



**Massachusetts Habitat Conservation Plan for Piping Plover  
Request for Amended Certificate of Inclusion**



Prepared for submission to:  
Massachusetts Division of Fisheries & Wildlife  
Natural Heritage & Endangered Species Program  
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# Introduction and Overview

The following is a request by Duxbury Beach Reservation, Inc. for a Certificate of Inclusion (COI) in the statewide Habitat Conservation Plan (HCP) for Piping Plover for the 2020 nesting season on Duxbury Beach. The request includes four covered activities: Use of Roads and Parking Lots in the Vicinity of Unfledged Piping Plover Chicks and Least Tern Chicks; Recreation and Beach Operations Associated with Reduced Symbolic Fencing Around Nests; Recreation and Beach Operations Associated with Reduced Proactive Symbolic Fencing of Piping Plover and Least Tern Habitat; and Recreation and Beach Operations at Piping Plover and Least Tern Nest Sites with Nest Moving. Review of the past three years of nesting on Duxbury Beach has determined that 10 Piping Plover broods and 25 Least Tern pairs may be impacted. The area affected will be length of Gurnet Road from the north edge of the property (Northern Lot formally known as the Lagerstedt Lot) to the Gurnet Guardhouse in the south covering 7.2 kilometers (4.5 miles) of improved gravel roadway. The area may be reduced for some covered activities if recreational activity (driving) is restricted.

The Reservation is proposing that mitigation will be in the form of self-funding to implement selective predator management on-site as well as increased education efforts and experimental habitat management.

## 1.0 Site Description

Duxbury Beach is a barrier beach that consists of a peninsula, 12 kilometers (7.5 miles) long, extending from the Town of Duxbury at the northern end to the communities of Gurnet and Saquish (hereafter referred to as “Gurnet-Saquish”) at the southernmost end (Town of Plymouth). Duxbury Beach Reservation, Inc. (the Reservation), a 501 (c)(3) charitable corporation, owns 7.2 kilometers (4.5 miles) of Duxbury Beach, including the portion leased by the Town of Duxbury, Duxbury Beach Park, and the far northern section of the beach that the Reservation reserves for public access. The property is an average of 60 meters (67 yards) wide – ranging from 46 meters (50 yards) to 168 meters (183 yards) and covering approximately 550 acres. Duxbury and Kingston Bays, as well as the northerly part of Plymouth Bay, lie west of the beach. The beach is owned and managed by Duxbury Beach Reservation, with the exception of the extreme southerly end of the beach (Gurnet-Saquish), which contains approximately 205 homes, mostly occupied by summer residents.

Duxbury Beach Reservation consists of several parcels of property in both Duxbury and Plymouth. These parcels span from the northern end of Duxbury Beach Park in Duxbury to the Gurnet Guardhouse in Plymouth. Several partners manage portions of the beach and oversee aspects of the day to day operations, particularly in regard to human-use and enforcement. The Town of Duxbury leases the portion of Duxbury Beach from the northern end of the town parking lot (referred to as the resident parking lot) south to the Gurnet Guardhouse in Plymouth. Duxbury Beach Park, also known as “Blakeman’s”, “The Bathhouse”, and “The Pavilion” interchangeably, is under contract with Dana Battista. Duxbury Beach Park is managed as a parking area, restaurant, and recreational beach.

### 1.1 Physical Description of the Property

Duxbury Beach is a barrier beach located in the towns of Duxbury and Plymouth, Massachusetts. It connects to the mainland at a kame (a small, circular hill of glacial drift) in Duxbury, approximately 1.6 kilometers (1 mile) south of Green Harbor, Marshfield, and extends southeast along Gurnet Road into Plymouth (Appendix 1, Maps 1-4). Duxbury Beach ends at the drumlin of Gurnet Point in Plymouth. Between these two glacially formed anchor points at the northern and southern ends is a third point, at a section of the beach referred to as High

Pines, which is glacial till covered by sand dunes. Duxbury Beach was formed due to the erosion of glacial landforms as sand and gravel began to accumulate, protruding from these three anchor points and eventually joining to create Duxbury Beach.

On its western side, Duxbury Beach protects tidal flats; salt marsh; and Duxbury, Kingston, and the northerly part of Plymouth bays. In addition, valuable shellfishing activity is conducted in these areas. Coastal dune and coastal beach span much of the length of Duxbury Beach. The beach is a combination of sand, pebble, and cobble substrate. Due to shoreline armoring efforts by the towns of Scituate and Marshfield, sediment reaching Duxbury Beach has greatly diminished, leaving cobble exposed on Duxbury Beach for longer portions of the year when sand would historically build up during the summer. In order to maintain the barrier beach, the Reservation has made extensive efforts to prevent breaches, including dune reconstruction, beach nourishment, berm creation, and vegetation management.

Extensive vegetation management by the Reservation, including beach grass and woody shrub plantings and annual fertilizer placement, have helped to maintain and recolonize vegetated areas in an effort to stabilize the barrier beach. Vegetation management occurs with consideration of maintaining shorebird nesting habitat and with approval from the Massachusetts Natural Heritage and Endangered Species Program (NHESP). Dunes and marsh are vegetated with American beach grass (*Ammophila breviligulata*), Eastern red cedar (*Juniperus virginiana*), beach plum (*Prunus maritima*), beach rose (*Rosa rugosa* and *Rosa virginiana*), bayberry (*Myrica pensylvanica*), goldenrod (*Solidago sempervirens*), poison ivy (*Rhus radicans*), common mullein (*Verbascum thapsus*), sea lavender (*Limonium carolinianum*), saltmarsh cordgrass (*Spartina alterniflora*), etc.

Although much of the length of the barrier is narrow with low lying coastal dunes, the anchor points mentioned above are areas of diverse coastal habitats. The northern part of the beach protects saltmarsh habitat which extends to the mainland. The glacial till at High Pines is covered with tall woody vegetation and protects a small area of saltmarsh. Extending north from Gurnet Point is Plum Hills, an area of higher coastal dunes and dense woody vegetation. Westward of Plum Hills is saltmarsh extending to Saquish, a barrier beach anchored at Gurnet Point and extending southwest. The entirety of Duxbury Beach is mapped by NHESP as Priority Habitats of Rare Species and Estimated Habitats of Rare Wildlife. Piping Plover (*Charadrius melodus*) and Least Tern (*Sternula antillarum*) nest on Duxbury Beach, on the eastern and western sides of the beach. A large number of other shorebirds use Duxbury Beach for staging and as a stopover during migration. During the winter, Snowy Owls (*Bubo scandiacus*), captured at Logan Airport are released on Duxbury Beach. While many of the Snowy Owls continue south, some remain on Duxbury Beach for several months.

Duxbury Beach is accessible via Marshfield along Gurnet Road, to the Beach roadway at the north end of the Reservation property in Duxbury and from the west in Duxbury via the Powder Point Bridge, which extends from the mainland at Powder Point to the Beach, merging with the Beach roadway at the southern end of a series of parking lots. Gurnet Road continues the length of the Beach in Duxbury, becoming King Arthur Road as it crosses the Plymouth town line before reaching Gurnet Point. The road is paved in small sections from the north and again in and near the parking lots, but is primarily an improved gravel road (as defined by the HCP) composed primarily of processed gravel. There is a court-protected right of way for land owners of Gurnet/Saquish (and their visitors) from Marshfield to Plymouth over the roadway. The roadway also provides access for Duxbury residents and non-residents with current over-sand vehicle (OSV) permits to the beach, and access to tidal flats for vehicles with over-sand vehicle permits with separately-licensed fishing or shellfishing.

Shellfishing access points are located intermittently on the west side of the roadway for access to the bayside beach. Limited OSV permit holders access the oceanside beach designated via three vehicle crossovers. Crossovers 1 and 2 are located south of the town parking lots and north of High Pines, and Crossover 3 is located

to the south of High Pines. Vehicle use on the oceanside beach is restricted by a series of posts running perpendicular to the beach to the north of Crossover 1 and to the south of Crossover 3.

Four areas provide parking options for non-OSV visitors to Duxbury Beach: the Northern Lot (east of Gurnet Road and north of Duxbury Beach Park), Duxbury Beach Park lots (east and west of Gurnet Road to the north and east of the road to the south, known as the “Caterers’ lot”), and the Duxbury Beach town resident lots (east and west of Gurnet Road north of the Powder Point Bridge and west of the road to the south), and the West End Lot (west end of Powder Point Bridge, not on Reservation property). Eleven “pull-offs” exist south of the bridge on the east and west side of the road and are usable by those with over-sand permits, unless closed due to protected species nesting.

Pedestrians are able to access the oceanside and bayside beach via walkways at the parking lots, including handicap accessible ramps oceanside at the town resident parking lot and Duxbury Beach Park and bayside at the Powder Point Bridge Guardhouse. Two pedestrian-only paths cross the dunes to the oceanside beach from Gurnet Road just south of the town resident lots. In addition, OSV access points on oceanside and bayside (three crossovers and shellfishing access roads) provide paths for pedestrians between the beach and Gurnet Road.

Duxbury Beach offers two lifeguarded beaches from Memorial Day through Labor Day. One lifeguarded beach is located on the town-leased portion of the oceanside beach in front of the resident parking lot, consisting of an area 91 meters (100 yards) on either side of a stationary lifeguard chair. A second lifeguarded beach is located at Duxbury Beach Park.

Four buildings are located on Duxbury Beach, consisting of the following (north to south): McLaughlin Cottage, the Pavilion, Powder Point Bridge Guardhouse, and High Pines Cottage. The McLaughlin Cottage is owned by a private individual for personal use, but it sits on Reservation-owned land. The cottage is located between the Northern Lot and Duxbury Beach Park. The remaining three buildings are owned by Duxbury Beach Reservation. The Pavilion building consists of a restaurant, snack bar, and upstairs loft operated by Duxbury Beach Park. The Powder Point Bridge Guardhouse is located at the east end of the Powder Point Bridge. Town of Duxbury Police Beach Rangers or Police Officers staff the guardhouse. High Pines Cottage is a garage structure with a second floor. It is located at High Pines, and Reservation personnel use it for storage, meetings, and monitor trainings.

## **1.2 Piping Plover Nesting**

### Piping Plover Nesting Habitat

Piping Plover nesting occurs on Duxbury Beach annually from March through August, primarily south of Duxbury Beach Park. Nesting, foraging, and chick-rearing take place both east and west of Gurnet Road. Proactive symbolic fencing is placed around the potential nesting habitat, which includes: oceanside beach from Duxbury Beach Park to the end of the driving beach south of Crossover 3, from the path at the Gurnet Guardhouse north to Plum Hills, and around the bayside replicated habitats (further discussion of symbolic fencing on page 20). The areas of oceanside habitat are fairly narrow with a sand-cobble substrate and sparse vegetation. Nests are typically located on the slope or toe of the dune or seaward as vegetation at the crest of the dune is fairly dense and dunes are steeply scarped along parts of the front beach. Along the restored section of dune between Crossovers 1 and 2, nesting habitat is available at the crest of the dune.

Replicated habitat construction and maintenance has occurred on Duxbury Beach via several methods since 1999. Habitat areas are 400 to 1000 square meters (478 to 1196 square yards) in size and are level with the surrounding beach, typically 0.3 meters (1 foot) above the extreme high tide. All former and current areas are located on the west side (bayside) of Duxbury Beach between High Pines and Plum Hill. These areas were chosen as they reduced the likelihood of broods crossing the road. In addition, these areas provide easy access to the bayside foraging habitat. Five habitat areas were most recently maintained in February 2019 and remain suitable for nesting in 2020.

Piping Plover Abundance and Productivity

Historically, less than 20 Piping Plover pairs have nested on Duxbury Beach. However, beginning in 2014, the number of nesting pairs has ranged from 23 to 28. Similarly, the number of chicks fledged has increased, apart from 2017. The Reservation strives to maintain a fledge rate above 1.24 chicks fledged/pair, and has been successful during 51% of nesting seasons since 1989. In recent years, productivity has peaked at 1.94 chicks fledged/pair in 2013 and 1.83 chicks fledged/pair in 2016.

Abundance and productivity of the Piping Plover population on Duxbury Beach for the years 2010 through 2019 are as follows.

*Table 1-1. Piping Plover abundance and productivity 2010 through 2019.*

<u>Year</u>	<u>Pairs</u>	<u>Chicks fledged</u>	<u>Productivity (chicks fledged/pair)</u>
2010	11	16	1.45
2011	12	19	1.58
2012	14	13	0.93
2013	17	33	1.94
2014	26.5	24	0.91
2015	25	30	1.20
2016	23	42	1.83
2017	28	11	0.39
2018	24	24	1
2019	28	46	1.64

Piping Plover Egg Loss

The primary causes of egg loss on Duxbury Beach are predation and overwash. Major predators on the site are Eastern Coyote, American Crow, and Red Fox. In 2018, 57% of nest losses (4 of 7) were attributed to predation, and in 2019, 25% of nest losses (4 of 16) were suspected or likely due to predation.

Table 1-2. Piping Plover egg loss due to predation 2011 through 2019.

<u>Year</u>	<u>Nests laid</u>	<u>Nests lost to predation (of total nests lost)</u>	<u>Percentage Loss</u>
2011	23	8 (of 14)	57%
2012	22	3 (of 11)	27%
2013	19	2 (of 2)	100%
2014	30	5 (of 8)	62%
2015	28	3 (of 6)	50%
2016	29	5 (of 10)	50%
2017	46	24 (of 39)	62%
2018	24	4 (of 7)	57%
2019	38	4 (of 16)	25%

The Reservation instituted a lethal predator management program in 2010, carried out by the United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service Wildlife Services (APHIS WS). Predator presence and impact has been variable since predator management was first instituted on Duxbury Beach. Crow predation has been low since crow removal began, with the exception of 2012, at zero to one instances of Piping Plover nest loss to crow predation each season (Table 1-3).

The inclusion of Eastern Coyote in the predator management program beginning in 2011 was based on the increase of suspected and known coyote predation on both plover and tern nesting, as well as the increase in tracks and sightings. Following this change to predator management in 2011, out of the 83 plover eggs laid by 12 pairs, 19 chicks fledged, resulting in a fledge rate of 1.58. This number is higher than the previous year's rate of 1.45 and well over the rate of 1.24 required to sustain the species. Coyote impact on nesting birds has remained high on Duxbury Beach since 2014 (Table 1.3).

While Red Fox impact on nesting birds was low from 2011 to 2016, there was a drastic increase in nest loss for both plovers and terns due to fox depredation in 2017 (Table 1-3). At the recommendation of APHIS WS, the Reservation voted to commence fox management in June of 2017. The Reservation plans to continue fox management efforts based on the high levels of loss in 2017.

From 2011 to 2019, there have been two instances of known nest predation events not caused by the three listed above. Common Grackle was deemed responsible for one nest failure in 2015, and in 2017 one nest was lost to skunk depredation. These two events account for two of the 58 nest losses attributed to known predators from 2011 to 2019. In 2019, Common Grackle was observed preying on Piping Plover chicks. Due to the levels of predation and number of grackle on-site, Common Grackle predator management was instituted during the 2019 season.

Table 1-3. Total Piping Plover nests lost (% of total lost to known causes) to American Crow, Eastern Coyote, and Red Fox, 2011-2019.

Year	Total Piping Plover nests lost (% of total lost to known causes) to American Crow	Total Piping Plover nests lost (% of total lost to known causes) to Eastern Coyote	Total Piping Plover nests lost (% of total lost to known causes) to Red Fox
2011	5 (33%)	2 (13%)	2 (13%)
2012	0	1 (10%)	1 (10%)
2013	1 (50%)	1? (50%)*	1? (50%)*
2014	0	4 (57%)	0
2015	1 (20%)	0	0
2016	0	5 (56%)	0
2017	2 (5.8%)	9 (26%)	12 (35%)
2018	0	0	4 (57%)
2019	0	3-4* (19%)	0-1*

\*Unknown if predation was due to fox or coyote – track indeterminate

Due to the narrow nesting habitat on the oceanside beach, overwash during storms and monthly high tides does occur. During 2019, Duxbury Beach experienced extremely high monthly tides, particularly during the incubation period in mid-May. The monthly high tide occurred concurrently with a mild storm with east winds. The high surf during this event served to overwash six nests. All six pairs renested and, of these six, five pairs successfully hatched chicks.

In 2019, a total of four Piping Plover nests were lost due to mammalian predation. Three nests were confirmed depredated by coyote, with another nest lost due to an undetermined canid. The tracks surrounding this nest loss were indeterminable due to weather conditions. This rate of predation is similar compared to 2018 though fox predation decreased while coyote predation increased. This was a substantial decrease compared to 2017 when 24 nests were lost to predators (Table 1-2). In addition, 14 chicks were believed predated by grackle, coyote, and fox. Coyote and fox tracks were common along the toe of the oceanside dune, traveling through the intertidal, and crossing over to the bayside beach. Flocks of common grackles were a regular presence on the beach and were observed harassing Piping Plover broods on numerous occasions. Common Grackle predation on Piping Plover chicks was observed at least once in 2019. It is possible the full impact of predator activity on Piping Plover chicks this season is an underestimate.

### 1.3 Other State-Listed Species

In addition to Piping Plover, state-listed Least Tern (*Sternula antillarum*) nest on Duxbury Beach from May to August each year. Least Tern typically nest on the oceanside of the site in distinct sub-colonies. From 2010-2019, Least Tern have typically nested in five areas of Duxbury Beach. This includes: the pedestrian boardwalk to the south end of the pedestrian beach; between Crossovers 1 and 2; between High Pines and Crossover 3; and south of Plum Hills to the Gurnet Guardhouse. In addition to these four areas, in 2014 terns nested north of



the Pavilion. In 2018 and 2019, Least Terns nested in two additional areas: north of the boardwalk on the pedestrian beach to the south end of the Caterers’ Lot at Duxbury Beach Park and south of the South OSV Poles to the north end of Plum Hills.

Ideal Least Tern habitat location is similar to that of the Piping Plover nesting habitat on Duxbury Beach: (1) oceanside beach from Duxbury Beach Park to the end of the driving beach south of the Crossover 3, and (2) south of Plum Hills to the Gurnet Guardhouse. Typically, at least one Piping Plover pair will nest within each Least Tern colony. The areas of oceanside habitat are fairly narrow with a sand-cobble substrate and sparse vegetation. The colonies are typically located below the crest of the dune due to the dense vegetation. In 2019, Least Tern were observing utilizing the dune crest and back dune area of the restored dune between Crossovers 1 and 2. Least Tern have not typically established colonies on the bayside of the site; however, it is believed that the artificial habitats for Piping Plovers may also create suitable nesting habitat for a small Least Tern colony.

*Table 1-4 Least Tern abundance and productivity 2010 through 2019.*

<u>Year</u>	<u>Pairs</u>	<u>Chicks fledged</u>	<u>Productivity Estimate*</u>
2010	107	-	Poor to Fair/Good
2011	53	0	None
2012	217	0	None
2013	133	-	Poor to Excellent
2014	57	-	Poor
2015	205	-	Fair
2016	151	31	Poor to Fair/Good
2017	196	0	None
2018	152	65	None to Good
2019	129	134	Fair to Excellent

\*Classifications defined by MA NHESP

Threats to Least Tern eggs and chicks are similar to that of nesting Piping Plovers on Duxbury Beach. According to the Mass Audubon 2017 Beach Nesting Summary Report, the largest causes of egg and chick loss for Least Tern in 2017 on Duxbury Beach were fox predation and overwash. Coyote and fox tracks were observed in the colony areas throughout the season, including tracks around recently lost nests and egg shells apparently depredated by crows.

Predator activity appeared to impact the Least Tern colonies on Duxbury Beach in 2018. Least Tern pair numbers increased in mid-late June at five of the six colonies, possibly due to the decreased coyote and fox activity. However, an increase in coyote, fox, crow activity at the north end of the beach beginning in mid-July likely caused high losses of eggs and chicks and resulted in zero productivity. Increased coyote and fox activity within the Second Crossover colony and Third Crossover colony also resulted in lower productivity, though still fair to good. The primary cause of Least Tern egg and chick loss in 2019 was predation by coyote, red fox, and peregrine falcon. Peregrine Falcons were observed frequenting the tern colonies between Crossover 1 and 2, and between High Pines and Crossover 3. The peregrines were mainly observed depredating recently fledged tern chicks. It is likely that the Least Tern nesting on Duxbury Beach have also benefited from the predator management program instituted in 2010.

## **2.0 Responsible Staff**

Duxbury Beach is a unique beach in many ways from its ownership to its management. As owner of Duxbury Beach, the Duxbury Beach Reservation has overall responsibility to ensure that the Endangered Species Program is a sound and well executed program. The Reservation works with the Town of Duxbury Police Department – Beach Operations Division to implement the program. The roles and qualifications of each group are outlined below.

### 1. Duxbury Beach Reservation

#### a. Executive Director, Cris Luttazi

Ms. Luttazi holds a BS in Marine and Freshwater Biology, as well as, a BS in Finance from Kingston University, London, England and Bridgewater State College, respectively. Ms. Luttazi is the Reservation’s first appointed Executive Director and has held the position since June 2017. Prior to her current appointment, Ms. Luttazi was employed with Mass Audubon Coastal Waterbird Program for six years and the Woods Hole Oceanographic Institution. Ms. Luttazi is the chief operating officer and controller of the corporation and reports to the Reservation’s President and the Board of Directors. Included in the duties and responsibilities of the Executive Director are leadership and management of the Reservation, inclusive of the Endangered Species Program.

#### b. Assistant Director, Brynna McGlathery

Ms. McGlathery holds a BS in Biology and Environmental Science from Tufts University. Prior to joining the Reservation as the Reservation Coordinator, Brynna worked as the Field Coordinator for the Mass Audubon Coastal Waterbird Program, as a shorebird technician for the Massachusetts Trustees of Reservations, and with the Rachel Carson National Wildlife Refuge in Wells, Maine, focusing on Piping Plover and Least Tern protection. Ms. McGlathery is responsible for the oversight of all facets of the Endangered Species Program on Duxbury Beach, coordinating the efforts of the Duxbury Beach Coastal Ecology Program and communicating with the Town of Duxbury Beach Operations Division. Ms. McGlathery is responsible for reporting to the Duxbury Conservation Commission as it relates to beach operations under Order SE 18-1198.

#### c. Chairman of the Duxbury Beach Reservation Technical Committee, Alan Vautrinot

Mr. Vautrinot is the chairman of the Duxbury Beach Reservation Technical Committee and has supported the Reservation by managing regulations related to shorebird management since 1991. Mr. Vautrinot holds a Massachusetts surveyors license and is partner of Vautrinot Land Surveying, Inc.

#### d. Coastal Ecology Program (CEP) Coordinator, Bradford Bower

Mr. Bower holds a BS in Ecology, Evolution, and Behavior from the University of New Hampshire and a Masters in Environmental GIS from Unity College. Prior to working with the Reservation, Bradford worked as the Lead Monitor Supervisor of the Duxbury Beach Endangered Species Program under the Town of Duxbury. Previously, Bradford worked in coastal waterbird monitoring and protection for USFWS at Maine Coastal Islands NWR in Maine and for the Mass Audubon Coastal Waterbird Program. The CEP Coordinator reports directly to the Assistant

Director and is required to communicate routinely with the Town of Duxbury Beach Operations Division. The CEP Coordinator is responsible for the daily operation of the Duxbury Beach Endangered Species Program, including overseeing the Shorebird Monitors, Monitor Supervisors, and Field Technicians.

e. Field Technicians (3)

Three seasonal Field Technicians are employed by the Reservation from late March through August to implement monitoring, data collection, and reporting for nesting protected coastal waterbirds, including Piping Plover and Least Tern, on Duxbury Beach. Field Technicians are responsible for locating and identifying protected species nesting and foraging areas; collecting nesting data, including spatial data; monitoring pair, clutch, and brood status; communicating changes in location or behavior of protected species as necessary to CEP Coordinator, Shorebird Monitors/Monitor Supervisors, and Assistant Director; working with Shorebird Monitors to ensure that fencing and signage provide adequate protection for nests and chicks; assisting in the training of Shorebird Monitors; locating clutches and chicks prior to the opening of the beach to non-essential vehicles; interacting with the public to provide education about the protected species nesting on Duxbury Beach; and submitting nesting summary data to NHESP.

The Field Technicians reports directly to the CEP Coordinator and are required to communicate routinely with the Monitor Supervisors, Assistant Director, and Beach Operations staff.

f. Monitor Supervisor (3 positions)

The Reservation employs three Monitor Supervisors from late April through August to perform supervisory and administrative work in the management of the Endangered Species Program. The Monitor Supervisors assist the CEP Coordinator in initial and continued training of Shorebird Monitors. In addition, the Monitor Supervisors work to schedule and place monitors for protection of Piping Plover and Least Tern chicks. The Monitor Supervisors assist as needed in locating clutches and chicks prior to opening the beach and help Shorebird Monitors locate broods as necessary throughout the day. As necessary, the Monitor Supervisors communicate with Town of Duxbury Beach Operations staff and the general public regarding motor vehicle, pedestrian, or dog closure areas on Duxbury Beach.

The Supervisors reports directly to the CEP Coordinator and are required to communicate routinely with the Field Technicians, Assistant Director, and Beach Operations staff.

g. Shorebird Monitors

Approximately 30-40 Shorebird Monitors are employed from May through August by the Reservation to assist in the protection of the listed shorebird species nesting on Duxbury Beach, including Piping Plover and Least Tern. Monitors are responsible for collecting behavioral data on chicks and broods, including location and movement of listed shorebird species. In cases where a monitor is deemed to have adequate experience and has a proven track record of being a qualified shorebird monitor, the Monitor Supervisors may use such monitors to confirm chick location and number prior to opening the beach. Monitors are also responsible for observing and recording environmental data, predator presence, and avian community composition. Monitors interact with the public to provide information about beach rules and regulations and to answer questions as necessary in a polite and professional manner. Shorebird Monitors report directly to the Monitor Supervisors. Monitors are required to communicate routinely

with the Field Technicians and the CEP Coordinator. Monitors are required to attend a training held by the Reservation at the commencement of the monitoring season. This training includes plover and tern nesting biology and conservation efforts, chick monitoring protocols, data collection, beach rules and regulations, public interaction protocols, focal species and predator tracking, and special projects. In addition, the monitors receive ongoing in-field training to ensure classroom instruction is carried out correctly. Throughout the summer, monitors receive additional classroom training as needed as well as informal support while on the beach.

## 2. Town of Duxbury Police Beach Operations Division

- a. The Duxbury Police Department has full-time and seasonal staff that are responsible for managing the safety of the public on Duxbury Beach and supporting and upholding the rules and regulations of the Duxbury Beach Endangered Species Program. Chief of Police Stephen McDonald and Deputy Chief Michael Carbone have executive responsibility for the Duxbury Police Department including the enforcement of all applicable laws and regulations relative to the use of Duxbury Beach.
- b. Lt. Lewis Chubb is the Administrative Supervisor for the Beach Operations Supervisor and participates in policy and operational decisions relative to the Beach Operations Division.
- c. Beach Operations Supervisor, Sergeant Friend S. Weiler Jr.

Sgt. Friend Weiler holds a Master's Degree in Criminal Justice from Northeastern University, as well as, a BA in Sociology from Connecticut College. He has been with the Duxbury Police Department since 1995. Sgt. Weiler has held many positions within the department including Juvenile Detective, Traffic Safety Coordinator and School Resource Officer. He is currently the Professional Standards and Training supervisor, the Firearms Licensing Officer and Beach Operations Supervisor.

### d. Police Officers

The Police Officers assigned to Duxbury Beach are responsible for patrolling the beach and enforcing the conditions and regulations of the Endangered Species Program, including supporting the Shorebird Monitors and Monitor Supervisors during road crossings. These Officers report directly to the Beach Operations Supervisor.

### e. Beach Rangers

Beach Rangers are present on the beach during operating hours to control access, oversee parking, and enforce beach rules and regulations. The Beach Rangers will receive training related to Endangered Species management and will assist in outreach, informing visitors of rules and regulations related to nesting birds, and answering questions related to bird activity and management.

## **3.0 Beach Management Plan**

Duxbury Beach offers a variety of activities related to conservation and recreation, and beach goers have at times disparate expectations that require oversight from two organizations, Duxbury Beach Reservation and Town of Duxbury Police Department. In addition, the variety of uses means that visitors are spread throughout the site, and thus intensive and well-founded management is critical.

### 3.1 Recreational Activities

#### Over Sand Vehicles (OSV)

Over-sand vehicle use is permitted on Duxbury Beach year-round with the purchase of an over-sand driving permit from the Town of Duxbury. Driving on the beach is restricted to certain areas and to particular times of day and year, depending on protected species nesting and other factors, such as maximum number of vehicles allowed or unusually high tides. The over-sand permit use hours are dependent on the time of year and were adjusted in 2019 (Figure 3-1).

Table 3-1. Over-sand permit use hours on Duxbury Beach for the 2020 season.

<u>Time of Year</u>	<u>Crossover 1</u>	<u>Crossover 2</u>	<u>Beach Hours</u>
Summer Season (Memorial Day Weekend-Labor Day Weekend)	Open	Open	8:00-22:00 Sunday-Thursday 8:00-23:00 Friday-Saturday (Holiday Sundays/Holidays)
Early Fall Season (Tuesday after Labor Day-September 30)	Open	Open	8:30-21:00
Late Fall Season (October 1-October 31)	Open	Closed	8:30-15:30 (Sun-Thurs) 8:30-19:30 (Fri-Sat)
Winter Season (November 1-March 31)	Open	Closed	8:30-15:30
Early Spring Season (April 1-April 30)	Open	Closed	8:30-15:30 (Sun-Thurs) 8:30-19:30 (Fri-Sat)
Late Spring Season (May 1-Thursday before Memorial Day)	Open	Open	8:30-21:00

Further restrictions may be required for access management or public safety. While unfledged Piping Plovers are present, Crossovers 2 and 3 are closed at 20:00 (if open prior). If no unfledged Piping Plover chicks remain on the beach, Crossover 2 may be open until 22:00/23:00.

When OSVs became popular on the beach, the Reservation mapped out an area of the beach that could have supported over 1000 vehicles. The length of the beach deemed suitable for OSV use extends for approximately 3,322 meters (3,633 yards), starting near the first pedestrian crossover south of the Powder Point Bridge and extending to a location approximately 76 meters (83 yards) south of Crossover 3. However, in order to protect existing shorebird nesting habitat and the barrier beach system, the Reservation chose to restrict the maximum number of vehicles allowed on the beach to 500. The Reservation further decreed that half this number, or 250

spaces, would be reserved for non-resident OSVs. The number of OSVs allowed decreases equally for residents and non-residents as Restricted Areas for nesting birds increase.

No non-emergency vehicles are permitted within Restricted Areas (front beach and bayside), which are placed north and south of brood ranges and tern nursery areas (for further discussion of Restricted Areas see page 20). Non-emergency essential vehicles related to the Endangered Species Program may pass through Restricted Areas (front beach and Bayside) with an escort provided by Duxbury Beach Reservation staff.

### Swimming

There are two lifeguarded beaches on Duxbury Beach – one located on the oceanside of Duxbury Beach Park and the second on the oceanside beach east of the Powder Point Bridge. Swimming outside of these areas is without lifeguard supervision.

### Horseback Riding

Horseback riding is permitted on Duxbury Beach with a permit purchased from the Town of Duxbury. From October through April, riding is permitted daily from sunrise to sunset. During May through September, riding is permitted sunrise to 09:00 and 18:00 to sunset, weekdays only. Horseback riding is not allowed in Closed and Restricted Areas used by nesting Piping Plover adults and broods or in Least Tern nurseries. Shorebird Monitors and Beach Operations staff help to enforce this rule during patrols of the beach.

Horseback riders must respect vehicle speed limit restrictions, including those put in place for protected species crossings, and they must stop as directed by Beach Operations staff or Endangered Species Program staff if a crossing occurs.

### Shellfishing

Shellfishing access is allowed on Duxbury Beach with a permit purchased from the Town of Duxbury. Motor vehicle access for this purpose must comply with all beach motor vehicle regulations. Shellfish access points are located along the bayside of Duxbury Beach and are accessible to permit holders at all times of day outside of the shorebird season. Bayside access is completely closed to all vehicles two days prior to the estimated first hatching date and remains closed until all plover and tern chicks have fledged. Chains are in place at vehicle entrances on the bayside. The Duxbury Harbormaster Department is responsible for sending out notification to all commercial and recreational shellfishermen on the bayside of Duxbury Beach. Duxbury Beach Operations staff are responsible for enforcing the closure.

### Bike Riding

Bike riding is permitted on Gurnet Road without a beach permit year-round. Bicyclists must respect speed limit restrictions, including those put in place for protected species crossings, and they must stop as directed by beach staff if a crossing occurs. In order to cross a Restricted Area on the beach, bicyclists must dismount and walk bikes through the area below the fencing extending perpendicular to the shoreline and be guided around foraging broods if necessary by monitors. Beach staff help to enforce this rule during patrols of the beach.

### Beach Walking

Beach walking is encouraged on Duxbury Beach and is permitted year-round. Walkers must stay out of all dune, vegetated, marsh grass, posted bird or wildlife, and fenced areas. Walkers are not permitted inside symbolically fenced Closed Areas that are located around ideal habitat and plover pair and tern colony nesting territories. Walkers are allowed to cross through oceanside and bayside Restricted Areas below the perpendicular fencing

and may be escorted around broods by Shorebird Monitors. Beach staff help to enforce this rule during patrols of the beach. When accessing the oceanside or bayside beach, walkers must use designated crossovers and pathways.

### Kiteboarding

Kiteboarding is permitted off of Duxbury Beach on the bayside but outside of Restricted Areas and not within 200 meters (219 yards) of nesting Piping Plover adults or unfledged chicks. Kiteboarders use vehicle pull-offs to park and access the water and must have an over-sand driving permit. The primary access point is at High Pines. Pull-offs within Restricted Areas established due to chick locations are closed to all vehicles, including kiteboarders. Landing is not permitted within Restricted Areas or within 200 meters (219 yards) of any nesting activity.

### Boating

Boating is not permitted within 46 meters (50 yards) of the oceanside beach except in designated vessel access areas. The designated area on the oceanside beach is located at the far southern end of the OSV parking area near Crossover 3. However, this area is closed to all vessels in the event of chick activity within 100 meters (109 yards). Beach staff help to enforce this rule during patrols of the beach. On the bayside, boating is not permitted within 46 meters (50 yards) north or south of the Powder Point Bridge or within any Restricted Areas. Vessels in designated areas may anchor and access is at steerage speed only. Vessels include motorboats, sailboats, sailboards, paddleboards, kayaks, jet skis, etc.

### Kites and Drones

Use of kites is prohibited on the beach within 200 meters (219 yards) of territorial or nesting adult and unfledged juvenile Piping Plovers and Least Terns from April 1 until no unfledged chicks remain on the beach. Use of kites or drones is not permitted north of the North OSV poles from Memorial Day through Labor Day. The use of drones or unmanned aerial vehicles launched, operated, flown over, or retrieved on Duxbury Beach property is not permitted with the exception of flights specifically approved by Duxbury Beach Reservation, Inc., Duxbury Police Beach Operations Division personnel, and the Marshfield Airport.

## **3.2 Parking and Roads**

### Parking Lots

Several parking lots are located on Duxbury Beach or adjacent to the beach and are available year-round or seasonally. Below is an overview of parking lots, north to south.

- I. Northern Lot (Lagerstedt Lot): The Northern Lot is located on the east side of Gurnet Road at the northernmost end of Duxbury Beach. This gravel lot is kept gated when not in use for event parking or as overflow parking for non-resident OSV permit holders unable to access the front beach due to vehicle number restrictions. Overflow parking is managed by Town of Duxbury Beach Rangers.
- II. Duxbury Beach Park: Three parking lots are located at Duxbury Beach Park. A gravel parking lot is located on the west side of Gurnet Road to the north of the Pavilion building. Across the road from this lot is a paved parking area. A second gravel parking lot is located on the east side of the roadway south of the Pavilion, referred to as the "Caterers' Lot." These three parking lots are gated and locked from Columbus Day through Memorial Day, except for events. From Memorial Day through Labor Day, the

operators of the Pavilion, manage the parking areas based on daily fees set by the Reservation for visitors without seasonal parking permits. In the event that the Northern Lot is unavailable for overflow non-residents, part of the Duxbury Beach Park eastern lot may be used for this purpose, provided Beach Rangers are available. Access will occur via the northern gate.

- III. Town Parking Lot: Town resident parking lots are located immediately north of the east end of Powder Point Bridge. The western lot is gravel and the eastern lot is paved. These parking lots are open year-round, dependent on weather and construction work. Parking in these lots is restricted to vehicles with a resident parking permit. Parking lots are managed by the Town of Duxbury Beach Operations staff. Lots are open 08:00 to sunset from May through August and 08:30 to 15:30 from September through April.
- IV. South Resident Lot: A small paved parking lot is located immediately south of the Powder Point Bridge Guardhouse on the west side of Gurnet Road. The South Lot is open 06:00 to 23:00 May through August and 06:00 to sunset September through April. This lot operates under the same rules as the larger town lots on the north side of the bridge.
- V. West End Lot: A town parking lot is located on the west side of Powder Point Bridge. This lot is open year-round to all visitors. No restrictions apply.

#### Vehicle Pull-offs

Eleven vehicle pull-offs are located south of the Powder Point Bridge along Gurnet Road on the east and west side. The pull-offs provide space for vehicles to turn around and provide parking for 35 vehicles with over-sand parking permits year-round. If a pull-off falls within a Restricted Area, the pull-off is closed off with symbolic fencing, cones, and signs. In addition, if a section of the roadway is closed to recreational vehicles, all pull-offs within the closed section are closed off with symbolic fencing, cones, and signs. While unfledged Piping Plover chicks are present south of High Pines, all vehicle pull-offs between Crossover 2 and the southern property line are closed to recreational vehicles.

#### Roads

Gurnet Road runs from mainland Duxbury (immediately south of Marshfield) the length of the peninsula in Duxbury, becoming King Arthur Road in Plymouth before reaching Gurnet Point. The improved gravel roadway is paved in small sections near the Town of Duxbury resident parking lots but is primarily gravel. The roadway provides access for residents and visitors to Gurnet-Saquish, access for Duxbury residents and non-residents with OSV permits to the beach, and shellfishing access to tidal flats. Those without OSV or shellfish permits or those who are not on a homeowner or visitor list for access to Gurnet-Saquish are not allowed south of the Powder Point Bridge Guardhouse at the east end of the Powder Point Bridge. Depending on Piping Plover chick activity, recreational vehicles (holding OSV permits to the beach) are not permitted to drive on certain sections of roadway. This is enforced by Town of Duxbury Beach Operations staff stationed at the Powder Point Bridge Guardhouse, Crossover 1 and Crossover 2 during open hours. In addition, notices are posted at the Guardhouse, on the Town website, and social media regarding roadway closures for recreational vehicles.



### 3.3 Beach Cleaning and Refuse Management

The Reservation strives to present a clean, well run beach. To ensure public safety, avoid attracting predators, and minimize damage that large debris can cause to fencing, a thorough refuse management plan is utilized. As Duxbury Beach has several operators throughout the year responsible for distinctive areas, there is a multifaceted approach to refuse management on-site. The Reservation oversees all aspects of the Beach refuse program with the support of the Facilities and Maintenance Committee.

Regular refuse management on Duxbury Beach includes parking lots, roadways, and oceanside and bayside beaches. With respect to the town parking lot at the west end of the Powder Point Bridge and the intensively used town resident beach parking lots at the east end of the bridge, trash removal during the week is the responsibility of the Duxbury Department of Public Works (DPW). These areas are equipped with large trash barrels that are serviced daily during the summer and as needed at other times. Signs direct that all trash be placed in the barrels.

Removal of small land and marine debris in the area of the Lagerstedt Lot and Crossovers 1, 2, and 3, including Gurnet Road, is performed by Reservation employees or contractors on a weekly basis from April through Labor Day and monthly during the rest of the year. Trash removal occurs outside of Closed and Restricted Areas.

The parking lots and food concession at Duxbury Beach Park are open to the general public. This area is also equipped with trash barrels and the operators remove all trash from both the concession area and the adjacent beach on a daily basis. They also remove trash in the vicinity of the town resident parking lots on the weekends when the DPW is not on duty.

In addition to daily and weekly refuse management protocols, the Reservation organizes two site-wide, volunteer-based clean-ups: the Duxbury Beach Coastal Sweep takes place during a weekend in September/October, post nesting season, each year and is managed by Reservation staff and volunteers. Prior to the nesting season, a Duxbury Beach "Spring Sweep" includes a site-wide clean-up run by Reservation staff and volunteers. The timing of the clean-up takes into account the arrival of nesting shorebirds and the possibility of spring storms that may bring in additional debris. Typically, the clean-up takes place during the second half of March. Volunteers are instructed on disturbance avoidance measures if plovers are on-site.

The Reservation employs a private Maintenance Team that works throughout the year. The Maintenance Team is responsible for a number of projects, including removal of large debris accumulated due to storms or degradation of equipment on the site (broken posts, fencing, etc.). Removal of large debris is dependent on location and time of year, taking into account shorebird nesting activity. Large debris that requires the use of a vehicle or is located within 100 meters (109 yards) of plover or tern activity (March 15 to September 15) is reported to the Assistant Director, who then seeks approval to remove from the NHESP.

Beach raking does not occur on Duxbury Beach regardless of season and location. Limited removal of wrack by hand may occur on the Resident Parking Beach and Duxbury Beach Park. In the event of excessive wrack public health officials may deem it necessary to clear wrack from the beach for public safety reasons. Paved parking lots are swept to decrease dust annually.

### 3.4 Rules and Regulations

The Duxbury Beach Rules and Regulations vary by section of the beach as well as time of year due to the presence of protected shorebird species and increased human use. Upon purchasing a beach permit through the Town of Duxbury, recreationalists are provided with a paper copy of the Duxbury Beach Guide and Rules. The Guide outlines all rules and regulations enforced on the beach. The Guide specifically discusses the Habitat Conservation Plan, Piping Plover behaviors, and how beachgoers must behave while operating vehicles to minimization potential risk to the birds. Duxbury Beach Guide and Rules provided in Attachment A.

#### General

1. All beach users must comply with all federal/state and local laws, terms, conditions, policies and the request or instructions of the patrolling Police Department personnel, Beach Rangers, Endangered Species personnel, or other authorized agencies or departments.
2. When endangered species are present on Duxbury Beach, no person, their animal, or their vehicle shall disturb or attempt to disturb the endangered species in any way and/or fail to adhere to the direction and instruction of the patrolling Police Department personnel, Beach Rangers or other authorized agencies or departments.
3. Drinking of alcoholic beverages is prohibited.
4. Dogs must be leashed and under the immediate and effective control of their handler at all times (see also Dog Regulations below).
5. No sand, stone, vegetation, salt marsh hay, seaweed or other material may be removed from Duxbury Beach. Erosion control fencing, access fencing and cabling or signs shall not be damaged or removed.
6. Store and discard trash, especially food scraps properly. All beach refuse must be removed by the beach user. Littering and dumping of household trash are prohibited. Glass containers are not allowed on beach property. Trash receptacles for incidental beach trash are available seasonally at the resident parking lot. Otherwise, beach policy is “carry-in, carry-out” at all times.
7. Bonfires and campfires are prohibited. Bonfires and campfires are prohibited. Small cooking fires in a metal container are permitted but only on the ORV portion of the beach. No materials may be added to a fire within one hour prior to beach closing. All fires must be extinguished with water within a half hour prior to closing, and all fire remnants must be removed from beach property by the beach user.
8. Overnight camping is prohibited. Unauthorized vehicles access is prohibited.
9. Fireworks are illegal and prohibited on beach property.
10. Loitering in the beach parking lots is prohibited after beach closing.
11. Beach functions or group gatherings of 20 or more persons, or any other special event or research, require a special permit from the Police Department and notification given to the Duxbury Beach Reservation. Applications for permits shall be received at least one week prior to the proposed function.
12. Public demonstrations on beach property are prohibited.

## Motor Vehicle Regulations

1. All vehicles on beach property must carry a current copy of the Duxbury Beach Guide and Rules.
2. All vehicles parked on Duxbury Beach property must visibly display a current Duxbury Beach sticker. Vehicles parked in any parking area at the east end of the Powder Point Bridge must visibly display a resident or rental resident beach lot sticker from Memorial Day to Labor Day. All vehicles driving in or parked in over-sand areas or parked in roadside pull-offs south of the Powder Point Bridge must visibly display a current resident or nonresident over-sand permit appropriate for year-round or off-season use. Parking permits shall be affixed to the windshield, below the rearview mirror, and never in a tinted area. Unauthorized parking in all roadways, fire lanes, or vehicle crossovers is prohibited at all times. There are three types of Duxbury Beach permits valid during the shorebird nesting season;
  - a. Resident Beach Lot Permit for use of paved parking lots (valid April through March)
  - b. Resident Over-sand Permit for four-wheel drive (4WD) vehicles in paved parking lots, over-sand areas, and roadside pull-offs, (valid April through March)
  - c. Non-Resident Over-sand Permit 4WD vehicles in over-sand areas and roadside parking areas, (valid April through March)
3. Permits are valid only for the vehicle for which they were purchased. The permit registration number must match the vehicle registration. Permits are nontransferable. (Original permit must be returned in order to receive a replacement due to sale of vehicle, windshield replacement, etc.)
4. All other vehicles are prohibited, including motorcycles, minibikes, minicars, snowmobiles, paraglides, ATVs and ATCs (except when necessary for official use). No airplanes or helicopters are permitted to land on Duxbury Beach except in an emergency.
5. All parking is on a first come, first served basis. When parking capacities are reached, vehicle access restrictions will be imposed. Further restrictions may be imposed on the number of vehicles permitted on the beach properties at one time for public safety, access management and/or protected species management.
6. All off-road vehicles must have 4WD and the proper tire pressure for beach conditions (15PSI). All off-road vehicles must be properly equipped before they are permitted on the beach, and. All OSVs must be properly equipped before they are permitted on the beach.

Vehicles may be inspected for the following equipment at any time. Vehicles lacking this equipment or tire pressure may be cited and/or refused entry for any missing items:

- a. Shovel
  - b. Tow rope, tow strap, or chain
  - c. Spare tire, jack, and 18 inches square plywood support pad
  - d. Tires that are properly pressurized for beach conditions
7. Resident Parking Area hours (weather permitting) are:
    - North Lot: 08:00 to Sunset (Seasonal) September through April 08:30 to 15:30 (Off-Season)

- South Lot: 06:00 to 23:00 September through April 06:00 to sunset (Off-Season)
8. The over-sand permit use hours vary depending on season (Table 3-1). Further restrictions may be required for access management or public safety. During May through September, Crossovers 2 and 3 are closed at 20:00 (if open prior) while unfledged Piping Plover chicks are present or Least Tern chicks are within 100 meters.
  9. Driving must be confined to designated routes and never in the water and never on or over dunes, vegetated areas, marsh grass, posted areas, or fenced areas. Vehicles shall travel in established tracks. Vehicles shall park perpendicular to water's edge in an organized fashion in a manner that will not interfere with the established track or traffic flow. Parked vehicles must move if instructed by Police Department personnel at any time. Vehicles driving off the beach shall have the right of way. Vehicles are not allowed in pedestrian, mudflat/shellfish, or wildlife areas. No vehicle shall travel or park within 3 meters (10 feet) of a sand fence or symbolic string fence on the ocean side of the beach.
  10. All vehicles must be operated for the safety and regard of the operator, vehicle occupants, pedestrians, protected species and wildlife, and beach resources. Maximum speed on the Powder Point Bridge, vehicle turnarounds, paved parking areas, vehicle crossovers, and in designated over-sand areas is 10 mph, conditions permitting; on Gurnet Road, the maximum speed is 15 mph, conditions permitting. In any protected species area, the maximum speed shall be reduced to 5 mph, and traffic may be further restricted or stopped by the Police Department personnel or Duxbury Beach Reservation personnel for listed species protection and management.
  11. All persons must ride within the confines of any motor vehicle and must be seated. Riding on fenders, tailgate, or roof, or standing in the vehicle is prohibited.
  12. The roadway over the leased portion of the beach (Gurnet Road) to Gurnet Gate is for use by OSVs only. All Gurnet-Saquish traffic must use the roadway.

Any dog on beach property must be leashed at all times and under immediate and effective control of its handler. NOTE:

#### Dog Regulations

From September 15 through April 1, dogs are permitted as listed under the Town of Duxbury dog regulations. Dog walking is not permitted in vegetated areas or fenced areas year-round.

The following rules shall be in effect on Duxbury Beach properties from April 1 to September 15.

1. Dogs are prohibited from the front beach, known as the Resident Beach, south to the poles delineating the start of the over-sand beach, April 1 to September 15.
2. Dogs are prohibited from the bayside beach north of the Powder Point Bridge adjacent to the Resident Parking Lot from April 1 to September 15.
3. Dogs and their handlers are prohibited from all dunes, vegetation, marsh grass, posted bird or wildlife areas, and all Restricted Areas.

4. Dogs and their handlers are prohibited from disturbing any endangered species or wildlife on Duxbury Beach. Dogs are not permitted to pass through Restricted Areas on the oceanside or bayside beach or dunes.
5. A dog on Duxbury Beach properties shall be at all times leashed and under immediate and effective control of its handler. NOTE: "Immediate and effective control" is determined by Police Department personnel.
6. Any person wishing to take a dog onto Duxbury Beach properties shall register with the Town of Duxbury and obtain a permit. Registration and permits will be available at the Duxbury Town Hall. The permit must be carried by the handler of that dog at all times while the dog is on Duxbury Beach properties.
7. If in accordance with all rules and regulations, dogs are allowed on the Duxbury Beach properties between the hours of 08:00 and sunset, unless these hours are amended by action of the Duxbury Police Department. Dogs are prohibited on Duxbury Beach properties between the hours of sunset and 08:00.
8. Unless specifically amended by these rules or, if applicable, by action of the Duxbury Police Department, all other Duxbury, state or federal Dog Control Regulations shall continue to apply. These include regulations under the "Special Dog Regulations Contained within the General Beach and Motor Vehicle Regulations" pamphlet, Section 7.1 of the General By-laws of the Town of Duxbury, and Article 37 of the 2002 Duxbury Annual Town Meeting.
9. Dog handlers are required at all times of the year to remove droppings from the Powder Point Bridge, beach parking lots, and all beach areas and dispose of droppings in provided trash receptacles or otherwise remove them from beach property.
10. Any violation of these Rules and Regulations or Duxbury General By-Laws or other federal/state laws may result in non-criminal and/or criminal process or provisions found in the Duxbury General By-Laws involving the revocation of the dog permit for the remainder of the season. If a dog permit is revoked, such revocation shall be recorded at the Duxbury Town Hall, and the owner's immediate family will not be eligible to re-apply for another permit until the following year.

#### Duxbury Beach Park

The following are not permitted on Duxbury Beach Park:

1. Drinking of alcoholic beverages is prohibited.
2. Fires of any type are prohibited.
3. Horses are not permitted.
4. Dogs are not permitted from Memorial Day through Labor Day.
5. Vehicles are not permitted off of the parking lot or roadway.

### 3.5 Law Enforcement

The Town of Duxbury employs Police Officers and Beach Rangers who are responsible for enforcing Duxbury Beach rules and regulations, as well as documenting and reporting violations of the federal and state Endangered Species Acts to the appropriate enforcement agency. They are responsible for enforcing traffic regulations on-site, including parking, speed limits, OSV beach use and access, and traffic restrictions during brood crossings. They are responsible for stopping OSVs from queuing on the back roadway prior to the beach opening and escorting OSVs to the open Crossovers upon opening. Duxbury Beach is patrolled 12 months a year. On weekends a maximum of seven enforcement staff are present on the beach, and on weekdays a minimum of four are present.

Police enforcement staff patrols on Duxbury Beach are as follows throughout the year:

- May through September \*
  - Monday through Thursday 07:00-22:30
  - Friday through Sunday 07:00-23:30
- October
  - Monday through Thursday 08:30-16:00
  - Friday through Sunday 08:00-20:00
- November through January 08:00-16:00
- February 08:00-16:00
- March 08:00-16:00
- April 08:00-16:00

\*During the height of the season when OSV's are expected to begin queuing prior to 07:00 the Police Department will use regular patrol staff to regulate the queue and prevent OSV's from traveling unescorted south of Powder Point Bridge prior to the opening of the beach.

The team of four to seven personnel is responsible for patrolling the beach. During the season, Crossover 1 is open until 22:00/23:00 and Crossover 2 closes at 20:00. Officers and Rangers are responsible for ensuring that OSV operators have access to Crossover 1 (that is, they do not have to cross a Restricted Area) beginning at 20:00 when Crossovers 2 and 3 are closed. A Police Officer or Beach Ranger is stationed at Crossover 1 from 20:00 to 22:00/23:00 to stop non-essential traffic traveling south. From October through April, Police Officers and Beach Rangers are responsible for patrolling the beach and opening and closing the gates to the front beach. Weather and tide dependent, the beach is open to vehicles daily from 08:00 to 15:30 via Crossover 1.

Due to the unique geographical location of Saquish and Gurnet Point, the Plymouth Police Department often seeks mutual aid from the Duxbury Police Department when responding to calls for service there. Essential vehicles have the right to access Gurnet-Saquish properties and include vehicles carrying property owners, their guests and invitees, service and repair personnel, fire, police, and other emergency vehicles. Duxbury Police Units will respond under mutual aid to Gurnet-Saquish upon the lawful request of Plymouth Police Department.

Duxbury Police Units will respond to Gurnet-Saquish in cases of reported life-threatening medical emergencies upon the request of Plymouth emergency personnel.

### **3.6 Other Operations**

Beach functions or gatherings of 20 or more persons, or any other special event or research, require a special permit from the Police Department. After receiving the permit application, the town is responsible for submitting event information to Duxbury Beach Reservation for approval by the Executive Director. Applications for permits shall be received at least one week prior to the proposed function. Those attending a function must follow the rules and regulations of the beach, including vehicle rules. They must also respect all protected species signage and closed and Restricted Area fencing. Any groups or individuals holding an event must work with the Town of Duxbury and Duxbury Beach Reservation staff to ensure event details are in compliance with all federal, state and local law, terms, conditions, policies and the request or instructions of the patrolling Police Department personnel, Endangered Species personnel, or other authorized agencies or departments.

Fireworks are illegal and not permitted on Duxbury Beach and do not take place on the beach year-round. Once a year, a Town of Duxbury-sponsored bonfire celebration may take place on the oceanside beach at a point between the resident parking lot and north to Duxbury Beach Park after the close of the shorebird season. A limited number of private events may occur at Duxbury Beach Park during the year. Locations and scheduling vary based on plover and tern activity. Events may take place in the “Caterers Lot”, the Duxbury Beach Park parking lot or the Duxbury Beach Park overflow lot on the west side of Gurnet Road. All events during the nesting season occur in the western lot to ensure no disturbance to nesting activity. Event organizers are informed prior to booking that events may be moved or cancelled depending on bird activity. All event operations are performed in conjunction with Duxbury Beach Reservation to ensure appropriate protocols are followed.

In addition, in May and June educational programming, typically for schools, takes place on the ocean and bayside beaches near the resident parking lot. Camp programs also visit the site occasionally during the summer season.

### **3.7 Listed Species Monitoring and Management**

#### Fencing and signage

Fencing on Duxbury Beach is extensive and varied depending on purpose and audience (vehicle versus pedestrian). Protection efforts are flexible and responsive to ensure that as nesting locations shift and brood range moves or expands, protection adapts accordingly. Signage notifying beachgoers of protected areas and certain beach rules (such as dogs and speed limits) are plentiful and enforced by the presence of enforcement and monitoring staff.

Permanent “symbolic fencing” is in place on the beach year-round, consisting of wooden posts approximately 10 inches in diameter and 4 feet above ground are placed every 15 meters (16 yards) parallel to the dune to protect the dune and vegetation from vehicles and as a visual deterrent to people. Sand fencing exists along

much of the beach to limit pedestrian and vehicle incursion on dunes. Sturdy drift fence serves a similar purpose. Although both are possible to climb over, they serve as a visual deterrent to entering the dunes, and in some cases, shorebird nesting habitat. Sand fencing is also used along vehicle and pedestrian crossovers over the dune and restricts movement of vehicles and pedestrians into vegetation and nesting habitat. Post and cable fence, sand fence, split rail fence, and boulders are placed along roadways and parking lots to prevent pedestrians and vehicles from walking or driving over dunes, thus protecting the dunes, vegetation, and nesting. This fencing serves to physically prevent vehicles from driving over shorebird habitat and sensitive dune areas.

Seasonal symbolic fencing, consisting of rebar posts and orange twine, is erected the last week of March each season to proactively protect potential habitat. Proactively fenced areas are located along the oceanside beach from Duxbury Beach Park to the end of the driving beach south of Crossover 3, from the path at Gurnet Guardhouse north to Plum Hills, and around the bayside artificial habitats. As Field Technicians identify new plover or tern nesting areas, they erect new areas of symbolic or extend existing fencing. Fencing is also extended when nests are laid close to the fence line to provide a larger buffer from disturbance. This wider buffer extends 50 meters (54 yards) north and south of the nest. Closed Area signs are placed on every other post, and speed limit signs are placed every 15 meters (16 yards). These symbolically fenced areas are referred to as "Closed Areas." Closed Areas may also be erected in areas of high recreational use in case of brood use and for dune protection. Closed Areas are expanded if deemed necessary due to evidence of adult plover disturbance, or the need for additional cover or foraging opportunities for plover chicks.

In addition to Closed Areas that provide protection for nests and incubating adults, signage is put in place to prevent parking within 50 meters (55 yards) north and south as well as seaward of active nests. "Restricted Area" fencing is erected one to two days prior to the estimated hatch date to expand the protected areas for chicks. Restricted Areas are placed north and south of the brood range and include the entire side east to west (oceanside to bayside beach), provided that, vegetation or topography of the beach makes habitat east to west accessible. If a brood is adjacent to an OSV area, the Restricted Area is set at 200 meters north and south of the brood range for the first week after hatching as brood activity has not been established. The same is true for broods that are found post hatching when the nest was not identified. Following the first week of observation, Restricted Area fencing may be reduced to 100 meters (109 yards) adjacent to the OSV area. Restricted Areas within the pedestrian only zone will be placed in areas of high use to reduce disturbance. The size of such Restricted Areas may vary depending on brood range and location on the beach.

In cases where nests or brood ranges are within 1000 meters of Crossover 1 and Crossover 1 is open to OSV access, special distances apply in order to account for nighttime use. One to two days prior to the estimated hatch date, Restricted Area fencing is established 500 meters from the nest in the direction adjacent to the nighttime OSV area (the opposite side is established based on whether there is daytime OSV use or not). The 500-meter buffer is maintained for days 0-1 and increased if the brood ranges further than anticipated. From days 2 until fledging, the Restricted Area adjacent to the nighttime OSV use area is established 200 meters from the brood range. If the brood range is greater than 800 meters, the buffer increases to 300 meters. The brood range in relation to OSV Restricted Areas is defined as the total area on the oceanside and the roadway utilized by the brood within the last seven days. For example, if a brood shifts its range, the entire span would continue to be utilized when establishing the Restricted Area fencing for at least seven days before shifting the Restricted Area fencing. If a brood is observed from a nest that was undetected, a nighttime buffer of 1000 m from the brood's observed range will be established until the brood has been monitored over a 24-h period. A buffer of 500 m from the brood will be applied during the next 24-h period, unless the first day of monitoring indicates that this buffer could be insufficient to protect the brood. After the second 24-h period, the Restricted Area buffer will be reduced to 200 meters (or 300 meters depending on range size). In addition, on the day of hatching, a buffer of 500 (or more, as appropriate) will only be applied if the brood has received at least two



checks spaced 3 hours apart, with the last being within 2 hours of sunset. Otherwise, a 1000 m buffer is established.

Restricted Areas on oceanside and bayside are delineated with symbolic fencing running perpendicular to the beach – extending from the Closed Area fencing to somewhere between the high tide mark and low water mark (dependent on depth and surf to ensure fencing is resilient). Perpendicular fencing on the bayside generally does not extend past the high tide mark so as to ensure that boats moving through the channel do not hit the rebar posts. Initially, the perpendicular fence lines are placed 200 meters on either side of plover nests, providing 400 meters of protected beach. Restricted Area fencing is placed around Least Tern colonies within or bordering the OSV area. Restricted Area fencing is placed 100 meters (109 yards) to either side of the outermost Least Tern nest in the colony two days before the projected hatch date. Restricted Areas are adjusted as broods move throughout the site or tern chick nurseries shift to provide a 100-200 meter (depending on timing and range) buffer from vehicles.

Pedestrians are able to walk through Restricted Areas below the end of the perpendicular fencing. This path may be through the water depending on the tide. Bikes must be walked through the area, and dogs, pets, horses, and non-essential vehicles are not permitted. Signs informing visitors of the restrictions are located on the perpendicular fences with arrows indicating that pedestrians must walk around the fencing rather than ducking under.

In places where vehicle pull-offs fall within the Restricted Area, these pull-offs are closed to all vehicles (not including enforcement and monitoring staff). Pull-offs are closed with temporary symbolic fencing, “area closed” signage, and orange cones. Sections of roadway within a Restricted Area are delineated with orange barrels, orange sign posts and reduced speed limit signs (speed drops to 5 mph), which are placed in the center of the roadway. Visitors to the beach are informed of reduced speed limit areas by the attendants at the Powder Point Bridge Guardhouse.

The Duxbury Beach Guide and Rules containing beach rules and regulations and guidance related to driving near piping plover chicks are available at the Powder Point Bridge Guardhouse, and additional signage is in place at the beach entrance and parking lots regarding vehicle access, speed limits, and dog rules. Beach rules and regulations are also available to visitors online through the town and Reservation websites.

### Other management

**Predator Management:** In 2009, the Reservation met with the United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS) to discuss recommendations and procedures for a possible predator management plan. In 2010, the Reservation’s Board of Directors adopted a predator management plan and contracted with APHIS WS during the shorebird season to remove predators as appropriate and according to the approved plan. The plan’s original focus was to manage American Crow (*Cosvus brachyrhynchos*). American crow management was done through DRC-1339 COR treated brown chicken eggs placed in mock exclosures to target crows exhibiting nest predating behavior.

In 2011, the decision was made to expand the predator management program to include Eastern Coyote (*Canis latrans var.*). This policy enhancement was based on the increase of suspected and known coyote predation on both plover and tern nesting, as well as the increase in tracks and sightings. In 2011, out of the 83 plover eggs laid by 12 pairs, 19 chicks fledged, resulting in a fledge rate of 1.58 chicks fledged/pair. This number was higher than the previous year’s rate of 1.45 and well over the rate of 1.24 required to sustain the species.

Predator management efforts remained consistent from 2011 through 2016, with the exception of 2014, when the Reservation suspended predator management efforts for mammalian predators and instead engaged Dr.

Chris Bloch of Bridgewater State University to provide a study of the effectiveness of predator management on Duxbury Beach and other beaches. Piping Plover productivity decreased to 0.92 chicks fledged/pair that season, compared to 1.94 in 2013. Dr. Bloch concluded that crow and coyote management had significantly improved Piping Plover productivity, and to a lesser extent Least Tern productivity. He also concluded that coyote removal on Duxbury Beach has had a negligible effect on the overall coyote population.

Animal and Plant Health Inspection Service Wildlife Services reported Red Fox (*Vulpes vulpes*) presence on Duxbury Beach in early May 2017. In June 2017, the Reservation voted to implement Red Fox management. Red Fox management had occurred previously in 2012. Due to high numbers and observed and suspected predation events by Common Grackle (*Quiscalus quiscula*) in 2019, Grackle removal was initiated. It is anticipated to continue in 2020.

In the past, Reservation policy has required APHIS WS to survey the beach in late winter/early spring to determine the presence of predators and make recommendations to the Reservation. Beginning in 2017, the Reservation policy has been amended to allow coyote and crow removal in late winter without a survey. The goal of the new approach is to create a window of time when unfledged plover and tern chicks are present, and the predator population is somewhat diminished. Similar to coyote and crow management, fox management will begin in late winter to ensure there is a window of time with a diminished fox presence on the site. These changes to the predator management program will continue in 2020.

The Reservation board voted to continue the predator management program, maintaining the current list of target species (American Crow, Eastern Coyote, Red Fox) on October 28, 2019. The Reservation will continue to evaluate the set of species approved for lethal removal annually and throughout the season based on predator presence and recommendations from APHIS WS.

To mitigate for the potential impacts of the covered activity on Piping Plovers, the Reservation self-funded a selective predator management plan in 2018 and 2019. The Reservation proposes to continue this practice in 2020. The Reservation has contracted with the United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service Wildlife Services (APHIS WS) to conduct on-site selective predator management of both avian and mammalian predators. The APHIS WS Proposal for FY20 will be submitted and approved by MADFW and USFWS. Between February and July, 2020, WS employees will make 14-15 visits to Duxbury Beach for the following activities: assessment, trapping, shooting, or DRC-1339 COR applications. Management in 2020 will deviate slightly from that in 2018 and 2019. Initial assessment early in the season will continue, however, the Reservation will erect and manage pre-baited mock enclosures internally. In addition, WS visits will be scheduled based on observations of predator activity made by Reservation staff. This will help to target visits to key problem times and areas. The number of visits may increase should predator activity increase later in the season.

**Habitat enhancement:** Based on discussions with Dr. Scott Melvin (NHESP), the Reservation began creating artificial nesting habitat areas in 1999. The Reservation placed 1,300 cubic meters (1,700 cubic yards) of quarry sand on the bayside beach between High Pines and Crossover 3 to form a large rectangular area measuring approximately 91 meters by 45 meters (100 yards by 50 yards). Part of this area was veneered with natural beach sand to help determine if nesting pairs prefer natural beach sand to quarry sand. One pair of Piping Plover nested in this area in 1999, suggesting preference for natural beach sand and helping to determine territory size on Duxbury Beach.

The project continued in 2000 with two additional habitat areas, each 53 meters in diameter (58 yards), just south of High Pines. In these cases, natural sand was spread over the entire area of quarry sand placed over the vegetation. Two pairs nested on the three enhancement areas, fledging three chicks. Two additional areas

were added south of High Pines in 2001, created in the same way as in 2000. No birds nested on the newly created areas, possibly because access for chick foraging was limited by the marsh. Lack of funding stalled the project in 2002, and vegetation regrew in the habitat enhancement areas – no plovers nested in these areas in 2002. An attempt was made to restore the areas in 2003 by rototilling the grass. This was deemed an ineffective method as the finished surface was rough with vegetation only partially buried. Again, no pairs nested in the habitat areas.

In 2005, DBR received a five-year permit from the Massachusetts Department of Environmental Protection to burn grass to create replicated habitat areas. This was first done in the fall of 2005 and in the spring of 2006, plovers nested on three of the five burned areas. Unfortunately, burning was deemed to be an unsuitable solution as the vegetation grew back too quickly. DBR then instituted the method of scraping replicated habitat areas using a small Bobcat skid steer in the early spring to scrape and bury vegetation. This method was deemed effective because while the grass grows back, it allows a window of no vegetation during egg laying and hatching. In 2010, at the recommendation of Mass Audubon Coastal Waterbird Program staff, DBR began to scrape areas to resemble a naturally occurring washover rather than the previously used 53 meters diameter circle (58 yards). Each area was approximately 279 and 371 square meters (334 and 444 square yards) and is level with the surrounding beach, typically 0.3 meters (1 foot) above the extreme high tide.

The “scraping” enhancement method continued in 2011, 2012, and 2013 with moderate success as at least one nesting pair used the areas each season. No maintenance work was performed at the habitat enhancement areas in 2014 and 2015 due to winter storms which either diverted DBR resources or prevented access to the areas. In 2016, three areas were scraped, and two pairs of plovers nested at the enhanced habitat areas, fledging three chicks.

In 2017, habitat enhancement occurred at three existing areas of replicated habitat and at three new locations on the west side (bayside) of the site. Three pairs of Piping Plover established territories and nested within three of the replicated habitat areas in 2017. Three chicks survived to fledge from the nests located in the enhanced habitat. Based on the work that occurred in 2017 and observations made over the previous 17 years, habitat enhancement was deemed effective in attracting nesting pairs, providing suitable chick rearing habitat, and reducing interactions between endangered species conservation efforts and beachgoers on Duxbury Beach.

Work in 2018 was suspended due to the number and intensity of March storms which made access for work difficult to accomplish before Plover pairs returned. Despite the lack of maintenance, two pairs nested in the replicated habitats in 2018.

In 2019, maintenance was performed at the southern five replicated habitats from February 19-22. Work was performed during February to allow the habitats to “naturalize” prior to Piping Plover pair arrival. This allowed time for wind and precipitation to remove construction vehicle tracks and any ridges or other abnormalities from the habitats’ surface. Due to the frequency of overwash, the Reservation did not maintain the most northern habitat.

Maintenance consisted of using an excavator to bury vegetation well below the surface, >2 feet in depth, in order to remove vegetation and expose native sand. Prior to initiating the work, the Reservation placed fiberglass rods around the perimeters of the habitat areas and entrances to guide maintenance work. The areas remained consistent with maintenance efforts done in 2017, except for habitat 5, where there was previously

no entrance path from the bayside to the habitat area. Three pairs of Piping Plovers nested in the replicated habitats in 2019, two of which successfully hatched and one of which produced a fledgling.

Based on activity in 2018 and observations of vegetation regrowth in 2019, the Reservation expects all five replicated habitats to remain viable for Piping Plover nesting in 2020. The Reservation will not perform maintenance prior to the 2020 season so as to allow the areas to completely revegetate as requested by NHESP.

**Exlosures:** Much of Duxbury Beach is unsuitable for exclosures due to the narrow width, slope, rocky substrate, and dense vegetation. These factors may increase the tendency for overwash or destruction of the exclosure and increase the likelihood of abandonment due to disturbance and limited visibility of predators. Clutches located in replicated habitat areas may be candidates for exclosures, as exclosures are primarily open, flat, sandy, and at less risk of overwash by being on the bayside of the site. The Reservation will determine where exclosures may be a viable option as territories are established and eggs are laid.

The Assistant Director for Duxbury Beach Reservation holds the exclosure permit for Duxbury Beach. Under the permit, the erection of exclosures will be completed by the Reservation. At least one of the Field Technicians be present during construction of any predator exclosure to ensure there is complete knowledge of the nesting pair and the exclosure protocol. Any changes in procedure relating to exclosure placement, assembly, and current issues should be reviewed at a training session involving the Reservation's Assistant Director, Coastal Ecology Program Coordinator, Field Technicians, and Monitor Supervisors.

**Vegetation management:** Extensive effort has been made to establish and maintain beach grass and woody plants on Duxbury Beach to stabilize the dune and entire barrier beach system. Plantings occur each spring in areas where work has been performed or where vegetation has been destroyed by winter storms after approval from the NHESP. In order to maintain suitable nesting habitat - sparsely vegetated, sand-cobble areas - all plantings are spaced 36 inches (91 cm) on center). The Reservation applies maintenance-blend fertilizer to beach vegetation annually, primarily through the use of a helicopter. However, because placing fertilizer by hand is more effective, in areas where it is critical to control placement, the Reservation will fertilize by hand rather than by helicopter.

#### Duxbury Beach Endangered Species Monitoring Program

Monitoring of listed species on Duxbury Beach is multifaceted with in-field and reporting responsibility. A successful monitoring program requires strong communication among the individuals on the ground doing the monitoring as well as with the Assistant Director and Coastal Ecology Program Coordinator, which performs the overall maintenance and oversight of the beach year-round. In addition, the success of the program is reliant on clear communication and responsiveness from the Town of Duxbury Beach Operations staff. To ensure all parties are aware of concerns, current status of nesting and protection work, and ongoing training of staff, bi-weekly meetings occur among the Town Beach Operations staff and Reservation Endangered Species Program staff. The effort spent monitoring is extensive to ensure that adequate protection through fencing and signage is in place.

**Field Technicians:** A team of three Field Technicians begin monitoring Duxbury Beach the first week of April, with visits three to five times per week. In May, monitoring visits increase, with daily visits beginning shortly before the first plover nest is due to hatch. Field Technicians collect information on plovers and terns during each site visit, focusing on pair abundance, nest status and location, brood status and location, nest and chick loss, flight status, predator presence, and staging activity. During the course of monitoring, the Field Technicians inspect symbolic fencing and may either make fencing updates or work with the Monitor Supervisors to ensure Shorebird Monitors assigned to fencing work for that shift make the fixes.

In addition, Field Technicians are responsible for determining the location and status of broods according to their location on the beach. All broods within 1000 meters of the open OSV area are monitored every morning prior to the beach being open. This occurs from 06:00-08:00. After locating all broods in proximity to the OSV area, Field Technicians will locate all broods adjacent to parking lots or roadway that are accessible to recreational vehicles prior to 10:00. Broods in areas not adjacent to recreational access on parking lots or roadways and beyond 1000 meters from the OSV area will be monitored a minimum of every other day. Field Technicians work with Monitor Supervisors to determine necessary changes to closed or Restricted Area fencing and placement of Shorebird Monitors. Monitoring efforts by Field Technicians also serve to inform the Monitor Supervisors of the anticipated need for Shorebird Monitors day to day and over the course of the season by communicating hatch dates and helping to determine the north-south and east-west extent of Restricted Areas.

Field Technicians will be responsible for monitoring Least Tern colonies every other day. If a Least Tern colony is adjacent to the OSV area, the colony will be monitored daily to determine if any nesting activity has extended beyond the existing fencing or within close proximity of the OSV area (including extending Restricted Areas in response to tern nursery area expansion). Colony check data will be captured via NestStory, an electronic in-field data capture application used for Piping Plover and Least Tern monitoring.

Field Technicians assist the Monitor Supervisors in checking the mock enclosures and traps placed for avian predator management by APHIS WS, and records data on predator signs and uptake and communicates enclosure status and observations to APHIS WS and the Reservation's Assistant Director.

Field Technicians complete the NHESP short form and submit the preliminary data for Duxbury Beach each July under the supervision of the CEP Coordinator. The Technicians also complete annual census reports, and site maps for Duxbury Beach to be submitted to the state each September. These forms are completed based on the field book data and NestStory data captured during each site visit by each staff member.

### **Shorebird Monitors:**

Shorebird Monitors (monitors) begin on the beach at least two days before the earliest plover nest is due to hatch. From this point, monitors are scheduled in three shifts per day with varying hours depending on nesting activity. Monitors will be present seven days per week while unfledged Piping Plover chicks are present in areas within 1000 meters of the OSV area and/or adjacent to parking lots or roadway accessible to recreational traffic. Monitor shifts can be classified as Morning, Daytime, and Evening. Morning and Evening shifts will generally consist of special Least Tern chick monitoring, fencing work, patrolling the back roadway, and Piping Plover brood location checks. The Daytime shift will entail more frequent and focused brood monitoring.

In the event that a Least Tern chick nursery area is directly adjacent to an OSV Crossover (within 100 meters) that would otherwise be open (does not fall within a Piping Plover brood range or Restricted Area) and the nursery does not span the Crossover, special monitoring will be employed to allow OSV access. Shorebird Monitors will be assigned to Least Tern colonies to implement this management with oversight from the Monitor Supervisors and Field Technicians. If Least Tern chicks are 30-100 meters from the crossover, the nursery area will be monitored at least once per hour from 08:00-20:00. If chicks are less than 30 meters from the crossover, the nursery area will be monitored constantly from 08:00-20:00. The Monitor will be responsible for herding the tern chicks away from the crossover if they come within 15 meters.

Morning: First-shift monitors arrive at 06:00 and assist with fencing modifications to the Restricted Areas based on upcoming estimated hatch dates, fledging, and changes to brood range. At 08:00 the monitors will be assigned to one of a variety of tasks depending on nesting activity. If Least Tern chicks are present in close proximity to an open Crossover (see below), monitors will be assigned to monitor the colony at the Crossover. Once all Piping Plover chicks have fledged, if Least Tern chicks remain on the beach in close proximity to a

Crossover, monitoring continues 7 days per week from 7:00 or 7:30 (dependent on number of tern colonies). Other tasks assigned to monitors during the 08:00-10:00 timeframe will include patrolling the roadway for crossing events and implementing the crossing protocol, assisting Field Technicians in monitoring broods, and performing special projects (trash pick-up, knotweed removal, data entry).

Daytime: Monitors will be scheduled from 10:00 to 18:00, seven days per week while unfledged chicks proximal to recreational vehicle activity are present. This time frame was chosen based on typical over-sand vehicle activity. Monitors will be assigned to particular zones of the beach and will be responsible for patrolling territories within their assigned monitoring zone to check for brood location and activity. These territories will be confined to either the oceanside beach or the roadway. Should a brood move to the bayside beach, the monitor will be responsible for both roadway and bayside. Zones and territories may shift depending on nesting activity, but generally will be laid out as illustrated in Map 1. Each monitoring zone will have a minimum of 1 oceanside and 1 roadside monitor while broods are present. The exact number of monitors assigned to each side of the dune is dependent on the number of active broods in the area, propensity of broods to cross, historic rates of crossing activity, and the amount of recreational activity for the area. On average, Monitors will be responsible for two broods per territory, however actual responsibilities could range from one to five broods (with higher number of broods per monitor in areas without recreational activity). Monitor territories within their zone will be determined based on nesting locations, brood range extents, and proximity to recreational vehicle use. Monitors will be responsible for constant communication with other monitors in their zone, and if necessary, neighboring zones, to share current locations of broods and possible movement to the roadway or other zones. Monitors will be present along the beach and roadway throughout the day covering the three peaks in over-sand vehicle traffic, actively patrolling their territories to assist broods in roadway crossings as necessary.

In the event of rain or storm conditions, monitoring may be reduced because the broods seek shelter and searching for them could cause chick mortality. If broods cannot be monitored every three hours during the day, the OSV area will be closed or buffers will be expanded to 1000 meters.

The primary responsibility of the monitoring program is ensuring the protection of unfledged chicks from vehicles and that broods remain undisturbed. If the chicks are foraging at the water line, monitors may escort beachgoers around the brood to ensure chick safety or keep the area closed to pedestrians until the brood moves to a different area. Monitors also act as an additional deterrent (besides fencing and signage) for any vehicles approaching the Closed Areas on the oceanside beach. Monitors are instructed to stay below the high tide line and as far from the brood as possible to lessen any disturbance. In addition, monitors are trained in plover and tern behavior in order to recognize signs that the birds are being disturbed by monitor presence. Monitors do not access Closed Areas.

In areas where crossings are possible, monitors are responsible for identifying movement toward Gurnet Road and for then informing the monitor stationed on the roadway and the Monitor Supervisor on duty of the probable crossing. The Monitor Supervisor will inform the on-duty Beach Operations staff of the crossing for assistance in traffic management. This communication occurs as soon as the brood or adults begin moving away from the water line and toward the dune/vegetation so that the monitor and enforcement staff can be in place well before the chicks approach the roadway. The monitor located on the roadway stops traffic in both directions, including pedestrian traffic, once the brood reaches the sand fence or permanent symbolic fencing which is located at the toe of the dune or crest of the dune. The oceanside monitor maintains visual contact with the brood until the roadside/bayside monitor confirms that responsibility has shifted. Traffic remains stopped for as long as it takes the brood to cross the roadway and commit to the movement. Once off the road, the Reservation or Beach Ops staff maintains the closure while the monitor observes the brood to determine whether they are likely to stay on the present side or return to the original location. Typically, it is determined

that the brood is going to stay at the current location once the chicks have reached the high tide line. In the case of a prolonged crossing, a “floater” Monitor, Supervisor, or Beach Ops staff will stay at the crossing while the original roadside Monitor resumes patrolling their territory for other crossing events. If a bayside or oceanside Monitor cannot locate one of their assigned broods, they will inform the other monitors in their zone and the Monitor Supervisor. They will perform a sweep of the roadway in case of a crossing, stopping traffic immediately if birds are observed.

Once on the bayside, the brood is monitored by the monitor stationed on Gurnet Road while the oceanside monitor remains at the oceanside Restricted Area. Pedestrian use of the bayside is much less and due to the topography and lack of structures (sand fence and sturdy drift fence), monitors stationed on the roadway are able to easily intercept pedestrians approaching Restricted Areas on the bayside beach. In addition, because the roadway is above the bayside beach, monitors are more easily able to locate chicks and record observations without causing unnecessary disturbance.

The exact placement of monitors and number of monitors assigned to a territory varies as there are countless scenarios that may occur on the site. Factors in these scenarios include original nest location (oceanside vs. bayside), presence on OSV or pedestrian beach, extent of habitat moving east or west (whether a crossing is feasible), number of chicks and number of broods, presence of Least Tern nests or chicks, and a multitude of other details. In an effort to anticipate need during the season, the Reservation Assistant Director, CEP Coordinator and Field Technicians may perform a walk-through of the oceanside, bayside, and roadway to map potential crossing locations and other potential factors influencing management if there are significant changes during the off season.

Monitors carry tablets equipped with NestStory to record brood checks, brood locations, and crossing information (time and length of crossing, brood identification, and number of vehicles stopped). Monitors are responsible for checking broods at least once every two hours and recording information, including brood location and number of adults and chicks. Throughout shifts, monitors record predator presence or tracks, public interactions and information on special projects. Based on observations, the monitor informs the Monitor Supervisor if a brood moves within 100 meters (or greater depending on time of day and age) of an OSV area so that the Restricted Area boundary can be adjusted.



*Map 3-1. Example monitoring "zones" established for 2020 monitoring efforts on Duxbury Beach. Zones are estimated based on historic nesting and recreational activity.*

Evening: Evening shifts are utilized in the case of Least Tern chick activity within 100 meters of an open OSV crossover or in the case of Crossover 1 being open to nighttime OSV use while unfledged Piping Plover chicks are present within 1000 meters. In these instances, one to four monitors would be on-site until 20:00 to monitor Least Tern chick numbers in proximity to the crossovers and herd chicks that move within 15 meters and to monitor Piping Plover broods within 1000 meters of the nighttime OSV area. Piping Plover evening monitors would be responsible for locating broods between 18:00 and 20:00, adjusting Restricted Area fencing as necessary, patrolling the back roadway for crossing activity (focusing on the area between the Powder Point Bridge and Crossover 2), and monitoring the edge of the nighttime OSV zone prior to 20:00.

Monitors are equipped with tablets with NestStory to record Least Tern chick information in proximity to the crossovers, Piping Plover chick information and locations, and Piping Plover crossing activity. They will also record human disturbance, predator information, and other special observations.

**Monitor Supervisor:** The Monitor Supervisors are responsible for overseeing the monitoring and data collection work of the monitors. Supervisors work in two shifts per day once Piping Plover hatching begins – 06:00-14:00 and 13:00-21:00, in order to prepare, oversee, and close out all Monitor activities. In addition to this oversight role, the Monitor Supervisors assist the Field Technicians in checking the mock enclosures and traps placed for avian predator management by APHIS WS, and records data on predator sign and uptake and communicates enclosure status and observations to APHIS WS and the Reservation’s Assistant Director. The Supervisors are responsible for informing Beach Operations staff of changes to Restricted and Closed Areas when Field Technicians are not present.

**Beach Operations Staff (Beach Rangers and Police Officers):** Duxbury Police Department Beach Operations staff are stationed on Duxbury Beach from 08:00 – to close from May through Labor Day. Prior to May Beach Operations performs routine patrols of the beach during open hours. Throughout the year Duxbury Police Department and Harbormaster Division patrol the parking lots on the beach during day and nighttime hours. The officers and beach rangers are responsible for enforcing all rules and regulations of Duxbury Beach, particularly traffic management. In addition, the officers respond to emergency situations on the beach.

Vehicles queue up in the resident parking lot prior to the beach opening at 08:00. This queue can begin well before 06:00. At 08:00 the vehicles queued up will be led down the back roadway by a Beach Operations staff, who will be on the lookout for crossing activity and respond accordingly. Typically, this caravan of vehicles will be situated on the beach by 08:30. If a crossing occurs during this time, the staff member will stop the caravan and call the Field Technicians or Monitors to assist in the crossing.

Beach Operations staff are responsible for determining the number of vehicles allowed on the beach dependent on the amount of space required for the listed species, which is provided by Reservation staff. Beach Operations staff also monitor the number of vehicles on the beach and close beach access when the limit is reached (the maximum is 500 vehicles). Officers monitor for pedestrian and vehicle operator compliance with beach rules and regulations related to protected species. This is particularly important as it pertains to chick crossings. Beach Operations is alerted by the Monitor Supervisor of a potential crossing, and an officer is on-site to stop traffic and act as a show of force (uniform and truck).

Beach Operations staff man several vehicle access points on the beach and inform recreationalists of closures and restrictions. Staff are stationed at the Powder Point guardhouse to stop traffic coming over the bridge and coming from the north, at open OSV Crossovers, and at any open parking lots used by Town of Duxbury sticker holders. Staff will also patrol the beach and back roadway throughout the open hours.

The Beach Operations staff are responsible for recording emergency vehicle use within Restricted Areas, vehicle numbers on-site, and beach rule violations. They are responsible for completing an end of season report which



includes the number of violation warnings (verbal and written) and citations given out over the course of the season.

## 4.0 Covered Activities

Duxbury Beach Reservation is requesting to implement the Covered Activities, Use of Roads and Parking Lots in the Vicinity of Unfledged Piping Plover Chicks and Least Tern Chicks; Recreation and Beach Operations Associated with Reduced Symbolic Fencing Around Nests, Recreation and Beach Operations Associated with Reduced Proactive Symbolic Fencing of Piping Plover and Least Tern Habitat; and Recreation and Beach Operations at Piping Plover and Least Tern Nest Sites with Nest Moving, under the Massachusetts Habitat Conservation Plan (HCP).

Table 4-1. Piping Plover brood crossing data on Duxbury Beach, 2011-2019.

		Overall crossing data			# broods north of Crossover 1			# broods south of Crossover 1			
Year	Total Pairs	# of broods that crossed	# of areas crossed	# of broods crossing north of crossover 1	Pavilion to north end of Resident lot	Resident lot to Guardhouse	Guardhouse to Crossover 1	Crossover 1 to Crossover 2	Crossover 2 to Crossover 3	Crossover 3 to Plum Hills	Plum Hills to Gurnet
2019	28	12	5	4	3	0	1	3	3	0	2
2018	24	12	5	2	1	1	0	5	3	0	2
2017	28	3	2	0	0	0	1	2	0	0	0
2016	23	11	3	3	0	0	3	5	0	3	0
2015	25	11	3	3	3	0	0	4	0	4	0
2014	26.5	6	4	2	1	0	1	1	0	3	0
2013	17	2	1	0	0	0	0	0	0	2	0
2012	14	1	1	0	0	0	0	0	0	1	0
2011	12	4	2	0	0	0	0	3	0	1	0

Review of the past three years of Piping Plover activity on Duxbury Beach has determined that 10 Piping Plover broods (estimated 36% of the 28 on-site breeding pairs based on 2019 plover census) may be impacted (Table 4-1) by use of the back road and parking lots. The area affected will be the length of Gurnet Road from the north edge of the property (Northern Lot) to the Gurnet Guardhouse in the south covering 7.3 kilometers (4.5 miles) of improved gravel roadway. Exposure encompasses the area of the maximum width of crossing area and the width of the roadway (25 feet) for a total of 10 Piping Plover broods. The maximum width of a single crossing area of a brood observed on Duxbury Beach is 10 meters (30 feet). Based on historic crossing activity, this equates to a total crossing area (exposure area) of 0.18 acres. Since Gurnet Road provides court-protected

access for residents and visitors to Gurnet-Saquish, the roadway can only be closed temporarily to allow the crossing of listed species. However, the Reservation anticipates closing portions of the back roadway to recreational traffic while unfledged chicks are present to reduce the number of broods impacted by use of roadway and parking lots. The Reservation finances the employment of brood monitors to safeguard chick passage during roadway crossings. As mentioned previously, not all broods cross the roadway during the nesting season however each season there are crossing events. Some broods are frequent or daily crossers, whereas others may cross once during the season (Table 4-1).

Recreational activity on Duxbury Beach relies on access via pedestrian pathways and vehicle crossovers. On the oceanside, there are three vehicle crossovers which may be used for recreational access. In addition, there are 12 primary pedestrian access paths, four of which are handicap accessible, on the oceanside. The total shoreline distance impacted is 73.5 meters. However, many of these access paths are not vital for recreation. There are two vehicle crossovers and three pedestrian access paths that have a large impact on recreational access. Historically, Piping Plover nesting has not impacted these access ways, however, Least Tern nesting has encroached on both vehicle crossovers and may become an issue in the future. Should Piping Plover or Least Tern nesting occur at or on these access paths it would have considerable impact on recreation.

DBR is requesting coverage for up to 10 pairs of Piping Plover per season, for the remainder of the three-year life of COI (37% of the three year average 2017-2019).

#### **Inclusion of Least Terns**

The Reservation is requesting to allow exposure of up to 25 pairs of Least Terns on Duxbury Beach as part of the Reservation's Conservation & Management Permit (CMP). The average pair number on Duxbury Beach over the past three seasons (2017-2019) is 159 pairs. The take exposure would allow up to 16% of pairs to be impacted by covered activities during the 2020 season. The Reservation anticipates utilizing take exposure for Least Terns to implement the covered activity Use of Roads and Parking Lots in the Vicinity of Unfledged Least Tern Chicks to allow use of the 1<sup>st</sup> and 2<sup>nd</sup> crossovers in accordance with procedures outlined in Attachments N and S.

This covered activity will be initiated if Least Tern chicks are observed within 100 meters of Crossovers 1 or 2 (provided the crossover is open). The Reservation will employ intensive monitoring of Least Tern nests and chicks near the crossovers. Herding will be employed should any chicks come within 15 meters of the crossover. Due to the difficulty of determining whether Least Tern chicks are associated with the same nest, it is assumed that each chick is from a distinct nest when determining take exposures.

Table 4-2. Unfledged Least Tern chicks observed within 100 yards of an open OSV crossover in 2019.

<u>Date</u>	<u>Time Start</u>	<u>Time Off</u>	<u>Crossover</u>	<u># LETE incubating within 100 yds</u>	<u># LETE Chicks within 100 yds</u>
6/28/2019	8:00	20:00	1XO	5	1
6/29/2019	6:00	20:00	1XO	5	1
6/30/2019	6:00	20:00	1XO	5	1
8/16/2019	6:20	13:15	2XO	0	4
8/16/2019	13:00	20:00	2XO	0	6
8/17/2019	6:20	13:15	2XO	0	5
8/17/2019	12:30	20:00	2XO	0	1
8/18/2019	6:00	13:15	2XO	0	7
8/18/2019	12:30	20:00	2XO	0	5
8/19/2019	6:00	13:00	2XO	0	0
8/19/2019	12:30	20:00	2XO	0	0
8/20/2019	6:20	13:30	2XO	0	5
8/20/2019	13:00	20:00	2XO	0	0
8/21/2019	6:30	13:15	2XO	0	3
8/21/2019	12:30	20:00	2XO	0	0
8/22/2019	6:20	13:15	2XO	0	0
8/22/2019	13:00	20:00	2XO	0	0

## 4.1 Initiation of Covered Activities

### 4.1.1 Use of Roads and Parking Lots in the Vicinity of Unfledged Piping Plover and Least Tern Chicks

Gurnet Road is an improved gravel road that provides the only access to 205 private residences in the Town of Plymouth, of which fewer than 10 residences are occupied throughout the year. In addition, the Town of Duxbury has a mutual aid agreement with the Town of Plymouth to respond to fire, police, and other emergency calls utilizing Gurnet Road for access to assist property owners and their guests. Gurnet Road also provides access to recreational areas. Under the covered activity, the Reservation would provide unrestricted access for essential and non-essential vehicles in areas open to recreation.

Gurnet Road is graded up to three times a year under OOC SE18-1198 to reduce ruts that may entice Piping Plover chicks to rest or hide. During grading of the roadway surface, care is taken to minimize the gravel windrow that builds up along the edge of the roadway. In Piping Plover habitat areas, the windrows are flattened a minimum of 1 meter (3 feet) wide and spaced every 15 meters (16 yards) along the roadway. These smoothed-out transition areas facilitate the passage of Piping Plover chicks crossing from east to west and back to access both the bayside and oceanside beach.

#### Impact Minimization Measures

Impact minimization measures will limit the number of takes by reducing exposure of adults and chicks to vehicles traveling on Gurnet Road. There are four impact minimization measures outlined in the HCP that may be implemented as a condition of the covered activity “Use of Roads and Parking Lots in the Vicinity of Unfledged Piping Plover Chicks.” All measures may be employed on Duxbury Beach include barriers, signage, staff training, and managing traffic, including herding. In addition, intensive monitoring will be required when chicks are near roads and parking lots, as mandated in the HCP, and described in detail above and in section 4.1.2, below.

### Barriers

There are several areas of Duxbury Beach that do not provide Piping Plover habitat on the bayside. This primarily consists of saltmarsh but also includes the Powder Point Bridge with associated revetment and footings. In two sections these non-habitat areas border paved parking lots. This includes the length of the paved parking lot at Duxbury Beach Park and the main pedestrian path across from the Powder Point Bridge. In cases where a brood is using the area oceanside or exhibits behavior indicating an attempt to access the parking lots in these areas, a combination of herding (non-active: monitor stationed at pathway or active: monitors moving towards brood) and barriers will be utilized to discourage crossings in these areas. This will not prevent the brood from crossing to the bayside in other sections of the beach.

In special cases, barriers may be utilized for short durations (20:00-08:00) to discourage crossing activity overnight in specific parts of the beach where recreational vehicle use of the back road occurs. If a Piping Plover brood begins to cross the road utilizing on the pedestrian pathways north of Crossover 1, the Reservation Coastal Ecology Program and Town Beach Ops staff may place temporary barriers at night in these pathways. The Reservation plans to implement a barrier first during the daytime to assess adult and chick behavior and ensure that barriers do not increase risk to adults by causing them to land and stay in the road for long periods of time while encouraging chicks to cross.

In cases where a brood utilizes the road for long period of time without crossing or the brood approaches open pedestrian pathways bordering paved parking lots with no bayside habitat, the Reservation proposes to implement herding the brood according to the Duxbury Beach Reservation’s Piping Plover Brood Herding Protocol (Attachment B). Barriers will be placed, monitored, and maintained according to the Reservation’s Piping Plover Barrier Use Protocol (Attachment C). Barriers will be assessed daily, morning and evening, to check for entrapment hazards and will be fixed prior to 20:00 that same day if necessary. If repairs are not immediate, non-active or active herding will be implemented as necessary.

### Signage

Signage on Duxbury Beach is extensive and varied depending on purpose and audience (vehicle versus pedestrian). Signage notifying beachgoers of protected areas and certain beach rules (such as dogs and speed limits) are plentiful and enforced by the presence of enforcement and monitoring staff.

Seasonal symbolic fencing consisting of rebar posts and orange twine is erected the last week of March each season to proactively protect potential habitat. As the season progresses, symbolic fencing may be placed around new nesting areas or areas of recreational use as brood refuge and for dune protection. “Closed Area” signs are placed on every other post, and speed limit signs are placed every 15 meters (16 yards). These symbolically fenced areas are referred to as “Closed Areas.” Signage is placed 50 meters (55 yards) north and south of active nests by Beach Operations to prevent OSV parking within the buffer zone as well as seaward of the nest.

Although Closed Areas provide protection for nests and incubating adults, additional fencing is erected one to two days prior to a brood's estimated hatch date to provide protected areas for the chicks. Restricted Areas extend 100 meters (109 yards) north and south of the brood range or tern nursery (adjusted as necessary) and include the entire site east to west (oceanside beach to bayside beach), provided that vegetation or topography of the beach makes habitat east to west accessible. If the brood is adjacent to an OSV area, the Restricted Area is located 200 meters (218 yards) on the vehicle adjacent side(s) during the first week after hatching. If the brood is within 1000 meters of the nighttime OSV use area, these Restricted Areas are expanded dependent on age and brood range (see details above). Restricted Areas on oceanside and bayside are delineated with symbolic fencing running perpendicular to the beach. Signs informing visitors of the restrictions are located on the perpendicular fences with arrows indicating that pedestrians must walk around fencing rather than ducking under. If there are established vehicle paths approaching a Restricted Area that create confusion for approaching vehicles, sawhorses with "no vehicle access" signage are placed by Beach Operations in front of the perpendicular fencing to provide additional visual deterrents for OSV operators.

In cases where vehicle pull-offs fall within the Restricted Area, these pull-offs are closed to all vehicles (not including enforcement and monitoring staff). Pull-offs are closed with temporary symbolic fencing, "area closed" signage, and orange cones. Sections of roadway within a Restricted Area are delineated with orange cones and reduced speed limit signs (speed drops to 5 mph) placed in the center of the road. These signs designate the Restricted Area on the roadway and thus are the location where vehicles are stopped where there is a crossing.

The Duxbury Beach Guide and Rules listing beach rules and regulations and detailing Piping Plover behaviors and use of vehicles is available at the Powder Point Guardhouse. The Guide is also available online and mailed to all Duxbury Beach sticker holders. Additional signage is in place at the beach entrance and parking lots regarding vehicle access, speed limits, and dog rules. Beach rules and regulations are available on-line via the Reservation and Town websites.

### Managing Traffic

Multiple parties are responsible for identifying the need for alterations to traffic flow on Duxbury Beach. In order to properly determine where vehicles are permitted on the site, a full sweep of the open OSV beach and the area within 1000 meters is performed each morning from 06:00-08:00 by Field Technicians once broods are present. Field Technicians are scheduled to be on the beach at 06:00 each day which serves to make it easier and quicker to locate broods before the beach is open to non-essential OSVs. Once the sweep is complete and any necessary adjustments are made to Restricted or Closed Areas, the Beach Rangers then open the appropriate crossovers to over-sand permit holders after 08:00. At the Powder Point Guardhouse, attendants remind all visitors that there are nesting shorebirds and all speed limits are strictly enforced throughout the reservation (on oceanside beach, as well as, Gurnet Road). Once the beach is closed, traffic to Gurnet-Saquish is limited to residents and authorized visitors.

There is flexibility to the management of vehicles on the oceanside beach based on shorebird activity as there are three vehicle crossovers available if nesting or brood locations make one or more inaccessible. In addition, the presence of enforcement staff means that the number of vehicles on the beach can be adjusted if protected areas expand.

Monitoring efforts by Field Technicians and Shorebird Monitors prior to the beach opening and throughout the day determine the locations of Restricted Areas and allows Beach Operations to determine the location and number of vehicles permitted on the beach. The OSV corridors may be adjusted or closed if vehicle presence is deemed a disturbance to courting or incubating adults. Shorebird Monitors patrol brood ranges on the

oceanside and roadway and are able to inform OSV operators of the closed-off areas and provide education about the protected species work.

Town of Duxbury Beach Operations staff are responsible for enforcing traffic regulations on the OSV beach, requesting that vehicles move if protected areas shift, and providing support for monitors. In addition, Beach Operations staff are responsible for calculating and monitoring vehicle numbers on the beach and closing beach access when the limit is reached (this varies depending on available space, though always a maximum of 500). Prior to monitor departure at 18:00, a final assessment of Restricted Area locations is performed to best ensure that vehicle use areas do not overlap, or come within 100 meters (109 yards), of unfledged chicks and no parking can take place within 50 meters (55 yards) of active nests. All crossing brood locations are captured and reported. After 20:00 while chicks are present on Duxbury Beach, a Beach Ranger is stationed at Crossover 1 to ensure that nonessential vehicles do not continue south of this point. In addition, if broods are present within 1000 meters of Crossover 1, Shorebird Monitors are assigned to check broods and patrol the beach and road from 18:00-20:00. If movement is detected, a Monitor Supervisor will inform Beach Operations staff and ensure fencing is moved appropriately. This action serves to enhance protection of unfledged plover and tern chicks at night.

Traffic along Gurnet Road is preemptively managed with decreased speed limits (5 mph), posted on orange traffic barrels in the center of the road in areas where crossings are possible. All visitors to the site are informed of reduced speed limit areas by the attendants at the Powder Point Guardhouse. Shorebird Monitors stationed with the brood are responsible for identifying movement toward Gurnet Road and informing the Monitor patrolling on the road and the Monitor Supervisor on duty that a brood is likely to cross. The Supervisor informs Beach Operations staff via radio who then respond to the closure. This occurs as the brood begins moving toward the dune or vegetation. The monitor located on the road stops traffic in both directions, including pedestrian traffic, once the brood reaches the sand fence or permanent symbolic fencing which is located at the toe of the dune or crest of the dune. The monitor will independently close the road if the Supervisor or Beach Operations staff has not arrived prior to the brood reaching the sand fence or permanent symbolic fencing. The oceanside monitor maintains visual contact with the brood until the roadside/bayside monitor confirms that responsibility has shifted. Traffic remains stopped for as long as it takes for the brood to cross the road and commit to the movement. Additional details regarding monitoring during road crossings are discussed in section 3.7.

Vehicle use occurs on two additional areas of Duxbury Beach – on vehicle pull-offs along Gurnet Road and the bayside beach. In order to prevent vehicles from parking within Restricted Areas along the road, all pull-offs within restricted areas are blocked with symbolic fencing and “Area Closed” signs as well as orange traffic cones. Beach Operations staff monitor vehicle use on the Gurnet Road and enforce rules regarding parking, beach permits, and speed limits. Recreational driving is prohibited year-round on the bayside beach. In order to ensure that chicks are not harmed or disturbed from accessing this optimal foraging area, all shellfishermen traffic is stopped on the bayside beach two days prior to the first nest hatching and the area remains closed until all chicks have fledged.

*Herding:* During the 2019 season, four broods of Piping Plovers utilized the road for lengthy periods of time (>1 hour) for purposes other than access to bayside or oceanside habitat. These broods were observed brooding and attempting to forage on the processed gravel road between the Powder Point Bridge and Gurnet. In the case of two broods, these instances were singular, however, two of the broods repeatedly spent >1 hour in the road over the course of multiple days. It is possible the broods’ behavior was due to poor weather, predator presence, or natural barriers to crossing once in the road (dense vegetation or lack of bayside habitat).

When a Piping Plover brood attempts to use the back road for lengthy periods of time (>1 hr), Duxbury Beach Reservation will implement its herding protocol (Attachment B). This includes herding the brood off the road or parking lot and escorting vehicles past the area at scheduled times during daylight hours. Outside of scheduled times, vehicles may have to wait to travel until the next scheduled escort time.

### Staff Training

Duxbury Beach benefits from a team of professionals with wide-ranging experiences from both the Duxbury Beach Reservation and the Town of Duxbury Police Department. The result is a comprehensive monitoring program that provides both formal and informal trainings held both in the classroom and on-site throughout the season.

Year-round Police Department and Reservation employees serve to provide continuity season to season and therefore are able to train new or seasonal staff on protocols or updates to protocols. The largest aspect of the training program is that provided for the Shorebird Monitors. Approximately 30-40 monitors are employed May through August by the Duxbury Beach Reservation to assist in the protection of the listed shorebird species nesting on Duxbury Beach, including Piping Plover and Least Tern. Monitors are required to attend a training held by the Duxbury Beach Reservation at the commencement of the monitoring season. This training includes plover and tern nesting biology, coastal waterbird protection and conservation efforts, chick monitoring protocols, data collection, beach rules and regulations, public interaction protocols, focal species and predator tracking, and special projects. In addition, the monitors receive ongoing in-field training to ensure classroom instruction is carried out correctly. Throughout the summer, additional classroom training is held as the season progresses as part of a formal training program and informal support while on the beach.

Specifically related to crossings, monitors are trained on adult plover behavioral tendencies including the following: warning/alarm calls, foraging practices, prey habitats, tidal fluctuations, brooding characteristics, weather-induced behavioral traits, chick appearance (aging chart) and behaviors, habitat use, etc. As over 95% of chick crossings involve the adult flying into the road and then calling to chicks, becoming familiar with auditory cues is a focus of training. Monitors are trained to recognize signs of disturbance of plovers and terns and proper techniques to limit disturbance to ensure that monitoring efforts do not impact bird activity and protection measures are adequate. In addition, monitors are trained to properly use provided equipment, including binoculars, the Homebase App (used for scheduling and monitor communication), NestStory App (used for electronic in-field data capture), and any other equipment needed to complete specific tasks. Lastly, a thorough review of the crossing datasheet during classroom and in-field instruction is held to ensure that observations are crossing observations are collected accurately. In-field training includes a run through of a “mock crossing” so that monitors can simulate monitoring, traffic control, and communication protocols.

Opportunities for in-field training are plentiful throughout the season, including answering questions from monitors as issues come up. The presence of three Monitor Supervisors working alternate shifts ensures that monitors always have someone on call for support or questions. In addition, Beach Operations staff are present each day to provide informal training on beach rules and regulations, and Field Technicians are available to provide additional information on current nesting activity and bird biology and behavior. The Duxbury Beach Reservation’s CEP Coordinator and Assistant Director are on-site throughout the season to answer questions and ensure all communications run smoothly.

Duxbury Beach Reservation provides training for all Police Officers and Beach Rangers scheduled to work at Duxbury Beach. They are trained to recognize, respond to, and assist with crossing events, educated on the impact of disturbances to nesting adults and chicks, and taught to recognize specific behaviors. In the event

that an untrained Police Officer must fill in for a Beach Operations Police Officer, the Officer will receive the Duxbury Beach Guide and Rules to review.

### Monitoring

Although Duxbury Beach is 7.2 kilometers (4.5 miles) in length, several physical obstacles impede shorebird access to the road. Deterrents to road crossing include thick vegetation, sharp scarp incline, and lack of foraging habitat on the bayside of the barrier beach. This has led historically to only a few locations where crossings have occurred rather than throughout the entire length of the road. As the beach is dynamic and storm alterations can build up or reduce dunes significantly during the winter, crossing areas that were utilized one year may not be a crossing site the following year. With that being said, over the past three years, the broods that consistently crossed the road throughout the season have utilized the area between Crossover 1 and Crossover 2 and north of Crossover 3. Since Piping Plover accessible passage changes, prior to the start of the nesting season, experienced shorebird monitors walk the beach and road to determine all locations where crossing is possible. All crossing areas are noted, and as Piping Plovers start to nest, possible corridors are mapped.

In order to decrease risk posed to broods north of Crossover 1 between 20:00 and 22:00/23:00, information regarding crossings is relayed to staff on duty after 20:00. During the day, Shorebird Monitors patrol Gurnet Road in areas where brood crossings may occur based on access, historical use, and behavior. The monitors are responsible for monitoring crossings of specific broods during each shift. The monitors are responsible for filling out a brood location data book for all broods that may cross the road. Data captured includes brood ID, number of chicks and adults, age of chicks, location when last observed (bayside/oceanside and along the length of the site), location of last crossing, and other details (which may include tendency to cross at specific tides, etc.). The monitor (oceanside or roadside) responsible for recording the information for a brood is dependent on whether the brood is located on the ocean or bayside beach at the end of the shift. If the brood is located oceanside then the oceanside monitor is responsible for recording the data at the Guardhouse. If the brood is located bayside, the roadside monitor is responsible. In either case, monitors are encouraged to communicate at the end of the shift to ensure that accurate and complete information is relayed to the Beach Operations staff on duty that night.

Brood location information will be recorded in the brood location data book for every brood that has been known to cross the road, however, special consideration will be given to those that cross north of Crossover 1. In general, additional monitoring will not occur by Beach Operations staff at night so as not to increase risk with additional driving on the dark roadway. The Beach Operations staff on duty at the Powder Point Bridge Guardhouse remind arriving vehicles of the restricted areas and to reduced speed limits throughout the site, with particular focus on the broods north of Crossover 1 for those operating recreational vehicles. In addition, speed limit cones are located on either side of the Restricted Area to remind drivers of brood presence.

The Reservation believes Duxbury Beach has one of the most thorough monitoring programs for plover chicks in the state. All broods within 1000 meters of the OSV area are monitored every two to three hours from 06:00 to 18:00 (20:00 if nighttime access). All broods in proximity to recreational vehicle use on the road, parking lots, or beach are monitored at minimum every three hours per day from 08:00-18:00. Broods beyond the scope of recreational access are monitored every other day with additional monitoring equal to that of broods within recreational areas as staffing allows. A key component to monitoring on Duxbury Beach is recognizing the movement of broods east to west and vice versa. Monitors patrol both the roadway and the oceanside beach



from 10:00-18:00 seven days per week to record chick location and stop traffic in the event of a brood crossing. In the event of rain or storm conditions, monitoring may be reduced because the broods seek shelter and searching for them could cause chick mortality. In bad weather, enough monitors are kept on for coverage of known plover road crossing areas and areas adjacent to any non-restricted over-sand areas if the crossovers remain open.

The monitors will keep a log of all crossing events capturing time, direction of movement for adults and the brood, estimated chick age, GPS points, amount of time the crossing took, and start and end time of road closure. Monitors capture brood location (including proximity to road) in the course of regular monitoring, which occurs every at least once every three hours (with one check being between 18:00 and 20:00 if chicks are within 1000 meters of Crossover 1) to better inform data regarding possible crossing attempts and maintain appropriate buffers from OSV areas. A Crossing Summary Report will be submitted to the Massachusetts Division of Fisheries and Wildlife (MADFW) by October 15 outlining crossing activity and associated brood success.

#### Impact Minimization Specific to Least Terns

Management will remain consistent on Duxbury Beach with the addition of Least Terns to the CMP. The Reservation employs Field Technicians, Monitor Supervisors, and Shorebird Monitors to provide extensive monitoring of Least Tern chick nesting areas and chick nurseries. This includes monitoring of Least Tern nurseries within 100 meters of open OSV crossovers from 08:00-20:00.

Monitors are trained to recognize Least Tern nesting activity and to capture information on chick number and locations within colonies. As the tern colony areas oftentimes contain plover nesting territories, the monitors do spend time stationed at Restricted Areas set up for tern nurseries. Monitors are trained to inform Field Technicians and Monitor Supervisors of changes to tern nursery boundaries so that protection measures can be adjusted accordingly. In such cases as monitors are not consistently stationed at a Restricted Area protecting a tern nursery due to a lack of plover chicks, the area is monitored at least once per day if the nursery area is adjacent or proximal to recreational vehicle use. One of these monitoring sessions for nurseries adjacent to the OSV area will occur between 06:00 and 08:00, prior to the beach opening. The goal of this monitoring is to determine if nursery areas have shifted or expanded and Restricted Areas needs to be adjusted.

To minimize risk to Least Tern chicks within 100 meters of an open OSV crossover, the Reservation proposes increased monitoring of the tern nursery area. If chicks are within 30-100 meters of the crossover, the nursery will be monitored every hour from 08:00-20:00. Should chicks come within 30 meters of the crossover, a monitor will remain with the colony constantly from 08:00-20:00 to observe the Least Tern chicks and nesting adults. In the case that a Least Tern chick moves within 15 meters of the crossover, the tern chick will be herded 5 meters beyond the 15-meter buffer. To do so, the monitor will walk slowly towards the chick, coming from the direction of the crossover. The monitor will not push the chick towards the water or roadway, but will attempt to herd the chick parallel to the shoreline. No parking will be permitted within 100 meters of the nursery. Fencing will be placed to allow a driving corridor but no parking along the beach in the direction opposite to the tern colony until the vehicle has moved at least 100 meters from the edge of the nursery area. This area will be adjusted should the nursery area expand or reduce. Monitors will collect data about the colony/nursery within 100 meters of a crossover via the NestStory app. Monitors will record numbers of incubating adults and tern chicks (according to age class) once per shift. In addition, they will take location data for the closest chick and incubating adult and record any instances of herding.

In the event that a Least Tern nursery area is within 50 meters of Crossover 1 and Crossover 1 is open to OSV access between 20:00 and 22:00/23:00, additional protection will be put in place for nighttime use. The Reservation will either require the Town Beach Operations Division to close the Crossover after 20:00 or will

implement a barrier. A barrier will not be used if the area overlaps with the Piping Plover brood range and will not be used within 15 meters of a Piping Plover nest (unless the barrier was installed prior to nest initiation). The barrier will be constructed approximately 15 meters from the crossover in accordance with NHESP recommendations: mesh (with an opening size less than 1.3 cm), dug several inches into the ground, and extending from 1.5 meters above the high tide line to dense vegetation or scarping. Mesh material is recommended to reduce the likelihood of plover or tern chicks sheltering against the barrier. Tern chick shelters will be placed (one per chick within 100 meters) in the nursery area to discourage movement towards the barrier. A staff member will check the barrier for entanglements or other problems between 06:00 and 08:00 each morning. The barrier will be installed for as brief a period as possible – either two days before the earliest estimated hatch date for Least Tern nests within 100 meters of Crossover 1 or two days prior to reopening Crossover 1 following a closure due to other activity.

If a barrier is in place as outlined above at either Crossover 1 or Crossover 2 due to day or nighttime OSV use, monitoring may be reduced. The barrier will be checked every three hours for entanglements and maintenance needs. The colony within 100 meters of the crossover will be monitored to capture chick numbers and age classes, number of incubating adults, and locations of nearest nest and chick to the crossover. If any activity is observed between the barrier and the crossover, a monitor will remain at the crossover while MADFW is contacted to determine best course of action.

#### **4.1.2 Recreation and Beach Operations**

Piping Plover and Least Tern nesting occurs on Duxbury Beach annually from March through August, primarily south of Duxbury Beach Park. Proactive symbolic fencing is placed around the potential nesting habitat, which includes: oceanside beach from Duxbury Beach Park to the end of the driving beach south of Crossover 3, from the path at the Gurnet Guardhouse north to Plum Hills, and around the bayside replicated habitats.

As Field Technicians identify new plover or tern nesting areas, they erect new areas of symbolic or extend existing fencing, with the assistance of Monitor Supervisors and Shorebird Monitors. Fencing is also extended when nests are laid close to the fence line to provide a larger buffer from disturbance. This wider buffer extends 50 meters north and south of the nest. The areas of oceanside habitat are fairly narrow and so it is not always possible to create a buffer of 50 meters east and west of the nest. Fencing is extended as far as possible while providing a space for passage above the high tide line.

Duxbury Beach has several primary points of access to the front beach, both for pedestrians and for recreational and emergency vehicles. As nesting activity increases on Duxbury Beach for Piping Plovers and Least Terns, there is increased potential for nesting activity to block off access to primary access routes. This occurred on several occasions in 2019, during which both Crossover 1 and Crossover 2 were closed for lengthy periods of time both due to nesting proximity and chick proximity.

There are three vehicle crossovers within the OSV portion of Duxbury Beach, two of which are typically used for recreation. In addition, there are 12 pedestrian pathways located north of Crossover 1 on the oceanside. The Reservation would reduce proactive fencing and implement deterrents at specific access points if nesting activity by Piping Plovers or Least Terns was observed. It would not be necessary to implement this covered activity at all access points as some paths are redundant.

Several of these pathways are important for recreational and operational access, including Crossovers 1 and 2. Four of the pathways are handicap accessible with wooden ramps or mobility mats. These same paths are the primary access routes from the Resident Parking Lot and the Duxbury Beach Park parking lot to the beach and

include the pathways wide enough to allow emergency vehicles if needed. Two of the pathways are located between the parking lots and Crossover 1 and allow visitors on the road or beach to cross the dunes to form a “loop”. In addition, the parking lot at the northern property boundary has only one access path to the beach, however, nesting has not been observed in that area historically.

In addition to access paths, there are seven parking lots on Duxbury Beach, three paved and four processed gravel. Each of these parking lots is vulnerable to closures due to nesting activity. While nesting is unlikely in paved lots due to lack of sand, nesting could be possible if cracks form or sand is washed onto the pavement. In addition, pairs could nest immediately adjacent to parking lots. Duxbury Beach is a barrier beach and so traveling to the beach by foot is difficult. There is one public parking lot on the west end of the Powder Point Bridge, however, it is limited in size and not usable to access the beach for those with mobility concerns. The properties to the north and south of Duxbury Beach are privately owned and parking by the public is not permitted. In addition, the Reservation relies on funding provided by parking lot revenues and the Town lease, in order to protect and maintain Duxbury Beach.

#### **4.1.2.1 Recreation and Beach Operations Associated with Reduced Symbolic Fencing Around Nests**

The Reservation proposes to reduce symbolic fencing around Piping Plover and Least Tern nests in order to keep access open at primary entrance paths and allow parking in lots on the property. This will not occur at every access path or lot but specific locations to ensure access during incubation through handicap accessible paths and to the drive-on portion of the beach.

##### Impact Minimization

Symbolic fencing will be reduced in accordance with the conditions outlined on page 3-7 of the HCP. Fencing reductions will begin at least 24 hours after clutch completion. Prior, fencing will be maximized to the extent practical following discussion with MADFW. Fencing will be reduced incrementally, no more than 10 yards per day, until the pathway or access point is no longer blocked. If this requires a buffer of less than 10 yards, DBR will contact MADFW to request permission for further decreases or to discuss moving the nest.

Reduced fencing will only occur around a portion of the nest. For example, fencing around a nest immediately north of Crossover 1 may have fencing reduced to less than 50 meters on the south and east sides to allow vehicles to pass over the crossover and travel north past the nest to park. Parking will not occur within 50 meters of nests.

##### Monitoring

The nest will be monitored daily while fence reductions occur and daily for one week after reductions are complete. Monitors will strive to observe the nest during times of day when the path or access point is being utilized to determine whether the adults are disturbed. Monitoring will take place for 15 minutes each day, during which time the staff member will record changes in adult behavior (flushing from the nest, displaying defensive behavior, etc.) and any potential disturbances (pedestrians, vehicles, predators, etc.). Following the one-week daily monitoring, every other day monitoring will resume until the nest hatches. During each check, monitors will observe adult presence and behavior, disturbances, and infer nest presence based on adult behavior. After the nest hatches, any restrictions for vehicle use in proximity to unfledged chicks will be employed.

#### **4.1.2.2 Recreation and Beach Operations Associated with Reduced Proactive Fencing**

As discussed above, Duxbury Beach has several primary points of access for pedestrians, individuals with limited mobility, recreational vehicles, operations vehicles, and emergency vehicles. Nesting activity in front of or on these access paths or in or near parking lots could be very detrimental to recreational and operational activities. Due to the presence of chicks on the oversand driving portion of Duxbury Beach, OSV access has been extremely limited in recent years. Therefore, it is important to recreational operations that access to the drive-on portion remain open during nesting and incubation. In addition, many OSV users move to the pedestrian only beach when the OSV area is closed. Reducing or completely closing pedestrian access to the oceanside beach via pedestrian pathways or parking lots would effectively prevent many user groups from accessing the beach.

The Reservation proposes implementing reduced proactive fencing on or around primary access paths for pedestrians and OSV users and parking lots in order to keep some parts of the oceanside beach accessible. As it is unlikely that pairs will attempt to establish territories at each of these nine “important” access points and parking lots mentioned above and so the Reservation does not foresee a need to impact greater than 2 acres or 10% of existing habitat. In addition, the Reservation does not intend to use greater than 50% of its take exposures on this covered activity.

##### Impact Minimization

Prior to hatching, nesting habitat on Duxbury Beach is monitored every other day in order to have a good understanding of nesting locations and hatching timeline. In addition, this helps ensure that fencing is adjusted to encompass any nesting activity (courtship tracks, scraping, eggs). Therefore, the Reservation would identify nesting activity in important access areas early in the breeding cycle. Should nesting activity be observed at one of the identified important access sites, the Reservation will notify MADFW of its intent to initiate the covered activity. Monitoring of this area will increase to every day to ensure that if eggs are laid the area is fenced and the access closed.

Mechanical beach raking does not occur on Duxbury Beach and will not occur due the high cobble content and other constraints. In order to deter nesting the Reservation proposes using different materials to temporarily cover nesting habitat. The use of covers to deter nesting and the material used will be dependent on the access point and time of season. At paths used for handicap access, mobility mats and wooden ramps may be installed early to deter nesting. In other areas, silt fencing or tarps and wooden boards may be used. In the areas of vehicle crossovers, materials put down to deter nesting would likely be destroyed. To deter nesting, trained beach staff may hand rake the beach at the crossovers. This will help to deter nesting and will ensure that if eggs are laid, staff locate and protect nests prior to the crossover ramp being open to recreation for the day.

Deterrents at parking lots may vary depending on the condition of the lot. For example, if pairs are exhibiting interest in a paved lot due to sand cover or cracks, the Reservation may sweep the lot and fill in cracked areas (approval from Duxbury Conservation Commission given 2/11/20). In cases of pairs attempting to nest on unpaved lots or adjacent to lots, deterrents would include silt fencing or tarps and plywood sheets.

##### Monitoring

Should the Reservation choose to implement this covered activity in an area, that area will be monitored daily for Piping Plover or Least Tern activity by a qualified shorebird monitor. The monitor will assess deterrents, making repairs and adjustments as necessary. If a nest is laid in the area subject to reduced proactive fencing, the area will be fenced according to the guidelines (unless the covered activity allowing reduced fencing around nests is implemented).

Data collection in association with this covered activity will include taking GPS points of the area left unfenced and of any deterrents, including any movement of deterrents. In addition, monitors will record any Piping Plover or Least Tern activity (breeding, movement, feeding) in the area and within 50 meters north and south of the area daily. Monitoring 50 meters north and south will help to determine if the pair first observed at the access point has shifted activity out of the immediate vicinity. The surrounding habitat will continue to be monitored every other day.

#### **4.1.2.3 Recreation and Beach Operations Associated with Nest Moving**

In the case that reduced proactive fencing is unsuccessful in deterring nesting in an area important for recreational or operational access, the Reservation may request permission from MADFW to move the nest in order to allow access. As noted above, there are specific pathways and parking lots for which this permission may be requested. The need may vary depending on availability for access via other pathways or lots. For example, if Crossover 2 has been closed due to chick activity in the area, and Crossover 3 cannot be opened due to chick location, it would be more important for Crossover 1 to remain open for recreational and operational use as it is the sole remaining access.

The Reservation proposes to implement nest moving as a covered activity as a last effort following reduced proactive fencing and only in cases where reduced symbolic fencing around nests is inadequate to reopen an access point or parking lot.

##### Impact Minimization

A Piping Plover or Least Tern nest on Duxbury Beach will only be moved following discussion and permission from MADFW. In addition, it will be dependent on the ability to follow the minimization measures outlined on pages 3-11 and 3-12 of the HCP.

Prior to moving a nest, the Reservation will submit a plan to MADFW outlining the individuals responsible for moving and monitoring, the nesting activity of the pair thus far (nest attempts, behavioral observations), and the proposed new nest location along with a map showing other nesting activity within 1000 meters north and south. The proposed location will be no further than necessary to reopen the blocked access path or parking lot. However, the distance may be greater depending on habitat quality or level of disturbance. The plan will also include a proposed timeline for movement based on clutch completion (>48 hours post completion), weather, and MADFW staff availability. A nest will not be moved during extreme heat or cold, high winds or surf, monthly high tides, or during evening hours.

Following approval of the plan, the Reservation will receive training from MADFW on the “cylinder/plate/platform method” (referenced on page 3-11 of the HCP). Duxbury Beach cobble content varies

depending on area of the beach and so the Reservation will also provide a description and photo of the nest site to DFW prior.

In conjunction with MADFW staff, approved Reservation staff will move the nest gradually to reduce the risk of abandonment. The first move will be <15 feet, exact distance determined by MADFW and DBR based on nest location and surrounding activity. Distance moved and frequency of movement will be based on conditions outlined in the HCP and dependent on adult response and site conditions. Following the initial nest move, a qualified shorebird technician will observe the nest and adults from a distance to determine results. If incubation does not resume within 1.5 hours, the nest will be moved halfway back to the original location. If incubation does not resume in this location, DBR will consult with MADFW.

If incubation does resume within 1.5 hours, a monitor will continue to observe the nest for an additional 90 minutes following onset of incubation. If incubation is consistent during that time, the nest may be moved again, either one additional time that day or the following (provided good weather). The nest will not be moved more than twice in one day and no more than 20 feet at a time. Monitoring will continue each day of movement as outlined above. If significant distress or inconsistent incubation is observed movement will cease for the day but may continue the following day. If incubation does not resume at any point, DBR will consult with MADFW.

### Monitoring

Following the decision to attempt nest moving and during nest moving, the nest will be monitored daily. The observer will note adult location and behavior during each session. On days while the nest is being moved, the surrounding area will be monitored for new nesting activity or pair activity that may disrupt the pair from returning to incubation following nest movement. Monitoring following each nest movement will occur as outlined above, with 90-minute observation sessions following return to incubation.

During the 90 to 180-minute observation session (time dependent on return to incubation), the monitor will record adult behavior every 5 minutes, noting specifically when incubation ceases/resumes or adults switch off the nest. The monitor will also record any observations of disturbance and other pair activity in the vicinity, including interactions with the target pair. Once nest movement ceases, normal monitoring will resume. Monitors will observe the nest from a distance at least every other day, inferring nest presence based on adult behavior.

### **4.1.3 Compliance and Effectiveness Monitoring**

As mentioned above, monitoring of Piping Plovers and Least Terns on Duxbury Beach is multifaceted with in-field training and reporting responsibility in the hands of multiple groups. Intensive, yet flexible, protocols are in place to help ensure success of nesting shorebirds throughout the site. The extensive monitoring that occurs helps to inform staff of vulnerabilities and potential for additional protection. The Reservation strives to ensure monitoring protocols are constantly evaluated to confirm the program maintains a comprehensive shorebird monitoring and observation program.

Compliance monitoring will document that impact minimization and mitigation measures associated with the covered activities are implemented. Following initiation of any covered activity until the end of the season, the Reservation will provide weekly reports to MADFW outlining management and nesting activity associated with

covered activities. The Reservation will also provide information regarding nighttime OSV use to MADFW on a weekly basis. The Reservation will ensure that the annual Piping Plover and Tern Census forms will continue to be submitted along with associated maps indicating where nesting occurred. Data collected during the course of implementation will be submitted to MADFW along with a summary report. If applicable, any documented “take” of chicks or adults (injury or mortality) resulting from the covered activity will also be reported to MADFW and USFWS within 24 hours, as is currently standard Reservation practice.

## **5.0 Budget**

The implementation of the Impact Avoidance and Minimization Plan (IAMP) will be covered through the extensive monitoring program, referred to as the Duxbury Beach Endangered Species Program. In December 2019, the program was moved from the Town of Duxbury’s management to the Duxbury Beach Reservation’s Coastal Ecology Program.. The program is overseen by the Reservation’s Assistant Director and managed by the Coastal Ecology Program Coordinator with general oversight from the Executive Director. Table 5.1 reflects the budget over the past four years with a partial list of additional expenses. The program is funded, in part, through the lease agreement with the Town of Duxbury. For the 2020 nesting season, the funding was authorized in part by the 2019 Spring Town Meeting, and the FY20 budget will be authorized by the 2020 Spring Town Meeting. The meeting which was scheduled for March 14, 2020 was delayed due to the COVID-19 restrictions and will be rescheduled.

*Table 5-1. Duxbury Beach Endangered Species Program budget, 2016-2019. Projected budget 2020. Position titles have changed for the 2020 season.*

	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020 (projected)</b>
DBR Executive Director (15%)	0	<b>\$13,500 (FY18)^</b>	\$13,500	\$13,500	\$15,000
DBR Assistant Director (45%)	0	<b>\$18,000 (FY18)^</b>	\$18,000	\$27,000	\$29,000
Endangered Species Officers (1) & Assistant Endangered Species Officers (3) (position does not exist for 2020)	\$128,674.14	\$99,523.47	\$110,494.13	\$83,425.21	0
DBR Coastal Ecology Program Coordinator (90%)	0	0	0	0	\$31,500
Monitor Supervisor (2 in 2018, 3 in 2019, 2020) & Shorebird Monitors (30-40 in 2020, 74 in 2019, 60 in 2018, 57 in 2017, 53 in 2016)	\$87,952.50	\$139,720.14	\$214,869.66	\$374,392.58	\$179,562

	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>
Mass Audubon monitoring	\$26,414.87	\$21,473.00	\$23,500	\$21,500	0
Field Technicians (3 in 2020)	0	0	0	0	\$29,269.75
Additional Expenses: education, predator management, signage, artificial habitat creation, equipment	\$39,852.74	\$64,535.65	\$51,850.61	\$35,115.56	\$35,000
<b>Total Endangered Species Program Expenses</b>	<b>\$282,894.25*</b>	<b>\$325,252.26</b>	<b>\$434,937.40</b>	<b>\$554,933.35</b>	<b>\$319,331.75</b>

^ Salaries were not included in 2017 budget but will be in 2018

\*Significant increase from prior year due to increase in Piping Plover pairs



## 6.0 Mitigation Plan

In summary, the Reservation will self-fund a selective predator management plan in 2020. This plan is expected to benefit approximately 28 pairs of Piping Plover based on 28 breeding pairs in 2019. Additional information about the proposed 2020 mitigation will be provided in the APHIS WS Proposal for FY20 (Attachment D). The work plan will be approved by MADFW and USFWS as required pursuant to the HCP prior to implementation. As set forth in the HCP, the Reservation will provide a selective predator management work plan to MADFW on an annual basis in order to ensure that at least 3 Piping Plover pairs benefit from selective predator management for each brood exposed to the use of roads and parking lots. After the work plan and budget are approved by MADFW, selective predator management will be implemented in advance of carrying out the covered activities during the beach season. An estimated 129 pairs of Least Terns will benefit as well, based on the number of nesting pairs in 2019. In the event that DBR runs a mitigation deficit in a given year (e.g. due to between year decline in Piping Plover breeding population), DBR will make up any deficits by providing other supplemental mitigation approved by MADFW in the way of mitigation funds or increased education efforts. However, the Reservation does not anticipate running a deficit in 2020 due to an overage of 4 mitigation credits entering the season, selective predator management, and additional mitigation through education and habitat enhancement.

To mitigate for the potential impacts of the covered activity on Piping Plovers, the Reservation has contracted with the United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service Wildlife Services (APHIS WS) to conduct on-site selective predator management of both avian and mammalian predators in concert with a robust comprehensive non-lethal predator management plan.

The cost for an APHIS WS Cooperative Service Agreement (CSA) that provides five months of control, consisting of a minimum of 14 control visits will be \$11,620.00. These visits may be used for any of the activities: trapping, shooting, or DRC-1339 COR applications. Wildlife Services will schedule control visits and may increase or decrease visits during the agreement depending on predator presence and activity.

The Reservation will provide a selective predator management work plan to MADFW on an annual basis in order to ensure that at least three breeding pairs benefit from selective predator management for each brood exposed to the use of roads and parking lots activity to the extent able, with additional mitigation provided below (3:1 mitigation ratio for both Piping Plover and Least Terns as described in the HCP for Use of Roads and Parking Lots in the Vicinity of Unfledged Piping Plover Chicks).

A variety of non-lethal predator management measures also may be instituted to control the predator impact on nesting shorebirds including predator tracking, thorough refuse management, predator exclosures, electric fencing, elimination of perching availability, replicated habitats, and wooden chick shelters.

- The Reservation's Endangered Species Monitoring Program serves as a non-lethal deterrent to predators as there is heavy human presence near broods and nests, which are monitored by multiple parties. During the plover nesting season, between the hours of 06:30 and 20:00, the program requires the presence of a Monitor Supervisor, a Field Technician, numerous Shorebird Monitors, and Beach Operations staff resulting in 10-25 people at any one time on the beach. During an eight-hour period each day, at least one monitor will be patrolling each area of the beach with broods. Each morning one to two Field Technicians and one to four Shorebird Monitors will be present on different parts of the beach. As some predators are more active in the early morning when beaches are typically less populated by people, the presence of monitors and Field Technicians in nesting areas beginning at 06:00 may deter some predators.

- All Technicians, Supervisors, and Monitors attend a tracking class provided by the Reservation CEP Coordinator at the commencement of the monitoring season. This training educates monitors in the identification of common avian and mammalian predator species of Massachusetts shorebirds and the tracks of common species (domestic and wild) observed on area beaches. Special focus is given to differentiating dog, coyote, and fox tracks, due to their similarities and prevalence on Duxbury Beach. An intensive in-field training compliments the classroom training to ensure field monitors can conduct routine predator surveys to evaluate the impact enhanced predator management has on the reproductive success of the Piping Plovers and Least Terns on Duxbury Beach.
- A thorough refuse management plan is in place to ensure that predators are not attracted to Duxbury Beach (see Section 4.3 for details).
- Predator exclosures have been tied to both nest abandonment and adult mortality, and so prior to erecting a predator exclosure, consideration must be given for predator community, plover pair behavior (tendency to abandon nests), and site characteristics. Much of Duxbury Beach is unsuitable for exclosures due to the narrow width, slope, rocky substrate, and dense vegetation of the beach. Clutches located in replicated habitat areas may be candidates for exclosures as these areas are primarily open, flat, sandy, and at less risk of overwash being on the bayside of the site. The Reservation and partners will determine where exclosures may be a viable option as territories are established and eggs are laid.
- Electric fencing is typically utilized to protect multiple shorebird nests (Piping Plover, Least Tern and/or American Oystercatcher) from mammalian predators. Electric fencing has not previously been employed on Duxbury Beach as narrow beaches at high tide are not ideal candidates due to the limited space and potential for overwash. Small areas of electric fencing may be possible in some areas, such as the replicated habitats; however, these areas are typically small and used by only one pair. Three-sided electric fencing, connected only by a ground wire on the water side, may be considered around tern colonies to deter coyotes. Electric fencing will be considered for use on a case-by-case basis, depending on location and predator community.
- Prior to nesting season, a thorough review of perching post availability will be undertaken and all unnecessary posts will be removed. Thin posts are less likely to be used by potential avian predators as perches. Posts erected to mark the replicated habitat areas on the west side of the site are thin, rebar posts, thought to be poor perches. The Reservation will review and consider placing anti-perching materials (e.g., nails) on top of posts, depending on location and proximity to nesting.
- Wooden chick shelters are thought to protect tern, and less commonly plover, chicks from exposure and potential predators. Shelters can be used in areas where vegetation is limited and chicks have few options for cover. Shelters are typically used for tern colonies on Duxbury Beach.

In addition to the predation management program, the Reservation sponsors robust educational programs throughout the season. During the 2019 season, the Summer Education Programs at Duxbury Beach hosted 24 classes (one cancelled due to rain). These hour-and-a-half-long classes were offered on Tuesdays, Thursdays, and Saturdays throughout the months of July and August. Two classes are specifically directed or related to Piping Plovers: “Piping Plovers” and “Shorebird Feeding Adaptations.” In addition, Mass Audubon educators speak about Piping Plover and Least Tern nesting, protection efforts, and the importance of conservation during each program. The Reservation’s partners at Mass Audubon’s South Shore Sanctuaries presented these programs. The cost of the Mass Audubon Summer Programs for the 2020 season is \$4,350. The Reservation anticipates utilizing this programming as mitigation for two pairs.

In addition, five individual replicated habitats were maintained on Duxbury Beach in 2019. The habitats have been constructed and maintained on the bayside of Duxbury Beach since 1999. Since that time 1-3 pairs of Piping Plover have utilized the replicated habitats. If nesting occurs in the replicated habitats in 2020 as anticipated, this will further contribute towards mitigation efforts.

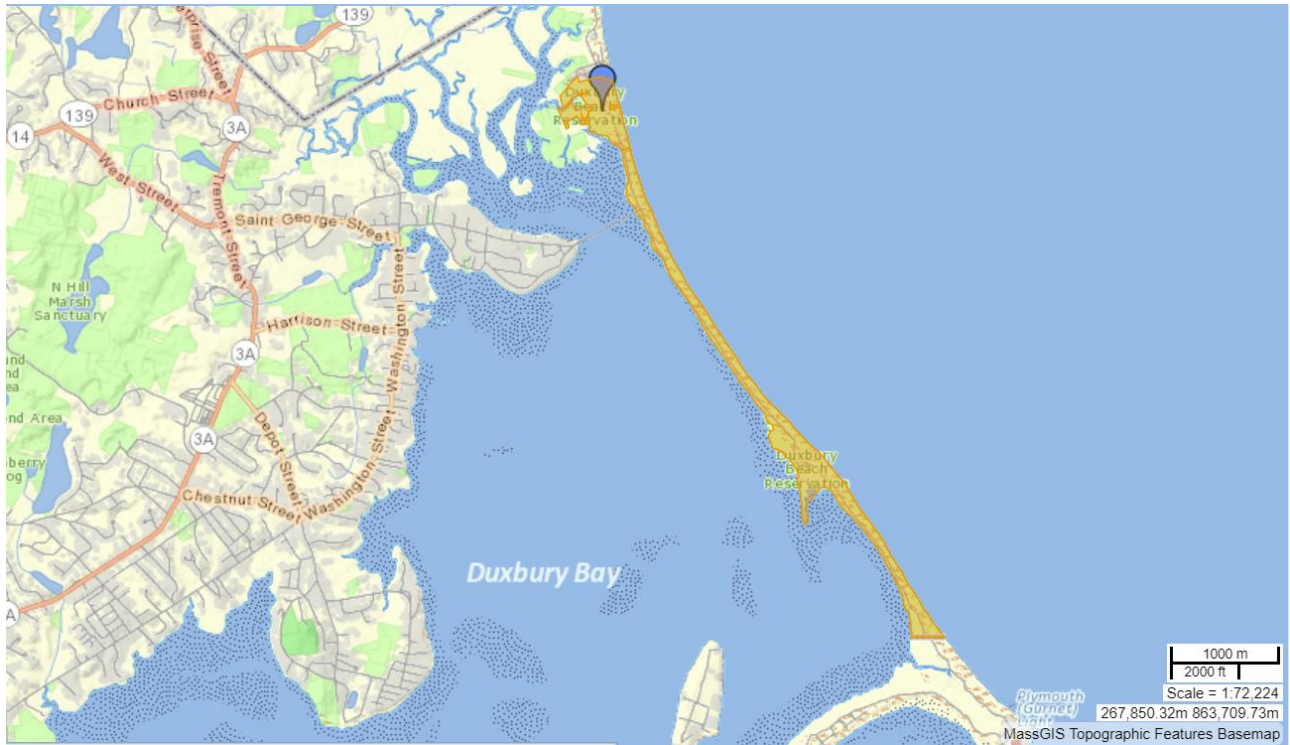
Through mitigation overage, selective predator management, education efforts, and habitat maintenance efforts, the Reservation anticipates mitigation efforts to total 36 in 2020. This is over the 30 mitigation total required for the requested 10 pairs exposed in 2020 at a 3:1 mitigation.

## **6.1 Mitigation Monitoring Plan**

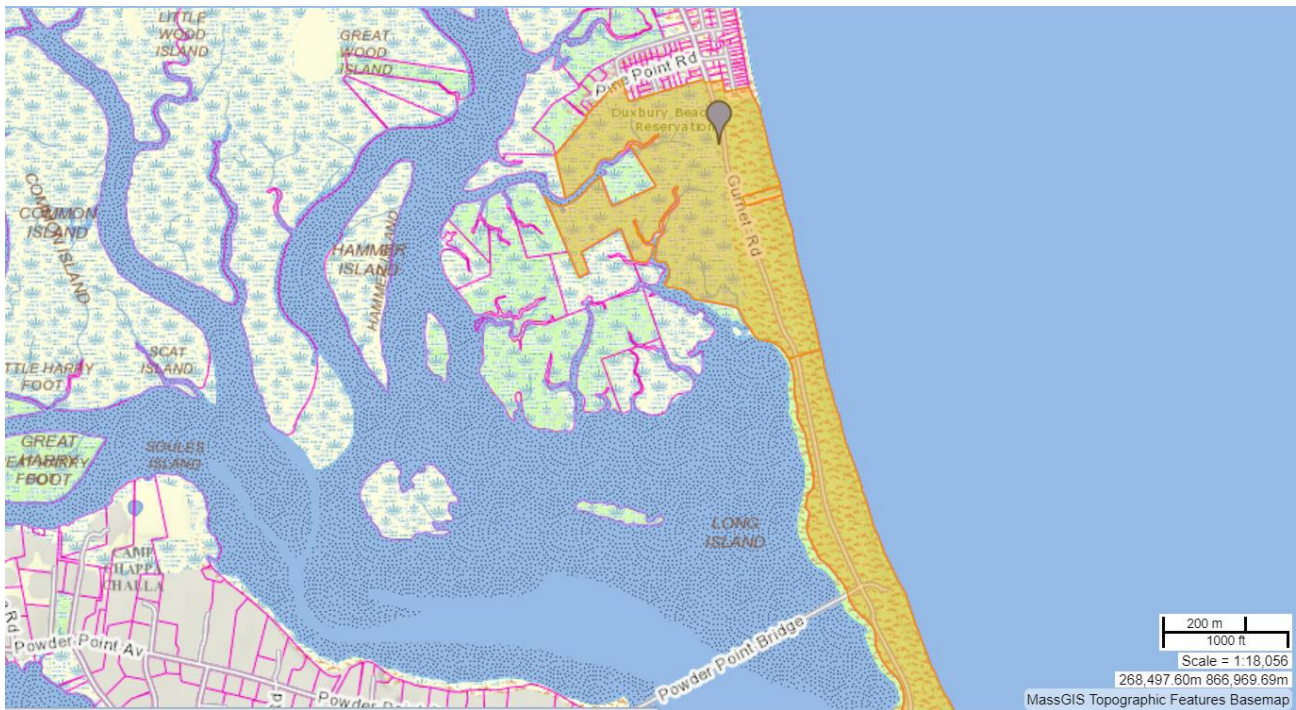
To assess effectiveness of the mitigation plan, the Reservation will monitor and report the following to MADFW annually:

- The actual number of Piping Plover broods exposed to covered activities
- The actual number of Least Tern chicks exposed to covered activities
- Actual number of breeding pairs of Piping Plovers that benefited from selective predator management
- Actual number of breeding pairs of Least Terns that benefited from selective predator management
- Actual number of breeding pairs of Piping Plovers that benefited from experimental habitats
- Piping Plover productivity from the site
- Least Tern productivity from the site
- Causes of nest and chick loss
- Any mitigation credits or deficits that will be carried over into the following season

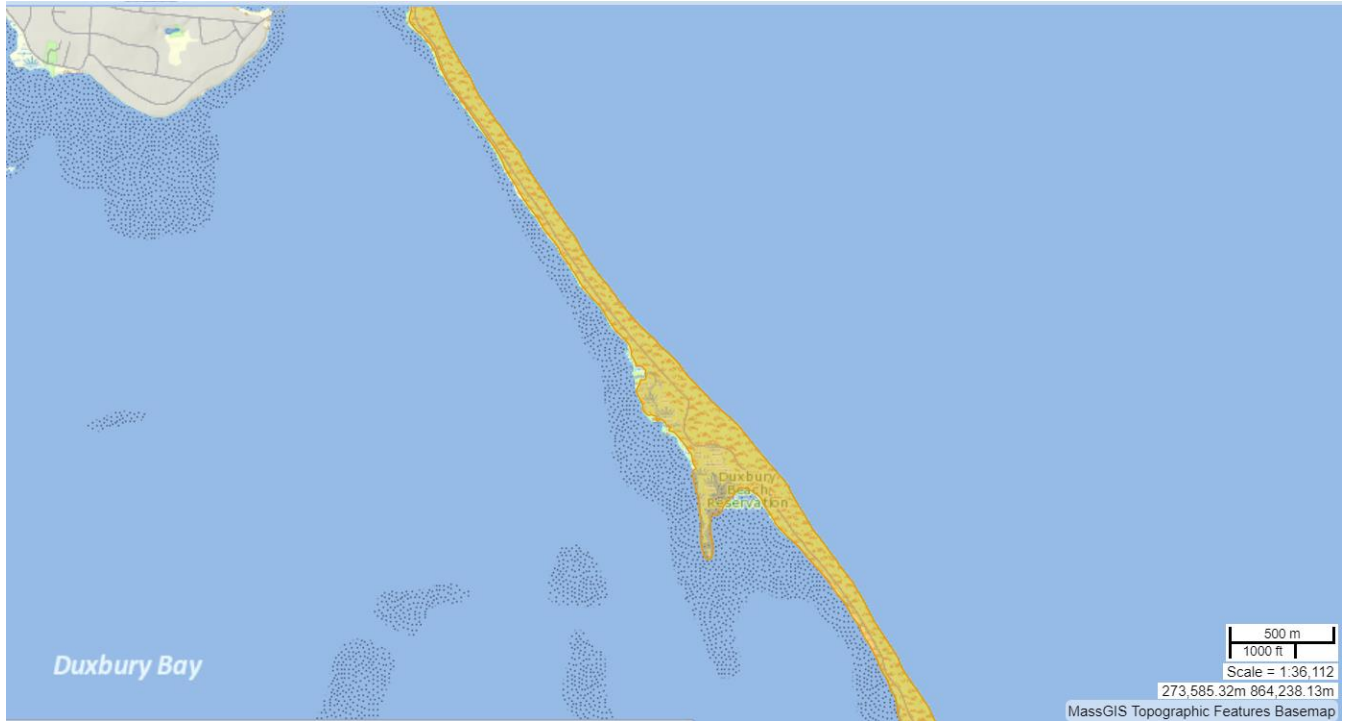
## **Appendix 1. Duxbury Beach Maps**



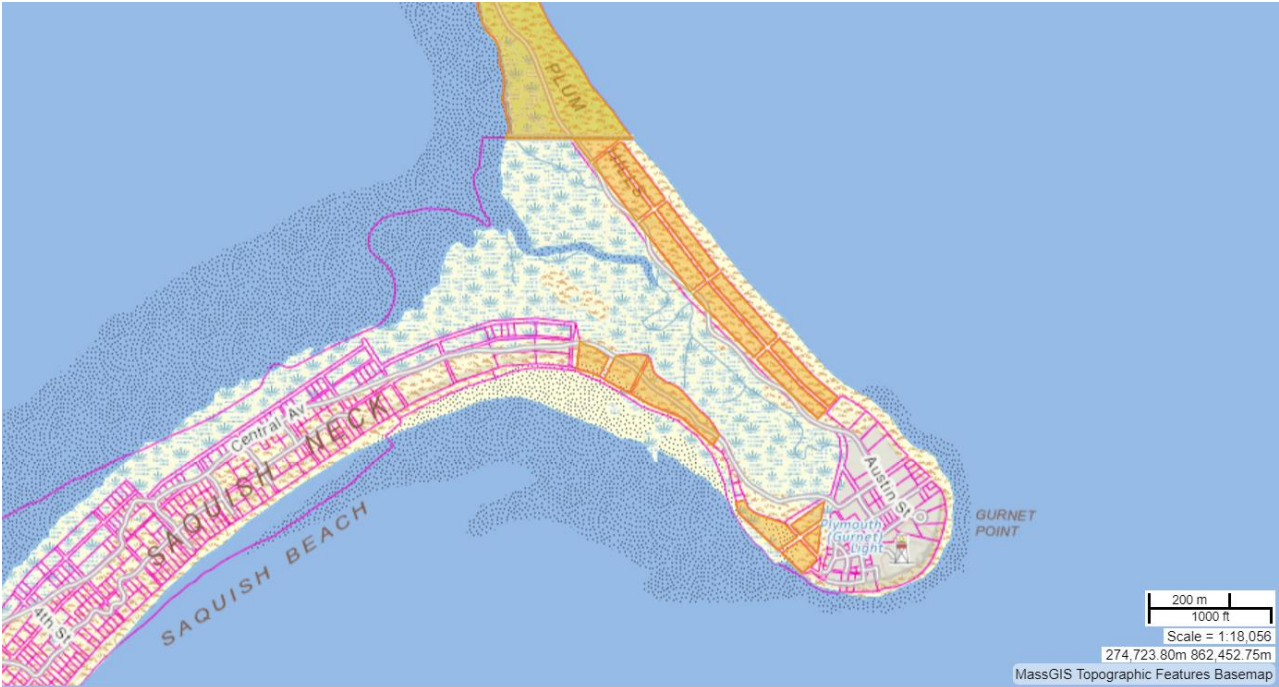
Map 1. Duxbury Beach Reservation property located in the Town of Duxbury. Including parcels: 145\_400\_000 and 141\_421\_900



Map 2. Duxbury Beach Reservation HAMPER Property, including Lagerstedt Lot, McLaughlin Cottage, Duxbury Beach Park, and Town of Duxbury Resident Lots/Pedestrian Beach.

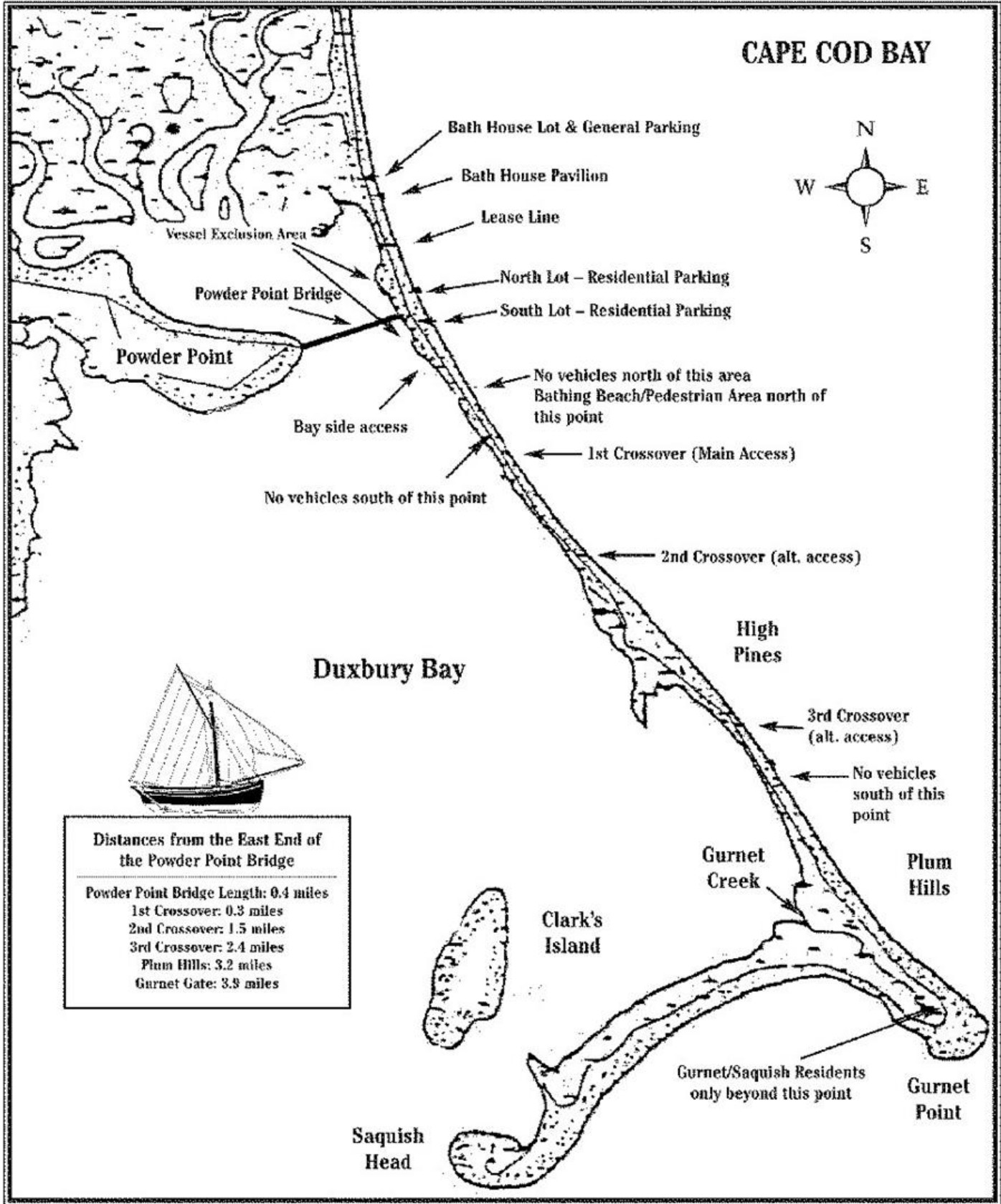


Map 3. Duxbury Beach Reservation property, including OSV beach (Crossover 1 to Crossover 3) and up to Town of Plymouth Line.



Map 4. Duxbury Beach Reservation property located in the Town of Plymouth. Property ID: 132-000G-096-000.



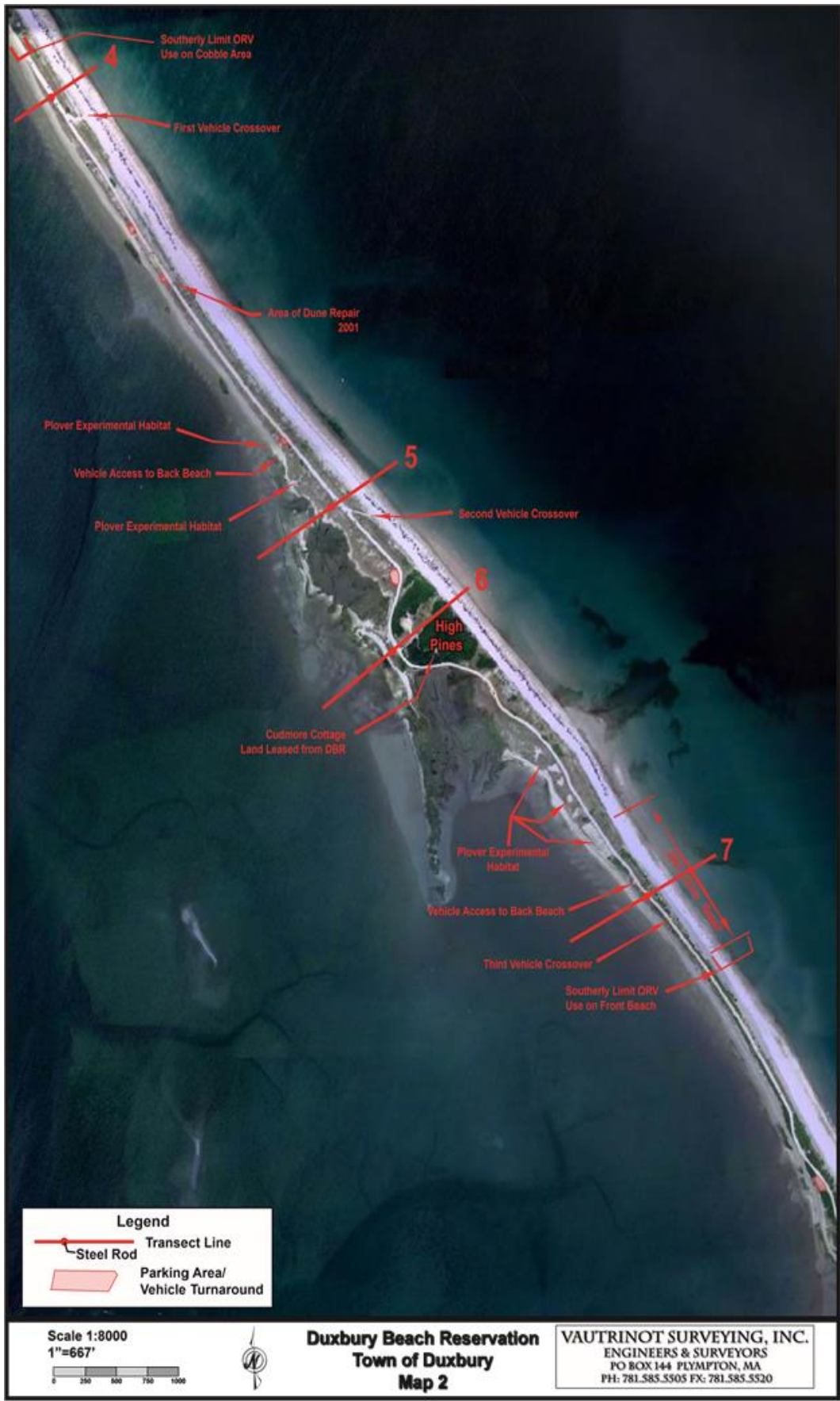




Imagery Date 03/11/12

09/06/12





Imagery Date 03/11/12

09/06/12



Imagery Date 03/11/12

09/06/12

### Special Dog Regulations

The following rules shall be in effect on Duxbury Beach property:

1. Any dog on beach property must be leashed at all times and under immediate and effective control of its handler. **NOTE:** "Immediate and effective control" is determined by Duxbury Police Department Beach Operations Division personnel.
3. If in accordance with all rules and regulations, dogs are allowed on beach property between the hours of 8:00am and Sunset, unless these hours are amended by the Duxbury Police Department Beach Operations Division. Dogs are prohibited between the hours of Sunset and 8:00am.
4. Unless specifically amended within these rules or by action of the Duxbury Police Department Beach Operations Division, all other Duxbury, state, or federal dog control regulations shall continue to apply. These include regulations under these "Special Dog Regulations" and contained within the "General Beach Regulations" section and the "Motor Vehicle Beach Regulations" sections of this Pamphlet, and Section 7.1 of the General By-Laws of the Town of Duxbury.
5. Dogs and their handlers are prohibited from all dunes, vegetation, marsh grass, posted bird or wildlife areas, and all Restricted Areas.
6. Dog handlers are required to remove droppings of their dogs from the Powder Point Bridge, beach parking lots, and all beach areas and dispose of droppings in provided trash receptacles or otherwise remove them from beach property.
7. All dogs are prohibited from the front beach, known as the Resident Beach, to the poles delineating the start of the ORV portion from April 1 to September 15.
8. All dogs are prohibited from the bayside beach north of the Powder Point Bridge adjacent to the Resident Parking Lot from April 1 to September 15.
9. Dogs and their handlers are prohibited from disturbing any protected species or wildlife on beach property. Dogs are not permitted to pass through Restricted Areas on the oceanside or bayside beach or dunes.
10. Any violation of these Rules & Regulations, the Duxbury Beach Guide, Duxbury General By-Laws, or federal or state law may result in non-criminal or criminal process, as well as provisions found in the Duxbury General By-Laws, and may involve the revocation of the dog permit for the remainder of the year. If a dog permit is revoked, such revocation shall be recorded at the Duxbury Town Hall, and the dog's owner and immediate family will not be eligible to re-apply for another permit until the following year.

Duxbury Beach is owned by Duxbury Beach Reservation, Inc., a Massachusetts non-profit corporation. The Reservation works to preserve the beach as a barrier beach for the protection of Duxbury, as an environmental asset and, consistent with its primary ecological objectives, to operate the beach for recreation by the public. On an annual basis, the Town of Duxbury has leased a portion of the beach from the Reservation. Consistent with the lease, the Town provides management of the leased portion for the benefit and enjoyment of the public, and provides enforcement of the beach rules and regulations contained in this document, which are agreed to by the Reservation and the Duxbury Board of Selectmen..

All visitors are subject to the current beach rules and regulations, as amended or added to from time to time, and to all applicable laws.

Non-compliance with any current beach rule, regulation or applicable law may result in the loss of a beach vehicle permit and of beach privileges, in addition to other appropriate penalties.

#### Limitation of Liability

1. The Town of Duxbury and Duxbury Beach Reservation, Inc. accept no responsibility or liability for any personal injury or property damage sustained on Duxbury Beach.
2. Entry upon or use of Duxbury Beach by any person, including by foot, bicycle, motor vehicle, boat, or horseback, shall be at their own risk and such entry or use shall constitute a release by such person of the Town of Duxbury and Duxbury Beach Reservation, Inc. from any and all claims for personal injury or property damage sustained on Duxbury Beach, and such release shall be binding upon such person, their personal representatives, and all persons claiming through or under them.
3. All beach users must comply with current beach rules and regulations and the request or instructions of the patrolling Duxbury Police Beach Operations Division personnel and/or Police Officers.

To report an emergency, dial 9-1-1  
For non-emergencies, dial (781) 934-5656

The most up-to-date information pertaining to beach conditions including restrictions and access limitations may be found on the internet at [www.town.duxbury.ma.us/](http://www.town.duxbury.ma.us/)

Beach conditions and information updates can be found by following the Duxbury Police Beach Ops Twitter feed at [www.twitter.com/DPD\\_Beach\\_Ops](https://www.twitter.com/DPD_Beach_Ops)

This pamphlet was produced by the  
Duxbury Police Department Beach Operations Division  
155 Mayflower Street, Duxbury, MA 02332

**Powder Point Bridge Length: 0.4 miles**

#### **Distances from the East End of the Powder Point Bridge:**

**1st Crossover: 0.3 miles**  
**2nd Crossover: 1.5 miles**  
**3rd Crossover: 2.4 miles**  
**Plum Hills: 3.2 miles**  
**Gurnet Gate: 3.5 miles**



# Duxbury Beach Guide & Rules

**Duxbury Beach is owned by Duxbury Beach Reservation, Inc.**

**Duxbury Police Beach Operations Division oversees  
daily recreational operations**



### Management of Duxbury Beach

Duxbury Beach is a unique and ever-changing natural resource for the entire South Shore of Massachusetts. This barrier beach serves as natural protection for the towns of Duxbury, Kingston, and Plymouth, and as a conservation, scenic, and recreational area. Due to its constant use and vulnerability to the natural forces on the Eastern Atlantic Coast, the beach and its protection is constantly managed by its owner, the Duxbury Beach Reservation, Inc., in connection with the Duxbury Beach Committee, a town advisory group; and the Duxbury Police Beach Operations Division, which directly oversees the daily recreational operations.

The beach grass on Duxbury Beach plays a vital role in holding the sand during wind and storm events. Beach grass is brittle and easily broken if stepped on. Just walking between the clumps of grass causes sand grains to break the fragile root hairs. Once broken, the plant immediately dies. It is essential to establish and enforce natural dune areas and keep them free of human impact. You will see that this management technique allows Duxbury Beach to recover naturally from high impact environmental forces such as storms. All beach erosion control devices such as fencing, grass and shrub planting areas, and cabling are here for the purpose of preserving the beach as a natural protective barrier and for your present and future enjoyment.

### Recreational Beach/Regulations

- Walking** is encouraged on Duxbury Beach. However, all persons, their animals, and vehicles must stay out of all dunes, vegetation, marsh grass, posted bird or wildlife areas, and Restricted Areas. Restricted Areas mean areas that are marked by fences, posts, signs, cones, or instructions or directions of authorized personnel. Please use designated crossovers and pathways only.
- Biking** is allowed on Duxbury Beach and its roadways. However, all bikers shall stay out of all dunes, vegetation, marsh grass, posted bird or wildlife areas, and Restricted Areas. All bikers shall abide by posted speed limits at all times. Bikers shall walk their bike through Restricted Areas, but only as permitted or directed by authorized personnel.
- Swimming** - All persons swimming or bathing at Duxbury Beach do so at their own risk (see "Limitation of Liability"). Lifeguards are on duty only in the designated lifeguard / bathing area. The designated lifeguard / bathing area is defined as the ocean side of the beach directly east of the Powder Point Bridge, 100 yards either side of the stationary lifeguard stand. Rafts, tubes, floatation equipment, face masks, and snorkeling and diving equipment are prohibited in the designated lifeguard / bathing area. Swimming in any other area of the beach is without lifeguard supervision. Swimming, diving, and jumping from the Powder Point Bridge is strictly prohibited. No swimming is permitted in the boat channel adjacent to the bayside beach.
- Boating** - Except for authorized emergency vessels, no vessels of any kind (boats, sailboats, sailboards, jet skis, etc.) are permitted within 150 feet of the water's edge of the oceanside beach except in designated vessel access areas, or within 150 feet of the water's edge of the bay side beach, 150 feet north and south of the Powder Point Bridge. In designated vessel access areas (a) all water skiing, swimming, and floatation devices are prohibited, (b) vessel anchoring is permitted, and (c) vessels may proceed at stearage speed only.
- Horseback riding** requires a special permit that must be purchased from the Treasurer's office at Town Hall. Riding is permitted daily, from sunrise to sunset, October through April. Riding is permitted, from sunrise to 9:00am and 6:00pm to sunset, May through September, weekdays only. All motor vehicle and parking regulations apply. Riders are responsible for removing all horse droppings from parking areas.
- Shellfishing** requires a special permit that must be purchased from the Inspectional Services Department at Town Hall. Motor vehicle access for this purpose must comply with all beach motor vehicle regulations.
- Fishing** from the bridge is permitted on the side-walk side only, as long as it does not interfere with vehicular or pedestrian traffic. No fishing is allowed within the marked channel area. Fishing on the beach must be respectful of swimmers, and poles on the beach must be kept at the water's edge at all times while in the act of fishing. Bait and carcasses must be removed.
- Hunting** is prohibited on beach property at all times. Discharge of firearms is prohibited on beach property.
- Facilities** - Portable restrooms are available throughout the beach. Snacks are available seasonally at the Duxbury Beach Park Bathhouse.
- Drones** - The use of drones / unmanned aerial vehicles launched, operated, flown over, or retrieved on beach property is not permitted with the exception of flights specifically approved by Duxbury Beach Reservation, Inc., Duxbury Police Beach Operations Division personnel, and the Marshfield Airport.
- Kites** - The use of kites is prohibited on beach property closer than 200 meters (219 yards) around or above territorial or nesting adult and unfledged juvenile Piping Plovers and Least Terns from April 1 through September 15.
- Kiteboarding** is permitted off of Duxbury Beach on the bayside, but only outside of Restricted Areas and no closer than 200 meters (219 yards) around nesting Piping Plover adults or unfledged chicks. Kiteboarders must use established vehicle pull-offs to park and access the water and must have an ORV driving permit. The primary access point is at High Pines. Pull-offs within Restricted Areas established due to protected species locations are closed to all vehicles, including kiteboarders. Landing kiteboards is not permitted within Restricted Areas or closer than 200 meters (219 yards) of any nesting activity.

### General Beach Regulations

- All beach users must comply with all federal, state, and local laws, as well as with rules, regulations, and directions, requests, and instructions from the Duxbury Police Department Beach Operations Division personnel, Police Officers, Duxbury Beach Reservation Coastal Ecology personnel, and other authorized agency or department personnel.
- When protected species are present on beach property, no person, their animal or vehicle shall disturb or attempt to disturb the protected species in any way and/or fail to adhere to the direction and instruction of the Duxbury Police Department Beach Operations Division personnel, Police Officers, and Duxbury Beach Reservation Coastal Ecology personnel, or other authorized agency or department personnel.
- Drinking of alcoholic beverages is prohibited on beach property.
- Dogs must be leashed *and* under the immediate and effective control of their handler at all times. All dogs on beach property must be covered by a current Town of Duxbury Walking Permit issued by the Duxbury Town Clerk (see "Special Dog Regulations").
- No sand, stone, vegetation, salt marsh hay, seaweed or other material may be removed from beach property. Erosion control fencing, access fencing and cabling or signs shall not be disturbed, damaged or removed.
- Store and discard trash, especially food scraps, properly. Littering and dumping of household trash is prohibited. Glass containers are not allowed on beach property. Trash receptacles for incidental beach trash are available seasonally at the resident parking lot. Otherwise, beach policy is "carry-in, carry-out" at all times.
- Bonfires and campfires are prohibited. Small cooking fires in a metal container are permitted but only on the ORV portion of the beach. No materials may be added to a fire within one hour of beach closing. All fires must be extinguished with water within a half hour of beach closing, and all fire remnants must be removed from beach property by the beach user.
- Overnight camping on beach property is prohibited. Unauthorized vehicles access is prohibited.
- Fireworks are illegal and are prohibited on beach property.

- Loitering in the beach parking lots is prohibited after beach closing.
- Beach functions or group gatherings of 20 or more persons, or any other special event or research, requires a special permit from the Duxbury Police Department Beach Operations Division. Applications for permits shall be received at least one week prior to the proposed function. Public demonstrations on beach property are prohibited.

### Motor Vehicle Beach Regulations

- All vehicles on beach property must carry a current copy of the Duxbury Beach Guide & Rules.
- All vehicles parked on beach property must visibly display a current Duxbury Beach sticker. Vehicles parked in any parking area at the east end of the Powder Point Bridge must visibly display a resident or rental resident beach lot sticker from Memorial Day to Labor Day.
- All vehicles driving in or parked in ORV areas or parked in roadside parking areas south of the Powder Point Bridge must visibly display a current resident or nonresident ORV sticker appropriate for year round or off-season use.
- Stickers shall be affixed under the "rearview" mirror to the vehicle windshield, never in tint. If not affixed in the correct position, the RFID system may not detect the sticker and a violation may occur. Unauthorized parking in all roadways, fire lanes, or vehicle crossovers is prohibited at all times. There are five types of Duxbury Beach permits:  
**Resident Beach Lot:** for use of paved parking lots (valid April - March)  
**Resident Oversand:** for (4WD) vehicles in paved parking lots, ORV areas, and roadside parking areas (valid April - March)  
**Resident Off-Season Oversand:** for (4WD) vehicles in ORV areas and roadside parking areas (valid October - March)  
**Non-Resident Oversand:** for (4WD) vehicles in ORV areas, and roadside parking areas (valid April - March)  
**Non-Resident Off-Season Oversand:** for (4WD) vehicles in ORV areas and roadside parking areas (valid October - March)
- Permits are valid only for the vehicle for which they were purchased. The permit registration number must match the vehicle registration. Permits are nontransferable. Original permit sticker must be returned in order to receive a replacement due to sale of vehicle, windshield replacement, etc.
- All other vehicles are prohibited, including motorcycles, minibikes, minicars, snowmobiles, paragliders, ATVs and ATCs (except when necessary for official use). No airplanes or helicopters are permitted to land on Duxbury Beach property except in an emergency.
- All parking is on a first-come, first-served basis. When parking capacities are reached, vehicle access restrictions will be imposed.
- Further restrictions may be imposed on the number of vehicles permitted on beach property for public safety, access management, and/or protected species management.
- All off-road vehicles must have 4WD and the proper tire pressure for beach conditions (15PSI), as this pressure will lessen damage to beach roads and crossovers and promote a safe and comfortable ride. All off-road vehicles must be properly equipped before they are permitted on the beach, and vehicles may be inspected for the following equipment at any time: shovel; tow rope, tow strap, or chain; spare tire, jack, and 18" square plywood support pad; and tires that are properly pressurized for beach conditions. Vehicles lacking this equipment or tire pressure may be cited and/or refused entry for any missing items.
- Parking Lot Hours: Hours are subject to change.  
**East End Parking Lot, North Resident Lot:** May-Aug: 8am - Sunset. Sept-Apr: 9am - Sunset  
**East End Parking Lot, Resident South Lot:** May-Aug: 6am - 11pm. Sept-Apr: 6am - Sunset
- Off Road Vehicle Hours - Hours are subject to change based on, but not limited to, weather, protected species and wildlife management issues, and other environmental factors. The Off Road Vehicle Hours will be posted via social media and at the East End of the Powder Point Bridge on a daily basis.
- Driving must be confined to designated routes and never in the water, on or over dunes, vegetation, marsh grass, intertidal areas, or Restricted Areas. Vehicles shall travel in established tracks. Vehicles shall park perpendicular to water's edge in an organized fashion and in a manner that will not interfere with the established track or traffic flow. Vehicles driving off the beach shall have the right of way. Vehicles are not allowed in pedestrian, mud-flat/shellfish, Restricted Areas, or protected species or wildlife areas. No vehicle shall travel or park within 10 feet of a sand fence, or symbolic string or post fence on the ocean side of the beach.
- All vehicles must be operated for the safety and regard of the operator, vehicle occupants, pedestrians, protected species and wildlife, and beach resources. Maximum speed on the Powder Point Bridge, vehicle turnaround, paved parking areas, vehicle crossovers, and in designated ORV areas is 10 mph, conditions permitting. On the improved beach roadway the maximum speed is 15 mph, conditions permitting. In any protected species area, the maximum speed shall be reduced to 5 mph, and traffic may be further restricted or stopped by authorized agency or department personnel for protected species management.
- All persons must ride within the confines of any motor vehicle and must be seated. Riding on fenders, tailgate, or roof, or standing in the vehicle, is prohibited.

**The roadway over the leased portion of the beach to Gurnet Gate is for use by off-road vehicles only. All Gurnet-Saquish traffic must use the roadway.**

Be advised that the ORV portion of Duxbury Beach, at times, may not be accessible during high tides. The ORV portion or sections of the ORV portion can be closed for many other reasons, including protected species activity, rip currents, and/or shark sightings. The hours of availability of the ORV portion or sections of the ORV portion on any day may be shortened, and/or the ORV portion or sections of the ORV portion may be closed at sundown for many reasons.

### ORV Driving Tips

If stuck, do not spin the tires. Let air out of your tires and try again. If your car frame is touching the sand, stop everything and follow this procedure: 1. Jack up each wheel and fill in the holes under each tire; 2. Drop the tire pressure further and attempt to back up car about 15 feet; 3. Fill in all holes; 4. Proceed forward.

**Duxbury Beach Guide**  
**For all Town of Duxbury ORV and Parking Lot Permit Holders - 2020**

**Introduction**

In 1986, Piping Plovers (*Charadrius melodus*) were listed as a threatened species under both the U.S. Endangered Species Act and the Massachusetts Endangered Species Act. Since 1991 Piping Plovers have nested on Duxbury Beach. Though the nesting population of Piping Plovers has continued to grow in Massachusetts and over two dozen pairs nest annually on Duxbury Beach, the Atlantic Coast population of Plovers as-a-whole is still in crisis.

In order to allow vehicles to travel on the beach roadway, use parking lots, and have over-sand vehicle (ORV) access on the beach, Duxbury Beach Reservation, Inc., the owner of Duxbury Beach, successfully obtained a permit for increased management flexibility from MassWildlife under its Habitat Conservation Plan (HCP). Among other provisions, this Plan allows vehicles to travel in the vicinity of unfledged (non-flying) piping plover chicks on Duxbury Beach, but only under specified rules and conditions designed to protect the birds.

Piping plover parents return to Duxbury Beach in late March and chicks begin to hatch in mid-May. Typically, the last chicks will begin flying in late August-early September. Piping plover chicks leave the nest about two hours after hatching and are able to feed themselves. Piping plovers eat a variety of marine and terrestrial invertebrates such as worms and amphipods. They move from one tidal area to another, multiple times per day, crossing the roadway and foraging along both the oceanside and bayside beaches. Chicks blend into their surroundings very effectively because of their camouflaged plumage. They are highly mobile, very fast, and feed over large areas. When disturbed, they may run in spurts, stop, and hide in dune grass or small depressions in the sand.

**Access**

Recreational vehicles with a valid Duxbury Beach sticker are allowed access onto the property during the Plover season. Access may vary depending on when chicks hatch and where nests are and where chicks move. Nesting locations and chick movements change each season and so it is impossible to predict where and when closures may occur. Over-sand vehicles must have an ORV sticker and drivers must respect restricted areas and adhere to the Duxbury Beach Motor Vehicle Beach Regulations (listed in the Duxbury Beach Guide & Rules), bird monitor and beach operations instructions, and information on signs.

**What to Look For**

Piping plover broods (parents and chicks) exhibit several behaviors to look out for while driving along the roadway, beach, or through a parking lot. The plovers are spread throughout Duxbury Beach – north to south and east to west. Looking out for certain behaviors can help make sure that we keep them safe.

**Flying:** Be on the lookout for parent plovers flying in and out of the roadway. Typically, they will be calling or “peeping” while doing this, and it is a sign that the parents and chicks are going to cross the road. **Stop your vehicle and scan the road for other birds on the edge of the road or in the road if you see a plover fly in or out of the roadway.** Keep in mind that you may not hear them calling over the sound of the vehicle engine.

**Chick Movement:** At the start of crossing the road, the parents will lead the chicks into the road. Plover broods do not travel in a tight group, so entry into the roadway may be staggered. **If you see one or two chicks in the road, be on the lookout for more entering from either side of the roadway.** Plover parents will typically dart back and forth along the road to guide their chicks and keep an eye out for danger.

**Camouflage:** Chicks rely heavily on their camouflage to keep themselves safe. When faced with danger, such as a vehicle near them, their instinct is to freeze and crouch down where they are rather than run away. They may also take shelter in potholes, tire tracks, and other depressions, as well as vegetation growing along the side of the road. **Check the roadway thoroughly to make sure the chicks aren’t hiding before you move your vehicle.**

**Brooding:** Chicks can also take shelter under one of the parents in a behavior called “brooding.” One or more chicks will push themselves under their parent to hide. It is very difficult to tell how many chicks are under the parent, even with binoculars. You can tell a parent is brooding chicks because they will stand still and looked fluffed up. Chicks can brood like this for several minutes at a time. **Do not attempt to pass the birds while they are brooding.** Brooding also helps chicks maintain their body temperatures and disrupting this behavior could cause them to die from being too cold or hot.

**Movement Along the Road:** The parents and chicks may go straight across the road and into the vegetation on the other side, but they may also travel up or down the roadway to access a more suitable exit point. **If the birds start traveling away from you, do not follow them. Following the brood as they are trying to find an exit point can make the crossing take longer.**

**Hiding Under Vehicles:** **If the birds start traveling toward you, do not move your vehicle.** Plover chicks have been known to take shelter under stationary vehicles and crouch under tires for safety. If no Shorebird Monitors are around, one person inside the vehicle should carefully get out to check if there are birds under the vehicle. If they are still there, do not attempt to move the birds. Get back in the vehicle and wait for them to move on their own. Lingering in the road can make the crossing take longer.

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## Piping Plover Photos



At left, a Piping Plover parent on Duxbury Beach. The adults are roughly the size of a tennis ball and they blend in with the sand and cobble very well. Look carefully for movement, distinctive black bands, and listen for peeping. At right, Piping Plover chicks are perfectly suited to blend in with Duxbury Beach. They grow quickly from the size of a cotton ball to adult size in about a month. They must find food for themselves and spend much of their time feeding and moving. (Photo credit: Stewart Ting Chong)

Additional photos and videos may be found at [www.duxburybeachreservation.org/hcp](http://www.duxburybeachreservation.org/hcp)

### Driving Procedures

When driving on the back roadway, in parking lots, and in ORV areas on the beach, observe posted speed limits and look for Plovers. The maximum speed limit is typically 15 mph, but it is reduced to 5 mph within known Plover crossing areas. Head-light use is required during evening/nighttime hours. Adhere to all closures indicated by roped-off areas, barrels and cones. Orange fencing twine denotes areas where vehicles are prohibited.

Pullouts and sections of the back road may have limited access during the Plover nesting season. Drivers are responsible for adhering to any closures, including limited access down the back road. Drivers will be notified of such restrictions when entering the beach and are responsible for limiting travel on the back road to open areas.

During portions of the day, monitors will be on site to manage Plover crossings. When a crossing closure occurs, vehicles must follow instructions from bird monitors and must stop when a monitor has raised the stop sign or has signaled a driver to stop. Closures can last from a few minutes to two hours. Drivers are requested to stay in vehicle and avoid harassing the birds or the staff. Anyone traveling on Duxbury Beach should be prepared for such an extended stay and travel with any medications, water, and other necessities. In the event of a medical emergency, DBR staff will call 911 so that you may be taken off the beach safely.

While driving, keep your attention and eyes on the road. Use your peripheral vision to look for chicks near the edge of the roadway or travel corridor that may dart out. Chicks may also hide in small depressions in the sand, including in tire ruts, or in dune grass. They are tiny when newly hatched and rely on blending in with their surroundings. When chicks are close to people, the parent plover will often get excited, peep loudly (a rapidly repeated "peep-peep") and stand in the road. Adults may also pretend to have a broken wing; they may flap their wing on the ground while moving away from you. This biological defense behavior is commonly referred to as the "broken wing display." If you see this, be aware the adults are attempting to draw attention to themselves and away from chicks.

If you observe a Plover adult or chick in the roadway or parking lot and there is no staff present, stop your vehicle (do NOT drive around the bird) and wait until the Plover has left the roadway or parking lot. Scan the area very carefully to check for any other chicks or parents. Oftentimes the chicks do not move as a group. Do not attempt to keep driving if you see another chick on the side of the road or in the parking lot. Do not harass or frighten the bird or attempt to herd the bird out of the way.

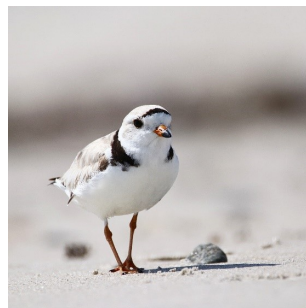
Once the birds have made it safely out of the area, scan the area one last time to ensure there are no crouching chicks or stragglers just entering the area. Once you are confident there are no birds left in the area, you may move your vehicle. Proceed slowly until you are out of the area.

Due to varying high tides, changing beach condition, plover related closures and other reasons, portions of Duxbury Beach may be closed to traffic. Therefore, such closures should be anticipated and expected and are a reflection of the dynamic and healthy coastal landscape that we all love and rely on.

**IMPORTANT!** In the event of an emergency, and beach personnel are not present, please dial 911.

**VIOLATIONS:** Any violations of the aforementioned protocol will not be tolerated. Violators of the Duxbury Beach Guide & Rules shall be subject to sticker revocation, and their rights to operate a vehicle on Duxbury Beach will be suspended immediately for a period of one year from the date of the violation. A ZERO TOLERANCE POLICY WILL BE IN EFFECT AT ALL TIMES on all rules that compromise plover safety. Your cooperation in complying with these conditions and requirements is critical in determining future vehicle access on Duxbury Beach. You are active stakeholders in successful implementation of activities covered under Duxbury Beach Reservation's HCP permit. Thank you for helping to keep Duxbury Beach a safe and enjoyable place.

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**Duxbury Beach Reservation, Inc.**

## **Piping Plover Brood Herding Protocol**

**Created: March 20, 2020**

**Purpose:** This protocol describes when and how Piping Plover broods may be herded off the back road or away from paved parking lots on Duxbury Beach in situations approved under DBR permits.

### **Herding due to plovers' use of roadway**

When a Piping Plover brood attempted to use the back road for lengthy periods of time (>1 hr) in 2019, MassWildlife authorized the Duxbury Beach Reservation to escort vehicles past the birds at scheduled times during daylight hours. Outside of scheduled times, vehicles had to wait to travel until the next scheduled escort time.

- **Details:**
  - Initially, a brood may be herded off the road after 30 minutes (following herding protocol below under *Herding Procedure*). If the Plover activity continues in the road, herding will occur at scheduled times.
    - Scheduled times are 7 am, 9 am, 11 am, 1 pm, 2 pm, 4 pm, 6 pm, and 8 pm.
    - Schedule has been set up to accommodate Gurnet-Saquish resident work schedules and monitoring staff shift start and end times. Scheduled times may shift dependent on staffing but will remain every two hours.
  - Schedule will be distributed to Gurnet-Saquish Corporation officers who in turn post on Gurnet/Saquish Corporation Facebook page and distribute via resident emails
  - If the back road is open to recreational vehicles, the schedule will also be posted by the Town of Duxbury on the town website, email blast, and Twitter.
- If the birds are not in the road, travel by Gurnet-Saquish residents may proceed as normal.
- This protocol is not intended for use during active road crossings.

### **Herding near Pedestrian Pathways**

There are several areas of Duxbury Beach that do not provide Piping Plover habitat on the bayside. This primarily consists of saltmarsh but also includes the Powder Point Bridge with associated revetment and footings. In two sections these non-habitat areas border paved parking lots. This includes the length of the paved parking lot at Duxbury Beach Park and the main pedestrian path across from the Powder Point Bridge. In cases where a brood is using the area oceanside or exhibits behavior indicating an attempt to access the parking lots in these areas, a combination of herding and barriers (see *Barrier Use*

*Protocol*) will be utilized to discourage crossings in these areas. This will not prevent the brood from crossing to the bayside in other sections of the beach.

- **Duxbury Beach Park Paved Parking Lot:**

- Should a pair nest on the oceanside of the paved parking lot at Duxbury Beach Park, staff will erect a barrier according to the DBR PIPL Barrier Use Protocol along the length of the west side of the oceanside dune prior to hatching to prevent entry into the parking lot. This should include all pedestrian pathways north of the boardwalk.
- If a brood moves into the area north of Duxbury Beach Park, a barrier will be erected along the western length of the oceanside dune bordering the parking lot. During the time that the barrier is being erected, a second monitor (two may be necessary depending on brood range) will be stationed at the nearest pathway to discourage plovers from entering. Should it become necessary, the brood will be herded (minimum two staff) away from the path.
- The boardwalk path should be assessed daily at 10:00 and 20:00 to ensure access via this path is not possible by chicks. Should access become possible because of sand build-up, a monitor will remain with the brood and a second monitor will be stationed at the access path to discourage entry. Should it become necessary, herding according to the Herding Procedure outlined below should be implemented until a barrier or other method of preventing access can be erected. Currently there is no access via the boardwalk due to the height difference between the beach and the boardwalk itself. This will continuously be evaluated throughout the season when barriers have been erected.

- **Resident Parking Lot Main Pedestrian Path:**

- Should a brood begin to approach the pedestrian path across from the Powder Point Bridge (move within 10 meters of the pathway and direction indicates they may use the path), staff should immediately begin preparing a barrier that can be erected across the width of the pathway on the east end. Staff will immediately initiate the DBR Herding Protocol (non-active herding).
  - Barrier may consist of landscape fabric or silt fencing, low enough for pedestrians to step over, with stabilizing wooden posts along its length.
  - The barrier should be able to stand up to normal wind but should also allow emergency vehicle access should it be necessary as this is the closest vehicle access path to the Town Pedestrian Beach.
  - Signs will be erected facing east and west at the barrier to inform pedestrians of the barrier and direct them to the nearest alternate handicap access.
  - Fluorescent flagging will be tied along the length of the barrier to increase visibility for pedestrians.
- From 10:00-18:00, a monitor will be stationed with the brood. Should the brood begin moving towards the path, the monitor will position themselves in front of the pathway



to discourage entry. If the brood moves within 3 meters of the pathway, the monitor will proceed to herd the brood away from the path following the *Herding Procedure* below.

- At 20:00, the barrier will be rolled out across the east end of the pathway and signs will be re-erected. Following initial observation of the brood the following morning, the barrier will be rolled off the path to allow use of the limited mobility access path.

### **Herding Procedure**

- Herding at Duxbury Beach may be defined as “Active” or “Non-active”.
  - Active herding is described below and indicated monitors are moving towards a brood to usher them in a certain direction.
  - Non-active herding indicates a monitor is stationed at a certain location to discourage brood movement towards that area by their presence and not movement towards the brood.
- Should herding be deemed necessary and no DBR staff member is present, Beach Operations staff must notify DBR prior to implementing herding to ensure the activity complies with DBR permits.
  - In the case of non-active herding away from the above-mentioned pedestrian pathways, the monitor with the brood should alert the Monitor Supervisor. The Supervisor should instruct the monitor to position themselves at the east end of the pathway and alert the CEP Coordinator.
- Two staff must be present for herding to occur (this may include Beach Rangers, Monitor Supervisors, Shorebird Monitors, and Field Technicians).
  - In the case of herding away from the main pedestrian path at the Resident Parking Lot, this number may be reduced to one if another staff is not immediately present.
- In the case of herding out of the roadway, prior to herding, staff should communicate to determine which direction (east or west) they will attempt to herd the brood. In the case of herding away from a pedestrian path, prior to herding, staff should communicate to determine which direction (north, south, or east) they will attempt to herd the brood. Considerations include:
  - Direction of brood’s movement
  - Predator presence
  - Tide (at low tide bayside may be preferable, at high tide oceanside may be preferable)
  - Access (dense vegetation, etc.)
  - Pedestrian presence
- During herding, staff should line up next to one another (spanning the width of the brood) and move slowly towards the brood. If the brood begins to move off the road or away from the pathway (>5m) independently, staff should stop herding.

- **Road Reopening:**
  - Road reopening following herding should not occur until the brood is at the eastern crest of the oceanside dune OR west of the vegetation on the bayside.
  - A minimum of two staff should be present to reopen the road following herding (additional staff may be necessary depending on number of chicks and tendency to range widely).
  - Monitors must have eyes on all chicks and adults in the brood prior to opening the road.
  - Prior to escorting, staff will explain the procedure to the first car in line north and south.
  - Vehicles should be escorted past the brood (200 ft from the brood north and south)
    - Monitor will walk in front of the northbound line of cars until the last car has passed the brood. The monitor will then lead the southbound cars in the same fashion.
    - 1-2 monitors should be observing the brood throughout the time needed to escort the vehicles past the brood.

## **Emergencies**

- **Emergency Vehicles**
  - There are no restrictions during emergencies.
  - Emergency vehicles should avoid the birds to the extent practicable under the circumstances.
  - Should beach staff be notified of an emergency vehicle approaching or observe it at an adequate distance, staff should notify a supervisor and attempt to herd the brood out of the road if safe to do so.
- **Personal Vehicles**
  - Beach personnel should offer to call an ambulance for the person.
  - If person declines emergency personnel, Beach Operations staff should notify DBR who will in turn notify MassWildlife.
  - Following proper notifications, the brood should be herded off the road and the vehicle escorted through (as described above) after notifying DBR.



**Duxbury Beach Reservation, Inc.**  
**Piping Plover Barrier Use Protocol**  
**Created 3/20/20**

**Purpose:** This protocol describes when and how barriers may be erected on Duxbury Beach.

There are several areas of Duxbury Beach that do not provide Piping Plover habitat on the bayside. This primarily consists of saltmarsh but also includes the Powder Point Bridge with associated revetment and footings. In two sections these non-habitat areas border paved parking lots. This includes the length of the paved parking lot at Duxbury Beach Park and the main pedestrian path across from the Powder Point Bridge. In cases where a brood is using the area oceanside and/or exhibits behavior indicating an attempt to access the parking lots in these areas, a combination of herding and barriers (see *Barrier Use Protocol*) will be utilized to discourage crossings in these areas. This will not prevent the brood from crossing to the bayside in other sections of the beach and will not prevent movement north and south along the oceanside beach.

**Barrier Locations**

- **Duxbury Beach Park Paved Parking Lot (map 1):** Should a pair nest on the oceanside of the paved parking lot at Duxbury Beach Park or a brood move into this area, staff will erect a barrier along the length of the west side of the oceanside dune prior to hatching to prevent entry into the parking lot. This should include all pedestrian pathways north of the wooden boardwalk in front of Blakeman's, which includes three at the paved parking lot and one at the Northern Lot.
- **Resident Parking Lot Main Pedestrian Path (map 2):** Should a brood begin to approach the pedestrian path across from the Powder Point Bridge, staff should immediately begin preparing a barrier that can be erected across the width of the pathway on the east end.
- **Pedestrian Pathways North of Crossover 1 (map 1-2):** In special cases, barriers may be utilized for short durations (20:00-08:00) to discourage crossing activity overnight in specific parts of the beach where recreational vehicle use of the back road occurs. These will be employed if a brood north begins crossing the road while nighttime driving is permitted.

## **Barrier Description**

- Possible barrier types include silt fence, landscape fabric, <math><1/2\text{''}</math> hardwire cloth, plastic jersey barrier, wooden planks
- Flimsy barriers (silt fence, landscape fabric or chicken wire) may be attached to existing or new sand fencing with zip ties or staples or wooden posts spaced approximately every 2-3 meters.
- In cases where the barrier also serves to prevent pedestrian access, barriers should include the use of sand fencing to provide height and stability.
  - Barrier should include “area closed” signage at the pathway entrance at the parking lot. If the pathway is closed it is encompassed by the closed area fencing (fencing around nests and nesting habitat) on the oceanside which would include additional signage.
- In cases where pedestrian access is permitted or emergency vehicles may need easy access, barriers should consist of low (8-12” high) hardware cloth, silt fencing, or landscape fabric attached to wooden posts.
  - Barrier should include signs indicating the barrier and to use caution facing both directions from the barrier. If applicable, include signs indicating the nearest handicap accessible pathway.
  - Fluorescent flagging should be tied along the length of the barrier to increase visibility for pedestrians.
- Pedestrian pathway barriers for nighttime use will consist of wooden planks nestled into the sand or cobble to make deploying and removing quick.

## **Barrier Placement and Monitoring**

- Barriers should be placed so as not to restrict access to bayside foraging habitat (may minimize restriction to habitat during nighttime hours only).
- Barriers should be erected by a minimum of two staff to ensure timely placement and that the barrier is taut and properly set up.
- Barrier set-up:
  - The barrier should be buried >3 inches beneath the sand or cobble to ensure the chicks cannot pass underneath.
  - Sand fencing or wooden stakes should be adequately deep so as not to fall over in normal wind conditions or be easily moved by a pedestrian.
  - Barrier should be taut to ensure chicks cannot pass over the top of the barrier.
- Barriers should be assessed during each shift daily, morning, afternoon, and evening, to check for entrapment hazards or issues with the barrier that may allow chick passage. Repairs should be made immediately.
- The Reservation will test the usefulness and safety of a crossing barrier at pedestrian paths during the daytime to assess adult and chick behavior and ensure that barriers do not increase risk to adults by causing them to land and stay in the road for long periods of time while encouraging chicks to cross.

- Barriers used to minimization impact of nighttime driving should be placed (or completed) at 20:00 and removed at 08:00. This will be performed by Duxbury Beach Operations staff.



Map 1. Potential barrier locations at Duxbury Beach Park if nesting occurs north of Blakeman's building.



Figure 2. Potential barrier locations in case of two scenarios. The barrier opposite the Powder Point Bridge would be installed if a brood attempts to use that pathway to access the paved parking lot. Barriers at pedestrian pathways will be installed at sunset and removed before the beach opens if Crossover 1 is open to nighttime OSV use and broods exhibit a tendency to cross the road/parking lot to the bayside in this area.



*Figure 3. Barriers at pedestrian pathways will be installed at sunset and removed before the beach opens if Crossover 1 is open to nighttime OSV use and broods exhibit a tendency to cross the road in this area.*