Vegetative Transect/Plots



### Transect 1, Plot 1 (T1, P1)

#### Ground

Bush honeysuckle (*Lonicera* sp): 10.5-midpoint (10-15%-cover range)

English ivy (*Hedera helix*): 3.0 (< 5%)

#### Shrub

Bush honeysuckle: 63.0 (60-75%)

#### Tree

Eastern red cedar (*Juniperus virginiana*): 85.5 (75-85%)

Pitch pine (*Pinus rigida*): 10.5 (6-10%)

#### Vine

Asiatic bittersweet (*Celastrus orbiculata*): 38.0 (35-40%)

### Transect 1, Plot 2 (T1, P2)

#### Ground

English ivy: 85.5 (80-90%)

Ground ivy (*Glechoma hederacea*): 10.5 (6-10%)

Dewberry (*Rubus flagellaris*): 3.0 (< 5%)

#### Shrub

Bush honeysuckle: 63.0 (55-60%)

Northern Arrowwood (*Viburnum dentatum*): 10.5 (10-15%)

Privet (*Ligstrum* sp.): 10.5 (10-15%)

#### Sapling

Black cherry (*Prunus serotina*): 20.5 (20-25%)

Eastern red cedar: 20.5 (15-20%)

Tree

Pitch pine: 20.5 (20-25%)

Black oak (*Quercus velutina*): 20.5 (20-25%)

Black cherry: 10.5 (10-15%)

Vine

Asiatic bittersweet: 63.0 (60-75%)

English ivy: 10.5 (10-15%)

**Transect 1, Plot 3 (T1, P3)**

Ground

English ivy: 63.0 (60-75%)

Garlic mustard (*Alliaria petiolata*): 38.0 (40-50%)

Common greenbrier (*Smilax rotundifolia*): 20.5 (20-25%)

Privet: 10.5 (10-15%)

Bush honeysuckle: 3.0 (< 5%)

Shrub

Bush honeysuckle: 38.0 (26-30%)

Highbush blueberry (*Vaccinium corymbosum*): 3.0 (< 5%)

Sapling

Black cherry: 10.5 (10-15%)

Tree

Eastern red cedar: 38.0 (30-40%)

Black oak: 38.0 (30-40%)

Pitch pine: 20.5 (20-25%)

White oak (*Quercus alba*): 10.5 (10-15%)

Vine

Common greenbrier: 63.0 (60-75%)

**Transect 2, Plot 1 (T2, P1)**

Ground

Bayberry (*Morella pensylvanica*): 20.5 (15-20%)

Poison ivy (*Toxicodendron radicans*): 10.5 (6-10%)

Black oak: 3.0 (< 5%)

Shrub

Bayberry: 20.5 (15-20%)

Sapling

Black oak: 10.5 (20-25%)

White oak: 10.5 (20-25%)

Tree

Pitch pine: 85.5 (75-80%)

Black oak: 20.5 (20-25%)

Vine

Common greenbrier: 3.0 (< 5%)

## **Transect 2, Plot 2 (T2, P2)**

### Ground

Poison ivy: 20.5 (15-20%)

Bayberry: 10.5 (6-10%)

Pitch pine: 10.5 (6-10%)

Pennsylvania sedge (*Carex pensylvanica*): 3.0 (< 5%)

### Shrub

Bayberry: 20.5 (20-25%)

### Sapling

Black oak: 63.0 (51-60%)

### Tree

Pitch pine: 63.0 (51-60%)

Black oak: 38.0 (35-45%)

### Vine

Poison ivy: 3.0 (< 5%)

## **Transect 2, Plot 3 (T2, P3)**

### Ground

Poison ivy: 10.5 (10-15%)

Dewberry (*Rubus flagellaris*): 3.0 (< 5%)

### Sapling

Black oak: 38.0 (26-30%)

### Tree

Pitch pine: 38.0 (35-45%)

Black oak: 38.0 (35-45%)

## **Transect 3, Plot 1 (T3, P1)**

### Ground

Wavy hair grass (*Deschampsia flexuosa*): 20.5 (15-25%)

Japanese honeysuckle (*Lonicera japonica*): 10.5 (10-15%)

English ivy: 10.5 (6-10%)

Pennsylvania sedge: 3.0 (< 5%)

Dewberry: 3.0 (< 5%)

### Shrub

Bayberry: 10.5 (6-10%)

### Sapling

Black locust (*Robinia pseudoacacia*): 10.5 (10-15%)

Black cherry: 10.5 (10-15%)

Norway maple (*Acer platanoides*): 10.5 (6-10%)

Pitch pine: 3.0 (< 5%)

### Tree

Pitch pine: 63.0 (60-75%)

Black oak: 20.5 (20-30%)

Black locust: 10.5 (10-15%)

### Vine

Asiatic bittersweet: 63.0 (50-60%)

Poison ivy: 20.5 (15-20%)  
Common greenbrier: 3.0 (< 5%)  
Japanese honeysuckle: 3.0 (< 5%)

**Transect 3, Plot 2 (T3, P2)**

Ground

Orchard grass (*Dactylis glomerata*): 98.0 (96-100%)  
Dewberry: 10.5 (10-15%)

Shrub

Bush honeysuckle: 3.0 (< 5%)

Tree

Eastern red cedar: 38.0 (25-35%)

**Transect 3, Plot 3 (T3, P3)**

Ground

Japanese honeysuckle: 63.0 (50-60%)  
English ivy: 20.5 (15-20%)  
Dewberry: 10.5 (6-10%)

Shrub

Lilac (*Syringa* sp.): 20.5 (20-30%)

Sapling

Eastern red cedar: 20.5 (20-30%)  
Norway maple: 3.0 (< 5%)  
Black oak: 3.0 (< 5%)

Tree

Norway maple: 63.0 (51-60%)  
Black locust: 20.5 (20-30%)  
Black oak: 10.5 (10-15%)

Vine

Asiatic bittersweet: 38.0 (25-35%)  
Japanese honeysuckle: 20.5 (15-20%)  
English ivy: 20.5 (15-20%)

11/25/24 vegetative plot data collection; cover ranges/midpoints based on MassDEP BVW  
Determination Form standards