Note: The correct title of this document is "The Trustees of Reservations Request for Certificate of Inclusion (COI) on East Beach and Leland Beach, Chappaquiddick Island, Martha's Vineyard"

Impact Avoidance and Minimization Plan for East Beach and Leland Beach, Chappaquiddick Island, Martha's Vineyard

The Trustees of Reservations

572 Essex Street

Beverly, MA 01915

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1. Site Description

1. Maps

Figure 1: Cape Poge Wildlife Refuge Trail and Property Boundary Map

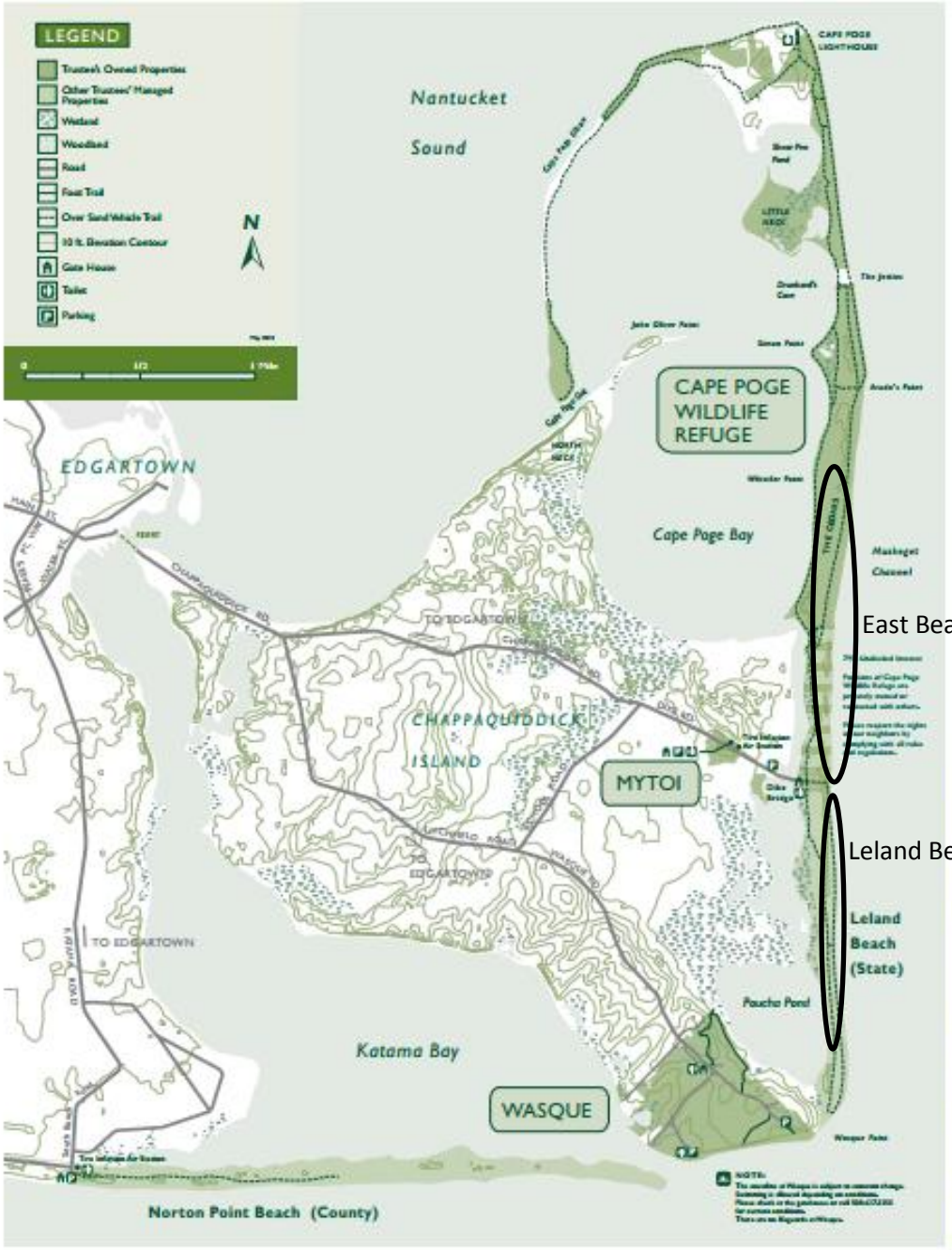


Figure 2: Piping Plover Nest locations on East Beach in 2015

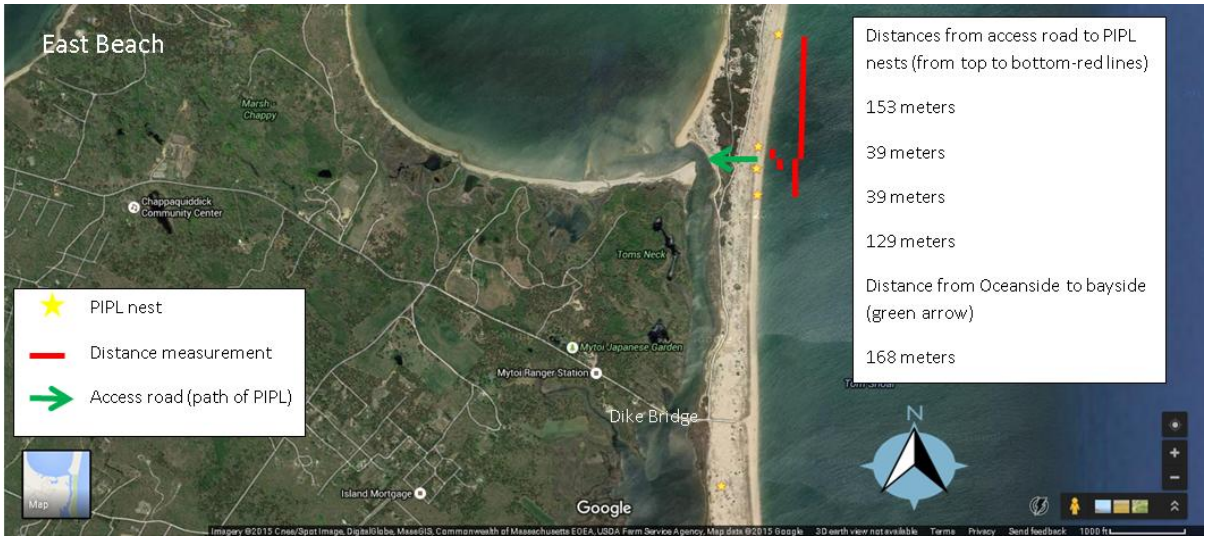
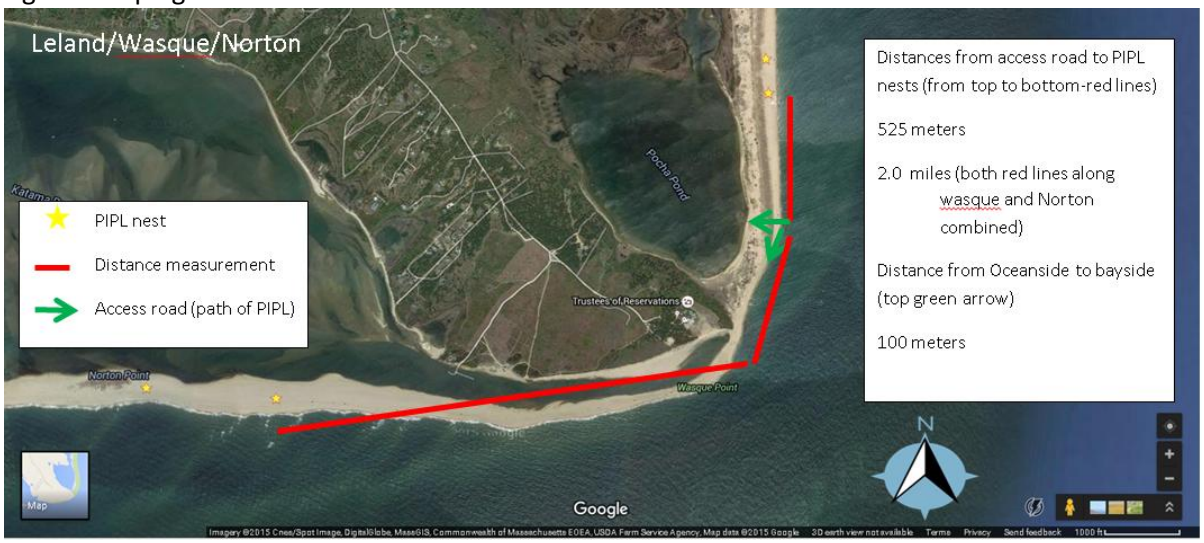


Figure 3: Piping Plover Nest locations on Leland Beach in 2015



2. Description of property, habitat, management, and past productivity.

a. The Trustees of Reservations, one of the oldest land conservation organizations, was founded in 1891 by Charles Eliot, a landscape architect, who wanted to preserve open spaces from the dramatic urban development he was witnessing. Our mission is to preserve areas, for public enjoyment and use, of exceptional scenic, historic, and ecological value throughout Massachusetts. We frequently collaborate with other conservation groups and government agencies that share our mission. Leland Beach is an approximately 1 mile stretch of barrier beach made up of an Oceanside beach, dunes, and a bayside beach along a salt pond. It is owned by the state but managed by The Trustees of Reservations a state-wide, non profit land conservation organization. Permission to participate in the HCP will be obtained from the landowner before implementation. Cape Poge Wildlife Refuge has 8.7 miles of beach total and is

722 acres (Figure 1). The Trustees of Reservations also manages the county-owned Norton Point Beach, and plovers and terns at the Cape Poge and Norton Point beaches are collectively managed under a unified management regime.

During the 2015 nesting season 17 piping plover pairs nested on Cape Poge Wildlife Refuge and Norton Point Beach, five of those pairs on East Beach (Figure 2, Fifth nest not shown as pair was discovered with chicks). All pairs nested on open beach between the high tide line and toe of the dune. Only three nests were lost across all sites, all to depredation. Seven chicks fledged out of the 34 which hatched. High chick mortality was attributed to several days of cold, rainy, and windy weather while the majority of chicks were one week old or younger. One entire brood of three chicks were found together, dead, after two days of this weather. Two more chicks were found dead days later. Other causes of chick mortality were unknown but could have been due to depredation by American crow or gull. Numbers of nesting pairs of PIPL have increased steadily increased from 12 to 17 pairs in the past five years. Egg loss has been due mainly to depredation by skunk and American crow. Chick loss has been unknown but also attributed to weather events and depredation. Because of this The Trustees of Reservations contracted USDA-APHIS to perform predator management in the form of box trapping of skunks, raccoon, and American crow on Norton Point Beach in 2012. In 2014 East Beach and Leland Beach were added. In 2015 avian predator control through the use of DCR-1339 was added. This had been used successfully on Crane Beach for 8 years. Between visits by the USDA, The Trustees staff conducts box trapping. The presence of predators decreased with the use of these predator management techniques. Exclosures are also used on all sites. During 2016, 17 pairs of Piping Plovers nested once again at Cape Poge (including Norton Point).

One pair of piping plovers was detected bringing their chicks from the Oceanside to bayside through the dunes for the first time in 2015, on Leland Beach (Figure 3). They fledged two chicks. The pair in the dunes fledged one chick. Once these adults crossed to the bayside they did not return Oceanside. The Oceanside beach had been closed two days before the chicks hatched. The bayside road was closed when the chicks were detected crossing bayside. It was opened when the chick fledged. This prevented beach goers from being able to drive from Norton Point Beach to Cape Poge Wildlife Refuge oversand.

Table 1: 5-year PIPL productivity

	2011	2012	2013	2014	2015	2016
# Pairs	12	15	16	16	17	17
Productivity	0.86	0.67	1.25	0.88	1.12	1.18

2. Responsible Staff:

Russ Hopping

Director of Ecology Program

Program director for the statewide ecology program, including shorebird management. Works with state and federal officials and partners in the implementation of the program. Has piping plover experience going back to 1991 and completed undergraduate research on migratory shorebirds. B.S. in Human ecology and M.S. in Environmental Studies.

Chris Kennedy

Islands Superintendent

Oversees island operations on Nantucket and Martha's Vineyard. Has been a beach manager since 1988 which included overseeing management and protection of rare shorebirds. Implemented state and federal guidelines related to beach nesting bird species. Former assistant commissioner of Massachusetts Department of Fish and Wildlife enforcing environmental laws. Also former deputy director of Massachusetts Environmental Police

Caitlin Borck

Southeast Ecology Assistant

Began monitoring nesting interior least terns on the Ohio and Mississippi Rivers in Kentucky in 2008 and 2009 while earning her M.S. in Biology and Applied Ecology. Worked for Mass Audubon on Martha's Vineyard as the Coastal Waterbird Coordinator overseeing the management of nesting piping plovers, American oystercatchers, and least terns in 2011 and 2012. Began working for the Trustees of Reservations in 2014 overseeing and coordinating ecological management on both Nantucket and Martha's Vineyard including the management of beach nesting birds. This covers approximately 21 miles of beach. Trains and supervises shorebird staff, interns, and volunteers. Seasonal Shorebird Monitors (2)

Seasonal Shorebird Monitors are hired by May 1 for a 15-week term at 40 hours per week. They are responsible for maintaining fencing around nesting areas, monitoring nesting shorebirds, conducting predator management, providing escort to staff needing to get past shorebird closures for essential maintenance or safety reasons, and recording and reporting shorebird data. They are trained by the Southeast Ecology Assistant.

Rangers

Seasonal Rangers are also hired to enforce rules and regulations and ensure the safety of visitors. Those who have received training can also serve as Shorebird Monitors and Escorts when needed.

3. Beach Management

The Trustees manage beaches and Off Road Vehicle (ORV) recreation using a management plan which adheres to the Massachusetts Division of Fisheries & Wildlife, Natural Heritage and Endangered Species Program and Guidelines for Managing Recreational Use of Beaches to Protect Piping Plovers and Terns and Their Habitat (1993).

1. Beach operations
    1. Recreational Activities

a. OSV use

Nesting habitat and nests are protected by symbolic fencing and signage by April 1st. This includes historic and suitable habitat. While pairs are sitting on nests vehicles are allowed to drive past them outside of symbolic fencing 100 yards (300 feet) away or as wide as the beach allows per the state and federal guidelines. Two days before the expected hatch date the beach is closed to vehicles up to and beyond 100 yards (300 feet) of the nest site. This necessitates the closure of the vehicle corridor in front of nests on our beaches as they are too narrow to allow vehicles past and maintain a safe distance. As the chicks move, the fencing is adjusted to maintain a minimum of 200 meters (600 feet) or more, and never less than 100 meters (300 feet) between them and OSVs. Broods are monitored every day, sometimes more often by qualified Shorebird Monitors.

b. Fishing

Symbolic fencing and signage is placed by April 1st. No pedestrians are allowed behind fencing.

c. Kiteboarding

Kiteboarding is not allowed within 200 yards (600 feet) of the shoreline where there is symbolic fencing and signage

d. Swimming

See Fishing

e. Boating

Boats are not allowed to land on the shore where there is symbolic fencing and signage.

F. Bird watching and photography

See Fishing

2. Parking and Roads

Parking is permitted along the shoreline or in designated pull-outs outside of symbolically fenced habitat as long as it is not within the travel corridor established 10 feet away from the toe of the dune. Vehicles are not permitted behind symbolic fencing or where beaches are closed to vehicle traffic due to the presence of unfledged chicks.

3. Beach Cleaning and Refuge Management

Beaches are NOT raked. Trash is picked up by Rangers during routine patrol and removed from the refuge. Recreational beachgoers are expected to carry in-carry out. No trash barrels that can attract predators are available.

4. Rules and Regulations

- Oversand vehicle access is subject to occasional closures (June/July) to protect rare nesting shorebirds, the presence of rare or endangered species, or for any other reason pertaining to the safety needs of visitors and/or wildlife.
- Dogs must be kept on a leash at all times.
- Seasonal hunting (waterfowl only) is permitted at this property subject to all state and town laws. In addition, a Trustees of Reservations permit is required.
- Access to and from Cape Poge Wildlife Refuge via Wasque is subject to periodic closure due to severe beach erosion at Wasque Point.
- Free town parking lot (20 cars) located on town-side of Dike Bridge.
- Additional parking (15 cars) is located at Mytoi on the left side of Dike Road 0.2 mi. before Dike Bridge.
- Limited handicapped-accessible transportation; call 508.627.3599 for details.
- Tour participants may utilize a complimentary shuttle service that runs all day, with pickup 30 minutes before tour time at the Edgartown-Chappaquiddick ferry landing on the Chappaquiddick side.
- When bringing a vehicle across, please be aware that summer ferry lines to Chappaquiddick Island may exceed 1 hour. Walk-on passengers rarely have to wait more than 7 minutes.
- Camping is not allowed
- Open fires are not allowed
- Fireworks are prohibited
- Collection of vegetation is prohibited
- Driving on beach vegetation is prohibited
- Entry into areas closed for shorebird management is prohibited
- Littering is prohibited
- Commercial activities are prohibited
- Conduct disturbing the tranquility of the refuge and visitors is prohibited
- Disturbing birds and other wildlife is prohibited

5. Law Enforcement

Rangers on the property are responsible for enforcing all property rules and regulations. Rangers may periodically request assistance from the Edgartown Police Department and the Massachusetts Environmental Police. Rangers patrol assigned areas approximately once per hour. Areas which require more frequent patrol (areas with higher visitation) have a stationary Ranger assigned.

Keith Robinson 508-257-6932, Massachusetts Environmental Police

Brian Willard, USFWS Federal Wildlife Officer

6. Other operations (e.g. fireworks, public events)

7. Plover monitoring and management (terns if applicable)

1. Symbolic fencing and signage is placed around suitable and historic habitat by April 1st in accordance with state guidelines. It is adjusted as needed throughout the season. Signs are placed every third post. Twine and flagging are used as well as galvanized t-posts. Two Shorebird Monitors are hired for a 15-week period by May 1

and works five days a week for 40 hours. The Southeast Ecology Assistant fills in on the Shorebird Monitors' days off. The Shorebird Monitors are in charge of locating and recording the courtship, territorial, and nesting behavior of shorebirds. They will also locate and record reproductive data including nest locations, number of eggs laid, number of chicks hatched and number of chicks fledged. They will complete daily observation forms, census forms, and nest attempt and nest failure forms. They will also create maps using GPS locations of nests. In addition, they will perform some predator management. Monitoring will be conducted daily during daylight hours. They will be provided with binoculars, spotting scopes, field notebooks, map software, GPS unit, and computer in order to perform their duties. They will be directly supervised by the Southeast Ecology Assistant

2. Other Management

Rare plants are also symbolically fenced and invasive plants monitored for. Typically rare plants are found growing in similar areas that shorebirds use for nesting. Nest exclosures will be used when suitable and in consultation with MNHESP.

3. Monitoring

    1. Two Shorebird Monitors are on site every day and monitors every pair unless weather prevents it.
    2. Daily site visit forms are filled out as well as nest attempt and nest failure forms for each nest. Census forms are filled out and turned into the state at the end of the season. Maps are updated in each gatehouse to keep all staff informed. Field books are kept by each Shorebird Monitor to keep a detailed account of each day.

    3. Staffing levels and qualifications

    Martha's Vineyard Superintendent
    Experienced and trained in shorebird monitoring and management

    Assistant Superintendent
    Trained in shorebird monitoring and management

    Southeast Ecology Assistant
    Advanced degree in ecology, wildlife management, or related degree in addition to work experience with managing nesting shorebirds.

    2 Shorebird Monitors who have at least a high school degree and are working towards a degree in biology or natural resources-related field. They are trained to identify shorebirds and their behaviors. Monitors work in an environment with biting insects, ticks, heat, and sand and are expected to operate 4X4 trucks and UTVs.

4. This management plan is in compliance with state and federal guidelines which ensure that there is no adverse impact to or "take" of protected species. The Trustees properties include nesting piping plovers, American oystercatchers, black skimmers, and least, common, and roseate terns. Piping plovers are state and federally threatened. Roseate terns are state and federally endangered. Common and least terns are species of special concern in Massachusetts. The Trustees report census information to the Massachusetts Division of Fisheries and Wildlife and maintains communication with this agency throughout the nesting season.

This management plan meets the Orders of Conditions approved by The Edgartown Conservation Commission on May 26th, 2016. .

4. Covered Activities

1. OSV use in vicinity of unfledged chicks

This will impact a maximum of 2 broods, or up to 11.8% of breeding pairs based on 2016 breeding census. Although the Trustees anticipates that take exposure will be restricted to Leland/East Beach, TTOR reserves the right to shift take exposure to other portions of the site, if necessary. Beach will continue to be closed to OSV traffic when the next pair of PIPL is encountered with setbacks as per the Guidelines. When the Southeast Ecology Assistant identifies the brood to be exposed, 24 hour advance notice will be provided to DFW before initiating the covered activity.

The travel corridor will be an interior road, no greater than 5 yards wide. There will be no parking or stopping along the self escort corridor until the exposed brood has been passed by at least 200 meters (600 feet) as designated by signs placed by shorebird staff and readjusted as necessary. Travel will only occur between 1000 and 1600 hours. OSVs will be self guided with a passenger in front of every vehicle. Each vehicle must have at least one passenger 16 years of age or older to walk approximately 10 feet in front of the vehicle in the self-escort corridor. The escort will look for chicks in the road and stop the vehicle if either a chick is observed or one of the monitors (shorebird or vehicle monitor) requires the vehicle to stop. All self- escorted vehicles must maintain a safe distance of at least 15 feet from the escort to the vehicle in front. Vehicles will be held by the Compliance Monitor (i.e., cue) in the travel corridor before the 200 (600 foot) meter self escort zone until chicks have moved more than 50ft away as confirmed by the Brood Monitor.

There will be a Shorebird Monitor continuously keeping track of the pair during the entire travel period. At least ½ hour before 1000, the Monitor will be dispatched to locate the brood and account for all unfledged chicks. Once the Brood Monitor has established the locations of chicks, he/she will notify the Southeast Ecology Assistant. At this time, the Compliance Monitor will be notified that the OSV trail is open for

travel. In the event that all chicks are not located, opening the OSV trail will be delayed until such time that all chicks are accounted for or it has been determined by the Brood Monitor that there are no chicks in the OSV trail. The Brood Monitor will communicate his/her determination to the Southeast Ecology Assistant for confirmation to open the trail. Monitors will be given lunch and breaks as required by law and will be relieved by trained Rangers or shorebird staff as needed.

During the entire self-escort period, the Brood Monitor shall maintain constant visual on any plover chicks using binoculars from a distance of no less than 200 feet. Disturbance, if any, of the chicks shall be minimized. Once vehicles have passed through the delineated "chick zone", which shall extend at least 200 meters (600 feet) past the closest chick, vehicles may proceed to use the sections of beach previously determined to be free of piping plover chicks, in accordance with state and federal Guidelines (including but not limited to restrictions on parking within 200 meters (600 feet) of unfledged chicks; some exceptions apply, see Guidelines).

Simultaneously, a Compliance Monitor will be located along the self escort corridor so that they can stop traffic if the pair begins to lead their chicks to the road. The Monitors will communicate through radio with cell phones as a backup.

If at any time during the escorting process, the Brood Monitor loses visual contact with one or more chicks, travel through the self-escort corridor will be stopped until chicks can be located. Monitors will document in the daily report the approximate time that visual contact with the chick(s) was lost and efforts made to relocate it.

The Southeast Ecology Assistant, Compliance Monitor, and each individual Brood or Shorebird Monitor will have the independent authority to temporarily close the trail at any time for any reason. For example, if at any time a Brood Monitor determines that chicks have approached within 50 feet of the self-escort corridor, the Monitor will immediately notify the Gate and Compliance Monitors by radio to temporarily halt traffic and allow the chicks to cross the corridor and/or move >50 feet from it. The OSV trail will not reopen until the Southeast Ecology Assistant or Brood Monitor determines that it is safe to do so. Monitors will document in the daily report the approximate time that the OSV trail was closed and the duration of the closure. They will carry radios to call for backup when chicks approach the vehicle corridor in order to ensure that traffic is stopped from both directions.

All OSV operators wishing to participate will receive an OSV self-escort training. They will be required to carry a signed proof that they have read and understand the rules and procedures in the vehicle at all times. Tire ruts will be smoothed out after each period of travel until chicks reach 14 days old. This will be done on foot with rakes or with ATV and appropriate attachment.

The Compliance and Brood Monitors will be additional staff, not taking from existing staff (see budget below). They will have at least a high school education, be able to safely operate UTV/ATVs, have clear communication skills, and the ability to learn shorebird identification and behavior. They will be trained for at least two weeks before beginning monitoring and compliance duties.

2. Contingency Plan

Personnel availability

In the event that the Brood Monitor or Compliance Monitor is unavailable (e.g., calls in sick), the Southeast Ecology Assistant, Shorebird Technician or their designee shall assume this duty.

Inclement weather

The Martha's Vineyard Superintendent, Assistant Superintendent, Southeast Ecology Assistant, or their designee, will monitor weather forecasts on a daily basis. In the event that a storm warning is predicted by the National Weather Service, or any other weather warning that could jeopardize public safety within a 24-hour period, the self-escort corridor shall be closed for the duration of the hazard or the start time may be moved one hour later or earlier. The self-escort corridor may not reopen until the Martha's Vineyard Superintendent, Assistant Superintendent, Southeast Ecology Assistant, or their designee has given the all clear. It shall be presented in writing prior to purchasing an OSV sticker that all users shall use the beach at their own risk. Exiting escorts will not take place due to unpredicted weather. OSV sticker holders shall be informed in writing that a "shelter in place" policy will go into effect until the inclement weather has passed, or scheduled exiting escorts have begun.

Medical or family emergencies

OSV sticker holders shall be advised verbally and in writing at the time of OSV sticker application, via affidavit, that egress from the beach outside of the self-escort windows shall be strictly prohibited (see permit Rules and Regulations for information to report an emergency). In the event of a life-threatening medical emergency, the staff of The Trustees and/or emergency responders should be notified. Essential vehicles will assist in escorting the vehicle off of the beach.

3. Violations

Any violations of the aforementioned protocol will not be tolerated. A zero tolerance policy will be fully enforced. Monitors and Beach Rangers will be in constant contact to ensure enforcement. Beach Rangers will be authorized to revoke OSV stickers and eject the violators from the beach immediately. Violators of the escort protocols shall be subject to OSV sticker revocation and shall have their rights to operate an OSV on Cape Poge Wildlife Refuge suspended immediately for a period of one year from the date of the violation.

4. Self-Escorting Program Reporting

Chick numbers, chick locations, and travel corridor locations/dimensions shall be provided to the Southeast Ecology Assistant by the shorebird monitor daily, prior to commencing self-escort procedures. A map showing the locations shall be posted at

Mytoi maintenance shop and Mytoi and Dike Bridge gatehouses and shall be updated daily. As required by the HCP, a daily implementation log will be kept to document staffing, frequency of brood monitoring, and compliance with OSV escorting procedures, and will be made available to DFW upon request. Any violations, incidents or accidents associated with the vehicle escort program, including take of a chick(s) shall be immediately reported to DFW and USFWS staff. In the event of an alleged incident related to the escort program Southeast Ecology Assistant, or their designee in coordination with a Shorebird Monitor shall cooperate with and assist Town, State and Federal officials with the investigation of the incident. Depending on the nature of the incident, The Trustees, DFW and USFWS reserve the right to suspend all vehicle escorts for such time as they deem appropriate.

Every week, a summary report will be submitted to DFW. The report will include; (1) daily vehicle trip count; (2) for each affected brood, daily observations of chick numbers and behavior including a daily sketch map of the observed range of the brood on the beach; (3) weekly tally and description of any rules violations and enforcement actions taken; (4) weekly tally and description of all observations of broods crossing or approaching <100 feet from the vehicle corridor; *both during the OSV travel windows and any other such observations* during routine monitoring; (5) any other notes, observations, or recommendations relevant to operating the escorting program.

By October 15 of each calendar year, The Trustees will submit an escort monitoring report to DFW describing at minimum, estimated age of chicks in each brood when self-escorting was initiated, fledging success, escorting dates, number of broods, number of chicks present during self-escorting on each date, estimated daily chick survival based on daily brood counts, number of vehicle passages, and any documented "take" of chicks resulting from the vehicle self escorting program shall be included in this report. The report will also contain recommendations for improving the efficiency and or effectiveness of the escorting program in the future.

Staff will meet weekly to assess effectiveness and go over issues. After any incident a meeting will be held to discuss what happened and how to prevent it. Pair data will be recorded into field notebooks, daily monitoring sheets, nest attempt and fate forms, and census forms. Compliance and Brood Monitors will be in addition to current staff.

5. Budget

Cost To Implement HCP First Year

Item	Cost
MESA CMP application fees (one time fee/3 year COI)	$600
Compliance and Brood Monitors (3 new hires at $15/hour, 40 hours/wk for 13 weeks)	$23,400
Fringe benefits (13%)	$3,042
Two radios (year one expense)	$500
ATV (year one expense)	$10,000 (approximate)
Fuel ($2,500), O/H @ 10% ($3,089), Signs ($1,000) , Uniforms ($500)	$7,089

Mitigation (changes annually)	$693
Contingency (5%)	$2,266
TOTAL	$47,590

6. Mitigation Plan

In order to mitigate for piping plover pairs impacted The Trustees will implement a comprehensive predator management plan at Crane Beach, Ipswich, MA through contracting with US Department of Agriculture-Wildlife Services (USDA-WS). In 2016, WS identified four species of predators impacting the reproductive success of nesting shorebirds at Crane Beach. These were American crow, common raven, great-horned owl and Eastern coyotes. Each species has been responsible for shorebird predation at various times of the year and will require different management practices.

In 2017, WS will use mock piping plover exclosures baited with hard-boiled chicken eggs to detect avian predators. Infrared cameras will confirm species uptaking bait eggs If American crows or common ravens are observed WS will replace plain chicken eggs with DRC-1339-laced chicken eggs to reduce, remove or take these predators that may "key in" on piping plover exclosures. The Trustees of Reservation (Trustees) staff on Crane Beach will set up mock exclosures and place plain bait eggs two weeks before WS site visits. Three (3) mock exclosures will be placed in similar locations as 2016. When The Trustees staff observes 100% pre-bait uptake, they will contact WS staff to conduct a DRC-1339 application.

WS will use a variety of trapping methods in order to manage and capture great-horned owls (GHOW) on Crane Beach. These traps include Goshawk traps, Bal-Chatri traps, and pole traps. They are all non-lethal so that non-target species can be released. WS will release any non-target species of owls or hawks as any of these are potential predators to nesting shorebirds. Traps will be set overnight by WS and monitored every few hours by Trustees staff to ensure the safety of any animal captured. WS will remain in the area performing other control activities so that they can respond immediately when notified of a capture by Trustees staff. WS will remove the animal. Any GHOW will either be taken to a licensed rehabilitator and released after the shorebird nesting season, or will be euthanized. Permits issued by the U.S. Fish and Wildlife Service (USFWS) and Massachusetts Department of Fisheries and Wildlife (MDFW) will specify the disposition of captured animals. Traps can be placed prior to the nesting season, March-April, or when there are signs of GHOW depredation. During the 2017 nesting season there were no GHOW depredation events until June, after chicks had hatched so the timing of trapping will be flexible.

Also during the 2016 season WS observed five (5) coyotes on Crane Beach while conducting night surveys for GHOW. They responded to electronic distress calls being used during GHOW control. Coyotes were responsible for some depredation so the WS will continue to use electronic calls to remove coyotes in the nesting areas. WS will use suppressed rifles and/or shotguns with non-toxic shot prior to, and throughout, the nesting season.

Based on a scope of work developed by USDA, APHIS, in consultation with TTOR staff, the cost for this comprehensive predator management on Crane Beach will be $8,300. It will include six months of control which consists of up to twelve (12) control visits. In addition it is expected Trustees staff will spend greater than 60 hours on predator management, costing $680. This plan is expected to benefit an estimated 30 pairs of piping plovers and 115 pairs of least terns based on the number of pairs nesting in 2016, resulting in an estimated cost of $277 per piping plover breeding pair to benefit from predator control ($8,300/30). The use of OSVs in the presence of unfledged chicks requires mitigation for 2.5 pairs per exposed brood, resulting in an estimated mitigation cost of $693 ($277 x 2.5). TTOR is committed to implementing the full 2017 Crane Beach predator management plan regardless of whether or not external funding (e.g. a grant) is available to partially fund the work. TTOR may elect to self-fund more than the minimum required $693 in order to avoid the need to "true up" mitigation funding the following year in the event that the 2017 Crane Beach plover population declines below 30 pairs (see Statewide HCP for more information). TTOR will fund additional predator management as necessary to meet the truing up requirements of the HCP and will continue to fund predator control during the term of the three year COI as necessary to offset exposure of up to three broods (one per year) to the covered activity at an estimated cost of up to $693 per year (at least 2.5 piping plover breeding pairs to benefit per exposure).

The Trustees expects to only expose up to two broods to potential "take." The Trustees use both passive and lethal predator management. Using exclosures helped for many years until American crow began targeting them as a source of food. The use of avicide showed immediate results in improving reproductive success but other predators are also present. The GHOW prevented the use of exclosures in 2016 due to adult mortality by GHOW. Unexclosed nests were also depredated by coyotes in 2016. This comprehensive predator management plan will address the multiple predators present at Crane Beach.

Additionally, The Trustees have a similar program on Martha's Vineyard and Nantucket where we are applying for COIs and will continue for 2017. These are not considered comprehensive so do not contribute towards our mitigation efforts but do contribute towards successful management of nesting shorebirds. On Martha's Vineyard American crows and striped skunk are the main predators. The USDA-WS will conduct crow control similar to Crane Beach on Leland, East, and Norton Point Beach. Trustees staff will place box traps such as Have-a-heart traps and monitor them daily for striped skunk. Captured animals will be euthanized using CO2 in a chamber. WS will conduct box trapping when they are on site. On Coskata-Coatue Wildlife Refuge, Nantucket, MA rats, American crow, and Northern harriers are the main predators of nesting shorebirds. Northern harriers are protected so will not be controlled. American crow will be controlled as they are on Crane Beach and Martha's Vineyard. Rats will be controlled using a rodenticide, iphacinone-50, in bait stations containing multiple bait boxes. These are checked every two weeks and run from March through June or July.

The Trustees will monitor and provide an annual report to MADFW. This report will contain the number of plover broods exposed to covered activities, number of breeding pairs of piping plovers and least terns benefitting from the comprehensive predator management, program reach and effectiveness (e.g. number of warnings, citations, any violations, changes in public attitude) documentation that the

selective predator management was implemented (i.e. paid invoices and contractor final report), piping plover and least tern productivity for the site, causes of nest and/or chick loss, and any mitigation credits or deficits that will be carried over into the following season.

7. Itemization of Costs for Predator Management

Cost of Crane Beach, Ipswich, MA Comprehensive Predator Management Plan

Item	Cost
Contract Services (USDA-WS)/per year	$8300