

Massachusetts Habitat Conservation Plan for Piping Plover

2023 Annual Report



Bill Byrne/MassWildlife



MASSWILDLIFE

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I. Executive Summary

On July 8, 2016, the United States Fish and Wildlife Service (USFWS) issued a 26-year Incidental Take Permit (ITP) to the Massachusetts Division of Fisheries and Wildlife (MassWildlife) in accordance with Section 10(a) (1) (B) of the Endangered Species Act of 1973 (ESA), as amended, 16 U.S.C. 1539 (a) (1) (B). Pursuant to the ITP, MassWildlife is responsible for administering the Massachusetts Statewide Habitat Conservation Plan (HCP). The HCP identifies covered activities that are authorized by the ITP that could expose Piping Plovers (*Charadrius melodus*) to “take.” Incidental Take coverage can be extended by MassWildlife to approved landowners and beach managers through Certificates of Inclusion (COIs).

During the 2023 beach season, seven beach operators held valid COIs encompassing eight permit-sites. Covered activities were carried out at six beaches:

1. Duxbury Beach Reservation, Duxbury (“Duxbury Beach”);
2. Horseneck Beach State Reservation, Westport (“Horseneck Beach”);
3. Plymouth Long Beach, ;
4. Revere Beach State Reservation, Revere (“Revere Beach”);
5. Sandy Neck Beach Park, Barnstable (“Sandy Neck”); and
6. Wychmere Beach Club, Harwich (“Wychmere”).

Statewide, 25 pairs of Piping Plovers, including 61 chicks, were exposed to covered activities:

- *Use of Roads and Parking Lots in the Vicinity of Unfledged Chicks* – 14 pairs;
- *Oversand Vehicle (OSV) Use in the Vicinity of Unfledged Chicks* – No exposures;
- *Recreation and Beach Operations* – 11 pairs;
 - *Reduced Fencing Around the Nest* – Six pairs;
 - *Reduced Proactive Symbolic Fencing* – Seven pairs; and
- Multiple covered activities – Within *Recreation and Beach Operations*, two pairs were exposed to both *Reduced Fencing Around the Nest* and *Reduced Proactive Symbolic Fencing*. These pairs are included above in each of those categories but counted only once each in Recreation and Beach Operations.

Intensive impact avoidance and minimization measures were implemented at sites where the HCP was implemented this year. Required HCP compliance and effectiveness monitoring were carried out by both MassWildlife and COI-holders.

The 24 pairs for which there was complete information that were exposed to covered activities fledged 27 chicks (1.13 chicks per pair). *(Information on nesting activity is incomplete for one pair that was deterred from nesting at Sandy Neck and probably left the site soon after covered activities were implemented.)*

- Of the 14 broods that were exposed to use of roads and parking lots, eight fledged at least one chick for a total of 19 fledglings.
- Of the six pairs for which there was complete information that were subject to reduced proactive symbolic fencing, two fledged at least one chick for a total of five chicks. *(Note one pair is also counted in “reduced fencing around the nest,” below.)*
- Of the six pairs subject to reduced fencing around the nest, two fledged three chicks each for a total of six chicks. *(Note one pair is also counted in “reduced proactive fencing,” above.)*

Participation in the HCP expanded recreational opportunities at all six beaches where covered activities were implemented.

- **Duxbury Beach.** The Duxbury Beach Reservation operated roads and parking lots contributing to 68 days of recreational activity on Duxbury Beach.
- **Horseneck Beach.** Reduced fencing in plover territories and around a nest allowed for 1.5 acres of additional recreational beach use.
- **Plymouth Long Beach.** The Town of Plymouth allowed recreational vehicle access to a road and parking areas for 83 days when it might otherwise have been limited by the presence of unfledged plover chicks (66 days) or tern chicks (54 days: 37 overlapped with plover implementation and 17 were for Least Terns only).
- **Revere Beach.** Reduced fencing in plover territories and around a nest allowed for 1.25 acres of additional beach to be open to recreation.
- **Sandy Neck.** The OSV beach remained open for 42 days when there likely would have been a full beach closure absent implementation.
- **Wychmere.** Reduced fencing and nesting deterrence allowed for an additional 0.44 acres of beach area available for recreational activities and weddings.

On-site mitigation consisted of selective predator management designed to increase productivity and more than offset any harm resulting from exposure to the covered activities. Two off-site mitigation projects occurred in 2023. In all, 185 breeding pairs of Piping Plovers benefited from selective predator management under the HCP, substantially more than the minimum benefit of 69.5 pairs required pursuant to the HCP. This report documents compliance with the HCP and provides information about other state-listed species, Least Terns, and Diamond-backed Terrapins, which may be exposed to take by covered activities.

II. Annual Report Requirements

This annual report summarizes HCP implementation activities during 2023 and has been prepared by MassWildlife in accordance with the requirements of the HCP.

The goals of the annual report are as follows:

- To provide the information and data necessary for MassWildlife to demonstrate to the USFWS and the public that the HCP is being implemented properly.
- To disclose any problems with HCP implementation and the corrective measures planned or implemented to address the problems.
- To identify administrative or minor changes to HCP components required to increase the success of conservation actions.
- To identify the results and/or need for adaptive management and changed circumstances, and whether any HCP or ITP changes may be subsequently proposed as a result pursuant to Chapter 3.3.3. of the HCP.

A bulleted list of the required contents of the annual report is provided on pages 5-9 of the HCP. To facilitate review by the USFWS and the public, the remainder of this report systematically addresses each item on the list. Supporting documentation and data are included in the Appendices, which are available upon request.

II.1 Description of all covered activities implemented during the reporting period by activity type and location.

Twenty-five pairs of Piping Plovers were exposed to three activities covered under the HCP. **Tables 1a, 1b, and 1c** provide details of permits and implementation at each site, including duration of covered activities and nest productivity of exposed pairs.

1. *Use of Roads and Parking Lots in Vicinity of Unfledged Chicks.* Fourteen broods were exposed.
 - **Duxbury Beach.** Seven broods were exposed to recreational traffic on Gurnet Rd. or parking lots. One of those broods was exposed to a barrier in order to direct its movements through a parking lot. Six of those broods crossed the road when moving between the oceanside and bayside; four of them were herded. (Additional broods crossed but were exposed to essential vehicle traffic only.) Twenty chicks were exposed to recreational traffic; ten of those fledged. Four chicks were run over in the roadway. Three of these incidents occurred after the beach was closed to recreational traffic and are more likely attributed to essential vehicle traffic (*i.e.*, not HCP-related). It was unclear if a fourth chick was run over by an essential vs. recreational vehicle.
 - **Plymouth Long Beach.** Seven broods were in the vicinity of Ryder Way and parking lots, including three broods that crossed the road. Two of these broods were exposed to barriers. Nine of 25 exposed chicks fledged.
2. *Oversand Vehicle Use in Vicinity of Unfledged Chicks.*

Not implemented.

3. *Recreation and Beach Operations*. Eleven pairs/broods were exposed.
 - *Reduced Proactive Fencing of Habitat*. Seven pairs/broods were exposed.
 - i. **Duxbury Beach**. One territorial pair was exposed to raking and flagging across 0.21 ac of unfenced habitat to deter them from nesting near the resident boardwalk. The pair was deterred from that area and likely nested elsewhere on the beach.
 - ii. **Horseneck Beach**. An area totaling 3.5 acres was left unfenced and raked daily in an unsuccessful attempt to deter one territorial pair from an important recreational area.
 - iii. **Revere Beach**. An area totaling 1.25 acres was left unfenced and raked daily to successfully deter one territorial pair from an important recreational area.
 - iv. **Sandy Neck**. In all, 2.31 acres of nesting habitat were impacted. Fencing was initially close to the base of dune through the 0.7-mile mark in the Recreation Zone (RZ), but on two occasions, portions of it (0.55 – 0.7-mile mark and 0.45 – 0.55-mile mark; total, 0.25 miles) were expanded to the dimensions recommended in the Guidelines to allow two pairs to settle in an area that did not impede use of Trail 1 in the RZ. Beach raking (77 times) over 2.21 acres and 1,509 linear ft (0.1 ac or 4,527 ft²) of coverboards were used to deter three pairs from a portion of the RZ. At least two of these pairs nested elsewhere at Sandy Neck. The first nest of one pair was overwashed and its second nest was lost to unknown causes. The second pair fledged two chicks. The third pair apparently did not nest at Sandy Neck and may have been deterred to another site.
 - v. **Wychmere**. An area of nesting habitat totaling 0.44 acres was left unfenced. Beach raking (approximately 85 times) and mylar streamers were used in an unsuccessful attempt to deter a pair. Three chicks fledged.
 - *Reduced Fencing Around the Nest*. Six pairs were exposed.
 - i. **Horseneck Beach**. Three pairs (four nests) were exposed. Two nests hatched but no chicks fledged. At one nest, one or two chicks died after being attacked by a neighboring plover male and the other two chicks disappeared. At the first nest of another pair, three eggs disappeared and the fourth was abandoned, possibly because of territorial interactions with a neighboring pair. At the pair's second nest, three eggs hatched: one chick probably died of heat exhaustion; two chicks disappeared and may have been predated. The third pair lost its nest to predation.
 - ii. **Revere Beach**. One nest was exposed and hatched. Two chicks were predated by gulls and another was lost during a storm.
 - iii. **Wychmere**. Two nests were exposed; both hatched and fledged three chicks. One of these was the pair for which deterrence was unsuccessful (see above): after the pair nested at the base of a streamer, the nest was protected with reduced fencing

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- *Nest Moving*. Not implemented.

Table 1a. Covered activities permitted (X) and implemented (gray shading) in 2023.

Location	Covered Activities			Specific Permissions					
	Roads & Parking Lots	Rec. & Bch. Ops.	Oversand Vehicle Use	Reduced proactive symbolic fencing	Reduced symbolic fencing around nests	Nest moving	Barriers	Chick herding	Deterrents (incl. raking)
Duxbury Beach, Duxbury (Duxbury Beach Reservation)	X	X		X	X	X	X	X	X
Horseneck Beach State Reservation, Westport (DCR)	X	X		X	X		X		X
Nauset Beach, Orleans		X	X		X	X			
North (Nauset) Beach, Chatham		X	X	X	X				
Plymouth Long Beach, Plymouth	X		X				X	X	
Revere Beach State Reservation, Revere; Winthrop Shore Reservation, Winthrop; Nahant Beach State Reservation, Nahant (DCR)	X	X		X	X	X	X		X
Sandy Neck Beach Park, Barnstable		X	X	X					X
Wychmere Beach Club, Harwich		X		X	X	X	X	X	X

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Table 1b. Take exposures permitted and implemented, productivity, and habitat affected in 2023.

Location	Description of Covered Activity Implementation	No. permitted take exposures	No. take exposures used	% of total pairs exposed	Productivity, exposed pairs (fledglings/pair)	Productivity, unexposed pairs (fledglings/pair)	Overall site productivity (fledglings/pair)	Nesting habitat affected (acres)
Duxbury Beach, Duxbury (Duxbury Beach Reservation)	Roads and parking lots were open to non-essential vehicles. Proactive fencing was reduced and raking and flagging occurred to deter birds from nesting. Occasional use of herding and barriers.	16	8	17.3	1.42	1.05	1.1	0.31
Horseneck Beach State Reservation, Westport (DCR)	Proactive fencing was reduced, raking occurred, and fencing around nests was reduced to keep areas open for recreation.	4	3	16.7	0	0.47	0.39	1.4
Nauset Beach, Orleans	None	2	0	0	n/a	n/a	0.87	
North (Nauset) Beach, Chatham	None	2	0	0	n/a	n/a	2.2	
Plymouth Long Beach, Plymouth	Ryder Way and parking areas were open to non-essential vehicles. A barrier was used along part of the roadway.	8	7	14	1.29	0.98	1.02	0.92
Revere Beach State Reservation, Revere; Winthrop Shore Reservation, Winthrop; Nahant Beach State Reservation, Nahant (DCR)	Proactive fencing was reduced, raking occurred, and fencing around nests was reduced to keep areas open for recreation.	10	2	7.1	0	0.58	0.54 overall (Revere 0.50; Winthrop 0.63; Nahant 0.50)	1.75
Sandy Neck Beach Park, Barnstable	Proactive fencing was reduced, beach raking was conducted, and coverboards were installed to deter nesting and keep a recreational area open.	3	3	5	0.66	1.58	1.53	2.31
Wychmere Beach Club, Harwich	Proactive fencing was reduced in an area prioritized for recreation. Fencing was reduced around nests. Raking and streamers were used as deterrents.	3	2	40	3	2	2.4	0.44

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Table 1c. Details of take exposures in 2023.

Location	Description of Covered Activity Implementation	Pair identifier	No. chicks exposed	No. fledged from exposed pairs	Start of implementation	End of implementation	No. days pair/brood exposed to covered activity	Age of chicks when first exposed (days)
Duxbury Beach, Duxbury (Duxbury Beach Reservation)	Recreation & beach operations: reduced proactive symbolic fencing (raking and flagging)	Un-nested	0	0	5/10/2023	5/11/2023	1	n/a
Duxbury Beach, Duxbury (Duxbury Beach Reservation)	Use of roads & parking lots in the vicinity of unfledged chicks (crossing)	1	4	0	5/26/2023	6/3/2023	9	1
Duxbury Beach, Duxbury (Duxbury Beach Reservation)	Use of roads & parking lots in the vicinity of unfledged chicks (crossing and herding)	2	1	3	6/9/2023	7/4/2023	25	14
Duxbury Beach, Duxbury (Duxbury Beach Reservation)	Use of roads & parking lots in the vicinity of unfledged chicks (crossing and herding)	3	3	0	5/30/2023	6/3/2023	5	3
Duxbury Beach, Duxbury (Duxbury Beach Reservation)	Use of roads & parking lots in the vicinity of unfledged chicks (barrier)	22	4	1	6/7/2023	7/15/2023	38	0
Duxbury Beach, Duxbury (Duxbury Beach Reservation)	Use of roads & parking lots in the vicinity of unfledged chicks (crossing and herding)	36	4	3	6/25/2023	7/20/2023	25	0
Duxbury Beach, Duxbury (Duxbury Beach Reservation)	Use of roads & parking lots in the vicinity of unfledged chicks (crossing and herding)	13	1	0	6/5/2023	7/3/2023	28	4
Duxbury Beach, Duxbury (Duxbury Beach Reservation)	Use of roads & parking lots in the vicinity of unfledged chicks (crossing)	30	3	3	8/4/2023	8/14/2023	10	22
Horseneck Beach State Reservation, Westport (DCR)	Reduced fencing around the nest, with raking	16	4	0	5/26/2023	7/5/2023	40	0
Horseneck Beach State Reservation, Westport (DCR)	Reduced fencing around the nest, with raking	17	3	0	5/26/2023	7/15/2023	50	0
Horseneck Beach State Reservation, Westport (DCR)	Reduced proactive fencing; Reduced fencing around the nest, with raking	18	0	0	5/26/2023	7/5/2023	41	0
Plymouth Long Beach, Plymouth	Use of roads & parking lots in the vicinity of unfledged chicks	3A	4	1	5/26/2023	6/27/2023	33	0
Plymouth Long Beach, Plymouth	Use of roads & parking lots in the vicinity of unfledged chicks	7A	4	0	5/30/2023	6/5/2023	6	0
Plymouth Long Beach, Plymouth	Use of roads & parking lots in the vicinity of unfledged chicks, with barrier	13A	4	0	5/31/2023	6/11/2023	11	0
Plymouth Long Beach, Plymouth	Use of roads & parking lots in the vicinity of unfledged chicks, with barrier	14A	4	2	5/27/2023	7/2/2023	36	0
Plymouth Long Beach, Plymouth	Use of roads & parking lots in the vicinity of unfledged chicks	27B	2	0	7/12/2023	7/20/2023	9	0
Plymouth Long Beach, Plymouth	Use of roads & parking lots in the vicinity of unfledged chicks	43A	3	2	7/2/2023	7/27/2023	26	3
Plymouth Long Beach, Plymouth	Use of roads & parking lots in the vicinity of unfledged chicks	44A	4	4	6/28/2023	7/31/2023	33	0
Revere Beach State Reservation, Revere; Winthrop Shore Reservation, Winthrop; Nahant Beach State Reservation, Nahant (DCR)	Reduced fencing around the nest	RBS 05A	3	0	6/18/2023	7/24/2023	36	0
Revere Beach State Reservation, Revere; Winthrop Shore Reservation, Winthrop; Nahant Beach State Reservation, Nahant (DCR)	Reduced proactive symbolic fencing with raking	RBN 07	0	0	6/29/2023	7/5/2023	6	n/a
Sandy Neck Beach Park, Barnstable	Reduced proactive symbolic fencing with raking, flagging, and coverboards	33	0	0	4/1/2023	6/25/2023	32	n/a
Sandy Neck Beach Park, Barnstable	Reduced proactive symbolic fencing with raking, flagging, and coverboards	56	0	2	4/1/2023	6/25/2023	37	n/a
Sandy Neck Beach Park, Barnstable	Reduced proactive symbolic fencing with raking, flagging, and coverboards	unk	0	unk	4/1/2023	6/25/2023	9	n/a
Wychmere Beach Club, Harwich	Reduced proactive symbolic fencing , with raking and streamers; Reduced fencing around the nest	1A	3	3	4/4/2023	6/18/2023	76	N/A
Wychmere Beach Club, Harwich	Reduced fencing around the nest, chick herding	2A	3	3	4/20/2023	6/8/2023	50	4

II.2 Summary of annual take exposure.

The total allowable take exposure for a given year is based on a three-year rolling average of the statewide Piping Plover breeding population (**HCP Table 3-1**). The average breeding population size for 2020 – 2022 was 931.5 breeding pairs, based on Adjusted Total Count, resulting in an allowable exposure to covered activities of 7%, or a maximum of 65 territories, pairs, nests, and/or broods that could be exposed to covered activities statewide (**Table 2**). During 2023, 25 territories/pairs/nests/broods were exposed to covered activities, and exposure at three sites was >15% of the breeding population size at that site (**Tables 1, 4**).

Under a formal Section 7 consultation in 2010 with the Cape Cod National Seashore (CACO), the USFWS issued an incidental take statement for the exposure to take of up to three pairs of Piping Plovers to flexible management. The USFWS completed a second formal consultation with the CACO in 2021 for additional flexible management actions and locations at which the management could be implemented. Annually, up to five Piping Plover pairs may be exposed to take beginning in 2022. Although take exposure for recreational activities on federal properties is not associated with the Massachusetts Piping Plover HCP, MassWildlife is required to subtract these authorizations from the total allowable statewide take exposure available to HCP participants in a given year.

Table 2. Abundance of breeding Piping Plovers in Massachusetts, 2020-2022, and allowable and actual take exposure for 2023 under the Massachusetts Piping Plover HCP and the National Park Service’s flexible management program at the Cape Cod National Seashore.

	YEAR		
	2020	2021	2022
MA breeding pairs (<i>adjusted total count</i>)	794.5	967	1033
MA <i>adjusted total count</i>, 3-year average (2020 – 2022):	931.5		
Maximum allowable exposure in MA, 2023 (7%):	65 territories/pairs/nests/broods		
• Statewide HCP			
Maximum allowable exposure	60 territories/pairs/nests/broods		
Actual exposure	25 territories/pairs/nests/broods		
• Flexible management, NPS-Cape Cod National Seashore			
Maximum allowable exposure	5 territories/pairs/nests/broods		
Actual exposure	unknown		

II.3 Summary of the annual mitigation implemented, and any mitigation credits or deficits outstanding from previous years.

Offsite mitigation. MassWildlife partially funded two organizations to conduct offsite mitigation projects (selective predator management) during the 2023 season. The Massachusetts Audubon Society,

contracting with USDA-Wildlife Services, conducted selective predator management at Allens Pond Wildlife Sanctuary, Dartmouth; this benefitted 24 pairs of plovers and 200 pairs of Least Terns. BiodiversityWorks conducted selective predator management at Edgartown Great Pond on Martha's Vineyard; this benefitted seven pairs of plovers and 182 pairs of Least Terns.

Onsite/internal mitigation. Three COI-holders used their own resources to offset take exposures at four sites. In all cases, USDA APHIS Wildlife Services carried out selective predator management in accordance with plans approved by the New England Field Office of the USFWS for the purpose of HCP mitigation. This work was not cost-shared with MassWildlife.

1. **Department of Conservation and Recreation.** Onsite work benefitted 69 pairs of plovers at: Horseneck Beach, Westport; Revere Beach, Revere; Winthrop Beach, Winthrop; Demarest Lloyd State Park, Dartmouth; Sandy Point, Ipswich (benefits also accruing to Parker River NWR, Newburyport); and West Island, Fairhaven.
2. **Duxbury Beach Reservation.** Work onsite at Duxbury Beach benefitted 46 pairs of plovers.
3. **Town of Plymouth.** Work onsite at Plymouth Long Beach benefitted 50 pairs of plovers.

The COI-holders implemented more than enough selective predator management to meet the 2023 mitigation requirements. Therefore, there is a mitigation credit that carries forward (**Table 3**). At the mitigation ratios of 2.5:1 (OSV Use and Reduced Fencing) and 3:1 (Roads and Parking Lots), selective predator management was required to benefit 69.5 pairs in order to mitigate for exposures that occurred during 2023. In fact, selective predator management benefitted 185 pairs: COI-holders implementing on-site/internal mitigation benefitted 165 pairs while the portion of offsite mitigation funded through escrow benefitted 20.4 pairs. Including unexpired credits carried forward from previous years (2020 – 2022), at the end of 2023 there were 28.8 credits statewide and an additional 319 credits allocated to individual sites (*i.e.*, because the COI-holder directly funded mitigation activities). However, 19.2 statewide credits from 2020 expired after 2023, reducing the number carrying into 2024 to 9.6. Similarly, 70.5 individual site credits expired after 2023 (five for Chatham and 65.5 for Plymouth), yielding 248.5 site credits carrying into 2024. **Tables 3 a-c** provide additional detail on mitigation requirements, deficits, and credits.

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Table 3a. Predator management mitigation requirements and credits for COI-holders under the Massachusetts Piping Plover HCP in 2023.

2023 COI Site	No. authorized exposures	No. actual exposures, 2023	Selective predator management mitigation, required credits	Site credits gained, 2023 ^a	Annual site credit balance, 2023 ^{ab}	Total site credit balance, end of 2023 ^{ac}	Non-expired credits carrying into 2024 ^a	Year credits will expire ^d
Barnstable	3	3	7.5	7.5	0	0	0	2026
Chatham	2	0	0	0	0	5	0	2026
Duxbury	16	8	23.5	46	22.5	57	57	2024
Horseneck	4	3	7.5	69	56.5	134	134	2024
Revere/ Winthrop/ Nahant	10	2	5	Same as Horseneck	Same as Horseneck	Same as Horseneck	Same as Horseneck	2024
Orleans	2	0	0	5	5	5	5	2025
Plymouth	8	7	21	50	29	115.5	50	2026
Wychmere	3	2	5	7.5	2.5	2.5	2.5	2026
TOTAL	48	25	69.5	185	115.5	319.0	248.5	

^a From selective predator management or escrow/mitigation fund only

^b Annual site credit balance includes site credits and take exposures from the current season only; it does not include credits or deficits from previous years

^c Total site credit balance includes site credits or deficits from previous years in addition to the current season

^d Credits from a previous permit term expire in the first year of a subsequent, consecutive term.

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Table 3b. Predator management mitigation programs and credits under the Massachusetts Piping Plover HCP in 2023.

2023 Mitigation site	Total cost	HCP cost (COI-holder or grant awardee)	HCP cost (State)	HCP cost-share (COI-holder or grant awardee)	Actual pairs benefiting	Site credits gained (selective pred. mgmt. only)	Site credits gained (escrow)	State credits gained (selective pred. mgmt. only)	Site credits used	Location(s) of credit use
Allens Pond	\$19,600.00	\$4,850.00	\$14,750.00	25%	24	n/a	n/a	18.06	n/a	n/a (offsite mitigation)
Edgartown Great Pond	\$11,904.61	\$7,863.00	\$4,041.61	66%	7	n/a	n/a	2.38	n/a	n/a (offsite mitigation)
Duxbury	14,998.92	14,998.92	\$0.00	100%	46	46	n/a	0	23.5	Duxbury
Horseneck, Demarest Lloyd, Sandy Point, Revere, Winthrop, West I., Parker River NWR	31,989.41	31,989.41	\$0.00	100%	69	69	n/a	0	12.5	Horseneck, Demarest Lloyd, Sandy Point, Revere, Winthrop, West I., Parker River NWR
Plymouth	14,094.87	14,094.87	\$0.00	100%	50	50	n/a	0	21	Plymouth
<i>Subtotal, mitigation sites</i>	<i>\$92,587.81</i>	<i>\$73,796.20</i>	<i>n/a</i>		<i>196.0</i>	<i>165.0</i>	<i>0</i>	<i>20.44</i>	<i>57.0</i>	-
<i>Subtotal, State & escrow sites</i>	<i>n/a</i>	<i>n/a</i>	<i>\$18,791.61</i>		<i>0</i>	<i>0</i>	<i>20</i>	<i>-20</i>	<i>12.5</i>	20 escrow credits from Barnstable (7.5), Orleans (5), & Wychmere (7.5) are subtracted from 'State credits gained' so that they are not double-counted when the State funds mitigation.
TOTAL	\$92,587.81	\$73,796.20	\$18,791.61		196.0	165.0	20	0.44	69.5	

Table 3c. Statewide predator management net mitigation credits under the Massachusetts Piping Plover HCP in 2023.

2023 Credit Type	Credits, end of 2022	Credits gained, 2023	Credits used, 2023	Net credits, end of 2023	Credits expiring, 2023	Credits carrying into 2024
Credits Allocated to Individual Sites (includes escrow credits)	203.5	185	69.5	319	70.5	248.5
Credits Available Statewide	28.38	0.44	12.5	28.82	19.19	9.63
TOTAL NET CREDITS	231.88	185.44	82	347.82	89.69	258.13

^a Excludes 5 credits remaining allocated to a previous COI-holder that did not renew its COI.

II.4 Summary of exceptions to the restrictions on the number or territories/nests/broods affected (15% vs. 75%) and habitat impacts (2 acres/10% vs. 4 acres/20%) employed for the covered activities (as provided for in the Plan).

- *Restriction on the number of territories/pairs/nests/broods affected (15% vs. 75%)* – The limit on the number of pairs that can be affected is calculated based on the number of pairs present during the previous breeding season (HCP Section 3.2.2.2., p. 3-9). Up to eight sites annually may exceed 15%. In addition, sites with six or fewer pairs may impact one pair.
 - **Number of exceptions.** Based on the number of authorized take exposures and the 2022 population size, five sites had potential to exceed 15% of pairs affected, although only three did so in 2023 (**Table 4**).
 - **Duxbury Beach.** Eight pairs were impacted: seven by *Use of Roads and Parking Lots* and one by *Recreation and Beach Operations (Reduced proactive symbolic fencing)*. Roads and parking lots were open to non-essential vehicles. Proactive fencing was reduced and raking and flagging occurred to deter birds from nesting. Herding and barriers were occasionally used.
 - **Horseneck Beach.** Three pairs were impacted by *Recreation and Beach Operations (Reduced proactive symbolic fencing and/or Reduced fencing around the nest)*. Proactive fencing was reduced, raking occurred, and fencing around nests was reduced to keep areas open for recreation.
 - **Wychmere Beach Club.** Two pairs were impacted by *Recreation and Beach Operations (Reduced proactive symbolic fencing and/or Reduced fencing around the nest)*. Proactive fencing was reduced in an area prioritized for recreation. Fencing was reduced around nests. Raking and streamers were used as deterrents.
- *Restriction on habitat impacts (2 acres/10% vs. 4 acres/20%)* – This restriction refers specifically to the covered activity *Recreation and Beach Operations-Reduced Proactive Symbolic Fencing* (HCP Section 3.2.2.2, pp. 3-8 – 3-9). Up to five sites annually may exceed 2 acres or 10% of habitat impacted, whichever is less, up to a maximum of 4 acres or 20%, whichever is less.
 - **Number of exceptions.** Only three sites exceeded 10%/2 acres in 2023 (**Table 4**).
 - **Horseneck Beach.** See description immediately above. Four acres (<20%) were impacted.
 - **Sandy Neck.** Three pairs were impacted across 2.31 acres (<4%) by *Recreation and Beach Operations (Reduced proactive symbolic fencing)*. Proactive fencing was reduced, beach raking was conducted, and coverboards were installed to deter nesting and keep a recreational area open.
 - **Wychmere Beach Club.** See description immediately above. 0.44 acres (20% of nesting habitat) were impacted.

Table 4. Percent of pairs and nesting habitat impacted by covered activities, 2023. Shaded cells indicate authorized and actual exceptions to restrictions.

Permit-site, 2023	No. PIPL take exposures permitted	No. PIPL pairs in previous year (2022)	Max. % PIPL pairs authorized to be exposed at site	No. take exposures (actual), 2023	No. PIPL pairs, 2023	% PIPL pairs exposed (actual), 2023	Exceptions to % pairs exposed	Exceptions to "Reduced proactive symbolic fencing": acreage or % habitat impacted
Duxbury Beach	16	40	0.40	8	46	17.4	Y (17.4%)	N
Horseneck Beach	4	15	0.27	3	18	16.7	Y (16.7%)	Y (<20%; 4 ac)
Nauset, Orleans	2	42	0.05	0	45	0.0	N	N
North (Nauset) Beach, Chatham	2	21	0.10	0	23	0.0	N	N
Plymouth Long Beach	8	48	0.17	7	50	14.0	N	N
Revere, Winthrop, Nahant	10	27	0.37	2	28	7.1	N	N
Sandy Neck Beach Park	3	50	0.06	3	58	5.2	N	Y (<4%; 2.31 ac)
Wychmere Beach Club	3	5	0.60	2	5	40.0	Y (40%)	Y (20%; 0.44 ac)

II.5 Year-to-date cumulative summary (i.e., from the start of the permit term) of temporary impacts to Piping Plover habitat resulting from covered activities (Table 5).

Table 5. Annual and cumulative temporary impacts to Piping Plover habitat under the activity *Recreation and Beach Operations - Reduced Proactive Symbolic Fencing*

Year	Temporary habitat impacts ^a (ac)	Cumulative temporary habitat impacts ^a (ac)	Description
2016	0	0	Covered activities were confined to existing roads, parking lots, and OSV corridors, and, therefore, did not result in any additional impacts to habitat.
2017	1.8	1.8	Reduced proactive fencing and beach raking to deter plovers at 2 sites: Winthrop Shore (0.6 ac) and Sandy Neck Beach Park (1.2 ac).
2018	11.66	13.46	Reduced proactive fencing and beach raking to deter plovers at 3 sites: Sandy Neck Beach Park (1.2 acres), Revere Beach (0.96 acres), and Horseneck Beach (9.5 acres). To deter Least Terns only: Winthrop Shore (0.44 acres).
2019	2.1	15.56	Reduced proactive fencing, beach raking, and/or coverboards to deter plovers at 3 sites, Sandy Neck Beach Park (1.2 acres), Revere Beach (0.6 acres), and Horseneck Beach (0.3 acres). To deter Least Terns only: Horseneck Beach (5.7 acres).
2020	4.92	20.48	Reduced proactive fencing, beach raking, and/or physical deterrents (coverboards, tarps, flagging) at 3 sites: Horseneck Beach (0.3 ac), Sandy Neck Beach Park (3.12 ac), and Duxbury Beach (1.5 ac in a gravel parking lot).
2021	1.55	22.03	Reduced proactive fencing, beach raking, and coverboards to deter plovers at Sandy Neck Beach Park (1.55 ac).
2022	1.618	23.648	Reduced proactive fencing, beach raking, and coverboards to deter plovers at Sandy Neck Beach Park (1.618 ac).
2023	6.75	30.398	Reduced proactive fencing, beach raking, and coverboards to deter plovers at Sandy Neck Beach Park 2.31 ac). Reduced proactive fencing, beach raking, and streamers to deter plovers at Wychmere Beach Club (0.44 ac). Proactive fencing was reduced, raking occurred, and fencing around nests was reduced to keep areas open for recreation at Horseneck Beach (4 ac).

^aFor Piping Plovers only, under the activity *Recreation and Beach Operations - Reduced Proactive Symbolic Fencing*

II.6 Year-to-date and cumulative (*i.e.*, from the start of the permit term) quantification of exposure to incidental take of Piping Plover individuals for the purpose of demonstrating compliance with the authorized level of take on the ITP (Table 6).

Table 6. Annual and cumulative quantification of Piping Plover take exposure under the Massachusetts Piping Plover HCP, 2016 – 2023.

Year	No. Pairs/ Territories/ Nests/ Broods Exposed	Total Statewide Allowable Take Exposures	% of Statewide Allowable Exposure	Cumulative No. Pairs/ Territories/ Nests/ Broods Exposed
2016	3	47	6.4	3
2017	5	46	10.9	8
2018	19	46	41.3	27
2019	19	46	41.3	46
2020	22	48	45.8	68
2021	14	51	27.5	82
2022	16	58	27.6	98
2023	25	65	38.5	123

II.7 Description of all experimental vegetation management actions implemented during the reporting period including a year-to-date and cumulative summary of the extent and location of land cover types enhanced through vegetation management.

To date, two experimental habitat management projects have been implemented, both in 2017.

1. **Duxbury Beach.** Vegetation in five experimental plots was scraped or buried, creating and maintaining five areas of potential nesting habitat totaling approximately 0.77 acres. Two pairs nested in the replicated habitats in both 2017 and 2018. Duxbury Beach maintained these sites by burying vegetation in February 2019, and three pairs subsequently nested within the experimental plots. In 2020, two pairs nested and each fledged three chicks. In 2021, one pair nested and fledged one chick. In 2022, three pairs nested and fledged nine chicks. In 2023, three pairs nested and fledged seven chicks.
2. **Winthrop Shore Reservation.** Cobble was removed from the southern portion of the shorebird nesting area, where two pairs of Piping Plovers and 20-25 pairs of Least Terns nested in 2017. Plovers and terns continued to nest in this area annually through 2023.

II.8 Assessment of the efficacy of vegetation management actions in achieving performance objectives and recommended changes to improve the efficacy of the methods.

Piping Plovers continued to nest in the experimental habitat areas at both Duxbury Beach and Winthrop Shore in 2023. In ~2021, MassWildlife recommended cessation of vegetation management in habitat

Massachusetts Habitat Conservation Plan for Piping Plover

areas at Duxbury, as plovers in these areas are immediately adjacent to the road and at higher risk of mortality.

II.9 List of all plan participants and activities authorized for take coverage.

See **Table 1**.

II.10 Accounting of all mitigation funds collected from plan participants during the previous year, and any unspent funds from previous years (Table 7).

Table 7. Accounting of Offsite Mitigation Funds

Statewide Mitigation Funds Balance (end of 2023)	
<i>Balance from Previous Years</i>	
\$52,689.00	Unspent funds, end of 2022
<i>Income</i>	
\$17,400.00	Barnstable escrow
\$11,600.00	Orleans escrow
\$17,400.00	Wychmere escrow
<i>Expenses</i>	
\$13,530.00	Massachusetts Audubon Society, Selective Predator Management at Allens Pond Wildlife Sanctuary, 2023
\$4,041.61	BiodiversityWorks, Selective Predator Management at Piping Plover and Least Tern Nesting Beaches on Martha's Vineyard, 2023
\$15,000.00	Kim Smith, Piping Plovers of Moonlight Bay (documentary film production)
\$4,549.24	Duxbury Beach Reservation, Education and Outreach at Duxbury Beach (project approved in 2022 but delayed to 2023)
<i>Unspent Funds, end of 2023</i>	
\$61,968.15	

II.11 If appropriate, any updates to the mitigation fee as described under the adjustment process in Section 5.2.2.1 and an updated annual budget for MassWildlife's plan implementation.

No adjustments to the mitigation fee or MassWildlife implementation budget are required at this time.

II.12 If available at the time of the annual report, evidence that MassWildlife's needed funding has been assured for the coming year by the State legislature, and the funds have been earmarked or segregated for their intended purpose within MassWildlife's accounting system.

Funding for Massachusetts Fiscal Year 2023 (ending June 30, 2024) has been secured and funding for Fiscal Year 2025 (beginning July 1, 2024) has been requested (**Appendix A**).

II.13 Accounting of the cost of all mitigation measures implemented in the previous fiscal year and the expected cost of mitigation measures in the upcoming fiscal year.

An accounting for the costs of all mitigation measures implemented in 2023 is provided in **Table 3b**. Additional information on off-site mitigation is provided in **Table 5**. The cost of onsite/internal mitigation is expected to be similar in 2024. MassWildlife has already established contracts totaling ~\$30,000 for offsite mitigation activities in 2024, including selective predator management and education and outreach.

II.14 Record of any grants and Plan implementation contracts awarded to plan participants, other landowners, or implementation partners.

None. See “II.3 Offsite mitigation.”

II.15 Description of the adaptive management process used during the reporting period, if applicable.

No adaptive management took place during the 2023 reporting period.

II.16 Summary for the reporting period of the monitoring program objectives, techniques, and protocols, including monitoring locations, variables measured, sampling frequency, timing and duration, and analysis methods.

The monitoring program documented implementation of covered activities, compliance with the Guidelines, and mitigation programs. COI-holders kept required logs of initiation dates of covered activities; number of broods and chicks exposed; locations of exposed broods and any impacts to the broods associated with the covered activity; and monitoring frequency. MassWildlife was notified at least 24 hours in advance of implementing the covered activities and subsequently conducted COI compliance site visits at each site implementing a COI. Compliance with the impact avoidance and minimization protocols was documented in logs and summarized in the COI-holder final reports. Final reports and invoices also document implementation of required mitigation, which was also reported by USDA APHIS.

The monitoring program also aimed to assess the impacts of covered activities and effectiveness of impact minimization measures and mitigation programs. Effectiveness monitoring consisted of documenting pair behavior, chick behavior, road-crossing frequency, and nesting and fledging success at the covered activity implementation sites. Measures of reproductive success were also collected at the selective predator management implementation sites. Monitoring information was provided to MassWildlife in HCP annual site reports and through the PIPLODES online database. MassWildlife coordinated the synthesis of 2023 Piping Plover data by cooperators, performed quality control, and is currently finalizing the 2023 index count, adjusted total count, and productivity of breeding Piping Plovers.

II.17 Assessment of the efficacy of the monitoring and research program and recommended changes to the program based on interpretation of monitoring results and research findings, if applicable.

Compliance monitoring.

Compliance monitoring occurred at all sites that implemented covered activities in 2023; however, the Duxbury Beach Reservation struggled to properly implement its approved avoidance and minimization

measures on the Duxbury Beach roadway. The primary contributing factor was a lack of understanding or clarity about responsibilities among several entities and departments with HCP roles. Subsequently, MassWildlife facilitated a supplemental avoidance and minimization plan, as described in II.20, below.

Effectiveness monitoring. Making inferences about the effectiveness of mitigation measures and impacts of covered activities on productivity is methodologically challenging and will require larger sample sizes and possibly other methods, such as establishment of predator management control sites. There are no recommended changes to the monitoring program currently.

II.18 Description of all Plan-directed studies undertaken during the reporting period; a summary of study results; and a description of integration with monitoring, assessment, and compliance elements.

No Plan-directed studies were undertaken in 2023.

II.19 Description of any actions taken or expected regarding adaptive management and/or changed circumstances, including remedial actions resulting from any Plan or permit amendments granted in the prior years, if applicable.

No actions were taken or expected regarding adaptive management and/or changed circumstances in 2023.

II.20 Description of any unforeseen circumstances that arose and responses taken, if applicable.

Due to compliance issues involving avoidance and minimization measures, MassWildlife temporarily paused implementation of the covered activity “*Use of roads and parking lots*” at Duxbury Beach. MassWildlife then worked closely with the Duxbury Beach Reservation and its implementation partner, the Town of Duxbury, to facilitate development of a supplemental avoidance and minimization plan that more clearly defined roles, responsibilities, and communication pathways among partners and departments (see II.17, above). Once MassWildlife approved the supplemental plan, implementation of that covered activity was allowed to resume.

II.21 Summary of any administrative changes, minor modifications, or major amendments proposed or approved during the reporting year (see Section 5.3.3, *Modifications to the Plan*). Any information about mitigation measures other than selective predator management, the associated funding, and monitoring is being provided for informational purposes only, as the USFWS has indicated that these activities do not count as mitigation to offset take associated with the ITP.

None.

II.22 Other state or federally listed species affected by HCP implementation

Least Tern (*Sternula antillarum*)

COI-holders at covered sites developed impact minimization and mitigation plans for Least Terns and obtained Conservation and Management Permits (CMP) to ensure Massachusetts Endangered Species

Act (MESA) compliance. Status of implementation at sites with coverage for take of Least Terns during 2022 is shown in **Table 8**.

Table 8. 2023 implementation status for covered activities affecting Least Terns at sites with Least Tern coverage.

Site with Least Tern coverage	Take exposure in 2023?
Duxbury Beach, Duxbury	Yes
Horseneck Beach, Westport	Yes
Nauset Beach (North Beach), Chatham	No
Nauset Beach, Orleans	No
Plymouth Long Beach, Plymouth	Yes
Sandy Neck Beach Park, Barnstable	No
Revere, Winthrop, and Nahant (DCR beaches)	No
Wychmere Beach Club, Harwich	Yes

- **Sites with take exposure.** At the four sites where take exposure occurred, the COI-holders conducted on-site mitigation (three sites) or contributed to offsite mitigation (one site).
 - **Duxbury.** There were seven take exposures in two categories.
 - *Recreation and beach operations – Reduced fencing around the nest.* In late-May, Least Terns were scraping between two pedestrian paths north of the Duxbury Beach Park boardwalk. Fencing was expanded on the beach to cover some scrapes but not others. Three pairs and 0.15 - 0.2 acres were impacted.
 - *“Use of Roads and Parking Lots in the Vicinity of Unfledged Chicks.”* Four chicks were exposed to barriers and reduced buffers. Survival for most chicks was not determined but one was found dead within a fenced area; it was presumed to have died of natural causes.
 - Off-site mitigation in the form of selective predator management benefitted 353 pairs. DBR entered 2023 with a credit balance of 731, 10.5 of which were used for implementation in 2023, leaving a balance of 1073.5 credits. No credits were set to expire after 2023, so all will carry forward into 2024.
 - **Horseneck Beach.**
 - *Recreation and beach operations – Reduced fencing around the nest.* Fencing around two Least Tern nests was reduced to 10 yd around the nests to preserve space for recreational activities. This impacted 1.6 ac of habitat over 22 days. Both nests hatched. The chicks integrated into the main colony and could no longer be tracked individually so their outcome is unknown.
 - Off-site mitigation in the form of selective predator management benefitted 187 pairs. DCR entered 2023 with a credit balance of 156, six of which were used for implementation in 2023, leaving a balance of 343 credits. No credits were set to expire after 2023, so all will carry forward into 2024.
 - **Plymouth Long Beach.**
 - *Use of Roads and Parking Lots in the Vicinity of Unfledged Chicks.* A silt fence barrier was installed at the edge of Ryder Way along the length of the Lot O Least Tern colony to prevent chicks from accessing the road. Nineteen unfledged chicks from nine pairs were exposed to vehicle traffic during June 25

- August 17. A silt fence barrier was installed at the edge of Ryder Way along the Day Parking Area. Two chicks from one pair were exposed to vehicle traffic during July 5 – 23. No evidence of road-related mortality or injury was detected in the exposed subcolonies. At the Lot O subcolony, 14 of 19 exposed chicks fledged despite predation and extreme weather affecting chick survival in that area. The exposed chicks at the Day Parking Area disappeared at a young age and may have been predated.
- On-site predator management benefitted 36 pairs of Least Terns. Ten pairs were exposed to covered activities (20 debits). Going into 2023, Plymouth had a credit balance of 39, which covered the 20 debits accrued in 2023. The remaining credits from 2022 expired after 2023. Therefore, 36 credits from on-site predator management in 2023 will carry into 2024.
- **Wychmere.**
 - *Recreation and beach operations – Reduced proactive symbolic fencing.* Fencing reductions resulted in approximately 0.25 acres of historically utilized Least Tern nesting habitat being left unfenced. Based on the extent and size of the 2022 colony, the unfenced areas theoretically affected up to six Least Tern territories; however, nesting was concentrated on the east side of the site in 2023 so the number of territories affected was likely lower.
 - *Recreation and beach operations – Reduced fencing around the nest.* Fencing reductions affected four pairs. These pairs initially appeared to experience higher levels of disturbance (flushing) due to deterrent activities (raking) and pedestrian presence than non-exposed pairs. By late June, however, exposed pairs seemed to have acclimated, with few to no pairs flushing by the rake or pedestrians nearby. Wychmere Beach Club provided funds for offsite mitigation of Least Terns.

Diamondback Terrapin (*Malaclemys terrapin*)

- **Sites with coverage for take of Diamondback Terrapins.** COI-holders for these sites developed impact minimization and mitigation plans, including nest protection, for Diamondback Terrapin and obtained CMPs to ensure MESA compliance: Sandy Neck Beach Park, Barnstable; Nauset Beach, Orleans. The Nauset Beach CMP covered limited exposure of terrapins, which sometimes cross the OSV corridor to nest. The Sandy Neck CMP also covered limited exposure of terrapins, which are sometimes found crossing or nesting within the Marsh Trail used by essential vehicles and campers.
- **Sites with no take exposure.** Sandy Neck Beach Park and Nauset Beach, Orleans.
- **Sites with take exposure.** None.



MASSWILDLIFE

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January 6, 2023

Audrey Mayer

Supervisor – New England Field Office

U.S. Fish and Wildlife Service

Northeast Region – Ecological Services

70 Commercial St., Suite 300

Concord, NH 03301

RE: Funding assurances for implementation of the Massachusetts Statewide Piping Plover Habitat Conservation Plan in 2023 and 2024 per conditions L. and M. of the USFWS Incidental Take Permit TE01281C-0

Dear Ms. Mayer:

We are writing to confirm that the Massachusetts Division of Fisheries and Wildlife (MassWildlife) has secured adequate funding to fulfill its Statewide Piping Plover Habitat Conservation Plan (HCP) obligations for Fiscal Year 2023, in accordance with the budget presented in the Final HCP.

Additionally, MassWildlife has requested from the legislature adequate funding to fulfill its HCP obligations for Fiscal Year 2024, in accordance with the budget presented in the Final HCP.

Sincerely,

Mark S. Tisa, Ph.D., M.B.A.

Director

Kristin D. McCarthy

Associate Director, Chief Fiscal Officer

cc: Karen Dolan, MassWildlife Finance and Projects Administrator, NHESP
Carolyn Mostello, MassWildlife Coastal Waterbird Biologist, NHESP
Everose Schlüter, Assistant Director, NHESP
Margaret Harrington, USFWS
Susi von Oettingen, USFWS

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