

# SUMMARY OF THE 2021 MASSACHUSETTS PIPING PLOVER CENSUS

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Bill Byrne, MassWildlife

Prepared by:

Natural Heritage & Endangered Species Program  
Massachusetts Division of Fisheries & Wildlife  
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## SUMMARY OF THE 2021 MASSACHUSETTS PIPING PLOVER CENSUS

### ABSTRACT

This report summarizes data on abundance, distribution, and reproductive success of Piping Plovers (*Charadrius melodus*) in Massachusetts during the 2021 breeding season. Observers reported breeding pairs of Piping Plovers present at 188 sites; 158 additional sites were surveyed at least once, but no breeding pairs were detected at them. The population increased 21.7% relative to 2020. The **Index Count** (statewide census conducted 1-9 June) was **948 pairs**, and the **Adjusted Total Count** (estimated total number of breeding pairs statewide for the entire 2021 breeding season) was **967 pairs**. A total of 1,017 chicks were reported fledged in 2021, for an overall productivity of **1.06 fledglings per pair**, based on data from 99.3% 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 the 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 2021, 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 346 sites in Massachusetts in 2021 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. 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 2021, 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 period of time. 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. To be included in the *Total Count*, a pair must have exhibited territoriality and pair bonding for a minimum of two 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

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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 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 in calculations, 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. All nests with the aforementioned data were used to calculate both the median estimated date for the first egg laid and 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

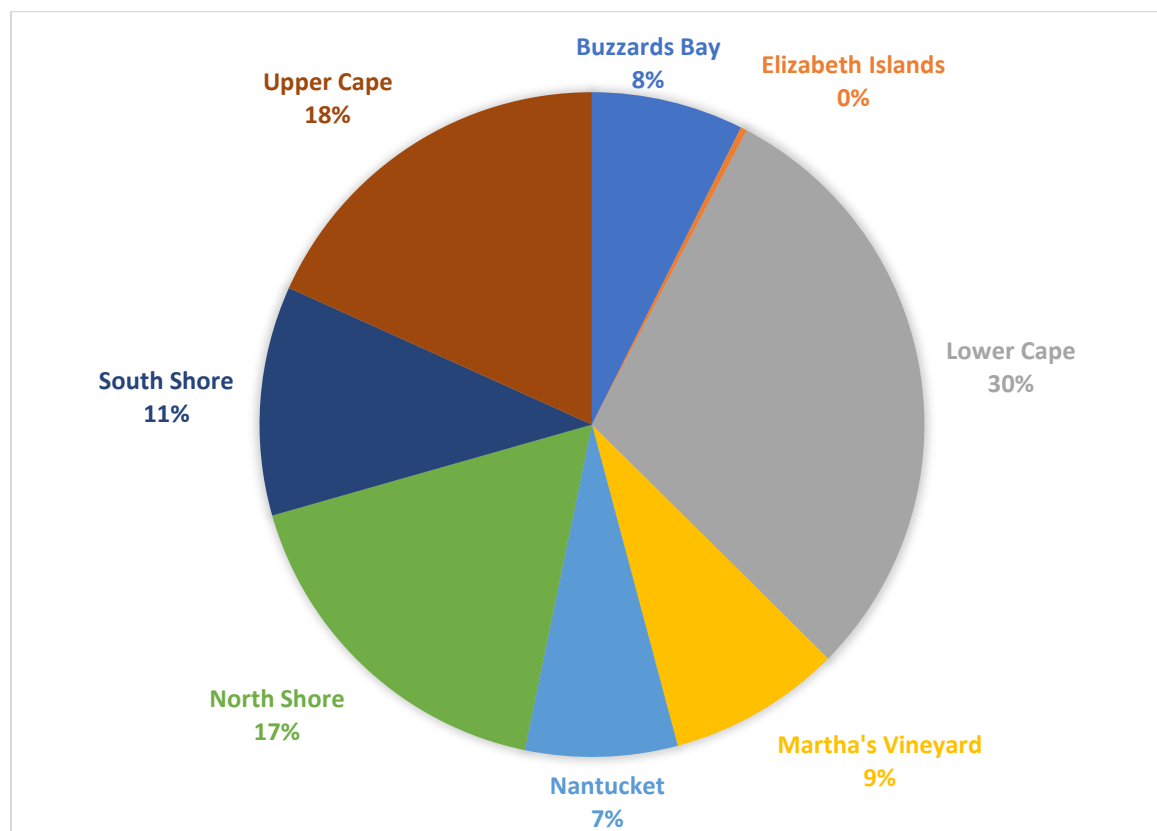
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locations of all nests were submitted with census forms. After reviewing census forms, if necessary, we contacted cooperators to obtain missing or incomplete data, resolve inconsistencies, and clarify ambiguities. When we could not obtain the needed information, we used best professional judgment to assign final values or noted data as preliminary; any such instances are noted in Appendix 1.

### RESULTS

Observers reported breeding Piping Plovers at 188 sites in Massachusetts in 2021. An additional 158 sites were surveyed one or more times during May and June, but no breeding pairs were detected at them (**Appendix 1**). The **Unadjusted Total Count** of the number of breeding pairs of Piping Plover was **986** (vs. 810 in 2020). The **Adjusted Total Count** was **967 pairs**, a 21.7% increase over 2020 (794.5 pairs). The **Index Count** was **948 pairs** (vs. 779 pairs in 2020), or 98.0% of the **Adjusted Total Count**.

Distribution of breeding pairs by region (**Figure 1**) was similar to 2020, with a slight increase on the Lower Cape (30%; vs. 28% in 2020) and slight decreases on the Upper Cape (18%) and Buzzards Bay (8%; vs. 19% and 9%, respectively, in 2020). Twenty-four sites with ten or more breeding pairs accounted for 52.3% of the Massachusetts breeding population, while 114 sites with three or fewer pairs accounted for 19.7% of the population.



**Figure 1.** Distribution of Piping Plover breeding pairs by Massachusetts region in 2021, based on Adjusted Total Counts for each region.

In total, 1,017 chicks were reported fledged, resulting in overall productivity of **1.06 fledglings/pair**, based on data from 967 of 986 pairs (99.3%; the *adjusted number of pairs with fledge data* divided by

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the *unadjusted total count*).<sup>1</sup> This represents a 19.1% decrease in productivity relative to 2020 (1.31 fledglings/pair). Productivity varied by region, ranging from 1.43 on the South Shore down to 0.43 fledglings/pair on Martha's Vineyard (**Table 1**). Productivity data were not available for the Elizabeth Islands due to a limited survey effort in that region.

**Table 1.** Productivity (fledglings per pair) of Piping Plovers in Massachusetts by region in 2021.

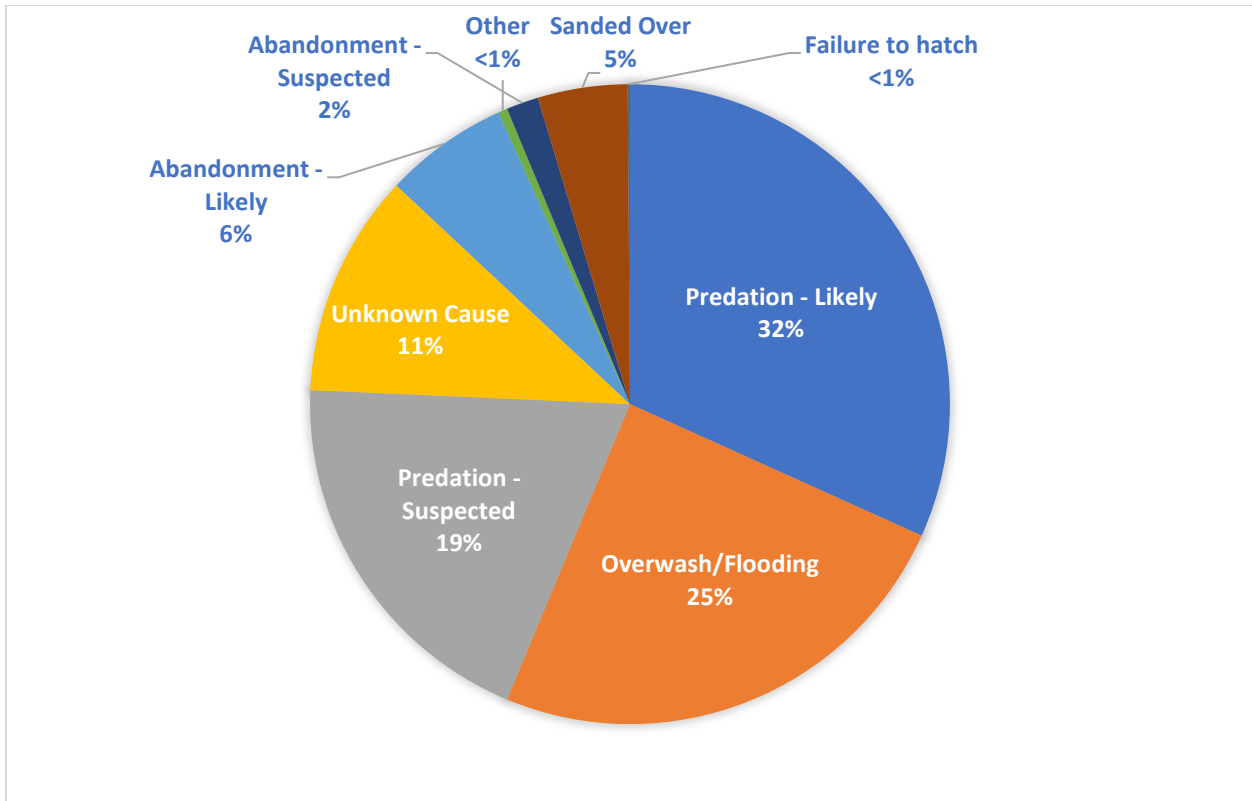
<b>Region</b>	<b>2021</b>	<b>2020</b>
Buzzards Bay	1.16	1.04
Elizabeth Islands	NA	NA
Lower Cape	0.97	1.46
Martha's Vineyard	0.43	1.08
Nantucket	1.05	0.82
North Shore	0.76	1.13
South Shore	1.43	1.51
Upper Cape	1.37	1.44

Nest failure rates were substantially higher in 2021 (58.0%) than in 2020 (45.1%). 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 lower proportion of nest loss in 2021 (51%) than in 2020 (60%), while overwash (25%) was substantially higher compared to 2020 (11%), likely due to a major multiday storm over Memorial Day weekend. **Figure 3** shows suspected predators of nests likely and suspected to have been depredated.

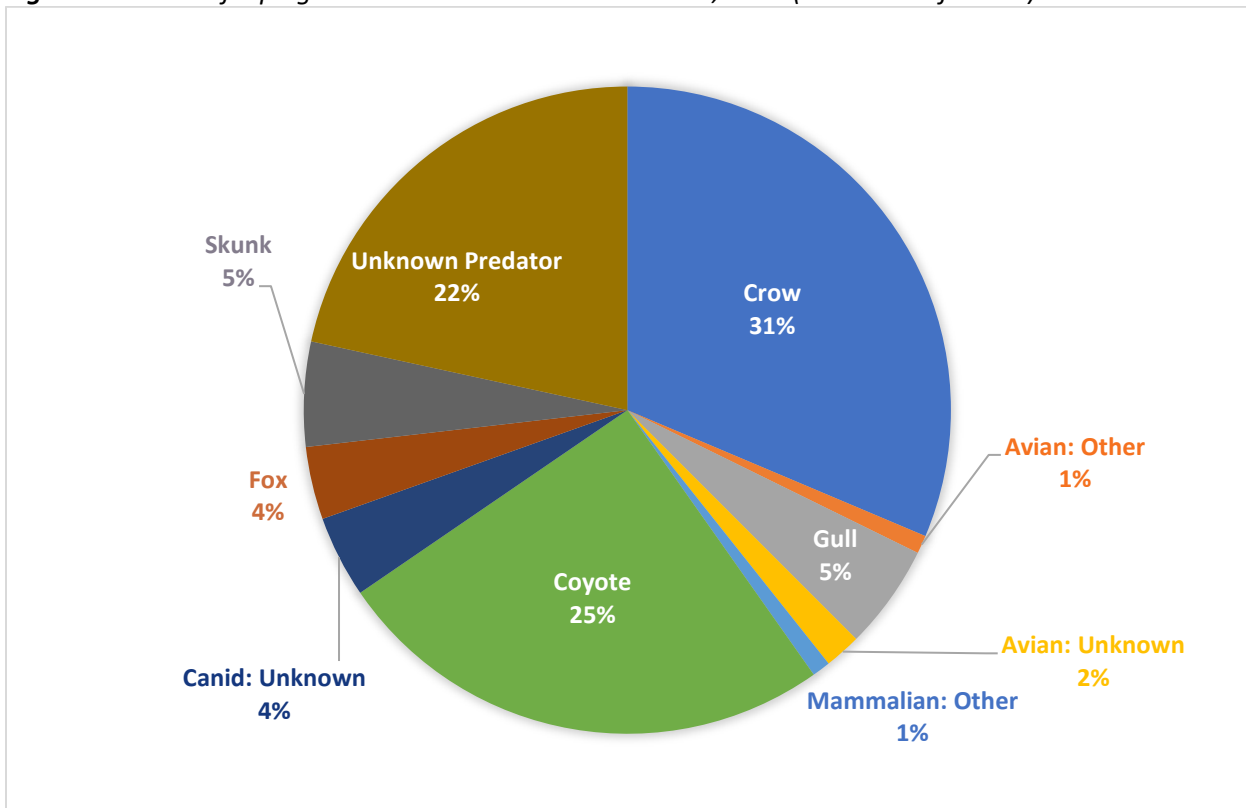
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<sup>1</sup> The *unadjusted number of pairs with fledge data* was 979 (out of 986 unadjusted total pairs). The *adjusted number of pairs with fledge data* was 960.

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**Figure 2.** Causes of Piping Plover nest loss in Massachusetts, 2021 (n=833 nest failures).



**Figure 3.** Presumed predators of Piping Plover nests suspected and likely to have been depredated in Massachusetts, 2021 (n=440, presumed predated nests).

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In 2021, the earliest clutch initiation date was estimated to be 15 April at Little Harbor, Wareham. Statewide, the median clutch initiation date was 23 May (24 May in 2020). The earliest approximate hatch date was 14 May, at Eel Point, Nantucket (24 May in 2020). The median hatch date statewide was 22 June (24 June in 2020).

Hatch rates decreased (42.0%; n=1,435 nests with known fates) relative to 2020 (54.9%; n=1,003) and nesting attempts per pair increased to 1.52 vs. 1.26 in 2020 (based on *adjusted total counts*). Hatch rates for exclosed and unexclosed nests were 61.4% (n=223) and 38.4% (n=1,212), respectively, as compared to 78.0% (n=159) and 51.5% (n=826) in 2020. The nest abandonment rate for exclosed nests (11.7%; 26 of 223 nests) was substantially higher than for unexclosed nests (2.6%; 31 of 1,212 nests with known fates), and somewhat higher compared to 8.8% (14 of 159 nests) and 2.3% (19 of 826 nests), respectively, in 2020.

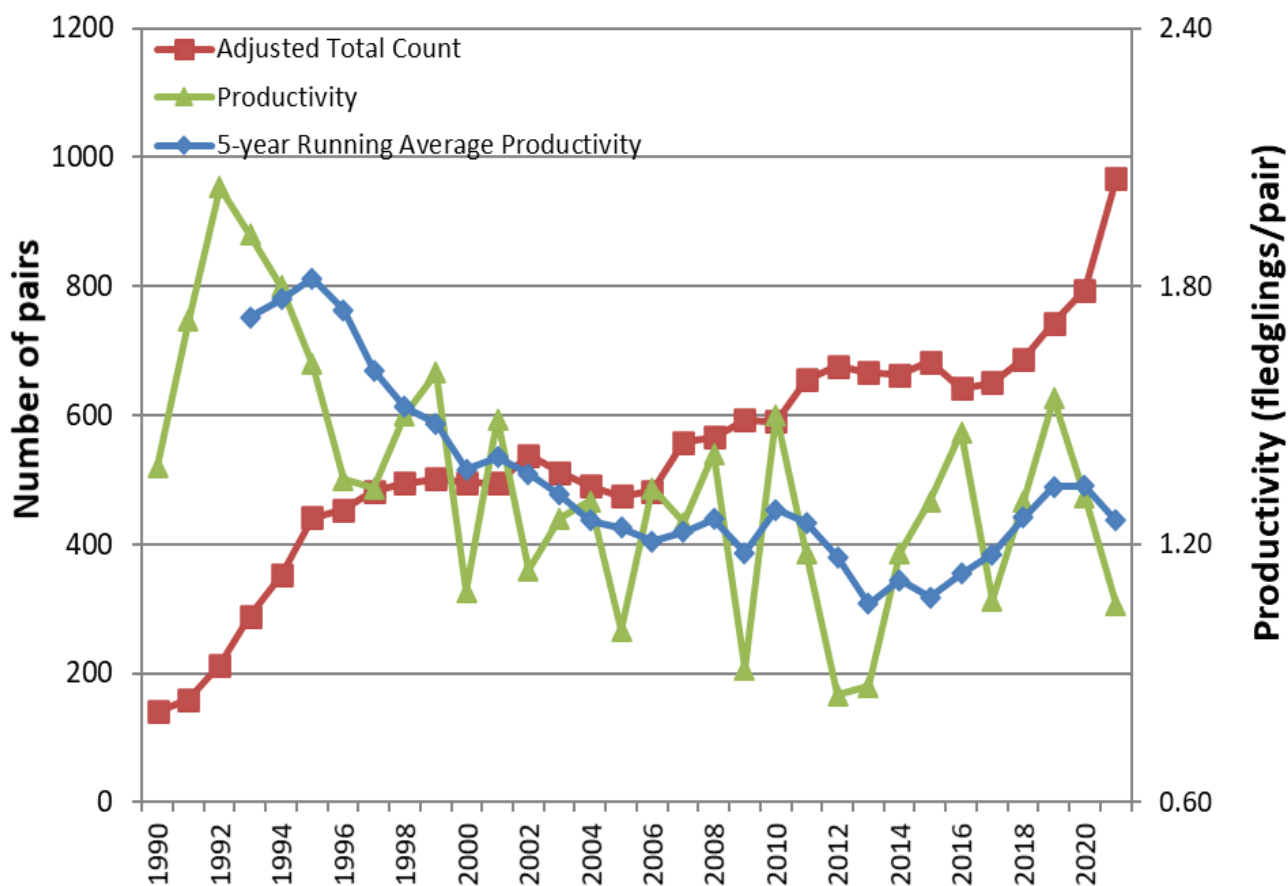
Long term trends in breeding Piping Plover population size and productivity are shown in **Figure 4**. The five-year running average of productivity has declined overall since 1995. However, there were consistent increases between 2015-2020 before a sharp decline in 2021. In contrast to the last three years, productivity dropped below the approximately 1.2 fledglings per pair thought to be necessary to maintain a stable population (Melvin & Gibbs 1996).<sup>2</sup> The population trend, meanwhile, had been relatively stable between 2012 – 2017, but has increased dramatically over the last several years.

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<sup>2</sup> 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).



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**Figure 4.** Piping Plover abundance (adjusted total count) and productivity (fledglings/pair) in Massachusetts, 1990-2021.

**ACKNOWLEDGEMENTS**

This report was prepared by Andrew Vitz 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 2021. We also thank the more than 20 state and federal agencies, local municipalities and county government, local and regional land trusts, private conservation organizations, volunteers, 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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**Appendix 1.** Abundance, distribution, and productivity of Piping Plovers in Massachusetts, 2021.

Site	Index Count <sup>a</sup> (no. pairs)	Total Count <sup>b</sup> (no. pairs)	No. chicks fledged <sup>c</sup>	No. pairs with fledge data <sup>c</sup>	No. unpaired adults <sup>d</sup>	Source <sup>e</sup>	Notes <sup>f</sup>
<b>NORTH SHORE</b>							
Cape Hedge, Rockport	1	1	2	1	0	KS, EH	Monitored by Kim Smith, Eric Hutchins, and others
Carson Beach, Boston	0	0	0	0	0	DCR	
Coffins Beach – Castles, Gloucester	1	1	0	1	0	ECGA	1 territorial/scraping non-nesting pair present >2 weeks
Coffins Beach - Bradford, Gloucester	0	0	0	0	0	ECGA	
Coffins Beach - East End, Gloucester	0	0	0	0	0	ECGA	
Constitution Beach, East Boston	0	ND	ND	0	ND	MAS	
Crane Beach, Ipswich	54	54	54	54	0	TTOR	
Good Harbor Beach, Gloucester	3	3	2	3	2	8	
L Street Bathhouse, Dorchester	2	2	5	2	1	MAS	A single male present >2 weeks
Lovell's Beach, Boston	0	0	0	0	0	MAS	
Nahant State Beach, Nahant	4	4	2	4	0	DCR	2 territorial/scraping non-nesting pairs present >2 weeks
Newbury Town Beach, Newbury	5	5	2	5	0	MAS	Male found deceased on the side of the road
Newburyport Beach, Newburyport	3	3	0	3	0	MAS	
Parker River NWR, Newbury/Rowley	48	50	33	50	0	USFWS	
Rainsford Island, Boston	0	0	0	0	0	MAS	
Revere Beach-North, Revere	11	11	0	11	0	DCR	
Revere Beach-South, Revere	7	7	11	7	0	DCR	
Salisbury Beach, Salisbury	2	2	0	2	0	DCR	
Sandy Point, Ipswich	15	16	2	16	0	DCR	One non-nesting pair at site >2 weeks
Snake Island, Winthrop	0	0	0	0	0	MAS	2 birds periodically foraging
Two Penny Loaf, Gloucester	0	0	0	0	0	ECGA	

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Site	Index Count <sup>a</sup> (no. pairs)	Total Count <sup>b</sup> (no. pairs)	No. chicks fledged <sup>c</sup>	No. pairs with fledge data <sup>c</sup>	No. unpaired adults <sup>d</sup>	Source <sup>e</sup>	Notes <sup>f</sup>
West Beach, Beverly	1	1	3	1	0	ECGA	
Winthrop Beach, Winthrop	8	8	10	8	0	DCR	
Yirrell Beach, Winthrop	3	3	4	3	0	Winthrop	
<b>SOUTH SHORE</b>							
Boathole, Plymouth	1	1	2	1	0	DBR	
Bumpkin Island	0	ND	ND	0	ND	MAS	
Duxbury Beach, Duxbury	30	31	46	31	0	DBR	One recently fledged bird found dead in roadway
East Beach, New Bedford	0	ND	ND	ND	ND	LCES	
Ellisville Harbor State Park, Plymouth	0	0	0	0	0	MAS	A pair was observed scraping early in season but at site <2 weeks
Ellisville Shifting Lots Preserve, Plymouth	3	3	8	3	0	MAS	
Fourth Cliff, Scituate	2	1	3	2	0	MAS	Second pair present < 2 weeks
Grape Island, Weymouth	0	ND	ND	0	ND	MAS	
Humarock, Scituate	0	ND	ND	0	ND	MAS	
Nantasket Beach, Hull	12	12	9	12	0	MAS	2 additional pairs observed scaping but at site <2 weeks
Nantasket DCR, Hull	0	ND	ND	0	ND	MAS	
Peddock's Island, Hull	0	ND	ND	0	ND	MAS	
Pleasant Beach, Cohasset	0	0	0	0	0	MAS	
Plymouth Long Beach, Plymouth	38	38	57	38	1	Plymouth	An unpaired bird observed 5/21/21 -mid-July
Rexhame Beach, Marshfield	1	1	0	1	0	MAS	
Sagamore Beach, Bourne	4	4	8	4	0	MAS	
Sagamore Beach, Plymouth	0	ND	ND	0	ND	MAS	
Saquish, Plymouth	7	7	13	7	0	GSC & MAS	
The Glades, Scituate	1	1	0	1	0	MAS	
Third Cliff, Scituate	9	9	7	9	0	MAS	2 non-nesting territorial pairs (present >2 weeks)
Wollaston Beach, Quincy	2	2	4	2	0	DCR	
<b>UPPER CAPE</b>							
Acapesket Beach, Falmouth	1	1	3	1	0	MAS	

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Bank Street Beach, Harwich	0	0	0	0	0	Harwich	≥4 plovers sporadically observed foraging; thought to have nested at Wychmere
Bass River Beach, Yarmouth	0	0	0	0	0	MAS	
Bassetts Island, Bourne	ND	ND	ND	0	ND	MAS	
Bayview Ave/Howe's, Dennis	1	1	0	1	0	MAS	
Bayview, Dennis	0	0	0	0	0	Dennis	
Belmont Condos, Harwich	1	1	1	1	0	MAS	
Black Beach, Falmouth	1	1	0	1	0	MAS	
Bone Hill Road, Barnstable	0	ND	ND	0	ND	MAS	
Chapin Beach, Dennis	1	1	2	1	0	Dennis	
Coast Guard Beach, Truro	0	0	0	0	0	MAS	
Cold Storage Beach, Dennis	0	0	0	0	0	Dennis	
Corporation Beach, Dennis	0	0	0	0	0	Dennis	
Craigville Beach, Barnstable	1	1	0	1	0	MAS	
Crosby Landing, Brewster	2	2	8	2	0	MAS	
Crowes Pasture (Cole's Pond) / Quivett Neck, Dennis	3	3	7	3	0	Dennis	One of these pairs nested on private beach adjacent to Crowes Pasture. Newly hatched chicks found.
Dead Neck Sampsons Island, Barnstable	18	18	7	18	0	MAS	1 non-nesting territorial pair (at site >2 weeks).
Depot Street, Dennis	ND	ND	ND	0	ND	Dennis	Site only visited 1x (April)
Dowses Beach, Barnstable	1	2	1	2	0	Barnstable	
Dr. Botero, Dennis	1	1	0	1	0	MAS	
East Sandwich Beach, East Sandwich	3	3	7	3	0	Sandwich	
Falmouth Harbor Jetty, Falmouth	0	0	0	0	0	MAS	
Flume Pond, Falmouth	0	0	0	0	0	MAS	
Fortes Beach, Barnstable	0	ND	ND	0	ND	MAS	
Glendon Beach, Dennis	ND	ND	ND	0	ND	Dennis	Site surveyed 1x (April)

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Gray's Beach, Yarmouth	0	0	0	0	0	MAS	PIPLs occasionally observed foraging/roosting
Great Island Causeway, Yarmouth	4	4	6	4	0	MAS	1 territorial pair observed >2 weeks - no nest found
Great Island - Smith Point, Yarmouth	4	5	9	5	0	MAS	6th territorial pair (non-nesting) observed <2 weeks on site
Hagis to Inman Rd., Dennis	ND	ND	ND	0	ND	Dennis	Site surveyed 1x (April)
Harbor View, Dennis	ND	ND	ND	0	ND	Dennis	Site surveyed 1x (April)
Howe's St. Beach, Dennis	0	0	0	0	0	Dennis	
Inman Beach, Dennis	ND	ND	ND	0	ND	Dennis	Site surveyed 1x (April)
Kalmus Beach, Barnstable	4	4	6	4	0	Barnstable	1 territorial non-nesting pair at site >2 weeks
Linnell Landing Beach, Brewster	0	ND	ND	0	ND	MAS	
Little Island Beach, Falmouth	0	ND	ND	0	ND	MAS	
Long Beach, Barnstable	5	6	5	6	0	MAS	1 non-nesting territorial pair observed >2 weeks
Mashnee Dike, Bourne	1	1	2	1	0	USACOE	
Mayflower Beach, Dennis	0	0	0	0	0	Dennis	
Memorial Beach/Covell's, Barnstable	0	ND	ND	0	ND	MAS	
Menauhant Beach, Falmouth	0	ND	ND	0	ND	MAS	
Menauhant Yaucht Club, Falmouth	1	1	0	1	0	MAS	
Metcalf Memorial, Dennis	ND	ND	ND	0	ND	Dennis	Site survey 1x (April)
Mussel Point, Barnstable	0	ND	ND	0	ND	MAS	
New Seabury, Mashpee	7	7	3	7	0	MAS	
Paine's Creek, Brewster	0	ND	ND	0	ND	MAS	
Popponesset Spit, Mashpee	5	5	8	5	0	MAS	
Radio City Beach, Yarmouth	1	1	0	1	0	MAS	
Raycroft Beach, Dennis	ND	ND	ND	0	ND	Dennis	Site surveyed 1x (April)
Red Jacket Inn, Yarmouth	0	0	0	0	0	MAS	

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Red River Beach, Harwich	1	1	4	1	0	Harwich	
Rushy Marsh Pond, Barnstable	0	0	0	0	0	MAS	
Sagamore Beach – Sandwich, Sandwich	7	7	5	7	0	MAS	
Sandy Neck Beach Park, Barnstable	38	38	73	38	0	Barnstable	
Saquatucket Beach, Harwich	ND	ND	ND	0	ND	MAS	Site not surveyed
Scorton Neck (Torrey), Sandwich	5	6	10	6	0	MAS	One pair arrived after Index Count
Scorton Shores, East Sandwich	0	0	0	0	1	Sandwich	
Scorton Shores, Sandwich	2	2	5	2	0	MAS	
Scusset Beach State Reservation, Sandwich	1	2	0	2	0	MAS	No nests found for either pair
Sea St./ Keyes Beach, Barnstable	0	ND	ND	0	ND	MAS	
Sea Street, West Dennis	ND	ND	ND	0	ND	Dennis	Site surveyed 1x (April)
Sea Street Beach, Dennis	0	0	0	0	0	Dennis	
Seagull Beach, Yarmouth	6	8	18	8	0	MAS	1 territorial non-nesting pair at site > 2 weeks
Sesuit Harbor Beach, Dennis	0	ND	ND	0	ND	Dennis	Site not surveyed after Index Count
Sippewisset, Falmouth	1	1	0	1	1	MAS	One unpaired adult sporadically observed
South Cape Beach, Mashpee	4	5	1	5	0	MAS	1 scraping non-nesting bird observed >2 weeks
South Village Beach, Dennis	0	1	0	1	0	Dennis	Nesting pair showed up late in season (6/20)
Spring Hill Beach, Sandwich	4	5	8	5	0	Sandwich	
Squaw Island, Barnstable	9	10	3	10	0	MAS	1 territorial non-nesting pair at site >2 weeks
Squaw Island Road, Barnstable	2	2	0	2	0	MAS	
Standish Way/Colonial Acres, Yarmouth	0	0	0	0	0	MAS	
Stone Horse Yacht Club, Harwich	0	ND	ND	0	1	MAS	Site only surveyed 1x - 1 unpaired adult bird foraging

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Surf Drive, Falmouth	1	1	0	1	0	MAS	
Swan River/Miramar, Dennis	2	2	6	2	0	MAS	
Town Neck Beach, Sandwich	2	2	3	2	0	Sandwich	
Trunk River/Moors, Falmouth	1	1	0	1	0	MAS	
Washburn Island, Falmouth	3	3	1	3	0	MAS	
West Dennis Beach, Dennis	8	8	17	8	0	Dennis	
Wings Island, Brewster	0	0	0	0	0	MAS	
Winstead Inn, Harwich	1	1	3	1	0	MAS	
Woodneck Beach, Falmouth	0	0	0	0	0	MAS	
Wychmere, Harwich	4	5	15	5	0	MAS	1 non-nesting territorial pair present >2 weeks
<b>LOWER CAPE</b>							
Clafin Landing/Chatham Bars Inn, Chatham	0	ND	ND	0	ND	MAS	
Cockle Cove, Chatham	1	1	0	1	0	MAS	Suspected to be the same as pair on Ridgevale Beach
Pleasant St. Beach, Chatham	0	0	0	0	0	MAS	
Boat Meadow, Eastham	0	ND	ND	0	ND	MAS	
Rock Harbor/Dyer Prince Rd, Eastham	0	ND	ND	0	ND	MAS	
Rock Harbor, Orleans	0	ND	ND	0	ND	MAS	
Skaket Beach, Orleans	0	ND	ND	0	ND	MAS	
Between Corn Hill Beach and Beach Point, Truro	0	ND	ND	0	ND	MAS	
Ryder Beach, Truro	0	0	0	0	0	MAS	
Field Point /Fox Is. WMA, Wellfleet	0	ND	ND	0	ND	MAS	
Indian Neck, Wellfleet	0	ND	ND	0	ND	MAS	
Mouth of Herring River - Mayo Beach, Wellfleet	0	ND	ND	0	ND	MAS	
Old Wharf, Wellfleet	0	ND	ND	0	ND	MAS	



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Armstrong Beach, Provincetown	9	9	12	9	0	NPS	
Ballston, Truro	3	3	5	3	0	NPS	1 pair originally nested at Newcomb Hollow
Ballston Town Beach, Eastham	2	2	0	2	0	MAS	
Beach Point, Truro	3	3	8	3	0	MAS	
Bound Brook, Wellfleet	1	1	3	1	0	NPS	
Cahoon Hollow, Wellfleet	2	2	0	2	0	NPS	1 territorial/scraping/non-nesting pair at site >2 weeks. 1 nesting pair moved to nest at Newcomb Hollow after nest failed at this site
Chatharbor Lane, Chatham	0	ND	ND	0	ND	MAS	
Clafin Landing/Chatham Bars Inn	0	ND	ND	0	ND	MAS	
Coast Guard Beach, Eastham	7	7	6	7	0	NPS	
Coast Guard Truro, Truro	8	10	10	10	0	NPS	2 pairs moved from Longnook to Coast Guard Truro after the census
Coast Guard Beach, Truro	0	0	0	0	0	MAS	
Corn Hill Beach, Truro	1	1	4	1	0	MAS	
Duck Harbor, Wellfleet	7	7	7	7	0	NPS	
Dyer Prince Beach	0	ND	ND	0	ND	MAS	
Exit 9, Provincetown	2	2	3	2	0	NPS	
First Encounter Beach, Eastham	0	0	0	0	0	MAS	
Fisher Beach, South Truro	3	3	11	3	0	MAS	
Fisher Beach, Truro	2	2	0	2	0	MAS	
Forest Beach, Chatham	1	1	4	1	0	MAS	2nd pair observed < 2 weeks
Great Is., Wellfleet	7	7	12	7	0	NPS	
Harding Beach, Chatham	5	5	9	5	0	MAS	
Harding Shores, Chatham	0	ND	ND	0	ND	MAS	Not surveyed after Index Count
Hatches Harbor, Provincetown	3	3	8	3	0	NPS	

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Head of the Meadow, Truro	5	6	8	6	0	NPS	1 pair failed and renested at Coast Guard Truro
Herring Cove, Provincetown	2	2	2	2	0	NPS	
Head of the Meadow, Truro (Town Beach)	0	0	0	0	ND	MAS	Head of the Meadow, Truro (Town Beach)
High Head, Truro	5	6	2	6	0	NPS	1 pair failed and renested at Armstrong
Jeremy Point, Wellfleet	6	6	6	6	0	NPS	
Lecount Hollow, Wellfleet	1	1	0	1	0	NPS	Single adult sporadically observed foraging
Lieutenant Island – SW, Wellfleet	0	ND	ND	0	ND	MAS	Not surveyed after Index Count
Lieutenant Island-NW, Wellfleet	1	1	4	1	0	MAS	
Lieutenant Island - The Hook, Wellfleet	0	ND	ND	0	ND	MAS	
Linnell Lane, Chatham	0	0	0	0	0	Chatham	
Longnook, Truro	3	3	2	3	0	NPS	2 pairs failed and renested at Coast Guard Truro
Marconi Beach, Wellfleet	1	2	0	2	0	NPS	Both pairs failed and renested at Marconi Station
Marconi Station, Wellfleet	4	5	4	5	0	NPS	2 pairs also nested on Marconi Beach
Minimoy Island, Chatham	5	5	8	5	0	USFWS	
Mission Bell, Provincetown	5	5	2	5	0	NPS	
Morris Island, Chatham	0	0	0	0	0	USFWS	2 birds periodically observed foraging on mudflats
Morris Island Dike/ Hardings Beach Point, Chatham	0	0	0	0	0	MAS	Foraging adults occasionally observed
Nauset Light Beach, Eastham	0	0	0	0	0	NPS	
Newcomb Hollow, Wellfleet	1	2	2	2	0	NPS	1 pair left site prior to Index Count and nested at Ballston; 1 pair nested here after failing at Cahoon Hollow
North (Nauset) Beach, Chatham	23	23	13	23	0	Chatham	
North Beach Island, Chatham	13	16	0	16	0	Chatham	1 pair left before Index Count and 2 pairs arrived after Index Count
North Monomoy Island, Chatham	1	2	2	2	0	USFWS	

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North Spit, Orleans	19	21	30	21	0	Orleans	
Quitneset, Chatham	5	6	0	6	0	MAS	2 non-nesting pairs scraping/territorial > 2 weeks and 1 may have nested
Race Point Beach, Provincetown	4	4	4	4	0	NPS	
Race Point North, Provincetown	14	15	21	15	0	NPS	
Race Point South, Provincetown	2	2	2	2	0	NPS	
Ridgevale Beach, Chatham	2	2	3	2	0	MAS	
Scatteree Landing, Chatham	0	ND	ND	0	ND	MAS	
South Beach - Middle Island, Chatham	14	14	1	14	0	MAS	2 territorial non-nesting pairs were present >2 weeks
South Beach (Nauset), Orleans	22	22	29	22	0	Orleans	
South Beach (North of Break), Chatham	1	2	3	2	0	MAS	Non-nesting scraping pair at site >2 weeks but left before Index Count
South Beach (South of Break), Chatham	8	8	ND	ND	ND	MAS	Site only surveyed on 5/27 due to access limitations
South Monomoy Island, Chatham	34	38	8	38	0	USFWS	
South Sunken Meadow, Eastham	0	0	0	0	0	MAS	1 unpaired male sporadically observed
Tern Island, Chatham	3	3	2	3	0	MAS	
White Crest Beach, Wellfleet	0	0	0	0	0	NPS	Territorial/scraping pair observed <2 weeks was likely pair counted at Cahoon Hollow
Wood End/Long Point, Provincetown	11	11	24	11	0	NPS	
<b>BUZZARDS BAY</b>							
Ward's Rock, Fairhaven	ND	ND	ND	0	ND	MAS	Site not surveyed
Blankenship Cove, Marion	ND	ND	ND	0	ND	MAS	
Meadow Island, Marion	0	ND	ND	0	ND	MAS	

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Planting Island, Marion	0	ND	ND	0	ND	MAS	
Planting Island Cove, Marion	0	ND	ND	0	ND	MAS	
Stewart's Island, Marion	0	ND	ND	0	ND	MAS	
Cedar Island, Wareham	0	ND	ND	0	ND	MAS	
Cromeset, Wareham	0	ND	ND	0	ND	MAS	
Swift's Beach, Wareham	0	ND	ND	0	ND	MAS	
Barney's Joy/Little Beach, Dartmouth	24	24	28	24	0	MAS	
Demarest Lloyd, Dartmouth	5	5	2	5	0	DCR	
Nonquitt, Dartmouth	3	3	7	3	0	MAS	
Round Hill, Dartmouth	0	0	0	0	0	MAS	
Salters Pond, Dartmouth	4	4	13	4	0	MAS	
Pine Island (Angelica Point and Strawberry Point), Mattapoisett	ND	1	ND	ND	ND	DFW	Site only surveyed once (late May)
South Shore Marshes, Fairhaven	ND	ND	ND	ND	ND	DFW	Site only visited once (late May)
West Island, Fairhaven	4	4	0	4	0	LCES	
West Island, Fairhaven	4	4	0	4	0	DCR	
Winsegansett Heights, Fairhaven	0	0	0	0	1	LCES	1 unpaired bird sporadically observed
Bird Island, Marion	0	0	0	0	0	DFW	
Little Island, Marion	0	ND	ND	0	ND	MAS	
Ram Is., Marion	ND	ND	ND	0	ND	DFW	Not surveyed
Brandt Island, Mattapoisett	ND	ND	ND	0	ND	DFW	Not surveyed
Ram Is., Mattapoisett	0	0	0	0	0	DFW	
Padanaram Harbor, South Dartmouth	0	0	0	0	0	MAS	Territorial pair scraped in mid-April; at site <2 weeks
Little Harbor Beach, Wareham	4	4	10	4	0	MAS	
Long Beach Point, Wareham	1	1	2	1	0	MAS	

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Stony Point Dike, Wareham	2	2	2	2	0	USACOE	
Baker's Beach, Westport	1	2	2	2	0	LCES	One pair last seen 5/30
Beach Ave, Westport	0	0	0	0	0	MAS	
Cockeast Pond (Elephant Rock), Westport	2	2	6	2	0	TNCRI	
East Beach, Westport	2	2	2	2	0	MAS	
Horseneck Beach, Westport	14	14	11	14	0	DCR	
Richmond Pond, Westport	2	2	0	2	0	TNCRI	
Westport Town Beach, Westport	3	3	0	3	0	MAS	1 territorial/scraping pair not documented nesting (at site >2 weeks)
<b>ELIZABETH ISLANDS</b>							
Church's Beach, Gosnold	0	ND	ND	0	ND	MAS	Site not surveyed after Index Count
Copicut Neck, Gosnold	0	ND	ND	0	ND	MAS	
Cuttyhunk, Gosnold	3	3	1	3	0	BBC	
Naushon Is. - West Beach, Gosnold	ND	ND	ND	ND	ND	DFW	Site not surveyed
Naushon Is. -Robinson's Hole, Gosnold	ND	ND	ND	ND	ND	DFW	Site not surveyed
Pasque Island-Quicks Hole, Gosnold	ND	ND	ND	ND	ND	DFW	Site not surveyed
Nashawena Island-Canapitsit, Gosnold	ND	ND	ND	ND	ND	DFW	Site not surveyed
Nashawena Island-Quicks Hole, Gosnold	ND	ND	ND	ND	ND	DFW	Site not surveyed
Naushon Is. - Crescent Beach, Gosnold	ND	ND	ND	ND	ND	DFW	Site not surveyed
Naushon Is. - French Watering Hole, Gosnold	ND	ND	ND	ND	ND	DFW	Site not surveyed
Naushon Is. - Kettle Cove, Gosnold	ND	ND	ND	ND	ND	DFW	Site not surveyed
Naushon Is. - Tarpaulin Cove, Gosnold	ND	ND	ND	ND	ND	DFW	Site not surveyed

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Pasque Island-Cobbly, Gosnold	ND	ND	ND	ND	ND	DFW	Site not surveyed
Pasque Island-Robinson's Hole, Gosnold	ND	ND	ND	ND	ND	DFW	Site not surveyed
<b>MARTHA'S VINEYARD</b>							
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	1	1	4	1	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	10	10	2	10	0	BW	
Lobsterville Beach, Aquinnah	1	1	2	1	0	MAS	
Menemsha Neck Preserve, Aquinnah	0	0	0	0	0	MVLBC	1-2 plovers sporadically observed foraging at site
Moshup Beach, Aquinnah	1	1	2	1	0	MVLBC	
Philbin Beach, Aquinnah	1	1	0	1	0	BW	
Black Point Pond, Chilmark	0	1	0	1	0	BW	
Cape Higgon, Chilmark	0	ND	ND	0	ND	BW	Site not surveyed after Index Count
Chilmark Pond Preserve, Chilmark	0	0	0	0	0	MVLBC	
Chilmark Pond, Chilmark	2	2	2	2	0	BW	
Great Rock Bight Preserve, Chilmark	0	0	0	0	0	MVLBC	
Lucy Vincent Beach, Chilmark	1	1	3	1	0	BW	
Nomans Land Island NWR, Chilmark	0	ND	ND	0	ND	USFWS	Site surveyed 1x (Index Count)

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Quansoo, Chilmark	5	5	0	5	0	MAS	
Spring Point, Chilmark	0	ND	ND	0	ND	BW	Site only surveyed during Index Count
Squibnocket Beach/Long Beach, Chilmark	3	3	0	3	0	BW	
Squibnocket Pond Reservation, Aquinnah	1	1	0	1	0	MVLBC	
Stonewall Beach, Chilmark	1	1	0	1	0	BW	
Arruda's Point/The Jetties, Edgartown	3	3	0	3	0	TTOR	
Bend-in-the-Road Beach, Edgartown	0	0	0	0	0	MAS	
Caleb's Pond, Edgartown	0	0	0	0	0	BW	
Cape Pogue Elbow / The Narrows, Edgartown	6	6	0	6	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	0	0	0	0	MAS	1 unpaired/scraping PIPL observed on site <2 weeks
Cracktuxet Trust Beach, Edgartown	0	0	0	0	0	BW	
Edgartown Great Pond (Job's Neck), Edgartown	8	8	3	8	0	BW	
Edgartown Great Pond, Edgartown	0	0	0	0	0	MVLBC	
Haystack Island, Edgartown	0	ND	ND	0	ND	MAS	
Leland / East Beach, Edgartown	8	8	6	8	0	TTOR	
Lighthouse Beach, Edgartown	3	3	2	3	0	BW	
Little Beach / Eel Pd., Edgartown	5	5	6	5	0	BW	

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Little Neck, Edgartown	0	0	0	0	0	TTOR	
Norton Point Beach, Edgartown	6	7	0	7	0	TTOR	
Oyster Pond, Edgartown	0	1	0	1	0	BW	
Paqua Pond, Edgartown	0	1	0	1	0	BW	Pair arrived in late June
Pease's Pond, Edgartown	ND	ND	ND	0	ND	BW	Site not surveyed after May
Quammox Preserve, Edgartown	0	0	0	0	0	MVLBC	
South Beach, Edgartown	0	ND	ND	0	ND	BW	Site not surveyed after Index Count
Sylvia State Beach Edgartown, Edgartown	0	0	0	0	0	MAS	
Wasque, Edgartown	1	2	0	2	0	TTOR	
Yorke - Allen Point, Edgartown	0	0	0	0	0	MAS	
Dougs Cove Preserve, Oak Bluffs	0	0	0	0	0	MVLBC	
Eastville Beach, Oak Bluffs	1	1	4	1	0	MAS	
Harthaven, Oak Bluffs	0	0	0	0	0	MAS	
James Pond Preservation West Tisbury	0	0	0	0	0	MVLBC	
Sarson Island, Oak Bluffs	0	ND	ND	0	ND	MAS	
Sylvia State Beach Oak Bluffs, Oak Bluffs	1	1	0	1	0	MAS	1 territorial/scraping pair present >2 weeks
Mink Meadows, Tisbury	2	2	0	2	0	MAS	
Tashmoo Preserve, Tisbury	0	0	0	0	ND	MVLBC	Unpaired adult observed 6/10
West Tashmoo, Tisbury	3	3	1	3	0	BW	
Wilfrids Pond Preserve, Tisbury	0	0	0	0	0	MVLBC	
Cedar Tree Neck, West Tisbury	0	0	0	0	0	BW	
Lamberts Cove, West Tisbury	1	1	3	1	0	BW	



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Long Point, West Tisbury	2	1	0	2	0	TTOR	
Paul's Point, West Tisbury	0	ND	ND	0	ND	BW	Site not surveyed after Index Count
Sepiessa Point Reservation, West Tisbury	1	1	0	1	0	MVLBC	1 territorial non-nesting pair at site >2 weeks
Seven Gates, West Tisbury	ND	ND	ND	0	ND	BW	
Short Cove Preserve, West Tisbury	0	0	0	0	0	MVLBC	
Tisbury Great Pond, West Tisbury	1	1	0	1	0	MVLBC	1 non-nesting territorial pair present >2 weeks
Watcha Pond, West Tisbury	0	2	0	2	0	BW	Pairs arrived after Index Count (mid-June) and likely came from Tisbury Great Pond and Long Point
<b>NANTUCKET</b>							
Hoicks Hollow, Nantucket	0	0	0	0	0	MAS	
40th Pole, Nantucket	2	2	0	2	0	Nantucket	
Capaum Pond, Nantucket	0	0	0	0	0	NCF	
Chase Links, Nantucket	1	1	3	1	0	MAS	Thought to be pair that moved from Washing Pond
Coatue, Nantucket	8	10	14	10	0	NCF	
Coatue Harbor Nantucket	0	0	0	0	0	TTOR	
Coskata-West Beach, Nantucket	1	1	2	1	0	TTOR	
Coskata-East Beach, Nantucket	1	1	0	1	0	TTOR	
Dionis Beach, Nantucket	2	3	6	3	0	Nantucket	No nest found for 1 pair (found 2-day old chicks)
Eel Point, Nantucket	10	10	8	10	0	NCF	
Eel Point, Nantucket	1	1	0	1	0	MAS	New census site on private property
Great Point, Nantucket	2	2	2	2	0	TTOR	
Hummock and West Hummock Ponds, Nantucket	0	0	0	0	0	NCF	
Jetties Beach, Nantucket	2	2	3	2	0	Nantucket	
Little Neck, Nantucket	0	0	0	0	0	NCF	
Long Pond, Nantucket	0	0	0	0	0	NCF	

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Low Beach, Nantucket	4	4	3	4	0	Nantucket	
Millie's Bridge, Nantucket	0	0	0	0	0	MAS	1 pair observed scraping and courting in the area on 4/27
Monomoy Creeks, Nantucket	0	0	0	0	0	NCF	
Muskeget Is., Nantucket	8	8	7	8	0	MAS	Possibly 2-4 more chicks fledged. A territorial 9th pair observed on one survey. Site not surveyed often.
Nantucket NWR (Great Point), Nantucket	2	2	1	2	0	USFWS	
Polpis Harbor (Medouie Creek and Pocomo Meadows), Nantucket	0	0	0	0	0	NCF	
Quidnet/Sesachacha Pond/Greenhills, Nantucket	2	2	0	2	0	MAS	
Sheep Pond, Nantucket	0	0	0	0	0	NCF	
Smith's Point, Nantucket	0	0	0	0	0	MAS	
Smith Point / Esther Is., Nantucket	8	8	12	8	0	Nantucket	
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	2	2	3	2	0	MAS	
The Galls, Nantucket	1	1	0	1	0	TTOR	
The Glades, Nantucket	0	0	0	0	0	TTOR	1 pair present in April scraping for a week but never nested and left site
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	0	1	0	TLT	
Tuckernuck Is. - East Pond, Nantucket	0	0	0	0	1	TLT	1 adult observed into June

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Tuckernuck Is. - North Pond, Nantucket	1	1	0	1	0	TLT	
Tuckernuck Is. - North Shore, Nantucket	0	1	0	1	0	TLT	Female thought to have been buried by sand incubating nest during Nor'easter
Tuckernuck Is. - Whale Point, Nantucket	8	8	13	8	1	TLT	
Tuckernuck Is. -Charlie's Point/ South Beach, Nantucket	0	0	0	0	0	TLT	Erosion has negatively impacted plover nesting habitat
UMass Field Station, Nantucket	0	0	0	0	0	NCF	
Washing Pond, Nantucket	1	1	0	1	0	MAS	Pair likely nested at Chase Links after nest failed
Wauwinet, Nantucket	2	3	0	3	0	MAS	
Western Ave, Nantucket	0	0	0	0	0	MAS	

<sup>a</sup> *Index Count* = number of pairs counted between 1-9 June 2020, the standardized *Index Count* period for the Atlantic Coast population.

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

<sup>c</sup> *Chicks fledged* are defined as chicks ≥ 25 days of age or observed in flight, whichever occurs first. Number of *Pairs with fledge 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.

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

<sup>e</sup> 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, GSC = Gurnet Saquish Corporation, 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

<sup>f</sup> Pairs that moved between sites (as indicated in "Notes") were not double-counted in tallies.