

SUMMARY OF THE 2019 MASSACHUSETTS PIPING PLOVER CENSUS



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ABSTRACT

This report summarizes data on abundance, distribution, and reproductive success of Piping Plovers (*Charadrius melodus*) in Massachusetts during the 2019 breeding season. Observers reported breeding pairs of Piping Plovers present at 181 sites; 132 additional sites were surveyed at least once, but no breeding pairs were detected at them. The population increased 8.1% relative to 2018. The ***Index Count*** (statewide census conducted 1-9 June) was **724 pairs**, and the ***Adjusted Total Count*** (estimated total number of breeding pairs statewide for the entire 2019 breeding season) was **743 pairs**. A total of 1,144 chicks were reported fledged in 2019, for an overall productivity of **1.54 fledglings per pair**, based on data from 99.7% of pairs.

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INTRODUCTION

Piping Plovers are small, sand-colored shorebirds that nest on sandy beaches and dunes along the Atlantic Coast from North Carolina to Newfoundland. The U.S. Atlantic Coast population of Piping Plovers has been federally listed as *Threatened*, pursuant to the U.S. Endangered Species Act, since 1986. The species is also listed as *Threatened* by the Massachusetts Division of Fisheries and Wildlife pursuant to Massachusetts' Endangered Species Act.

Population monitoring is an integral part of recovery efforts for Atlantic Coast Piping Plovers (U.S. Fish and Wildlife Service 1996, Hecht and Melvin 2009a, b). It allows wildlife managers to identify limiting factors, assess effects of management actions and regulatory protection, and track progress toward recovery. In this report, we summarize data on abundance, distribution, and reproductive success of Piping Plovers breeding in Massachusetts in 2019, as observed and reported by a coast-wide network of cooperators.

METHODS

Monitoring and management of Piping Plovers and other coastal waterbirds in Massachusetts is carried out by wildlife biologists, seasonal shorebird monitors, beach managers, researchers, and volunteers affiliated with over 20 federal and state agencies, local municipalities, local and regional land trusts, private conservation organizations, and universities. Cooperators monitored 313 sites in Massachusetts in 2019 for the presence of breeding Piping Plovers.

Abundance

We measure abundance of Piping Plovers in terms of breeding pairs, defined as pairs observed with either a nest or unfledged chicks or that exhibited site tenacity and evidence of pair bonding and territoriality for at least two weeks. We report three different measures of abundance: the *Index Count*, *Unadjusted Total Count*, and *Adjusted Total Count*. The *Index Count*, as reported since 1990, is the total number of pairs tallied statewide each year during a 9-day count period in late May and early June, standardized each year for the entire Atlantic Coast. In 2019, the *Index Count* period was 1-9 June. The objective of the *Index Count* is to estimate population size with minimal double-counting of pairs that may move between or within sites, thereby providing an index to population trends that is likely to be more precise than counts based on observations made over the entire breeding season. The *Index Count* likely minimizes double-counting because it occurs over such a short time period. However, it probably underestimates the actual number of breeding pairs because it does not include pairs that leave the state before, arrive after, or are present but simply go undetected during the 9-day *Index Count* period.

For sites for which "0" is reported for the *Index Count* but "ND" is reported for the *Total Count*, this indicates that the site was surveyed during the *Index Count* period (1-9 June) and no breeding pairs were detected, but during the rest of the breeding season, it was either not surveyed or was surveyed too infrequently during May and June to confidently conclude that no pairs were present for at least 2 weeks.

Since 2000, we have reported two different "Total Counts." The *Unadjusted Total Count* is simply a tally of the total number of pairs reported for all sites over the course of the entire nesting season, with limited effort made to adjust for any pairs that may have been double-counted if they nested unsuccessfully at one location and then re-nested at another. We then derive an *Adjusted Total Count* by calculating the average of the *Index Count* and the *Unadjusted Total Count*, rounded to the nearest whole number of pairs.

The *Unadjusted Total Count* likely overestimates the actual population by double-counting pairs that establish nesting territories at more than one location in a given year. Without banded birds, however, it is impossible to

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accurately determine whether late-nesting pairs may have nested earlier at a different site or whether they simply did not arrive or begin breeding activities until June. It is too subjective, and likely inaccurate, to try to adjust the *Total Count* of pairs each year by not tallying late-nesting pairs (*i.e.*, pairs reported as “new” pairs that nested after the first week in June) based on the assumption that these birds were probably already counted earlier in the season. We believe that the *Adjusted Total Count* is the most accurate estimate of the actual number of breeding pairs in Massachusetts, because it falls midway between the *Index Count* and *Unadjusted Total Count*, which we suspect slightly underestimate and overestimate, respectively, the actual breeding population.

Reproductive success

The primary measure of reproductive success that we report is *Productivity*, measured as number of chicks fledged per pair. The denominator of this ratio is the number of breeding pairs for which fledging data were reported; this includes not only pairs that successfully fledged chicks, but also pairs that cooperators believed did not nest, pairs that nested unsuccessfully (eggs did not survive to hatch), and pairs whose chicks failed to fledge. Since 2000, we have reported two different estimates of *Number of pairs with fledge data*. As with counts of breeding pairs, estimates of the number of pairs for which fledging data are reported will be biased if double-counting of pairs occurs. Double-counting will overestimate the number of pairs in the denominator of the productivity ratio, and thereby will underestimate actual productivity. To reduce the potential bias associated with double-counting, we multiply the *Unadjusted number of pairs with fledge data* (a tally of the total number of pairs with fledge data reported for all sites, with limited effort made to adjust for pairs that may have been double-counted) by the ratio of the *Adjusted Total Count* to the *Unadjusted Total Count* to arrive at the *Adjusted number of pairs with fledge data*.

Median Lay and Hatch Dates

The median estimated date of first egg laid was calculated by using known and estimated dates of first egg laid. Two days were subtracted from Date Clutch Found when the nest was found at two eggs and four days were subtracted from Date Clutch Found when the nest was found at three eggs. For nests that were found at four eggs, only nests that successfully hatched were used and 33 days were subtracted from the hatch date to estimate dates of first egg laid to account for the egg-laying period (6 days) plus the mean incubation period (27 days). The median estimated hatch date was calculated using the known hatch date. For hatch dates that consisted of date ranges, the median date was used as the estimated hatch date.

Data reporting and quality control

All data were reported by cooperators who filled out a standard Massachusetts Piping Plover Census Form for each site monitored, in most cases using the Piping Plover Online Data Entry System ([PIPLODES](#)). These forms are used to report data on number of breeding pairs (*Index Count* and *Total Count*); frequency of site visits; design(s) and installation dates of predator exclosures; dates of nest discovery, completion, and hatching or failure; number of eggs on the date the nest was discovered; total numbers of eggs laid, eggs hatched, and chicks fledged; reasons for egg and chick loss, if determined; and comments regarding census results, limiting factors, and management needs. Maps of sites showing the locations of all nests were submitted with census forms. After reviewing census forms, if necessary, we contacted cooperators to obtain missing or incomplete data, resolve inconsistencies, and clarify ambiguities. When we could not obtain the needed information, we used best professional judgment to assign final values or noted data as preliminary; any such instances are noted in Table 1.

RESULTS

Observers reported breeding Piping Plovers at 181 sites in Massachusetts in 2019. An additional 132 sites were surveyed one or more times during May and June, but no breeding pairs were detected at them (Table 1). The ***Adjusted Total Count* was 743 pairs**, an 8.1% increase over 2018 (688 pairs). The ***Index Count* was 724 pairs** (vs. 644 pairs in 2018), or 97.4% of the *Adjusted Total Count* (Table 1).

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Distribution of breeding pairs by region (**Figure 1**) was similar to 2018, with slight increases on the North Shore and in Buzzards Bay (18% and 7% respectively in 2018) and a slight decrease on the Lower Cape (35% in 2018). Fourteen sites with ten or more breeding pairs accounted for 47.8% of the Massachusetts breeding population, while 110 sites with three or fewer pairs accounted for 23.7%.

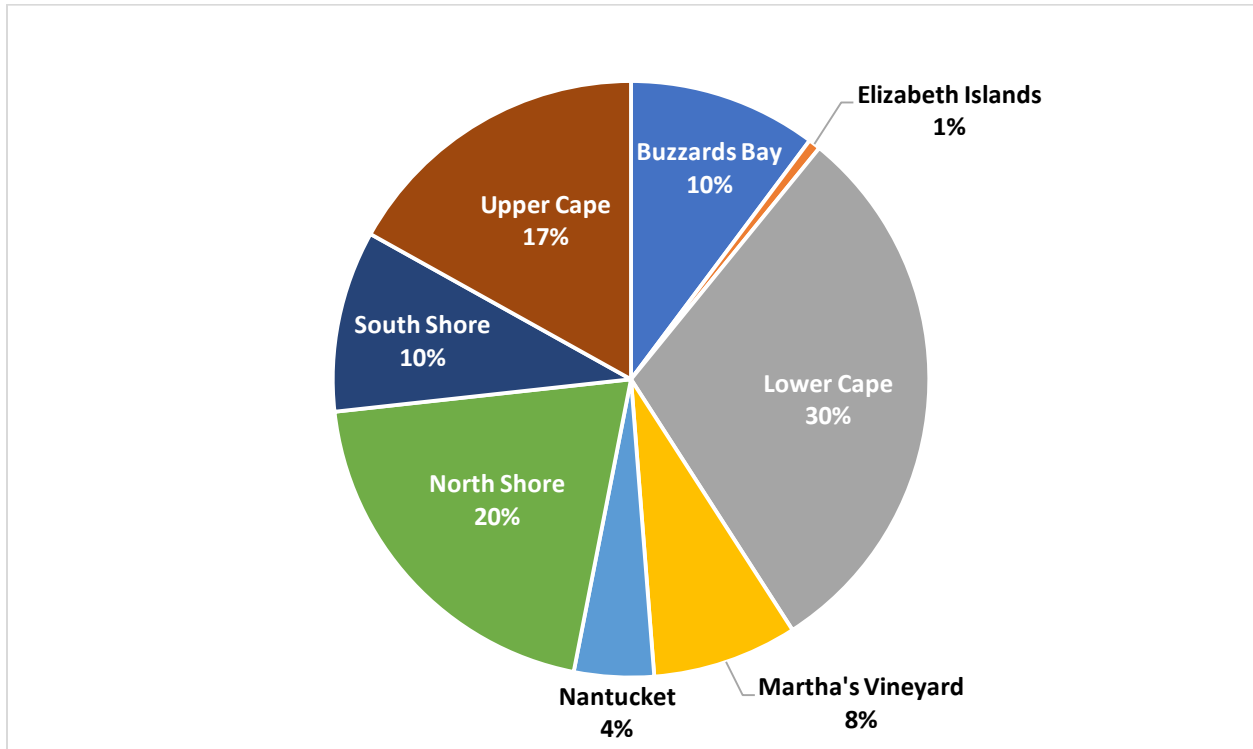


Figure 1. Distribution of Piping Plover breeding pairs by Massachusetts region in 2018, based on Adjusted Total Counts for each region.

In total, 1,144 chicks were reported fledged in 2019, resulting in overall productivity of **1.54 fledglings/pair**, based on data from 741.6 of 763 pairs (99.7%; the *adjusted number of pairs with fledge data* divided by the *adjusted total count*) (**Table 2**).¹ This represents a 15.8% increase in productivity relative to 2018 (1.33 fledglings/pair). Productivity varied by region, ranging from 1.72 on the South Shore down to 1.00 in Buzzards Bay, on Martha's Vineyard, and on the Elizabeth Islands. All other regions exhibited above-average productivity (**Table 1**).

¹ The *unadjusted number of pairs with fledge data* was 761 (out of 763).

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Table 1. Productivity (fledglings per pair) of Piping Plovers in Massachusetts by region in 2019.

Region	2019	2018
Buzzards Bay	1.00	1.58
Elizabeth Islands	1.00	1.23
Lower Cape	1.70	1.38
Martha's Vineyard	1.00	0.93
Nantucket	1.67	1.25
North Shore	1.53	1.27
South Shore	1.72	1.40
Upper Cape	1.49	1.39

Overall, nest failure rates were slightly lower in 2019 (47.8%) than in 2018 (49.9%). Causes of nest loss are shown in **Figure 2**. The largest causes of nest loss were predation (likely and suspected) and overwash/flooding. Predation accounted for a greater proportion of nest loss in 2019 (59%) than in 2018 (51%), as did overwash (18% vs. 14% in 2018). **Figure 3** shows suspected predators of nests likely and suspected to have been depredated.

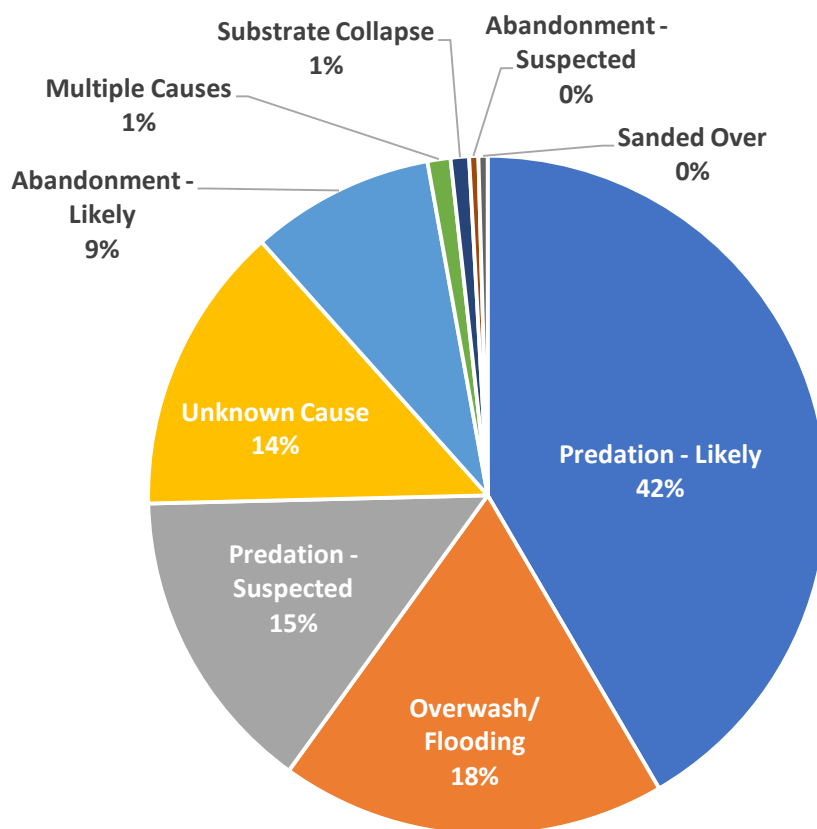


Figure 2. Causes of Piping Plover nest loss in Massachusetts, 2019 (n=514 nest failures).

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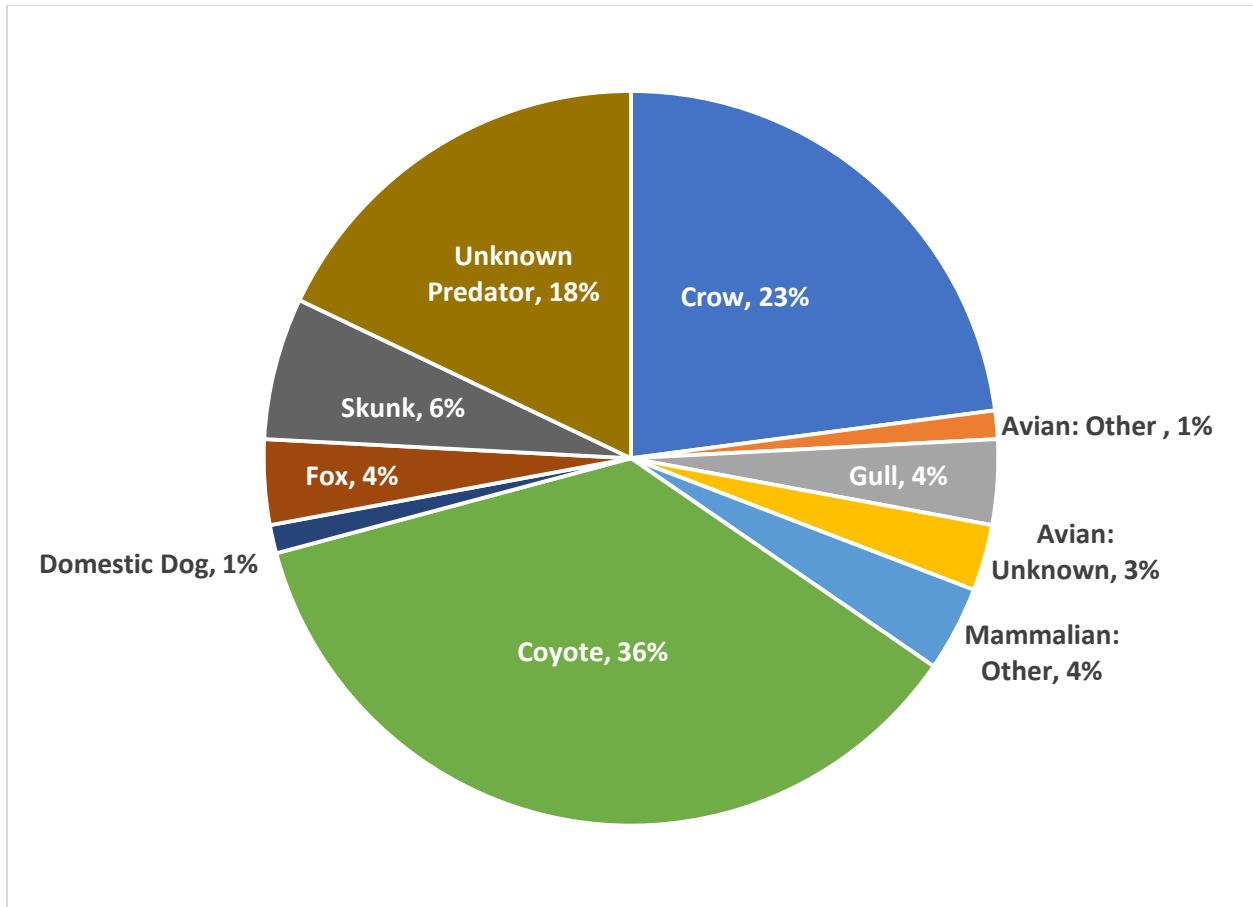


Figure 3. Presumed predators of Piping Plover nests suspected and likely to have been depredated in Massachusetts, 2019 (n=240).

The earliest clutch initiation date was estimated to be 17 April at Red River Beach, Harwich. Statewide, the median clutch initiation date was 20 May (19 May in 2018). The earliest approximate hatch date was 21 May, also at Red River Beach, Harwich (27 May in 2018). The median hatch date statewide was 21 June (19 June in 2018).

Hatch rates increased slightly (51.9%; n=1056 nests with known fates) relative to 2018 (50.6%; n=888), although nesting attempts per pair increased slightly to 1.44 vs. 1.3 in 2018 (based on *adjusted total counts*). Hatch rates for exclosed and unexclosed nests in 2019 were 86.1% (n=182) and 44.7% (n=874) respectively, as compared to 80.9% (n=141) and 44.8% (n=747) in 2018. Nest abandonment rate for exclosed nests (4.9%; 9 of 182 nests) was slightly higher than for unexclosed nests (4.1%; 36 of 874 nests with known fates), compared to 3.5% (5 of 141 nests) and 2.5% (19 of 747 nests), respectively in 2018.

Long term trends in breeding population size and productivity are shown in **Figure 4**. The five-year running average of productivity has declined overall since 1995. However, there have been successive increases since 2015 and for the second year in a row, productivity exceeded the approximately 1.2

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fledglings per pair thought to be necessary to maintain a stable population (Melvin & Gibbs 1996).² The population trend, meanwhile, has been relatively stable since 2012 but now appears to be increasing slightly.

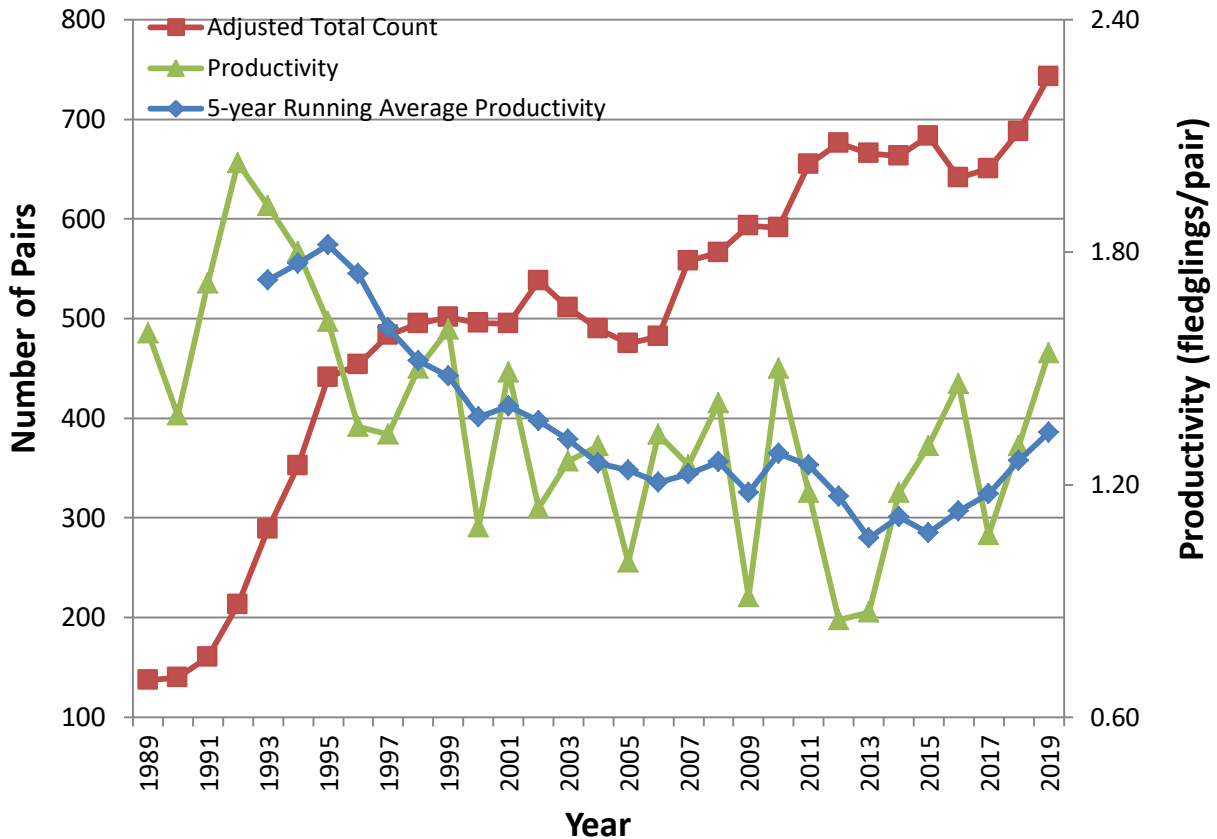


Figure 4. Piping Plover abundance (adjusted total count) and productivity (fledglings/pair) in Massachusetts, 1989-2019.

² Melvin and Gibbs (1996) suggest that the actual fecundity needed to maintain a stable population may be slightly lower than the estimate derived from their model. Other researchers have also suggested that early estimates of fecundity needed for a stable population may have been high (e.g. Catlin et al. 2015).

ACKNOWLEDGEMENTS

This report was prepared by Kiah Walker with assistance from Amanda Veinotte and Carolyn Mostello. We extend our sincere thanks to the many biologists, seasonal shorebird monitors, beach managers, landowners, and volunteers who participated in conservation efforts on behalf of Piping Plovers and other coastal waterbirds in Massachusetts in 2019. We also thank the more than 20 state and federal agencies, local municipalities and county government, local and regional land trusts, private conservation organizations, and universities that supported their efforts. We especially thank all the individuals who participated in population monitoring and submitted the data that are summarized in this report.

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Table 2. Abundance, distribution, and productivity of Piping Plovers in Massachusetts, 2019.

Site	Index Count ^a (no. pairs)	Total Count ^b (no. pairs)	No. chicks fledged ^c	No. pairs with fledge data ^c	No. unpaired adults ^d	Source ^e	Notes
NORTH SHORE							
Constitution Beach, East Boston	0	ND	ND	0	ND	MAS	
Carson Beach, South Boston	0	0	0	0	0	MAS	
West Beach, Beverly	1	1	3	1	0	ECGA	
Lovell's Beach, Boston	0	0	0	0	0	MAS	
Rainsford Island, Boston	0	0	0	0	0	MAS	
L Street Bathhouse, Dorchester	1	1	4	1	0	MAS	
Coffins Beach - Bradford, Gloucester	0	0	0	0	0	ECGA	
Coffins Beach - Castles, Gloucester	1	1	0	1	0	ECGA	
Coffins Beach - East End, Gloucester	0	0	0	0	0	ECGA	
Good Harbor Beach, Gloucester	1	1	3	1	1	ECGA	
Two Penny Loaf, Gloucester	0	0	0	0	0	ECGA	
Crane Beach, Ipswich	48	49	96	49	0	TTOR	
Sandy Point, Ipswich	12	13	17	13	0	DCR	
Nahant State Beach, Nahant	6	6	2	6	1	DCR	
Newbury Town Beach, Newbury	4	5	6	5	0	MAS	One pair was courting for ~2 weeks in May but departed without nesting
Parker River NWR, Newbury/Rowley	48	50	67	50	1	USFWS	
Newburyport Beach, Newburyport	3	4	4	4	0	DCR	
Revere Beach-North, Revere	7	9	14	9	1	DCR	One pair successfully raised two broods fledging a total of 7 chicks
Revere Beach-South, Revere	4	4	6	4	2	DCR	
Salisbury Beach, Salisbury	3	4	2	4	0	DCR	
Winthrop Beach, Winthrop	6	6	12	6	0	DCR	

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Site	Index Count ^a (no. pairs)	Total Count ^b (no. pairs)	No. chicks fledged ^c	No. pairs with fledged data ^c	No. unpaired adults ^d	Source ^e	Notes
Sagamore Beach - Plymouth, Plymouth	0	0	0	0	0	MAS	
The Glades, Scituate	0	0	0	0	0	MAS	
SOUTH SHORE							
Sagamore Beach - Bourne, Bourne	0	0	0	0	0	MAS	
Duxbury Beach, Duxbury	27	28	47	28	0	MAS	
Nantasket Beach , Hull	6	6	13	6	0	MAS	
Rexhame Beach, Marshfield	1	1	2	1	0	MAS	
Ellisville Harbor State Park , Plymouth	0	0	0	0	0	MAS	
Plymouth Long Beach, Plymouth	30	30	51	30	1	Plymouth	
Saquish, Plymouth	1	1	3	1	0	MAS	
Ellisville Shifting Lots Preserve , Plymouth	1	1	3	1	0	MAS	
Fourth Cliff, Scituate	1	1	3	1	0	MAS	
Humarock, Scituate	0	0	0	0	0	MAS	
Third Cliff, Scituate	6	7	7	7	1	MAS	
UPPER CAPE							
Bone Hill Road, Barnstable	0	0	0	0	0	MAS	
Fortes Beach, Barnstable	0	0	0	0	0	MAS	
Memorial Beach/Covell's, Barnstable	0	0	0	0	0	MAS	
Sea St./ Keyes Beach, Barnstable	0	0	0	0	0	MAS	
Linnell Landing Beach, Brewster	0	0	0	0	0	MAS	
Paine's Creek, Brewster	0	0	0	0	0	MAS	
Little Island Beach, Falmouth	0	0	0	0	0	MAS	
Menauhant Beach, Falmouth	0	0	0	0	0	MAS	

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Site	Index Count ^a (no. pairs)	Total Count ^b (no. pairs)	No. chicks fledged ^c	No. pairs with fledged data ^c	No. unpaired adults ^d	Source ^e	Notes
Saquatucket Beach, Harwich	0	0	0	0	0	MAS	
Town Beach-Grey Neck Road Beach/Earle Rd. Beach, Harwich	0	0	0	0	0	MAS	
Coast Guard Beach, Truro	0	0	0	0	0	MAS	
Red Jacket Inn, Yarmouth	0	0	0	0	0	MAS	
Standish Way/Colonial Acres, Yarmouth	0	0	0	0	0	MAS	
Craigville Beach, Barnstable	0	0	0	0	1	MAS	
Dead Neck Sampsons Island, Barnstable	9	9	15	9	0	MAS	
Dowses Beach, Barnstable	1	1	4	1	0	Barnstable	
Kalmus Beach, Barnstable	4	4	11	4	0	Barnstable	
Long Beach, Barnstable	4	5	9	5	0	MAS	
Sandy Neck Beach Park, Barnstable	36	36	25	36	0	Barnstable	
Squaw Is. Road / Causeway, Barnstable	2	2	4	2	0	MAS	
Squaw Island, Barnstable	3	3	10	3	0	MAS	
Mashnee Dike, Bourne	2	2	1	2	0	USACOE	
Crosby Landing Beach, Brewster	3	3	7	3	0	MAS	
Wings Island, Brewster	0	0	0	0	0	MAS	
Rushy Marsh Pond, Cotuit	0	0	0	0	0	MAS	
Bayview Ave/Howe's Beach (private), Dennis	1	1	2	1	0	MAS	
Bayview, Dennis	0	0	0	0	0	Dennis	
Chapin Beach, Dennis	1	1	4	1	0	Dennis	
Cold Storage Beach, Dennis	0	0	0	0	0	Dennis	
Corporation Beach, Dennis	0	0	0	0	0	Dennis	
Crowes Pasture (Cole's Pond) / Quivett Neck, Dennis	3	3	0	3	0	Dennis	

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Site	Index Count ^a (no. pairs)	Total Count ^b (no. pairs)	No. chicks fledged ^c	No. pairs with fledged data ^c	No. unpaired adults ^d	Source ^e	Notes
Depot Street, Dennis	0	0	0	0	0	Dennis	
Dr. Botero, Dennis	0	0	0	0	0	MAS	
Glendon Beach, Dennis	0	0	0	0	0	Dennis	
Haigis to Inman Rd., Dennis	0	0	0	0	0	Dennis	
Harbor View, Dennis	0	0	0	0	0	Dennis	
Howe's St. Beach, Dennis	0	0	0	0	0	Dennis	
Inman Beach, Dennis	0	0	0	0	0	Dennis	
Mayflower Beach, Dennis	0	0	0	0	0	Dennis	
Metcalf Memorial, Dennis	0	0	0	0	0	Dennis	
Miramar Beach (Swan River), Dennis	1	1	1	1	0	MAS	
Raycroft Beach, Dennis	0	0	0	0	0	Dennis	
Sea Street (West Dennis), Dennis	0	0	0	0	0	Dennis	
Sea Street Beach, Dennis	0	0	0	0	0	Dennis	
Sesuit Harbor Beach, Dennis	0	0	0	0	0	Dennis	
South Village Beach, Dennis	0	0	0	0	0	Dennis	
West Dennis Beach, Dennis	5	5	10	5	0	Dennis	
East Sandwich Beach, East Sandwich	2	2	8	2	1	Sandwich	
Scorton Shores, East Sandwich	1	1	0	1	0	Sandwich	
Black Beach, Falmouth	2	1	0	1	0	MAS	A non-nesting pair was present during the census window
Flume Pond, Falmouth	1	1	2	1	0	MAS	
Menauhant Yacht Club, Falmouth	1	1	2	1	0	MAS	
Sippewisset, Falmouth	0	1	0	1	0	MAS	Non-nesting pair was scraping in May but left the site prior to the index period
Washburn Island, Falmouth	2	2	1	2	0	MAS	
Woodneck Beach, Falmouth	0	0	0	0	0	MAS	
Trunk River , Falmouth	0	0	0	0	0	MAS	
Belmont Condos, Harwich	1	1	3	1	0	MAS	

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Site	Index Count ^a (no. pairs)	Total Count ^b (no. pairs)	No. chicks fledged ^c	No. pairs with fledge data ^c	No. unpaired adults ^d	Source ^e	Notes
Red River Beach, Harwich	1	1	1	1	1	Harwich	
Stone Horse Yacht Club, Harwich	0	ND	ND	0	ND	MAS	Site visited only once
Winstead Inn , Harwich	1	1	4	1	0	MAS	
Wychmere, Harwich	1	3	3	3	0	MAS	Two pairs arrived in late June; one nested and one did not
New Seabury, Mashpee	4	4	7	4	0	MAS	
Popponesset Spit, Mashpee	3	3	2	3	0	MAS	
South Cape Beach, Mashpee	5	5	6	5	0	MAS	
Scorton Neck (Torrey), Sandwich	4	4	12	4	0	MAS	
Scorton Shores, Sandwich	1	1	2	1	0	MAS	
Scusset Beach State Reservation, Sandwich	0	0	0	0	0	MAS	
Spring Hill Beach, Sandwich	5	5	6	5	0	Sandwich	
Town Neck Beach , Sandwich	2	2	5	2	0	Sandwich	
Sagamore Beach - Sandwich , Sandwich	5	5	7	5	0	MAS	
Grays Beach, Yarmouth	0	0	0	0	0	MAS	
Great Island Causeway, Yarmouth	2	2	1	2	0	MAS	
Great Island - Smith Point, Yarmouth	3	3	4	3	0	MAS	
Radio City Beach, Yarmouth	1	1	4	1	0	MAS	
Seagull Beach, Yarmouth	3	3	9	3	0	MAS	
LOWER CAPE							
Clafin Landing/Chatham Bars Inn, Chatham	0	0	0	0	0	MAS	
Cockle Cove, Chatham	0	0	0	0	0	MAS	
Pleasant St. Beach, Chatham	0	0	0	0	0	MAS	
Boat Meadow, Eastham	0	0	0	0	0	MAS	
Rock Harbor/Dyer Prince Rd, Eastham	0	0	0	0	0	MAS	

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Site	Index Count ^a (no. pairs)	Total Count ^b (no. pairs)	No. chicks fledged ^c	No. pairs with fledged data ^c	No. unpaired adults ^d	Source ^e	Notes
Haystack Island, Edgartown	0	0	0	0	0	MAS	
Rock Harbor, Orleans	0	0	0	0	0	MAS	
Skaket Beach, Orleans	0	0	0	0	0	MAS	
Between Corn Hill Beach and Beach Point, Truro	0	0	0	0	0	MAS	
Head of the Meadow, Truro	0	0	0	0	0	MAS	
Ryder Beach, Truro	0	0	0	0	0	MAS	
Field Point /Fox Is. WMA, Wellfleet	0	0	0	0	0	MAS	
Indian Neck, Wellfleet	0	0	0	0	0	MAS	
Mouth of Herring River - Mayo Beach, Wellfleet	0	0	0	0	0	MAS	
Old Wharf, Wellfleet	0	0	0	0	0	MAS	
Chatharbor Lane (Mill Ck.), Chatham	0	0	0	0	0	MAS	
Forest Beach, Chatham	1	2	0	2	0	MAS	One pair left the site prior to the index period after a failed nesting attempt
Harding Beach, Chatham	4	5	12	5	0	MAS	One pair departed the site prior to the index period after a failed nest attempt
Harding Shores, Chatham	0	0	0	0	0	MAS	
Linnell Lane, Chatham	1	1	3	1	0	MAS	
Minimoy Island, Chatham	0	0	0	0	0	USFWS	
Morris Island Dike/ Hardings Beach Point, Chatham	0	0	0	0	0	MAS	
Morris Island Dredge Spoil, Chatham	0	0	0	0	0	MAS	
North (Nauset) Beach, Chatham	13	14	25	14	0	Chatham	One pair nested on Nauset Beach (Orleans) and moved to Chatham after hatching; this pair and its fledglings are counted in Orleans
North Beach Island, Chatham	7	8	9	8	0	Chatham	
Quitnesset, Chatham	1	1	4	1	0	MAS	
Ridgevale Beach, Chatham	2	2	6	2	0	MAS	

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South Beach - Middle Island, Chatham	8	9	9	9	0	MAS	
South Beach (North of Break) , Chatham	0	0	0	0	0	MAS	
South Beach (South of Break) , Chatham	14	15	19	15	0	MAS	
South Monomoy Island, Chatham	31	31	24	31	0	USFWS	
Tern Island, Chatham	1	1	2	1	0	MAS	
Coast Guard Beach, Eastham	7	8	13	8	0	NPS	One pair nested at site before and after the index period but attempted to nest at Nauset Light during the index period; an additional pair likely moved from White Crest Beach where it was territorial but did not nest
First Encounter Beach, Eastham	0	0	0	0	0	MAS	
Nauset Light Beach, Eastham	1	1	0	1	0	NPS	Pair nested at Coast Guard Beach before and after a failed attempt at Nauset Light
South Sunken Meadow, Eastham	2	2	0	2	0	MAS	
North Spit, Orleans	23	23	56	23	0	Orleans	
South Beach (Nauset), Orleans	17	18	52	18	0	Orleans	One adult mortality at an enclosed nest possibly the result of high winds
Armstrong Beach, Provincetown	6	6	15	6	0	NPS	An additional territorial pair was scraping from 6/19 to 6/30
Exit 9, Provincetown	2	2	8	2	0	NPS	
Hatches Harbor, Provincetown	2	2	5	2	0	NPS	
Herring Cove, Provincetown	1	1	4	1	0	NPS	
Mission Bell, Provincetown	1	1	3	1	0	NPS	
Race Point Beach, Provincetown	4	4	8	4	0	NPS	
Race Point North, Provincetown	15	15	30	15	0	NPS	

SUMMARY OF THE 2019 MASSACHUSETTS PIPING PLOVER CENSUS

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Race Point South, Provincetown	5	5	12	5	0	NPS	
Wood End/Long Point, Provincetown	9	9	10	9	0	NPS	
Ballston, Truro	0	1	0	1	0	NPS	Pair moved to Newcomb Hollow after a failed nest attempt at Ballston
Beach Point, Truro	1	1	0	1	0	MAS	
Coast Guard Truro, Truro	1	1	1	1	0	NPS	
Corn Hill Beach, Truro	2	2	4	2	0	MAS	
Fisher Beach South, Truro	1	1	0	1	0	MAS	
Fisher Beach, Truro	3	3	2	3	0	MAS	
Head of the Meadow, Truro	5	5	16	5	0	NPS	
High Head, Truro	4	4	9	4	0	NPS	
Longnook, Truro	0	1	1	1	0	NPS	
Ballston Beach, Truro	1	1	0	1	0	MAS	
Bound Brook, Wellfleet	1	3	3	3	0	NPS	One pair previously nested at Duck Harbor; an additional pair with a banded male abandoned the site after a failed nest attempt; it was later seen on Town of Truro beach
Cahoon Hollow, Wellfleet	0	0	0	0	0	NPS	
Duck Harbor, Wellfleet	2	3	3	3	0	NPS	One pair failed before the index period and later re-nested at Bound Brook
Great Is., Wellfleet	4	4	6	4	0	NPS	
Jeremy Point, Wellfleet	4	5	3	5	0	NPS	
Lecount Hollow, Wellfleet	0	1	0	1	0	NPS	Pair failed before the index period and re-nested at Marconi Beach
Lieutenant Island - NW, Wellfleet	0	0	0	0	0	MAS	
Lieutenant Island - SW, Wellfleet	0	0	0	0	0	MAS	
Lieutenant Island - The Hook, Wellfleet	0	0	0	0	0	MAS	
Marconi Beach, Wellfleet	3	3	1	3	0	NPS	One pair previously nested at Lecount Hollow
Marconi Station, Wellfleet	5	5	4	5	0	NPS	

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Newcomb Hollow, Wellfleet	2	2	7	2	0	NPS	One pair nested at Ballston prior to nesting at Newcomb Hollow
White Crest Beach, Wellfleet	0	1	0	1	1	NPS	Territorial pair did not nest at White Crest Beach; moved to Coastguard Eastham
BUZZARDS BAY							
Ward's Rock, Fairhaven	ND	ND	ND	0	ND	MAS	
Meadow Island, Marion	0	0	0	0	0	MAS	
Planting Island, Marion	0	0	0	0	0	MAS	
Stewart's Island, Marion	0	0	0	0	0	MAS	
Cedar Island, Wareham	0	0	0	0	0	MAS	
Cromeset, Wareham	0	ND	ND	0	ND	MAS	
Swift's Beach, Wareham	0	0	0	0	0	MAS	
Barney's Joy/Little Beach, Dartmouth	18	20	10	20	0	MAS	
Demarest Lloyd, Dartmouth	6	6	11	6	0	DCR	
Nonquitt, Dartmouth	1	2	4	2	0	MAS	
Round Hill, Dartmouth	1	1	2	1	0	MAS	
Salters Pond, Dartmouth	1	1	0	1	0	MAS	
Pine Island (Angelica Point and Strawberry Point), Mattapoisett	0	ND	ND	0	ND	DFW	Site visited only twice
South Shore Marshes, Fairhaven	0	ND	ND	0	ND	DFW	Site visited only twice
West Island, Fairhaven	6	6	9	6	0	LCES	
West Island, Fairhaven	6	6	8	6	0	DCR	
Winsegansett Heights, Fairhaven	1	1	0	1	0	LCES	
Bird Island, Marion	0	0	0	0	0	DFW	
Ram Is., Marion Marion	ND	ND	ND	0	ND	DFW	No plovers detected during survey on 5/28
Brandt Island, Mattapoisett	0	ND	ND	0	ND	DFW	
Ram Is., Mattapoisett Mattapoisett	1	1	0	1	0	DFW	

SUMMARY OF THE 2019 MASSACHUSETTS PIPING PLOVER CENSUS

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Padanaram Harbor, South Dartmouth	2	2	4	2	0	MAS	
Little Harbor Beach, Wareham	1	3	5	3	0	MAS	Two pairs arrived in late June; one nested and one did not
Long Beach Point, Wareham	0	0	0	0	0	MAS	
Stony Point Dike, Wareham	2	3	5	3	0	USACOE	
Baker's Beach, Westport	2	2	2	2	0	LCES	
Beach Ave, Westport	0	1	0	1	0	MAS	
Cockeast Pond (Elephant Rock), Westport	2	2	6	2	0	TNCRI	
East Beach, Westport	1	1	1	1	0	MAS	
Horseneck Beach, Westport	13	13	10	13	0	DCR	One pair deterred from nesting in a high-use area accordance with a permit issued under the HCP
Richmond Pond, Westport	2	2	0	2	0	TNCRI	
Cherry & Webb, Westport	5	5	1	5	0	MAS	
ELIZABETH ISLANDS							
Cuttyhunk, Gosnold	5	5	5	5	0	MAS	
MARTHA'S VINEYARD							
Edey's Island, Chilmark	0	0	0	0	0	MAS	
Big Gravel Is., Oak Bluffs	0	0	0	0	0	MAS	
Eastville Beach, Oak Bluffs	0	0	0	0	0	MAS	
Little Gravel Is., Oak Bluffs	0	0	0	0	0	MAS	
Sarson Is., Oak Bluffs	0	0	0	0	0	MAS	
East Tashmoo, Tisbury	0	0	0	0	0	MAS	
Lagoon Pond-Maciel Marine/Ferry Boat Island, Tisbury	0	0	0	0	0	MAS	
Dogfish Bar, Aquinnah	7	8	9	8	0	BW	
Lobsterville Beach, Aquinnah	2	2	0	2	0	MAS	
Menemsha Neck Preserve, Aquinnah	0	0	0	0	0	MVLBC	

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Moshup Beach, Aquinnah	0	0	0	0	0	MVLBC	
Philbin Beach, Aquinnah	0	0	0	0	0	BW	
Black Point Pond, Chilmark	0	0	0	0	0	BW	
Cape Higgon, Chilmark	0	ND	ND	0	ND	BW	
Chilmark Pond Preserve, Chilmark	0	0	0	0	0	MVLBC	
Chilmark Pond, Chilmark	1	1	3	1	0	BW	
Great Rock Bight Preserve, Chilmark	0	0	0	0	0	MVLBC	
Lucy Vincent Beach, Chilmark	1	1	4	1	0	BW	
Nomans Land Island NWR, Chilmark	0	0	0	0	0	USFWS	
Quansoo, Chilmark	3	3	10	3	0	MAS	
Spring Point, Chilmark	0	0	0	0	0	BW	
Squibnocket Beach/Long Beach, Chilmark	3	3	2	3	0	BW	
Stonewall Beach, Chilmark	0	0	0	0	0	BW	
Arruda's Point / The Jetties , Edgartown	0	0	0	0	0	TTOR	
Bend-in-the-Road Beach, Edgartown	0	0	0	0	0	MAS	
Caleb's Pond, Edgartown	0	ND	ND	0	ND	BW	
Cape Pogue Elbow / The Narrows, Edgartown	1	1	0	1	0	TTOR	
Chappaquiddick Point Beach, Edgartown	0	0	0	0	0	MVLBC	
Cove Meadow Preserve, Edgartown	0	0	0	0	0	MVLBC	
Cow Bay, Edgartown	0	1	0	1	0	MAS	
Cracktuxet Trust Beach, Edgartown	0	ND	ND	0	ND	BW	

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Edgartown Great Pond (Job's Neck), Edgartown	6	6	4	6	0	BW	
Edgartown Great Pond, Edgartown	0	0	0	0	0	MVLBC	
Leland / East Beach, Edgartown	4	4	4	4	0	TTOR	
Lighthouse Beach, Edgartown	2	2	2	2	0	BW	
Little Beach / Eel Pd., Edgartown	4	4	8	4	0	BW	
Little Neck, Edgartown	0	0	0	0	0	TTOR	
Norton Point Beach, Edgartown	7	9	0	9	0	TTOR	
Oyster Pond, Edgartown	1	1	1	1	0	BW	
Paqua Pond, Edgartown	1	1	4	1	0	BW	
Pease's Pond, Edgartown	0	ND	ND	0	ND	BW	
Quammox Preserve, Edgartown	0	0	0	0	0	MVLBC	
South Beach, Edgartown	0	ND	ND	0	ND	BW	
Sylvia State Beach Edgartown , Edgartown	0	0	0	0	0	MAS	
Wasque, Edgartown	1	1	4	1	0	TTOR	
Yorke - Allen Point, Edgartown	0	0	0	0	0	MAS	
Dougs Cove Preserve, Oak Bluffs	0	0	0	0	0	MVLBC	
Harthaven, Oak Bluffs	0	1	0	1	0	MAS	Pair left the site prior to the index period after failed nesting attempts
Sylvia State Beach Oak Bluffs, Oak Bluffs	2	2	0	2	0	MAS	
Mink Meadows /West Chop, Tisbury	1	1	0	1	0	MAS	
Tashmoo Preserve, Tisbury	0	0	0	0	0	MVLBC	

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West Tashmoo, Tisbury	3	3	2	3	0	BW	
Wilfrids Pond Preserve, Tisbury	0	0	0	0	0	MVLBC	
Coskata-East Beach, Vineyard Haven	1	1	0	1	0	TTOR	
Cedar Tree Neck, West Tisbury	0	0	0	0	0	BW	
Lamberts Cove, West Tisbury	0	ND	ND	0	ND	BW	
Long Point, West Tisbury	0	0	0	0	0	TTOR	
Paul's Point, West Tisbury	1	0	0	0	0	BW	Pair and scrapes were seen on 6/7 but this pair likely settled at West Tashmoo instead.
Sepiessa Point Reservation, West Tisbury	0	0	0	0	0	MVLBC	
Seven Gates, West Tisbury	0	ND	ND	0	ND	BW	
Short Cove Preserve, West Tisbury	0	0	0	0	0	MVLBC	
Tisbury Great Pond, West Tisbury	2	2	3	2	0	MVLBC	
Watcha Pond, West Tisbury	0	2	0	2	0	BW	Both pairs left site in May without attempting to renest after crow predation.
NANTUCKET							
Hoicks Hallow, Nantucket	0	0	0	0	0	MAS	
40th Pole, Nantucket	2	2	3	2	0	Nantucket	
Capaum Pond, Nantucket	1	1	1	1	0	NCF	
Chase Links, Nantucket	1	1	3	1	0	MAS	
Coatue, Nantucket	2	2	2	2	1	NCF	
Coskata-West Beach, Nantucket	0	0	0	0	0	TTOR	
Dionis Beach, Nantucket	3	3	6	3	0	Nantucket	
Eel Point, Nantucket	5	6	2	6	0	NCF	One banded plover failed and later nested on Tuckernuck (Charlie's Point/South Beach)
Great Point, Nantucket	1	1	0	1	0	TTOR	

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Hallowell Lane Beach, Nantucket	0	0	0	0	0	Nantucket	
Hummock and West Hummock Ponds, Nantucket	0	0	0	0	0	NCF	
Jetties Beach, Nantucket	1	1	0	1	0	Nantucket	
Little Neck, Nantucket	0	0	0	0	0	NCF	
Long Pond, Nantucket	0	0	0	0	0	NCF	
Low Beach , Nantucket	2	2	7	2	0	Nantucket	One chick survived to at least 50 days but never learned to fly
Monomoy Creeks, Nantucket	0	0	0	0	0	NCF	
Muskeget Is., Nantucket	3	2	ND	0	0	MAS	Infrequent monitoring due to limited access; at least two pairs nested (based on broods observed late in the season) but possibly more
Nantucket NWR (Great Point), Nantucket	0	0	0	0	0	USFWS	One territorial non-nesting pair present between 5/8 and 5/16
Polpis Harbor (Medouie Creek and Pocomo Meadows), Nantucket	0	0	0	0	0	NCF	
Quaise Point, Nantucket	0	0	0	0	0	Nantucket	
Quidnet/Sesachacha Pond/Greenhills, Nantucket	2	2	2	2	0	MAS	
Sheep Pond, Nantucket	0	0	0	0	0	NCF	
Smith's Point, Nantucket	0	0	0	0	0	MAS	
South Pastures (Madequecham Valley to Tom Nevers), Nantucket	0	0	0	0	0	NCF	
Squam Pond, Nantucket	0	0	0	0	0	NCF	
Squam Pond, Nantucket	0	0	0	0	0	MAS	
Surfside/Western Ave, Nantucket	0	0	0	0	0	Nantucket	
The Galls, Nantucket	1	1	2	1	0	TTOR	
The Glades, Nantucket	0	0	0	0	0	TTOR	

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The Haulover , Nantucket	0	0	0	0	0	NCF	
Tom Nevers/Wanoma, Nantucket	0	0	0	0	0	MAS	
Tuckernuck Is. - Bigelow's Point, Nantucket	1	1	3	1	0	TLT	
Tuckernuck Is. - East Pond, Nantucket	1	1	4	1	0	TLT	
Tuckernuck Is. - North Pond, Nantucket	1	1	4	1	0	TLT	
Tuckernuck Is. - Whale Point, Nantucket	2	3	2	3	0	TLT	One pair may have moved to Smith's Point after nest failed
Tuckernuck Is. -Charlie's Point/ South Beach, Nantucket	1	1	3	1	0	TLT	Banded plover previously nested at Eel Point
UMass Field Station, Nantucket	0	1	2	1	0	NCF	
Washing Pond, Nantucket	1	0	0	0	0	MAS	
Wauwinet, Nantucket	3	3	9	3	0	MAS	
Western Ave, Nantucket	0	1	0	1	0	MAS	Pair departed site prior to the index period after a failed nesting attempt

^a *Index Count* = number of pairs counted between 1-9 June 2016, the standardized *Index Count* period for the Atlantic Coast population.

^b *Total Count* = total number of territorial or breeding pairs present at a site for at least 2 weeks during the breeding season.

^c *Chicks fledged* are defined as chicks \geq 25 days of age or observed in flight, whichever occurs first. Number of *Pairs with fledged data* includes all pairs for which number of *chicks fledged* was determined; this includes not only pairs that successfully fledged chicks, but also pairs for which no nests were found, pairs that nested unsuccessfully, and pairs whose chicks failed to fledge.

^d *Unpaired adults* = total number of territorial single adults present at a site for at least 2 weeks during the breeding season.

^e Source = primary source(s) that provided monitoring data: Barnstable = Town of Barnstable, BW = BiodiversityWorks, Chatham = Town of Chatham, DCR = Department of Conservation and Recreation, Dennis = Town of Dennis, DFW = Massachusetts Division of Fisheries & Wildlife, ECGA = Essex County Greenbelt Association, LCES = Lloyd Center for Environmental Studies, MAS = Massachusetts Audubon Society, MVLBC = Martha's Vineyard Land Bank Coalition, Nantucket = Town of Nantucket, NCF = Nantucket Conservation Foundation, NPS = National Park Service, Orleans = Town of Orleans, Plymouth = Town of Plymouth, TLT = Tuckernuck Land Trust, TTOR = The Trustees of Reservations, USACOE = U.S. Army Corps of Engineers, USFWS = U.S. Fish & Wildlife Service, Winthrop = Town of Winthrop