MASSACHUSETTS PIPING PLOVER HABITAT CONSERVATION PLAN
CERTIFICATE OF INCLUSION REQUEST 2016
SANDY NECK BEACH PARK
BARNSTABLE MASSACHUSETTS

Prepared for submission to:

Natural Heritage & Endangered Species Program
Massachusetts Division of Fish & Wildlife
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Westborough, MA 01581

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Table of Contents

1.0 INTRODUCTION AND OVERVIEW

This request for a Certificate of Inclusion (COI) is prepared as part of an application from the Town of Barnstable in order to participate in the statewide Plover Habitat Conservation Plan (HCP). This document also serves as an application for a Conservation and Management Permit (CMP) pursuant to the Massachusetts Endangered Species Act (MESA; MGL c. 131A; 320 CMR 10.00). The Town is requesting the opportunity to implement "Recreation and Beach Operations Associated with Reduced Proactive Symbolic Fencing," a covered activity described in the HCP. No more than one nesting territory would be exposed to this activity (2.5% of the breeding pairs on site, based on 40 breeding pairs in 2015). The activity and associated impact minimization procedures would be confined to a portion of the in suitable habitat along 2,000 linear feet of beach. This area supported a Plover nest in 2013, which caused a complete closure of the Off Road Vehicle Beach (ORV). The intent is to reduce symbolic fencing in this area to allow recreational activities that would not otherwise occur, and to use coverboards or the like to reduce the risk of interaction between beachgoers and Plovers attempting to breed in this section of beach. The Town is proposing that mitigation be in the form of funding to implement selective off-site predator management, educational outreach and increased law enforcement, overseen by the Natural Heritage & Endangered Species Program (NHESP), as set forth in the HCP. In the near future, the Town may request to expand this COI to include ORV escorts past Least Tern chicks.[1]

2.0 GEOGRAPHIC SCOPE

The geographic area encompassed by this request includes suitable Plover habitat from the east edge of the parking lot to 40 feet east of Trail 1 (Figure 1). We are also requesting that two small blow-outs (known as "Shoo" and "Scram") be included (Figure 1, Photographs 1 & 2). This area of suitable habitat equals 1.347 acres. We obtained this figure by using the Arc View measuring tool on a 2015 aerial map of the beach. Measurements were taken from the toe of the dune to the extreme high tide line. We would like to re-evaluate the geographical scope each year as winter storms may change the beach and dune profile which could shift the desirable Plover nesting habitat.

[1] In which case the NHESP will make the Town's amended COI application available for public review, prior to issuing an amended COI (and Conservation & Management Permit pursuant to the MA Endangered Species Act).

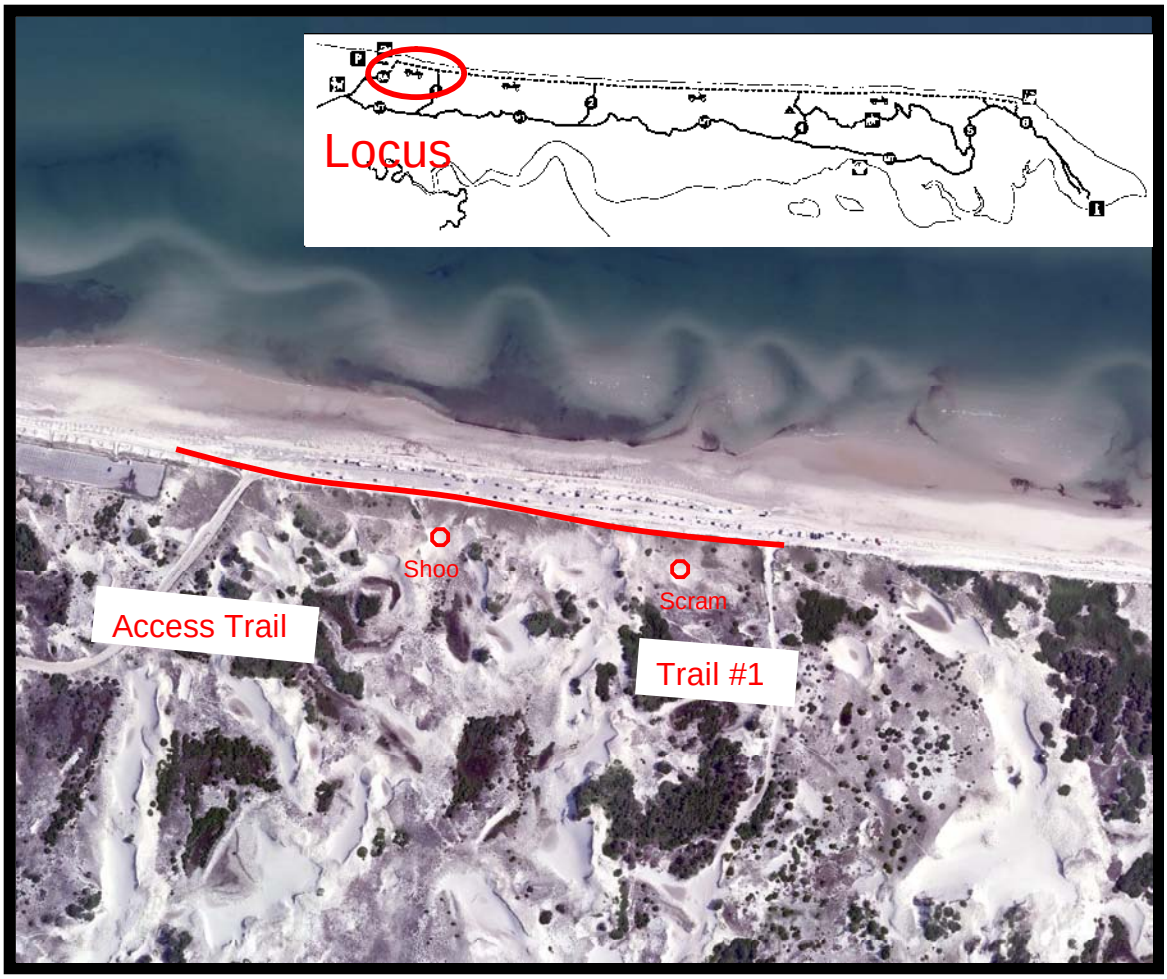


Figure 1: Recreation Zone.

Photograph 1: “Shoo”

Photograph 2: “Scram”

3.0 SITE DESCRIPTION

Sandy Neck Beach Park is a 1,390 acre barrier beach that is located on Cape Cod Bay. It is owned and operated by the Town of Barnstable (Figures 2 & 3). Most of the park has been preserved as conservation lands. The property is approximately 6.5 miles long by 0.5 miles wide and is located as a protective landform for The Great Marsh and Barnstable Harbor.

Sandy Neck Beach Park allows ORV access with a permit and this activity occurs on the front beach corridor, which is 4.5 miles long. However, the ORV corridor is reduced in length for much of the summer season due to nesting Plovers and Least Terns that require protection under state and federal law. Along the south side of the property is the Marsh Trail that runs east to west. There are six (6) trails that run north-south between the front beach and the Marsh Trail (Access Trail, Trail 1, Trail 2, Trail 4, Trail 5 and Trail 6). Trail 3 was abandoned. These trails are used by hikers and are also utilized for vehicular access to Sandy Neck cottages. There are 50 privately owned cottages. Some are on private lands and those that are located on town owned land require a yearly property lease. These cottages are situated along the Marsh Trail and within the Cottage Colony, which is also where the Sandy Neck Lighthouse is located.

On the front beach, east of Trail 6 is an area known as Little Neck, which is the most prolific section of the beach for shorebird nesting due to many acres of high quality habitat. East of Little Neck is Beach Point, which is a destination for boaters in the summer season particularly during low tide. This section of beach is closed to vehicular access, year-round.

Access to the beach (unless traveling via boat) occurs in one location at the western end of the property. Vehicles travel down Sandy Neck Road and patrons are greeted by Sandy Neck Gatehouse personnel. Some patrons park at the Gatehouse and enjoy the hiking trails. Others travel to the 200+ spaces parking lot (north of the Gatehouse) and use the public bathing beach known as Bodfish Park. Within this section of the property is the bathhouse which includes a concession stand and lifeguard room where first aid is provided. ORV and camper traffic is checked in at the Gatehouse and then they travel to the Access Trail and ultimately the front beach.

The summer season at Sandy Neck is bustling with the majority of patrons using Bodfish Park and the ORV beach. During the shoulder seasons, horseback riders, dog walkers, fisherman, hunters, birdwatchers, fat tire bike riders and hikers are more prevalent. Winter months often include nor'easters that hit the northern exposed shoreline head-on and change the landscape due to high rates of erosion and accretion.

Figure 2: Sandy Neck Beach Park Map for Patrons

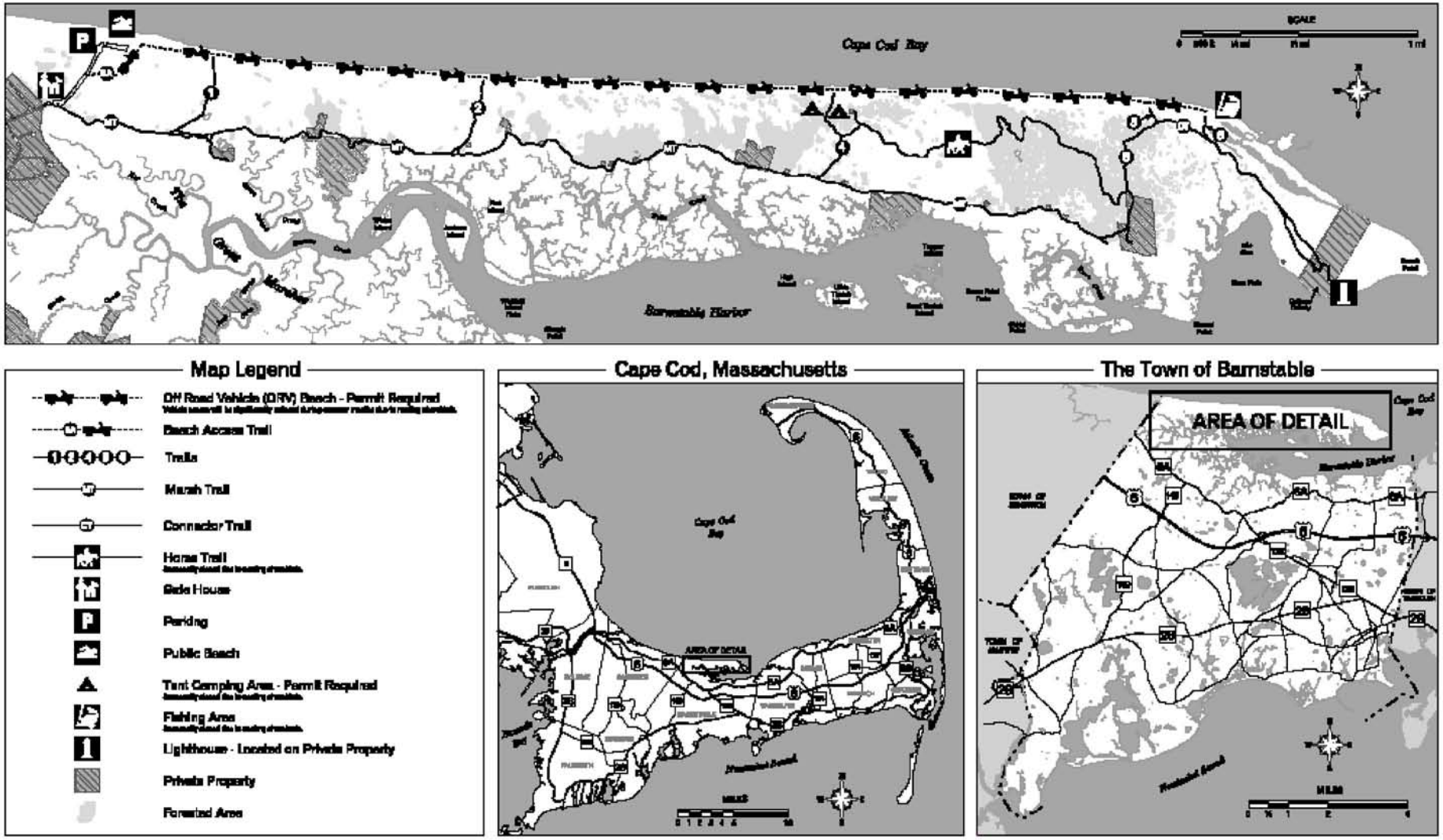


Figure 3: Sandy Neck Beach Park Landforms

4.0 NATURAL HISTORY OF SANDY NECK

Most of 4.0 and 5.0 were taken from the Sandy Neck Management Plan (2003). For a complete copy visit:
http://www.townofbarnstable.us/SandyNeckPark/fileuploads/managementplan.pdf

Sandy Neck is a valuable and beautiful barrier beach that has been recognized as a significant natural resource at the private, municipal, state, regional, and federal levels. It is included in the state's designation as an Area of Critical Environmental Concern (ACEC), and has been identified by the Nature Conservancy as one of the best barrier beach systems remaining in the North Atlantic Coast Ecoregion. For this reason, the Nature Conservancy, the Town of Barnstable, and other leading organizations invest resources into conservation and research efforts at Sandy Neck. For all of the attributes of Sandy Neck, there are a variety of stakeholders and interests that, at times, conflict, but share the undisputed importance of Sandy Neck as a valuable environmental resource. Sandy Neck includes one of the largest stretches of publicly accessible coastline in the Commonwealth, and has a pristine character. With its diverse and unique wildlife habitat, including migrating dunes, coastal beaches, tidal flats, wetlands, and maritime forests, Sandy Neck offers a coastal wilderness experience for the public only 15 minutes from the center of Hyannis or Sandwich.

4.1 Geology

Sandy Neck is a barrier beach system located on the north shore of Cape Cod, MA that extends approximately 6 miles east from its sole mainland connection. The barrier shelters on its leeward side extensive estuarine salt marsh and Barnstable Harbor. This narrow neck of sand varies in width from approximately 200 feet to a maximum of 1/2 mile. Shaped by glacial activity and longshore drift, Sandy Neck is geologically quite young, although relatively stable for this type of landform. The front beach is relatively stable with erosion rates on the order of one-quarter to one-half foot per year. The eastern tip of Sandy Neck at Beach Point has a substantial historical accretion rate of more than 1.5 feet per year. Pioneering work by Alfred Redfield in 1972 characterized the system, and dates the oldest sections of Sandy Neck at about 3500 years. Despite its historical evolution, the recent relative stability of the barrier spit has facilitated the establishment of a variety of soil types and natural communities, including migrating sand dunes, fresh and saltwater marshes, bogs and both deciduous and coniferous forests.

4.2 Hydrology

The topography of the surrounding embayment at Sandy Neck results in large fluctuations in local sea level due to tidal action. The mean tidal range at Sandy Neck exceeds 9 vertical feet and can reach 13 feet during full and new moon periods, with storm tides exceeding peak lunar values. During high tide periods, Sandy Neck is often inundated with water along its coastal and salt marsh boundaries, making human access along these ecotones nearly impossible. During winter storms and hurricanes, the storm surge often penetrates the primary dunes. These storms leave standing pools of salt water deep in the interdune area. Although rare, these storms provide

crucial nutrients to the plant communities within the dunes and help shape the topographic features of the beach. They do, however, present challenges to the management of permanent transportation corridors along the barrier beach. Current vehicle travel corridors are situated in the most dynamic areas of the beach that are at highest risk to tidal and storm action.

Freshwater wetlands at Sandy Neck are made possible by the presence of a freshwater supply that sits atop and slightly displaces the salty ground water. This lens of freshwater is nourished solely by rainwater. The freshwater table varies considerably throughout the annual cycle with the peak being in early spring. During spring, temporary ponds and flooded natural bogs dominate the landscape at Sandy Neck. These ephemeral freshwater ponds, called interdunal swales, are crucial resources for many organisms that complete their life cycles on Sandy Neck. Many species of amphibians, insects, and plants exploit these seasonal resources.

4.3 Wetland Resource Areas

Nearly all of Sandy Neck is considered a resource area with respect to the Massachusetts Wetlands Protection Act. These wetland resources include barrier beach, coastal beach, coastal dunes, salt marsh, land under the ocean, land containing shellfish, bordering vegetated wetlands, coastal banks, and estimated habitats of rare wildlife for coastal and inland wetlands. Additionally, all of Sandy Neck has been designated by the Secretary of Environmental Affairs as an Area of Critical Environmental Concern (ACEC) by the Massachusetts Office of Coastal Zone Management. The importance of Sandy Neck as an environmental resource is undisputed. As such, all proposals for management changes at Sandy Neck receive a higher level of scrutiny and review by various authorities.

5.0 RARE AND ENDANGERED SPECIES

Sandy Neck supports a wide range of biological diversity that includes significant numbers of endangered species. Its large size, isolation and relatively pristine ecology provide some of the most important habitats for rare and endangered species anywhere in Massachusetts. The Massachusetts Division of Fisheries and Wildlife has recorded and certified the presence of at least eight endangered or threatened species on Sandy Neck (Table 1). They include two species of plants, one invertebrate species, one amphibian species, one reptile species, and three species of shore birds. Other species observed and documented at Sandy Neck (but not resident) include transient Roseate terns (*Sterna dougallii*), Yellow-crowned night herons (*Nycticorax violaceus*), and a variety of sea turtles and marine mammals.

Table 1. Summary of federal and state-listed species of plants and animals that occur within the Barnstable portion Sandy Neck Beach not including the Great Marsh.

Common name	Scientific name	Listing status[a]
Coastal Heathland Cutworm	*Abagrotis crumbi benjamani*	SC
Diamondback Terrapin	*Malaclemys terrapin*	T
Plymouth Gentian	*Sebatia kennedyana*	SC
Eastern Spadefoot	*Scaphiopus holbrookii*	T
Bristly Foxtail	*Setaria geniculata*	SC
Least Tern	*Sterna antillarum*	SC
Common Tern	*Sterna hirundo*	SC

[a] FE = federal endangered, FT = federal threatened, E = state endangered, T = state threatened, SC = state Species of Special Concern

6.0 STEWARDSHIP EFFORTS

The Sandy Neck Program is known for its excellent stewardship of the land and endangered species. The following is a synopsis of our projects and programs.

6.1 Mapping

Using GIS/GPS, close to 300 interdunal swales have been mapped and attribute data collected. This project is a culmination of fifteen (15) years of fieldwork and we are presently working with Massachusetts (MA) Audubon (Long Pasture) to calibrate our spatial data with their Spadefoot Toad observation data.

6.2 Ecological Restoration

In 2000, the Sandy Neck Program and the Nature Conservancy, began an ambitious wetland restoration project. To date over 130 interdunal swales and over five (5) acres of Salt Marsh have been restored. Restoration refers to application of herbicides on Common Reed (*Phragmites australis)* and Bittersweet (*Celastrus orbiculatus*) and mechanical removal of Purple Loosestrife (*Lythrum salicari)* and an introduced grass (*Panicum amarum ssp. amarulum*). In addition, we mechanically remove Spotted Knapweed (*Centaurea maculosa*) from all dunes and roadways within the park. These activities are permitted under active Orders of Conditions (OOC) SE3-4129.

6.3 Vascular Plant Survey

We are working with the Cape Cod Botany Club to create a complete inventory of vascular plants on Sandy Neck Beach Park. This work is funded by a Mehrhoff Botanical Research Award. Locations of state listed plant species will be verified and documented on our GIS database.

6.4 Least and Common Tern Monitoring Program

Least and Common Terns are monitored during the nesting season and data is reported to NHESP as required. Management of state listed Terns conforms to state and federal guidelines for management of recreational activities as well as our active Orders of Conditions SE3-4712 and SE3-4713 (Appendices A & B). The rest of the Tern discussion will occur in this document under 7.0 (Sandy Neck Piping Plovers).

6.5 Sea Turtle Strandings

Every fall, the Sandy Neck staff participates in a massive sea turtle rescue effort that includes around the clock beach patrols to collect animals that wash up on our 6.5 miles of coastline. We work closely with MA Audubon (Wellfleet) to improve survivorship rates for these rare turtle species.

6.6 Spadefoot Toad Headstart Program

For the past seven (7) years we have been supporting the MA Audubon Spadefoot Toad research and headstart program at Sandy Neck Beach Park. This research and specimen collection is permitted by NHESP under Ian Ives, MA Audubon Long Pasture, Barnstable, MA.

6.7 Diamondback Terrapin Monitoring and Headstart Program

Sandy Neck Beach Park lies at the northern-most range for the Diamondback Terrapin (*Malaclemys terrapin*). Every year, from early June until mid-July, adult females are observed leaving the waters of the Barnstable Great Marsh in order to nest among the expansive dune systems on the south side of this barrier beach. On hot, sunny days, these turtles will crawl across the Marsh Trail in search of a good nesting site. There has never been any documented evidence of adults coming up to the beach from Cape Cod Bay. While a nest was found on the front beach in 2013, the track led to and from the dunes, and into the marsh. Last year track was observed at the south side of Sandy Neck Beach point, but no nest was discovered in the area.

Throughout this nesting season our Turtle Monitor patrols this trail via all terrain vehicle (ATV), looking for signs of nesting terrapins emerging from the marsh. Staff will follow these turtle tracks to the nest site, and determine if a clutch of eggs was deposited (Table 2). Female terrapins in this location generally lay between 10-20 eggs per clutch, and may lay up to two clutches per season. If eggs are observed, the monitor will then dig a small trench around the nest cavity and will cap the site with a plastic milk crate. These act as deterrents to the many predators that frequent these locations such as coyote, fox, skunk and raccoon. Plastic crates are used in place of metal materials, as research suggests that wire cages can interfere with a hatchling's ability to properly navigate after emerging from the nest. These milk crates have worked well at preventing

predators from digging up nests, and the holes within the crate are large enough to allow hatchlings to successfully emerge from the sand after hatching. The ability for a milk crate to affect incubating nest temperatures has not yet been studied in-depth. However, there is a direct correlation between nest caps and predation rates of Terrapin nests at Sandy Neck (Table 2). Capping nests has shown tremendous success in protecting eggs through the hatching period. Milk crates are also buried deep enough in the sand to minimize shading effects on Terrapin nests, and to maximize their effectiveness against predator interaction.

The Marsh Trail runs parallel west-east on the south side of the beach where the marsh and sand dune habitats connect. This trail is composed almost entirely of sandy sediments, causing female terrapins to sometimes nest directly in the trail. Because this trail is still used by vehicles to access private properties, these nests run the risk of being crushed or destroyed. Any nest that is deposited directly in the Marsh Trail is carefully dug up and relocated to a safe location for monitoring. When these selected nests hatch out in the fall, they are collected and sent to be used for our Headstart Program. Every year, schools and other organizations help us to raise these turtles over the course of the winter. Instead of these turtles digging into the mud and brumating, they will be raised in warm water and fed a proper diet so that they may continue to grow all winter long. By the time they are released into the marsh, these terrapins are generally the size of a 3-year old terrapin in the wild. At this point, they no longer run the risk of being eaten by many of the predators that go after smaller hatchling turtles. We believe that our nest capping and Headstart Program is improving the reproductive success rates of our terrapin population. An overwhelming majority of nests are laid north of the marsh trail. In 2015, only seven nests (including nests laid directly in the marsh trail) were discovered outside of this trend (4.7%).

During the terrapin nesting season, there are times when essential vehicles are using the Marsh Trail as the front beach is closed due to nesting shorebirds.[2] During these times essential vehicles travel the front beach to Trail 2 and then turn east on the Marsh Trail. As such, essential vehicles only travel through a small section of Marsh Trail where adult females may be crossing to reach nesting grounds. However, there is a small probability of a "take" and the Town is committed to continue our nest capping and headstarting programs for the next three years during the duration of this permit request. The benefits of this program will more than offset any small risk of harm associated with limited vehicular use of the Marsh Trail.

This headstarting project is permitted by NHESP under Nina Coleman, Sandy Neck Park Manager.

[2] Recreational ORVs *never* use the Marsh Trail, and implementation of the proposed covered activity is limited to one small section of the beachfront. Therefore, HCP implementation will in no way adversely affect Diamond-back Terrapins and their habitat, and actually stands to benefit this species by potentially reducing essential vehicle use on the Marsh Trail in years when Plovers nest in the covered activity area.

Year	Total # Nests	# Nests Capped for Predator Deterrence	# Nests Collected for Headstarting	# Nests Predated	Total # Nests Hatched
2001	85	0	5	40	45
2002	42	6	6	37	5
2003	48	22	3	21	27
2004	70	31	7	35	35
2005	32	29	1	2	30
2006	44	28	7	2	42
2007	36	19	0	0	36
2008	59	49	2	2	57
2009	119	111	7	0	119
2010	122	113	6	1	121
2011	116	N/A	6	4	112
2012	109	N/A	3	1	108
2013	87	79	4	4	83
2014	153	121	5	11	142
2015	147	124	5	14	133

Table 2. Summary of Diamondback Terrapin Breeding Success and Management Activities, 2001-2015.

7.0 SANDY NECK PIPING PLOVERS

The number of Sandy Neck Piping Plovers breeding pairs has been slowly increasing with an average of 29 pairs from 1996-2005 to an average of 34 pairs from 2006-2015 (Table 3). However, the data demonstrates large variability between years so this small upward trend in number of nesting pairs needs further analysis to determine significance (Chart 1). Further, the number of chicks fledged has varied dramatically over this same time-period (Chart 2).

Threats to Plover and Tern breeding success are numerous and vary from year to year making management challenging. For instance, in 2012 and 2013 we experienced summer storms that caused nearly 100% loss of nests due to over-wash. Other years, fox, coyote, crow and seagulls are problem species that caused low productivity rates.

Sandy Neck has acres of potential Plover and Tern nesting habitat along the toe of the dune, the entire Little Neck area, as well as blow-outs in the secondary dunes. Presently the highest quality habitat is located from the Sandwich Town-line to Trail 1, in the Trail 2 area, and from approximately Trail 4 to Beach Point (Figure 4). The rest of the beach has patches of decent habitat, which supports scattered nests. The less utilized habitat is generally due to erosion creating very soft shifting substrate void of pebbles or beach grass, which does not appear to attract nesting pairs. Within the interior of the beach, pebbly blowouts are sometimes habitat and nests have been located in odd areas. Of course, Plover and Tern nesting trends change overtime as storms alter the beach and dune profiles.

Year	Number of Plover Pairs	Index Pair Count	Number of Chicks Fledged
1995	25	20	49
1996	29	28	74
1997	33	33	29
1998	30	30	34
1999	32	32	32
2000	29	29	28
2001	26	23	43
2002	26	25	57
2003	31	27	74
2004	34	29	41
2005	28	26	29
2006	23	23	20
2007	35	34	53
2008	35	32	43
2009	28	28	28
2010	38	37	60
2011	44	41	57
2012	40	40	3
2013	27	24	14
2014	32	30	42
2015	40	37	55

Table 3. Summary of abundance and reproductive success of Piping Plovers on Sandy Neck, 1995-2015.

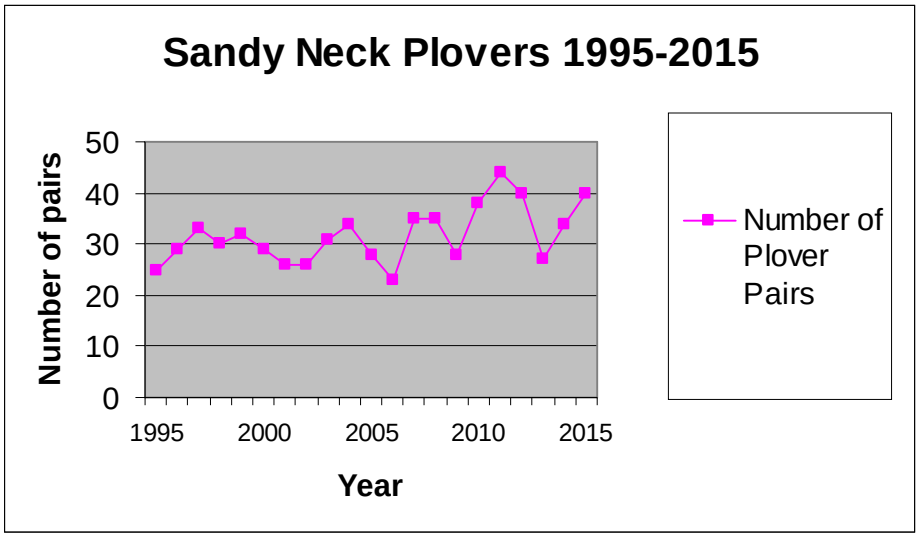


Chart 1. Number of Sandy Neck Piping Plover Pairs 1995-2015

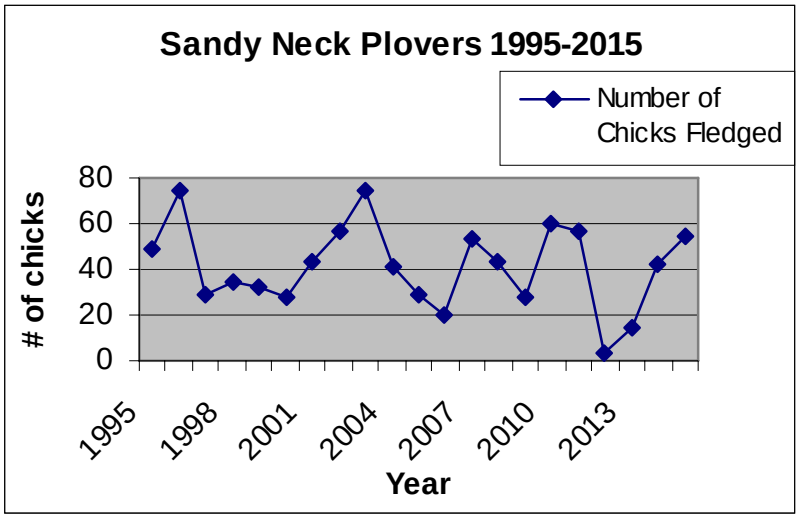
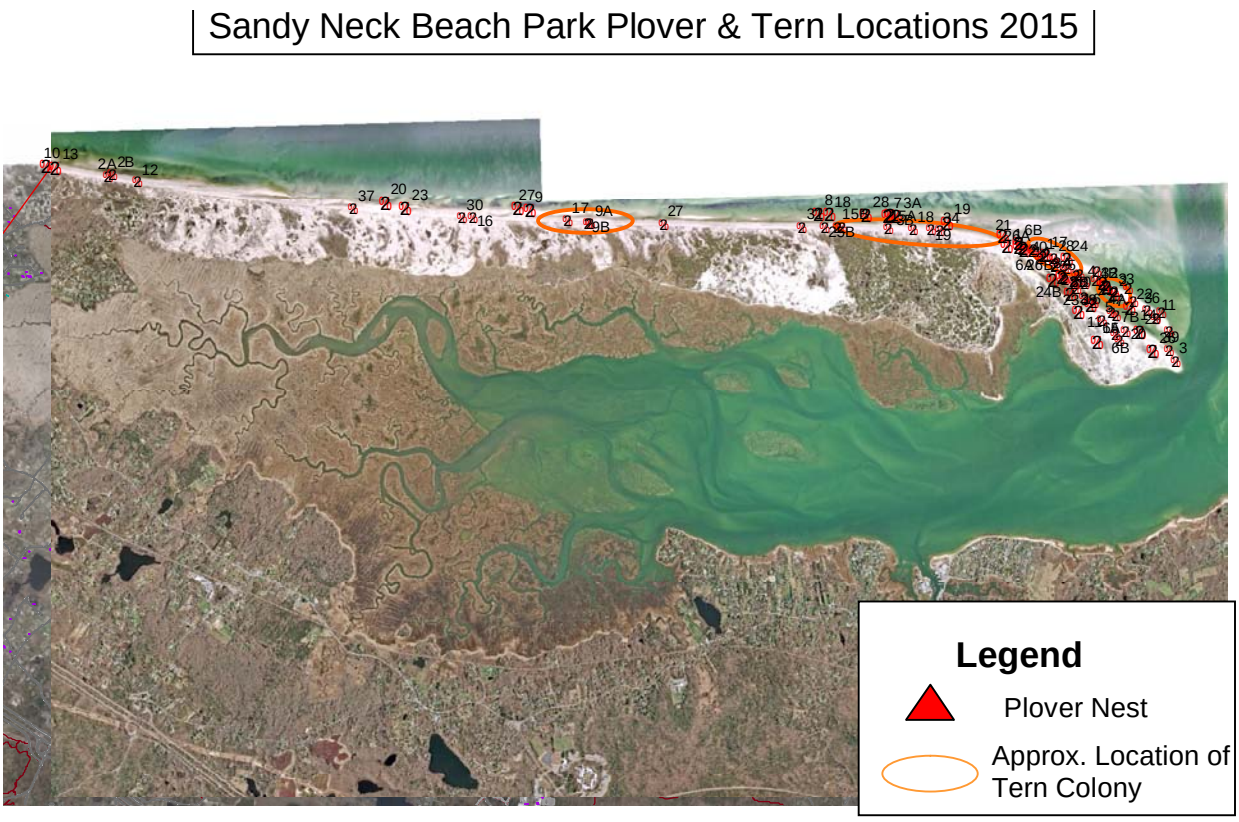


Chart 2. The Number of Sandy Neck Piping Plover Chicks Fledged 1995-2015

Figure 4: Plover and Tern Nesting Locations for 2015. Chosen beach location in 2015 represent recent nesting trends on Sandy Neck Beach Park.



Increases in the Sandy Neck Beach Park's population of Piping Plovers that have occurred during the past two decades are likely the result of our intensive monitoring and management program. Sandy Neck staff includes a full time Park Manager, one full time Natural Resource Officer, four seasonal Natural Resource Officers, two Seasonal Shorebird Monitors and a Seasonal Turtle Monitor.

Management of Sandy Neck Piping Plovers conforms to state and federal guidelines for management of recreational activities as well as our active Orders of Conditions SE3-4712 and SE3-4713 (Appendices A & B). Beginning in early April, off-road vehicles are restricted (by symbolic fencing) to discrete travel corridors along the outer edges of suitable Plover/Tern nesting habitat. Once nest areas are established, the protection zone is increased by symbolic fencing and warning signs. In addition, some nests are protected by wire mesh predator exclosures in order to increase the percentage of eggs that survive to hatching. These nests are selected by analyzing the predator tracks in the area and the number of nesting attempts by the pair.

Once the nests hatch, sections of beach where unfledged Plover/Tern chicks are present are completely closed to recreational vehicles until chicks reach 35 days of age or are observed in flight. Only staff escorted caravans of essential vehicles pass within areas of unfledged Plover and Tern chicks.

8.0 RESPONSIBLE STAFF

The Sandy Neck Program employs a full time Park Manager Nina Coleman and a full time Natural Resource Officer Sean Kortis (see attached résumé Appendices C & D). Both of these individuals are scientists with extensive experience in endangered species monitoring and management. Ms. Coleman and Mr. Kortis spend hours in the field and they hire, train and oversee daily operation of the seasonal staff. In addition, all seasonal field staff receives training from both the Barnstable Police Department and the West Barnstable Fire Department plus the seasonal shorebird staff participates in the MA Audubon shorebird training that is held at Long Pasture.

9.0 BEACH MANAGEMENT

9.1 Human Activities

As noted earlier, multiple recreational activities occur at Sandy Neck Beach Park. The most popular areas are the ORV and Public Bathing Beach. Sandy Neck also hosts primitive tent camping that requires a 3.3 mile hike to the sites, horseback riding, boating (including paddle boarding and kayaking), fishing and shellfishing, hunting, hiking, bird watching, fat tire biking and numerous events such as campfire gatherings, weddings and other celebrations. We also provide access to essential vehicles to the privately owned cottages and we support many research projects on a variety of topics.

9.2 Education and Enforcement

Over many years, the Sandy Neck Program has developed and implemented Sandy Neck Beach Park Regulations and Policies that address public safety and natural resource protection (Appendices E & F). Uniformed Natural Resource Officers (NROs) and Barnstable Police Department Officers patrol the beach, trails and Beach Point to ensure compliance with the rules and regulations of the beach. Staff uses multiple enforcement tools to achieve compliance including verbal and written warnings, citations, permit revocations and no-trespass orders. Patrons that cannot achieve respectful and responsible pet ownership could have their pet's beach privileges revoked. All warnings are tracked digitally so that decisions can be made about increasing our response to repeat offenders.

To educate the public, all vehicles must pass by the Gatehouse and staff is tasked with providing the rules and regulations to the different user groups along with trail maps and information about our Park. Our web site is at www.townofbarnstable.com and it includes a blog to provide updates and beach information including beach closures due to nesting shorebirds. In addition, we have recording surveillance cameras in multiple locations to help with the enforcement of beach laws. To educate the public about our endangered species populations and other Sandy Neck flora and fauna, we have scheduled walks and talks that take place throughout the year.

9.3 ORV Beach Use

All ORV and essential vehicle use is governed by our active OOCs (Appendices A & B) and each permit holder receives the Beach Park Regulations (Appendix E), which are designed to keep the Town in compliance with federal, state and local laws as well as ensure public safety. Beach closures for nesting Terns and Plovers follow strict requirements set forth by our OOC. In addition, escort procedures, fencing and signage requirements are all discussed within our OOCs.

Essential vehicle access was a contentious topic for much of the 1980s and 1990s. To avoid a lawsuit the town entered into a memorandum of understanding (MOU) with the cottage owners that in part promises "reasonable access." This is a balancing act but has been achieved by providing daily scheduled escorts on the front beach during the shorebird nesting season. In addition, the Town (via a Notice of Intent (NOI) opened the Marsh Trail for non-escorted essential vehicle access. Staff therefore is tasked with five scheduled escorts a day during the shorebird nesting season. We are also willing to escort outside of this schedule with reasonable notice. Staff also patrols the Marsh Trail for Diamondback Terrapins and closes the trail on days of high nesting activity. In an effort to reduce the number of essential vehicle escorts past unfledged chicks, the Sandy Neck Program has worked with the Barnstable Department of Public Works' (DPW) Highway Division to repair the Marsh Trail for improved vehicle access. This is achieved under active OOCs SE3-4207.

9.4 Shorebird Monitoring

Staff responsible for shorebird monitoring includes both Nina Coleman and Sean Kortis (Appendices C & D) who spend many hours in the field ensuring monitoring quality. In addition, two seasonal shorebird monitors are on duty from April 1 through Labor Day weekend. Further, the Turtle Monitor is cross-trained to help with shorebird monitoring as the bulk of the shorebird-nesting season precedes the turtle-nesting season. In addition, our four seasonal NROs are trained in escort procedures and basic shorebird ecology and identification.

Plover nests are check daily within the ORV corridor and at a minimum every other day in the more remote locations. Further, nests within the ORV corridor with unknown hatch dates are monitored twice a day per our Orders of Conditions.

Our OOCs (Appendices A & B) reference the State Guidelines for Managing Recreational Use of Beaches for additional monitoring and escorting protocol, exclosures, fencing and signage, etc. This document is required reading for our two seasonal shorebird monitors and the OOCs and Guidelines are available in the Gatehouse staff room for reference during the season. Over the years, Sandy Neck has developed our own Shorebird data collection sheets (Appendix G).

Sandy Neck field staff participates in weekly meetings to ensure good communication and daily changes in brood locations are written on a white board in the staff area of the Gatehouse. This insures that NROs are briefed on shorebird information each time they are tasked with an escort. In addition, all field staff is equipped with a two-way radio.

9.5 Public Beach (Bodfish Park)

Our lifeguarded public beach is a busy place during the summer season. It has been many years since a Plover nested within this area but if this occurred, protocols would be followed as set forth by our OOCs and the Guidelines. Limited removal of the seaweed line is achieved by hand tools only within the lifeguarded area of the front beach (approximately 600 feet). Plover and Tern nests are often located to the west of the lifeguarded area and this habitat is fenced by April 1st and adjusted when nests are established. Campfires and dogs are not permitted within this section of beach (from the west edge of the lifeguarded beach to the Sandwich Town-line). Campfires are permitted from the east edge of the lifeguarded area to the ORV beach (see campfire discussion).

9.6 Campfires and Fireworks

The ORV Beach and sections of the public beach allow evening campfires weather permitting. ORV permit holders are provided the campfire regulations when they purchase their permit. All other campfire patrons must purchase a fire permit at the Gatehouse at which time they are provided the regulations. In addition, our regulations booklet states that fireworks (including sky lanterns) are prohibited by state law. NROs and Barnstable Police address firework problems by issuing citations when appropriate and by confiscating fireworks from beach patrons.

9.7 Special Permits

Gatherings of over 20 people and all weddings require a special permit. This permit gives the patrons "Special Conditions" for their event that help with compliance with the regulations and ensure better safety protocols. Research projects also require a special permit and will not be issued until all other applicable permits have been secured.

9.8 Refuse Management

The ORV Beach is patrolled for trash pick-up and fencing repaired daily by NROs and maintenance personnel. We pride ourselves on presenting a clean, well run beach. Further, we provide portable toilets on the ORV beach for customer's comfort and also for environmental protection. We ask beach patrons to recycle and we provide a recycling dumpster that is located on the Access Trail. Trash barrels (and stand-alone recycling containers) are emptied daily and dumpsters are emptied three times a week (in season).

9.9 Bikes and Horses

Horseback riding on Sandy Neck Beach requires a permit and patrons are provided the regulations that address beach use. Horses (and fat tire bikes) are treated like vehicles in so much as they may not travel within the sections of beach where unfledged Plover or Tern chicks are present. Information about beach closures is available on the website which has updates for each beach use (ORV, Cottage Owner, Fat Tire Bikes, Horseback Riding, Fishing/Shellfishing and Campfires).

9.10 Boating

Boating activities are monitored by the Marine & Environmental Affairs Division - Harbormaster Program that shares our two-way radio channel making communication efficient. Beach Point is patrolled by the Harbormaster's Program by boat for vessel operation infractions and by land via Sandy Neck staff for issues such as dogs off leash, alcohol issues and walking in the dunes. Beach Point and Little Neck are symbolically fenced and signed to keep foot traffic out of the nesting areas. The adjacent boat ramps have signs reminding boaters in route to Sandy Neck to keep their dogs on leash and stay out of the fenced in areas due to endangered species protection.

9.11 Hunting and Fishing

Hunting and fishing are generally shoulder season activities and are overseen by our full time Natural Resource Officer who is also a shellfish constable. We would work with state Environmental Police if there was an egregious fishing or hunting violation.

9.12 Dogs

In season, dogs are allowed on the ORV beach as long as they are leashed. No dogs are allowed within the tent camping area because it is only patrolled a few times a day. Citations are issued for dogs off leash and patrons will be asked to leave the beach and/or lose their beach privileges if compliance is not achieved. We can also suspend beach privileges for a specific dog that owners cannot/will not keep under control.

9.13 Reporting

Under our Orders on Conditions, we are required to present a yearly report to the Conservation Commission each November. This report consists of data on endangered species nesting success as well as the park financials, number of permits sold, number of vehicular trips on the beach, enforcement efforts, and number of escorts. Reports can be made available upon request.

10.0 COVERED ACTIVITIES

The Sandy Neck Program has developed into a multifaceted stewardship effort that includes providing recreational opportunities to the public, ensuring property owner access rights, ecological restoration, environmental education, endangered species protection and public outreach. Starting in 2006, the Sandy Neck Program became an Enterprise Account and is tasked with self-funding via user fees. The bulk of our revenue is collected from the ORV program. Other sources include cottage leases, public bathing beach parking, concession stand revenue, merchandise sales and donations. However, our business plan is tenuous because any summer we could have the ORV beach close due to one nesting pair of Plovers. In addition, complete beach closures are extremely controversial and create negative sentiment for endangered species protection and the Sandy Neck Program.

The Sandy Neck Program is asking for the ability to ensure that at least a small portion of the beach is available for ORV use by allowing increased recreational use associated with reduced proactive symbolic fencing along 2,000 linear feet of beach hereon referred to as The Recreation Zone (Figure 1). This will assure that the delicate balance of recreation and endangered species protection can be better achieved. We are suggesting that discouraging nesting include reduced buffer, raking and using plywood or other objects to create undesirable nesting locations.

10.1 Reduced Buffer Zone

Within The Recreation Zone we are requesting the ability to reduce the area of symbolically fenced nesting habitat. Beach habitat above the high tide line would not be fenced, but a narrow buffer extending from the toe of the dune would be retained to help protect the dune. This activity is already permitted under our OOCs SE3-4713 (Conditions 2.1 and 10) therefore our OOC would not need to be amended. Reduced fencing would only occur once a territorial piping Plover or pair is observed in the area and fencing would only be reduced in the area where activity is observed. This will ensure that impacts are limited to a single territory in the unlikely event that more than one pair attempts to breed in the area.

10.2 Nesting Deterrents:

Within The Recreation Zone, as an impact minimization procedure (see Section 11.0), we are requesting the opportunity to deter one breeding pair from nesting thereby ensuring at least some ORV access throughout the year.

11.0 IMPACT MINIMIZATION

The proposed activity of reducing required symbolic fencing consists of 1.7% of Sandy Neck's potential nesting habitat (1.347 acres), which falls well below the site-specific limit specified in the HCP. The actual acreage to be impacted is likely to be considerably lower because it will be confined to a portion of the Recreation Zone where Plover activity is detected. The low percentage means that the displaced pair will not likely be under significant competition for other sites. In addition, Sandy Neck supports an average of 34 nesting pairs per year. Exposing one pair to a reduced buffer and deterrents, will not reach the stated maximum thresholds for numbers of pairs affected by the activity.

The primary impact minimization procedure will be to place boards within a portion of the nesting habitat to reduce the likelihood of interaction between breeding Plovers and recreational beach users in the area that will not be symbolically fenced. Cover boards would only be deployed at the very first signs of territorial behavior and courtship *before* the period of intensive scraping and mating. The purpose of this procedure is to reduce the likelihood that a pair attempting to breed would be disturbed later in the breeding cycle when recreational beach use increases by users such as pedestrians and ORV operators. If the procedure is not effective and more persistent scraping and courtship is observed the use of cover boards would cease. The NHESP would make the final decision about when to cease the use of cover boards.

12.0 MONITORING/COMPLIANCE REQUIREMENTS

All monitoring associated with the Covered activity shall be undertaken by Sandy Neck professional staff (Nina Coleman and/or Sean Kortis). Because these staff members are not involved in day to day monitoring of Plovers and terns, their involvement in COI monitoring will not in any way impact the routine Plover and tern monitoring and protection described in Section 9.4. Ms. Coleman and Mr. Kortis will continue to be involved in training and oversight of the seasonal shorebird monitors, but will allocate an additional estimated 1-1.5 hours per day to intensively monitor the Recreation Zone.

Beginning in early April, prior to initiation of the covered activity, the recreation zone will be monitored intensively on a daily basis (estimated 1-1.5 hours/day) to ensure early detection of territorial Plovers. Monitors will keep a daily log describing in detail all territorial, scraping, and courtship behaviors in order to ensure that cover-boards are deployed very early in the breeding cycle. Should cover boards be deployed, the deployment area will be monitored at least twice daily during the first three days of deployment to document Plover response. Any movement of boards or deployment to a new area within the recreation zone will trigger twice daily monitoring.

As described above, at baseline in most years, Piping Plovers do not nest in the Recreation Zone. Prior to initiation of the covered activity, if after several weeks no Plover activity is detected, the Beach Manager may elect to turn back the monitoring of breeding activity to this area to the seasonal monitors with the understanding that this may preclude early enough detections of breeding to deploy coverboards. If the seasonal monitors detect activity the professional staff will

reassume the intensive daily monitoring described above.

As long as any Plover activity is detected and the covered activity is implemented, supplemental daily monitoring will continue. After a period of ten days of no activity, increased monitoring can be suspended and the area of reduced symbolic fencing may remain in place. If new activity is detected, increased monitoring may be resumed to allow for additional modification of fencing (as long as the site-specific limit has not been exceeded) or redeployment of coverboards (if activity is detected early in the breeding cycle).

A log shall be maintained in which we will record Plover sightings, observations and activity within the Recreation Zone, as described above, as well as observations of Plover responses to recreational activities within the reduced fencing zone. This will include observations of disturbance (e.g. calling and broken wing displays), as well as accidental disturbance of scrapes incidental to the recreational activities. The log will include documentation of the dates and times of any fencing alterations, the areal extent of the habitat affected, and the dates, times, and areal extent of all coverboard placements. As required by the HCP, all logs will be made available to NHESP upon request. On or before October 1 of each calendar year the COI is in effect, the Park Manager will submit to NHESP a report that describes and quantifies monitoring effort, date range covered activity was implemented, extent and locations of fencing reduction and placement of coverboards, detailed description of Plover activity and behavior within The Recreation Zone, and management recommendations and lessons learned.

13.0 BUDGET

As we will be using existing full time professional staff, and this is a very limited request with regard to staffing hours, we do not feel that any additional staff salary allocation is needed to achieve this proposal. The estimated budget for Ms Coleman's and Mr. Kortis' salary is 35 hours costing $1,300 (field time and report preparation). This is a very small percentage of their annual work hours and it will not result in a reduction in time spent training and supervising field staff. The funding provided for mitigation will be secured through the budget process and will be paid for by the Sandy Neck Enterprise Account (Table 4) prior to the "take" activities.[3] Therefore, the total annual cost of HCP implementation is estimated to be $7,100 per year for each year during the three year COI term when covered activities are implemented.

[3] This is the rate per take exposure set by DFW in the HCP

Table 4: Sandy Neck Enterprise Account revenue Fiscal Year 11 through Fiscal Year 15

	FY11	**FY12**	**FY13**	**FY14**	**FY15**
Dune Fees (ORV)	$379,827	$549,593	$431,782	$541,363	$567,069
Beach Parking	$109,590	$130,050	$123,634	$113,336	$116,158
Sandwich Revenue	$39,599	$40,589	$41,605	$42,654	$43,711
Beach Concession	$14,499	$13,711	$15,996	$10,500	$7,500
Cottage Lease Fees	$35,343	$41,522	$43,115	$37,435	$34,700
Parking Stickers	$31,146	$31,321	$31,095	$58,965	$58,316
Merchandise	$16,783	$18,390	$16,659	$24,168	$25,150
Miscellaneous	$1,832	$671	$1,057	$1,130	$1,393
Earnings on Investments	$4,698	$7,848	$9,643	$11,466	$10,833
Sale of Bond	0	$5,629	0	0	0
Total Revenue	***$633,317***	***$839,324***	***$714,586***	***$841,017***	***$864,830***

14.0 MITIGATION PLAN

The Town of Barnstable is proposing to provide funding for one "take" to NHESP to implement predator management, educational outreach and increased law enforcement off site, as described in the HCP. To fund the mitigation, in advance of carrying out covered activities, the Town will establish an escrow agreement in substantially the same form as Appendix H. Prior to the implementation of covered activities in any given year, the Town will deposit $5,800 into said escrow account in accordance with the schedule set forth in the Escrow Agreement.

15.0 LIST OF APPENDICES

A. Orders of Conditions SE3-4712

B. Order of Conditions SE3-4713 (Revised)

C. Résumé: Nina Z. Coleman, Sandy Neck Park Manager

D. Résumé: Sean Kortis, Sandy Neck Natural Resource Manager

E. Sandy Neck Beach Park Regulations

F. Sandy Neck Beach Park Policies

G. Plover Monitoring Datasheet Example

H. Escrow Agreement-DRAFT