

**SUMMARY OF THE 2011  
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 2011 breeding season. Observers reported breeding pairs of Piping Plovers present at 146 sites; 111 additional sites were surveyed at least once, but no breeding pairs were detected at them. The *Index Count* (statewide census conducted 1-9 June) was 631.5 pairs, and the *Adjusted Total Count* (estimated total number of breeding pairs statewide for the entire 2011 breeding season) was 656 pairs. A total of 757 chicks were reported fledged in 2011, for an overall productivity of 1.18 chicks fledged per pair, based on data from 641 of 656 (98%) pairs

### 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 also is 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 2011, 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 30 federal and state agencies, local municipalities, local and regional land trusts, private conservation organizations, and universities. Data summarized in this report were contributed by over 80 individuals. Cooperators monitored a total of 257 sites in Massachusetts in 2011 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 2011, the *Index Count* period was 1-9 June. The objective of the *Index Count* is to estimate population size with a minimum of 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 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 color-banded birds, however, it is impossible to accurately determine whether late-nesting pairs may have nested earlier at a different site, or simply did not arrive or begin breeding activities until June. It is too subjective, and likely inaccurate, to try and 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*.

## **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. 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.

## **RESULTS**

Observers reported breeding Piping Plovers at 146 sites in Massachusetts in 2011. An additional 111 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* in 2011 was 656 pairs (Table 1). The *Index Count* in 2011 was 631.5 pairs, or 96 % of the *Adjusted Total Count*. A total of 757 chicks were reported fledged in 2011, resulting in overall productivity of 1.18 chicks fledged per pair, based on data from 641 of 656 (98%) pairs (Table 1). By comparison, in 2010 the *Index Count* was 573 pairs, the *Adjusted Total Count* was 591 pairs, and overall productivity was 1.50 chicks fledged per pair (Melvin 2011).

Two regions harbored 61% of the total breeding pairs in the state in 2011: the Lower Cape (39%) and the Upper Cape (22%) (Table 1). Individual sites with the largest numbers of pairs (*Total Count*) were South Beach, Chatham (55 pairs), Sandy Neck, Barnstable (43 pairs), South Monomoy Island, Chatham (41 pairs), Crane Beach, Ipswich (35 pairs), Nauset Spit, Orleans (24 pairs), Race Point-South, Provincetown/Truro (22 pairs), Plymouth Long Beach, Plymouth (20 pairs), North Beach Island, Chatham (16), and Parker River National Wildlife Refuge, Newbury and Rowley (13 pairs). Although the 16 largest sites, *i.e.*, those with  $\geq 10$  pairs, supported 54% of all pairs in the state, the smallest sites (1-3 pairs,  $n = 99$  sites) were collectively also important, accounting for 25% of all pairs.

### ACKNOWLEDGEMENTS

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 2011. We also thank the more than 30 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. Thanks also to Sarah Maier, Massachusetts Natural Heritage and Endangered Species Program, for her assistance in correcting an earlier version of this compilation.

### LITERATURE CITED

- U.S. Fish and Wildlife Service. 1996. Piping Plover (*Charadrius melodus*) Atlantic Coast population revised recovery plan. U.S. Fish and Wildlife Service, Hadley, MA. 245 pp.
- Hecht, A. and S. M. Melvin. 2009a. Population trends of Atlantic Coast Piping Plovers, 1986-2006. *Waterbirds* 32(1):64-72.
- Hecht, A. and S. M. Melvin. 2009b. Expenditures and effort associated with recovery of breeding Atlantic Coast Piping Plovers. *J. Wildlife Management* 73(7):1099-1107.
- Melvin, S. M. 2011. Summary of 2010 Massachusetts Piping Plover census. Massachusetts Division of Fisheries and Wildlife, Westborough, MA. 18 pp.

Table 1. Abundance, distribution, and productivity of Piping Plovers in Massachusetts, 2011.

Location	Number of pairs		No. chicks fledged <sup>c</sup>	No. pairs with fledge data <sup>c</sup>	Source <sup>d</sup>
	Index Count <sup>a</sup>	Total Count <sup>b</sup>			
<b>NORTH SHORE</b>					
North Salisbury Beach, Salisbury <sup>e</sup>	0	0	0	0	DCR
South Salisbury Beach, Salisbury <sup>e</sup>	0	0	0	0	DCR
Plum Island town beaches, Newburyport/Newbury	1	1	1	1	USFWS
Parker River NWR, Newbury/Rowley	19	19	34	19	USFWS
Sandy Point State Res., Ipswich	6	6	10	6	USFWS
Crane Beach, Ipswich	31	35	56	35	TTOR
Coffin's Beach, Gloucester	nd <sup>f</sup>	nd	nd	nd	nd
Wingaersheek Beach, Gloucester	nd	nd	nd	nd	nd
Good Harbor Beach, Gloucester	nd	nd	nd	nd	nd
Revere Beach, Revere	3	3	11	3	MAS, DCR
Winthrop Beach, Winthrop	2	2	7	2	MAS, DCR
Yirrell Beach, Winthrop	2	3 <sup>g</sup>	5	3 <sup>g</sup>	MAS
L Street Beach, Boston	nd <sup>g</sup>	1 <sup>g</sup>	0	1 <sup>g</sup>	MAS
<b>SOUTH SHORE</b>					
The Glades, Scituate	0	0	0	0	MAS
Third Cliff, Scituate	4	4	0	4	MAS
Fourth Cliff, Scituate	1	1	2	1	MAS
Humarock, Scituate	1	1	0	1	MAS
Rexhame Beach, Marshfield	0	0	0	0	MAS
Duxbury Beach, Duxbury/Plymouth	12	12	19	12	MAS, Duxbury
Saquish, Plymouth <sup>h</sup>	0	nd	nd	0	MAS
Plymouth Long Beach, Plymouth	20	20	19	20	Plymouth
Ellisville, Plymouth <sup>i</sup>	4	4	2	4	FEM, MAS

Location	Number of pairs		No. chicks fledged <sup>c</sup>	No. pairs with fledge data <sup>c</sup>	Source <sup>d</sup>
	Index Count <sup>a</sup>	Total Count <sup>b</sup>			
Sagamore Beach, Bourne, Sandwich, and Plymouth	3	3	0	3	MAS
Scusset Beach State Res., Sandwich	1	1	0	1	MAS
<b>UPPER CAPE</b>					
Mashnee Dike, Bourne	0	0 <sup>j</sup>	0	0	ACOE
Bassetts Island, Bourne	nd	nd	nd	nd	nd
Old Silver Beach, Falmouth	nd	nd	nd	nd	nd
Little Island Beach, Falmouth	0	nd	nd	0	MAS
Chappaquoit Beach, Falmouth	0	nd	nd	0	MAS
Black Beach, Falmouth	1.5 <sup>k</sup>	2 <sup>k</sup>	4	2 <sup>k</sup>	MAS
Sippewisset, Falmouth	4	4	7	4	MAS
Woodneck Beach, Falmouth	1	1	2	1	MAS
Falmouth Heights, Falmouth	nd	nd	nd	nd	nd
Acapasket Beach, Falmouth	0	nd	nd	0	MAS
Menauhant Beach, Falmouth	0	nd	nd	0	MAS
Menauhant Yacht Club Beach, Falmouth	1	1	0	1	WBNRR
Washburn Island, Falmouth	0	1	0	1	WBNERR
South Cape Beach, Mashpee	5	5	7	5	WBNERR
New Seabury, Mashpee	1	1	0	1	WBNERR
Rock Landing/Maushop Village, Mashpee	0	nd	nd	0	MAS
Popponesset Spit, Mashpee	2	2	3	2	MAS
Town Neck Beach, Sandwich	3	3	0	3	MAS
Springhill Beach, Sandwich	12	12	10	12	MAS
East Sandwich Beach, Sandwich	9	9	8	9	MAS
Scorton (Neck) Creek, Sandwich	4	4	1	4	MAS
Scorton Shores, Sandwich <sup>l</sup>	4 <sup>m</sup>	4 <sup>m</sup>	0	4 <sup>m</sup>	MAS

Location	Number of pairs		No. chicks fledged <sup>c</sup>	No. pairs with fledge data <sup>c</sup>	Source <sup>d</sup>
	Index Count <sup>a</sup>	Total Count <sup>b</sup>			
Sandy Neck, Barnstable	43 <sup>m</sup>	43 <sup>m</sup>	57	43 <sup>m</sup>	Barnstable
Rushy Marsh Pond Beach, Barnstable	nd	nd	nd	nd	nd
Loop Beach, Barnstable	nd	nd	nd	nd	nd
Sampson's Is.-Dead Neck, Barnstable	7	10	12	10	MAS
Bone Hill Road, Barnstable	0	nd	nd	0	MAS
Dowses Beach, Barnstable	1	1	0	1	Barnstable
Long Beach, Barnstable	2	3 <sup>n</sup>	0	3 <sup>n</sup>	MAS
Craigville Beach, Barnstable	1	1 <sup>n, o</sup>	3 <sup>o</sup>	1 <sup>n, o</sup>	MAS
Memorial Beach, Barnstable	0	1 <sup>o</sup>	3 <sup>o</sup>	1 <sup>o</sup>	MAS
Squaw Island, Barnstable	2	3	3	3	MAS
Squaw Is. Road / Causeway, Barnstable	0	1	0	1	MAS
Sea St./ Keyes Beach, Barnstable	0	nd	nd	0	MAS
Kalmus Park, Barnstable	6	6	11	6	Barnstable
Fortes Beach, Barnstable	0	nd	nd	0	MAS
Colonial Acres-Standish Way, Yarmouth	0	nd	nd	0	MAS
Gray's Beach, Yarmouth	1	1	0	1	MAS
Great Island - Smith Point, Yarmouth	1	1	0	1	MAS
Great Island Causeway, Yarmouth	2	3	3	3	MAS
Radio City Beach, Yarmouth	1	1	3	1	MAS
Seagull Beach, Yarmouth	3	3	9	3	MAS
Red Jacket Inn, Yarmouth	0	nd	nd	0	MAS
Bass River Beach / Smugglers, Yarmouth	0	nd	nd	0	MAS
West Dennis Beach, Dennis	5	5	14	5	Dennis
South Village Beach, Dennis	0	1	0	1	Dennis
Miramar Beach (Swan River), Dennis	1	1	4	1	MAS
Haigis to Inman Rd., Dennis	0	nd	nd	0	Dennis, MAS
Bayview, Dennis	0	nd	nd	0	MAS



Location	Number of pairs		No. chicks fledged <sup>c</sup>	No. pairs with fledge data <sup>c</sup>	Source <sup>d</sup>
	Index Count <sup>a</sup>	Total Count <sup>b</sup>			
Chapin Beach, Dennis	2	3	2	3	Dennis
Mayflower Beach, Dennis	0	0 <sup>P</sup>	0	0	Dennis, MAS
Corporation Beach, Dennis	0	nd	nd	0	MAS
Howes St. Beach, Dennis	0	nd	nd	0	MAS
Sesuit Harbor Beach, Dennis	0	nd	nd	0	MAS
Cold Storage Beach, Dennis	0	nd	nd	0	Dennis, MAS
Sea St. (north side), Dennis	0	nd	nd	0	Dennis, MAS
Coles Pond, Dennis	0	0	0	0	Dennis
Crowes Pasture / Quivett Neck, Dennis	1	2	0	2	Dennis
Wings Island, Brewster	1	1	0	1	MAS
Paine's Creek, Brewster	0	nd	nd	0	MAS
Mants Landing, Brewster	0	nd	nd	0	MAS
Robbins Hill Beach, Brewster	0	nd	nd	0	MAS
Saint's Landing, Brewster	0	nd	nd	0	MAS
Breakwater Beach, Brewster	0	nd	nd	0	MAS
Point of Rocks Landing, Brewster	0	nd	nd	0	MAS
Ellis Landing, Brewster	0	nd	nd	0	MAS
Linnell Landing Beach, Brewster	0	nd	nd	0	MAS
Crosby Landing Beach, Brewster	1	2	2	2	MAS
Earle Rd. Beach, Harwich	0	0	0	0	MAS
Grey Neck Road Beach, Harwich	0	0	0	0	MAS
Allens Harbor, Harwich	0	0	0	0	MAS
Belmont Condos, Harwich	1	1	0	1	MAS
Bank St./Merkel Beach/Wychmere, Harwichport	3	3	8	3	MAS
Saquatucket Shores, Harwich	0	0	0	0	MAS
Saquatucket Bluffs, Harwich	0	0	0	0	MAS
Red River Beach, Harwich	2 <sup>q</sup>	2 <sup>q</sup>	2 <sup>q</sup>	2 <sup>q</sup>	MAS

Location	Number of pairs		No. chicks fledged <sup>c</sup>	No. pairs with fledge data <sup>c</sup>	Source <sup>d</sup>
	Index Count <sup>a</sup>	Total Count <sup>b</sup>			
<b>LOWER CAPE</b>					
Pleasant St. Beach, Chatham	1 <sup>q</sup>	1 <sup>q</sup>	2 <sup>q</sup>	1 <sup>q</sup>	MAS
Forest Beach, Chatham	1	1	0	1	MAS
Chatharbor Lane (Mill Ck.), Chatham	1	1	1	1	MAS
Cockle Cove, Chatham	0	0	0	0	MAS
Ridgevale Beach, Chatham	2	2	2	2	MAS
Harding Shores, Chatham	0	nd	nd	0	MAS
Harding Beach, Chatham	3	3	8	3	MAS
Harding Beach Point, Chatham	0	nd	nd	0	MAS
North Monomoy Island, Chatham	0	0 <sup>r</sup>	0	0	USFWS
Minimoy Island, Chatham <sup>s</sup>	0	0 <sup>r</sup>	0	0	USFWS
South Monomoy Island, Chatham	38	41	46	41	USFWS
South Beach, Chatham	49	55	71	55	MAS
Morris Island dredge spoil, Chatham	0	nd	nd	0	MAS
Tern Island, Chatham	1	1	0	1	MAS
Clafin Landing/ Chatham Bars Inn, Andrew Harding Way, Chatham	0	nd	nd	0	MAS
Linnell Lane, Chatham	0	nd	nd	0	MAS
North Beach Island, Chatham	14	14	34	14	Chatham
North (Nauset) Beach, Chatham	6	6	8	6	Chatham
North (Nauset) Beach, Orleans	6 <sup>t</sup>	8 <sup>t</sup>	6	8	Orleans
Nauset Spit (Heights), Orleans	22	24	2	24	Orleans
New Island, Orleans/Eastham	1	1	0	1	NPS, Orleans
Skaket Beach, Orleans	0	0	0	0	Orleans
Rock Harbor (north and south sides), Eastham	0	nd	nd	0	MAS
Boat Meadow, Eastham	nd	nd <sup>u</sup>	nd	nd	MAS
First Encounter Beach, Eastham	0 <sup>v</sup>	0 <sup>v</sup>	0	0	MAS

Location	Number of pairs		No. chicks fledged <sup>c</sup>	No. pairs with fledge data <sup>c</sup>	Source <sup>d</sup>
	Index Count <sup>a</sup>	Total Count <sup>b</sup>			
Campground Beach, Eastham <sup>w</sup>	0	nd	nd	0	MAS
Cooks Beach, Eastham	0	nd	nd	0	MAS
So. Sunken Meadow, Eastham	1	2	3	2	MAS
Coast Guard Beach, Eastham	4	4	0	4	NPS
Nauset Light Beach, Eastham	0	0	0	0	NPS
Marconi Beach, Wellfleet	5	5	8	5	NPS
Marconi Station, Wellfleet	0	0	0	0	NPS
Lecount Hollow, Wellfleet	0	0	0	0	NPS
White Crest Beach, Wellfleet	0	0	0	0	NPS
Cahoon Hollow, Wellfleet	1	1	0	1	NPS
Lieutenant Island - SW, Wellfleet	0	1	0	1	MAS
Lieutenant Island - NW, Wellfleet	1 <sup>x</sup>	1.5 <sup>x</sup>	0	1.5 <sup>x</sup>	MAS
Field Point /Fox Is. WMA, Wellfleet	1	1	0	1	MAS
Indian Neck, Wellfleet	0	nd	nd	0	MAS
Jeremy Point, Wellfleet <sup>y</sup>	8	8	2	8	NPS
Great Is., Wellfleet <sup>y, z</sup>	5	5	3	5	NPS
Duck Harbor, Wellfleet <sup>y</sup>	2	2	0	2	NPS
Bound Brook, Wellfleet <sup>y</sup>	1	1	0	1	NPS
Ryder Beach, Truro	0	0	0	0	MAS
Fisher Beach (Pamet Harbor -South), Truro	4	4	4	4	MAS
Corn Hill Beach (Pamet Harbor - North), Truro	2	4	3	4	MAS
Between Corn Hill Beach and Beach Point, Truro <sup>aa</sup>	0	nd	nd	0	MAS
Pilgrim Beach/Beach Point, Truro	3	3	2	3	MAS
Newcomb Hollow, Wellfleet / Truro	0	0	0	0	NPS
Ballston Beach, Truro	6	6	16	6	NPS
Longnook Beach, Truro	1	1	4	1	NPS

Location	Number of pairs		No. chicks fledged <sup>c</sup>	No. pairs with fledged data <sup>c</sup>	Source <sup>d</sup>
	Index Count <sup>a</sup>	Total Count <sup>b</sup>			
Coast Guard Beach, Truro	1	1	1	1	NPS
Dead Forest / Head of the Meadow / High Head, Truro <sup>bb</sup>	4	4	3	4	NPS
Race Point-South Beach, Provincetown / Truro <sup>cc</sup>	20	22	19	22	NPS
Race Point-North/Hatches Harbor, Provincetown <sup>dd</sup>	10	10	9	10	NPS
Long Point/Wood End, Provincetown	12	12	25	12	NPS
Herring Cove Beach, Provincetown <sup>ee</sup>	0	0	0	0	NPS
<b>BRISTOL COUNTY</b>					
Stony Point Dike, Wareham	2	2	0	2	ACOE
Long Beach Point, Wareham	0	nd	nd	0	MAS
Little Harbor Beach, Wareham	1	1	2	1	MAS
Ram Is., Marion	1	1	0	1	MAS
Ram Is., Mattapoisett	0	0	0	0	DFW
Strawberry and Angelica Points, Mattapoisett	3	3	4	3	MAS
Round Is., Fairhaven	nd <sup>ff</sup>	nd <sup>ff</sup>	nd	nd	DFW
West Island, Fairhaven	5	5	15	5	LCE
Winsegansett Heights, Fairhaven	0	0	0	0	LCE
Round Hill Beach, Dartmouth	0	0	0	0	MAS
Salters Pond, Dartmouth	2	2	1	2	MAS
Nonquitt, Dartmouth	2	2	5	2	MAS
Demarest Lloyd State Park, Dartmouth	4	4	10	4	LCE
Little Beach/Barney's Joy, Dartmouth	12	13	13	13	MAS
East Beach, Westport	1	1	0	1	MAS
Gooseberry Neck, Westport	0	1 <sup>gg</sup>	0	1 <sup>gg</sup>	LCE
Horseneck Beach State Reservation, Westport <sup>hh</sup>	5	7 <sup>gg</sup>	2	7 <sup>gg</sup>	LCE

Location	Number of pairs		No. chicks fledged <sup>c</sup>	No. pairs with fledge data <sup>c</sup>	Source <sup>d</sup>
	Index Count <sup>a</sup>	Total Count <sup>b</sup>			
Baker's Beach / Westport Town Beach, Westport <sup>hh</sup>	2	3	1	3	MAS
Acoaxet, Westport	0	0	0	0	TNC-RI
Cockeast Pond, Westport	2	2	7	2	TNC-RI
Richmond Pond, Westport	3	3	1	3	TNC-RI
Bay Point, Swansea	0	0	0	0	A. Waring
<b>ELIZABETH ISLANDS</b>					
Naushon Is. – Tarpaulin Cove	2	2	nd	0	R. Thieler
Naushon Is. – Robinson's Hole	0	nd	nd	0	DFW
Naushon Is. – West Beach	1	1	nd	0	DFW
Naushon Is. – Crescent Beach	0	nd	nd	0	DFW
Naushon Is. – Kettle Cove	1	1	nd	0	DFW
Pasque Island-Robinson's Hole	1	1	nd	0	DFW
Pasque Island-Cobbly	nd	nd	nd	nd	nd
Pasque Island-Quicks Hole	nd	nd	nd	nd	nd
Nashawena Island-Quicks Hole	2	2	nd	0	DFW
Nashawena Island-Canapitsit	0	nd	nd	0	DFW
Cuttyhunk Island, Gosnold	1 <sup>ii</sup>	1 <sup>ii</sup>	nd	0	DFW
Penikese Island, Gosnold	0	0	0	0	DFW
<b>MARTHA'S VINEYARD</b>					
Eastville Beach, Oak Bluffs	0	0	0	0	MAS
Harthaven, Oak Bluffs	0	1	0	1	MAS
Sylvia State Beach, Oak Bluffs	1	1	0	1	MAS
Sylvia State Beach / Bend-in-the-Road Beach, Edgartown	1 <sup>jj</sup>	1 <sup>jj</sup>	0	1 <sup>jj</sup>	MAS
Cow Bay, Edgartown	1 <sup>jj</sup>	2 <sup>jj</sup>	0	2 <sup>jj</sup>	MAS

Location	Number of pairs		No. chicks fledged <sup>c</sup>	No. pairs with fledge data <sup>c</sup>	Source <sup>d</sup>
	Index Count <sup>a</sup>	Total Count <sup>b</sup>			
Sarson Is., Oak Bluffs	0	nd	nd	0	MAS
Little Gravel Is., Oak Bluffs	0	0	0	0	MAS
Big Gravel Is., Oak Bluffs	0	0	0	0	MAS
Yorke - Allen Point, Edgartown	0	0	0	0	MAS
Little Beach / Eel Pd., Edgartown	2 <sup>kk</sup>	2 <sup>kk</sup>	0	2 <sup>kk</sup>	BW
Lighthouse Beach, Edgartown	0 <sup>kk</sup>	1 <sup>kk</sup>	0	1 <sup>kk</sup>	BW
Chappaquiddick Point Beach, Chappaquiddick	0	0	0	0	MVLB
Cape Pogue Elbow / The Narrows, Chappaquiddick	3	3	4	3	TTOR
Little Neck, Chappaquiddick	0	0	0	0	TTOR
Arruda's Point / The Jetties, Chappaquiddick	0	0	0	0	TTOR
Leland / East Beach, Chappaquiddick	4	5	5	5	TTOR
Wasque, Chappaquiddick	0	0	0	0	TTOR
Norton Point Beach, Chappaquiddick	1	1	1	1	TTOR
Norton Point Beach, Edgartown	4	6	2	6	TTOR
South Beach, Edgartown	1	1	0	1	BW
Crackatuxet Pond, Edgartown	nd	nd	nd	nd	nd
Edgartown Great Pond, Edgartown	5	5	10	5	BW, MVLB
Jobs Neck, Edgartown	nd <sup>ll</sup>	nd	nd	nd	BW
Paqua Pond, Edgartown	nd <sup>ll</sup>	nd	nd	nd	BW
Oyster Pond, Edgartown	2	2	7	2	BW
Watcha Pond, W. Tisbury	1	1	2	1	BW
Long Point, Chilmark	0	0	0	0	TTOR
Tisbury Great Pond / Quansoo, Chilmark	5	5	0	5	MAS, MVLB
Black Point Pond, Chilmark	0	0 <sup>mm</sup>	0	0	BW
Chilmark Pond, Chilmark	3	3	2	3	BW
Lucy Vincent Beach, Chilmark	0	nd	nd	0	BW

Location	Number of pairs		No. chicks fledged <sup>c</sup>	No. pairs with fledge data <sup>c</sup>	Source <sup>d</sup>
	Index Count <sup>a</sup>	Total Count <sup>b</sup>			
Stonewall Beach, Chilmark	0	0	0	0	BW
Squibnocket Beach, Chilmark	0	2	2	2	BW
Long Beach, Aquinnah	1	1	2	1	BW
Philbin Beach, Aquinnah	0	nd	nd	0	BW
Moshup Beach, Aquinnah	0	0	0	0	MVLB
Dogfish Bar, Aquinnah	6	6	1	6	BW
Lobsterville Beach, Aquinnah	2	2	0	2	MAS
Menemsha Beach, Chilmark	0	nd	nd	0	MAS
Lambert's Cove, West Tisbury	0	nd	nd	0	BW
Cedar Tree Neck, W. Tisbury	1	1	0	1	BW
Great Rock Bight Preserve, Chilmark	nd	nd	nd	nd	nd
Sepiessa Point Reservation, West Tisbury	0	0	0	0	MVLB
West Tashmoo, Tisbury	1	1	0	1	BW
East Tashmoo, Tisbury	2	2	0	2	MAS
Mink Meadows /West Chop, Tisbury	2	3	3	3	MAS
Northern Pines Shores, Tisbury	nd	nd	nd	nd	nd
Wilfrid's Pond Preserve, Vineyard Haven	0	0	0	0	MVLB
Maciel Marine, Vineyard Haven	0	0	0	0	MAS
Nomans Land Island NWR	0	0	0	0	USFWS
<b>NANTUCKET</b>					
Great Point	3	3	3	3	TTOR
The Galls	2	2	1	2	TTOR
Coskata-West Beach <sup>nn</sup>	2	2 <sup>oo</sup>	3	2 <sup>oo</sup>	TTOR
Coatue	8	9 <sup>oo</sup>	1	9 <sup>oo</sup>	NCF
Coskata-East Beach <sup>pp</sup>	0	0	0	0	TTOR

Location	Number of pairs		No. chicks fledged <sup>c</sup>	No. pairs with fledge data <sup>c</sup>	Source <sup>d</sup>
	Index Count <sup>a</sup>	Total Count <sup>b</sup>			
Coskata Inlet/The Haulover <sup>qq</sup>	0	0	0	0	NCF
Wauwinet	1	2	0	2	MAS
Squam Pond / Squam Road	0	0	0	0	MAS, NCF
Quidnet/Sesachacha Pond	3	3	6	3	MAS
Low Beach	2	2	0	2	Nantucket
Tom Nevers	0	0	0	0	Nantucket
Surfside	0	0	0	0	Nantucket
Hummock Pond	0	0	0	0	NCF
Smith Point / Esther Is. <sup>rr</sup>	3	3	0	3	Nantucket
Eel Point	10	10	10	10	NCF
Dionis Beach	0	0	0	0	Nantucket
East Hallowell Lane	0	0	0	0	MAS
Jetties Beach	2	2	6	2	Nantucket
Monomoy Creeks	0	0	0	0	NCF
UMass Field Station	0	0	0	0	NCF
Quaise Point	0	0	0	0	Nantucket
Polpis Harbor, Ram Is., and Medouie Point	0	0	0	0	NCF
Long Pond	0	0	0	0	NCF
Madaket Beach	0	0	0	0	Nantucket
Tuckernuck Is. - Whale Point	3	3 <sup>ss</sup>	1	3 <sup>ss</sup>	TLT
Tuckernuck Is. - Bigelow's Point	3	4 <sup>ss</sup>	1	4 <sup>ss</sup>	TLT
Tuckernuck Is. - North Pond	1	1	2	1	TLT
Tuckernuck Is. - East Pond	0	0	0	0	TLT
Muskeget Is.	7	7	nd	0	MAS
"Minimusk" Is. <sup>tt</sup>	0	nd <sup>tt</sup>	nd	0	MAS



Location	Number of pairs		No. chicks fledged <sup>c</sup>	No. pairs with fledge data <sup>c</sup>	Source <sup>d</sup>
	Index Count <sup>a</sup>	Total Count <sup>b</sup>			
<b>UNADJUSTED TOTALS</b>	<b>631.5</b>	<b>680.5<sup>uu</sup></b>	<b>757</b>	<b>665.5<sup>vv</sup></b>	
<b>ADJUSTED TOTALS</b>		<b>656<sup>ww</sup></b>		<b>641<sup>xx</sup></b>	

<sup>a</sup> *Index Count* = number of pairs counted between 1-9 June 2011, 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  $\geq 25$  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> Source = the primary source(s) that provided monitoring data: ACOE = U.S. Army Corps of Engineers, Barnstable = Town of Barnstable, BW = BiodiversityWorks, Chatham = Town of Chatham, DCR = Massachusetts Department of Conservation and Recreation, Dennis = Town of Dennis, DFW = Massachusetts Division of Fisheries and Wildlife, Duxbury = Town of Duxbury, FEM = Friends of Ellisville Marsh, LCE = Lloyd Center for the Environment, MAS = Massachusetts Audubon Society, MVLB = Martha's Vineyard Land Bank, Nantucket = Town of Nantucket, NCF = Nantucket Conservation Foundation, NPS = National Park Service, Orleans = Town of Orleans, Plymouth = Town of Plymouth, TLT = Tuckernuck Land Trust, TNC-RI = The Nature Conservancy - Rhode Island Chapter, TTOR = The Trustees of Reservations, USFWS = U.S. Fish and Wildlife Service, WBNERR = Waquoit Bay National Estuarine Research Reserve.

<sup>e</sup> We define North Salisbury Beach as the segment of beach from the Massachusetts/New Hampshire border south to the center of the town of Salisbury Beach; South Salisbury Beach is the segment of beach from the center of the town of Salisbury Beach south to the Merrimack River and west to the boat ramp at Black Rock Creek..

<sup>f</sup> nd = no data available

<sup>g</sup> At L Street Beach in Dorchester, Boston, a pair of Piping Plovers with a 3-egg nest was first observed by beach staff sometime between 13 and 21 June and photographed. Nest was lost between 21-23 June, cause unknown, but possibly rat or crow, both of which were present on the beach. The plovers were not seen again at L Street Beach after nest loss, and may have moved northeast to Yirrell Beach, Winthrop, where pair 2A was first observed on/about 24 June. This is the first documented nesting by Piping Plovers at L Street Beach. This pair is included in *Total Count* and *No. pairs with fledge data* for both sites, but is tallied only once in statewide totals.

<sup>h</sup> Saquish, Plymouth, was reported as part of Duxbury Beach prior to 2001.

- <sup>i</sup> Ellisville includes both Ellisville State Park and the private beach along the south side of Ellisville Harbor.
- <sup>j</sup> At Mashnee Dike, Bourne, five apparently unpaired plovers were observed on 25 April, and one was observed on 4 May. None were observed after that date.
- <sup>k</sup> At Black Beach, Falmouth, the female of pair 2 was killed on 27 or 28 May, likely by a small raptor, *e.g.*, a Merlin or American Kestrel. The male was incubating on 1 June, but subsequently abandoned the nest, possibly as early as 2 June. These birds are tallied as a pair for the *Total Count* and *Pairs with fledge data*, but as only 0.5 pair for the *Index Count*.
- <sup>l</sup> Scorton Shores includes the Sandwich portion of Bodfish Park.
- <sup>m</sup> At Scorton Shores, Sandwich, monitors suspect that nest 2B was actually a re-nest by pair 5 from the west end of the Sandy Neck site (Bodfish Park). This pair is included in *Index Count*, *Total Count*, and *Pairs with fledge data* for both sites, but is tallied only once in statewide totals.
- <sup>n</sup> At Long Beach, Barnstable, pair 3 is believed to have re-nested on Craigville Beach after losing its nest on Long Beach (cause unknown) on 16 May. This pair is reported in the *Index Count* for Craigville Beach. It is included in *Total Count* and *Pairs with fledge data* for both sites, but is tallied only once in statewide totals.
- <sup>o</sup> The brood that hatched on 27 or 28 June at Craigville Beach, Barnstable, moved back and forth between Memorial Beach, a round-trip distance of 1.5 miles. This pair and the three chicks they fledged are reported for both sites, but are tallied only once in state totals.
- <sup>p</sup> At Mayflower Beach, Dennis, during nine surveys in April and May, Piping Plover tracks were observed, one adult was seen, and a plover was heard. Lack of protection from motorized vehicles and sand dumping during the second half of May may have discouraged nesting.
- <sup>q</sup> At Red River Beach, Harwich, the chicks that hatched from nest 2A frequently crossed east to Pleasant Street Beach, Chatham, to feed. This pair is believed to have been scraping at Pleasant Street Beach in April before eventually nesting as pair 2 at Red River Beach. This pair and their fledged chicks are reported for both sites in *Index Count*, *Total Count*, *No. chicks fledged*, and *No. pairs with fledge data*, but are tallied only once in state totals.
- <sup>r</sup> Although no breeding or territorial pairs were present at North Monomoy Island or Minimoy Island, Chatham, foraging Piping Plovers were observed on intertidal flats adjacent to both sites.
- <sup>s</sup> “Minimoy” Island, Chatham, is a small, low island that lies west of the north end of South Monomoy Island.
- <sup>t</sup> At North (Nauset) Beach, Orleans, in addition to the pairs reported, a single, unpaired bird was observed in the Pochet area for at least three weeks during the second half of May and the first week of June.
- <sup>u</sup> Although Boat Meadow, Eastham, was not surveyed in 2011, on 2 June a pair of Piping Plovers seen at First Encounter Beach subsequently flew south over the creek toward potential nesting habitat at Boat Meadow.

<sup>v</sup> At First Encounter Beach, Eastham, although no territorial or nesting pairs were observed, one adult was observed on 23 May, and an apparent male and female were seen together in the best-looking nesting habitat on the beach on 2 June, but flew away over water. Unknown if they might have nested on the small beach/marsh island west of Boat Meadow.

<sup>w</sup> The entire shoreline from Campground Beach south to First Encounter Beach, Eastham, was surveyed between 1 and 4 June, 2011.

<sup>x</sup> At Lieutenant Island - Northwest, Wellfleet, the female of pair 1 was depredated between 8-10 May. Their nest was subsequently abandoned, and the male was believed to have re-paired with another female and nested as pair no. 2. One pair is tallied for the *Index Count*, 1.5 pairs are tallied for *Total Count* and *No. pairs with fledge data*.

<sup>y</sup> Jeremy Point, Great Island, Duck Harbor, and Bound Brook were treated as a single site prior to 2001.

<sup>z</sup> Great Island in Wellfleet includes both National Park Service and town-owned sections of beach.

<sup>aa</sup> Approximately 5.5 miles of beach between Corn Hill Beach and Beach Point, Truro were surveyed on on 3 June.

<sup>bb</sup> For purposes of this compilation, Dead Forest/Head of the Meadow/High Head is defined as the sections of beach extending south from the High Head off-road vehicle access point to the "Dead Forest" that is south of the Head of the Meadow parking lot.

<sup>cc</sup> For purposes of this compilation, Race Point-South Beach is the section of beach from the High Head off-road vehicle access point north to the vehicle access point at the Race Point ranger station. It includes the "Mission Bell", "Tasha's", "Armstrong", and "Exit 9" sections of beach.

<sup>dd</sup> For purposes of this compilation, Race Point-North /Hatches Harbor is comprised of the beach and dune habitats that extend from the off-road vehicle access point at the Race Point ranger station north to and including the sandspit that borders Hatches Harbor to the west, as well as the western shoreline along Hatches Harbor and the interdune habitats along the Pole Line Road.

<sup>ee</sup> Prior to 2007, any plovers observed at Herring Cove Beach, Provincetown, were tallied as part of the Wood End/Long Point site.

<sup>ff</sup> On Round Island, Fairhaven, one Piping Plover was seen and heard giving "peep-lo" calls on 28 May, the only time this site was surveyed.

<sup>gg</sup> At Gooseberry Neck, Westport, the pair of plovers that nested (1-egg clutch found on 18 June) is suspected to have been one of the pairs from the east end of Horseneck Beach State Reservation. It is included in *Total Count* and *No. pairs with fledge data* for both sites, but is tallied only once in state totals.

<sup>hh</sup> Baker's Beach and Westport Town Beach (also known as Cherry and Webb Beach) were formerly reported as part of Horseneck Beach, but are reported separately here.

ii On Cuttyhunk Is., a pair of plovers was observed scraping and exhibiting pre-copulatory displays on the section of Barge Beach where Least Terns typically nest on 15 June, the only time the site was surveyed in 2011.

jj At Cow Bay Beach, Edgartown, monitors reported that two pairs of plovers nested. They believed that one of these pairs was also seen at Sylvia State Beach - Edgartown on 31 May, during the 1-9 June Index Count period, and possibly after that, prior to its nest being found at Cow Bay Beach on 18 June. No nests were found on Sylvia State Beach-Edgartown. This pair is included in *Total Count* and *No. pairs with fledge data* for both sites, but is only tallied once in state totals.

kk At Lighthouse Beach, Edgartown, a pair was scraping between 8 and 23 May, but no nest was found. This pair is believed to have subsequently moved north to Little Beach and nested. It is tallied in the *Index Count* for Little Beach. It is included in the *Total Count* and *No. pairs with fledge data* for both sites, but is tallied only once in state totals.

ll Piping Plover tracks were observed between Oyster Pond and Edgartown Great Pond, Edgartown, on 27 May, the only time this section of beach was surveyed.

mmm At Black Point Pond, Chilmark, a pair was seen in suitable nesting habitat on 8 May and was scraping there on 26 May, but was not seen on intervening or subsequent visits, nor were tracks or scrapes observed at any other times. Monitors suspected these birds may have moved east to Quansoo.

nn Coskata-West Beach refers to the beach along the Nantucket Sound side of Coskata, from the south end of The Galls south and west to the boundary of Coatue. This is the same area that was referenced as Coskata-North Beach in 1993 and as part of The Galls in 1991 and 1992. Census data for Great Point, The Galls, and Coskata-West Beach were not reported separately in 1996 or 1997.

oo At Coatue, Nantucket, pair 9 was likely a re-nest of a pair that was present and nested at Coskata -West Beach during the 1-9 June *Index Count* period. This pair is included in the *Index Count* for Coskata-West Beach. It is included in the *Total Count* and *No. pairs with fledge data* for both sites, but is tallied only once in state totals.

pp Coskata-East Beach refers to the beach along the eastern (Atlantic) side of Coskata, including the vicinity of the former washover at The Glades.

qq Coskata Inlet is the inlet from Nantucket Harbor into Coskata Pond.

rr Smith Point, Nantucket and Esther Island reconnected during late winter and spring 2009, after having been breached and separated by a channel since mid-April 2007.

ss At Whale Point on Tuckernuck Island, pair 1 was believed to be present during the Index Count after losing its re-nest (1B) on 27 May, but likely relocated to Bigelow Point-Tuckernuck and nested there as pair 8 (nest 8A hatched 4 eggs on 25 July). This pair is included in *Total Count* and *No. pairs with fledge data* for both sites, but is tallied only once in state totals.

tt "Minimusk" is a low-lying shoal island, southwest of Muskeget Island, that supported a Least Tern colony in 2011. A Piping Plover was seen feeding there on 26 June, and two plovers were feeding there on 4 July; one flew back to Muskeget.

uu *Unadjusted Total Count* is the sum of the *Total Counts* reported for all sites.

<sup>vv</sup> *Unadjusted Total Number of pairs with fledge data* is the sum of the *Number of pairs with fledge data* reported for all sites.

<sup>ww</sup> *Adjusted Total Count* is the average of the *Index Count* and the *Unadjusted Total Count*, rounded to the nearest whole number of pairs.

<sup>xx</sup> *Adjusted Total Number of pairs with fledge data* is calculated by multiplying the *Unadjusted Total Number of pairs with fledge data* by the ratio of the *Adjusted Total Count* to the *Unadjusted Total Count*, and rounding to the nearest whole number of pairs.