

**SUMMARY OF 2009
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 2009 breeding season. Observers reported breeding pairs of Piping Plovers at 125 sites; 95 additional sites were surveyed at least once, but no breeding pairs were detected at them. The *Index Count* (statewide census conducted June 1-9) was 574 pairs, and the *Adjusted Total Count* (estimated total number of breeding pairs statewide for the entire season) was 593 pairs. Overall statewide productivity was 0.91 chicks fledged per pair, based on data reported for 589 of 593 pairs (99%).

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 2009 a, 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 2009, 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 a coast-wide group of cooperators that includes wildlife biologists, seasonal shorebird monitors, beach managers, researchers, and volunteers from over 30 federal agencies, local municipalities and county governments, private conservation organizations, and universities. Data summarized in this report were contributed by over 80 individuals. Cooperators monitored a total of 220 sites in Massachusetts in 2009 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 2009, the *Index Count* period was June 1-9. 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.

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 time-consuming, subjective, and, we suspect, 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 *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 any 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 multiplied 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. This form requested 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 general comments and management needs. Maps of sites showing the locations of all nests were submitted with census forms. If necessary after reviewing census forms, we contacted cooperators to obtain missing or incomplete data, resolve inconsistencies, and clarify ambiguities.

RESULTS

Observers reported breeding Piping Plovers at 125 sites in Massachusetts in 2009. An additional 95 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 2009 was 593 pairs (Table 1). The *Index Count* in 2009 was 574 pairs, or 97% of the *Adjusted Total Count*. Overall productivity in 2009 was 0.91 chicks fledged per pair, based on data from 589 of 593 (99%) pairs (Table 1). By comparison, in 2008 the *Index Count* was 551 pairs, the *Adjusted Total Count* was 566 pairs, and the overall productivity was 1.41 chicks fledged per pair (Melvin 2009).

Two regions harbored 62% of the total breeding pairs in the state in 2009: the Lower Cape (40%) and the Upper Cape (22%) (Table 1). Individual sites with the largest numbers of pairs (*Total Count*) were South Beach, Chatham (51 pairs), South Monomoy Island, Chatham (32 pairs), Sandy Neck, Barnstable (28 pairs), Crane Beach, Ipswich (25 pairs), Plymouth Long Beach, Plymouth (24 pairs), Nauset Spit, Orleans (22 pairs), Parker River National Wildlife Refuge, Newbury and Rowley (15 pairs), and Dead Neck-Sampson's Island, Barnstable (15 pairs). Although the 18 largest sites, i.e. those with ≥ 10 pairs, supported 54.1% of all pairs in the state, the 78 smallest sites (1-3 pairs) were also important, collectively accounting for 21.6% 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 2009. We also thank the more than 30 state and federal agencies, local municipalities and county governments, 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.

LITERATURE CITED

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Table 1. Abundance, distribution, and productivity of Piping Plovers in Massachusetts, 2009.

Location	Number of pairs		No. chicks fledged ^c	No. pairs with fledge data ^c	Source ^d
	Index Count ^a	Total Count ^b			
NORTH SHORE					
North Salisbury Beach, Salisbury ^e	0	0	0	0	DCR
South Salisbury Beach, Salisbury ^e	0	0	0	0	DCR
Plum Island town beaches, Newburyport/Newbury	0	0	0	0	USFWS
Parker River NWR, Newbury/Rowley	17	15	12	15	USFWS
Sandy Point State Res., Ipswich	8	8	2	8	USFWS
Crane Beach, Ipswich	25 ^f	25 ^f	32	25	TTOR
Coffin's Beach, Gloucester	0	0 ^g	0	0	DFW
Wingaersheek Beach, Gloucester	0	0	0	0	DFW
Good Harbor Beach, Gloucester	nd ^h	nd	nd	nd	nd
Revere Beach, Revere	1	1	4	1	MAS, DCR
Winthrop Beach, Winthrop	2	2	7	2	MAS, DCR
Yirrell Beach, Winthrop	1	1	4	1	MAS
SOUTH SHORE					
The Glades, Scituate	1	1	0	1	MAS
Third Cliff, Scituate	3	3	9	3	MAS
Fourth Cliff, Scituate	1	1	0	1	MAS
Humarock, Scituate	0	0	0	0	MAS
Rexhame Beach, Marshfield	1	1	0	1	MAS
Duxbury Beach, Duxbury/Plymouth	10	11	4	11	MAS, Duxbury
Saquis, Plymouth ⁱ	nd ^j	nd ^j	nd	nd	MAS
Plymouth Long Beach, Plymouth	24	24	17	24	Plymouth
Ellisville, Plymouth ^k	2	2	3	2	FEM, MAS

Location	Number of pairs		No. chicks fledged ^c	No. pairs with fledge data ^c	Source ^d
	Index Count ^a	Total Count ^b			
Sagamore Beach, Bourne, Sandwich, and Plymouth	6 ¹	6 ¹	2	6 ¹	MAS
Scusset Beach State Res., Sandwich	0	2 ¹	0	2 ¹	MAS
UPPER CAPE					
Mashnee Dike, Bourne	1	1	3	1	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	1	4	1	MAS
Sippewisset, Falmouth	3	3	5	3	MAS
Woodneck Beach, Falmouth	0	nd	nd	0	MAS
Acapesket Beach, Falmouth	0	nd	nd	0	MAS
Menauhant Beach, Falmouth	0	nd	nd	0	MAS
Menauhant Yacht Club Beach, Falmouth	0 ^m	0 ^m	0	0	WBNRR
Washburn Island, Falmouth	2	3	2	3	WBNERR
South Cape Beach, Mashpee	2	2	4	2	WBNERR
New Seabury, Mashpee	2	2	0	2	WBNERR
Rock Landing/Maushop Village, Mashpee	nd	nd	nd	nd	nd
Popponeset Spit, Mashpee	2	4	2	4	MAS
Town Neck Beach, Sandwich	4	7	0	7	MAS
Springhill Beach, Sandwich	12	12	15	12	MAS
East Sandwich Beach, Sandwich	7	8	12	8	MAS
Scorton (Neck) Creek, Sandwich	10	10	4	10	MAS
Scorton Shores, Sandwich ⁿ	3	4	2	4	MAS
Sandy Neck, Barnstable	27	28	28	28	Barnstable

Location	Number of pairs		No. chicks fledged ^c	No. pairs with fledge data ^c	Source ^d
	Index Count ^a	Total Count ^b			
Rushy Marsh Pond Beach, Barnstable	nd	nd	nd	nd	nd
Loop Beach, Barnstable	0	nd	nd	0	MAS
Sampson's Is.-Dead Neck, Barnstable	14	15	8	15	MAS
Bone Hill Road, Barnstable	0	0	0	0	MAS
Dowses Beach, Barnstable	3	2	0	2	Barnstable
Long Beach, Barnstable	4	4	10	4	MAS
Craigville Beach, Barnstable	1	1	2	1	MAS
Memorial Beach, Barnstable	0	0	0	0	MAS
Squaw Island, Barnstable	3	3	6	3	MAS
Squaw Is. Road (causeway), Barnstable	0	0	0	0	MAS
Sea St./ Keyes Beach, Barnstable	0	nd	nd	0	MAS
Kalmus Park Beach, Barnstable	4	4	6	4	Barnstable
Fortes Beach, Barnstable	0	nd	nd	0	MAS
Colonial Acres-Standish Way, Barnstable	0	nd	nd	0	MAS
Gray's Beach, Yarmouth	0 ^o	nd ^o	nd	0	MAS
Great Island – Smith Point, Yarmouth	1	1	0	1	MAS
Great Island – Causeway, Yarmouth	0 ^p	0	0	0	MAS
Seagull Beach/Radio City, Yarmouth	2	3	8	3	MAS
Bass River Beach, Yarmouth	0	nd	nd	0	MAS
West Dennis Beach, Dennis	5	7	7	7	MAS, Dennis
South Village Beach, Dennis	0	0	0	0	MAS, Dennis
Miramar Beach (Swan River), Dennis	2	2	7	2	MAS, Dennis
Haigis Beach, Dennis	0	0	0	0	MAS, Dennis
Glendon Road Beach, Dennis	0	0	0	0	MAS, Dennis
Depot St., Inman St. beaches, Dennis	0	0	0	0	MAS, Dennis
Chapin Beach, Dennis	1	2 ^q	4	2 ^q	MAS, Dennis
Mayflower Beach, Dennis	1 ^q	1 ^q	0	1 ^q	MAS, Dennis

Location	Number of pairs		No. chicks fledged ^c	No. pairs with fledge data ^c	Source ^d
	Index Count ^a	Total Count ^b			
Corporation Beach, Dennis	0	0	0	0	MAS, Dennis
Howes St. Beach, Dennis	1	1	0	1	MAS, Dennis
Sesuit Harbor Beach, Dennis	0	0	0	0	MAS, Dennis
Cold Storage Beach, Dennis	0	0	0	0	MAS, Dennis
Coles Pond / Crowes Pasture / Quivett Neck, Dennis	2	2	0	2	MAS, Dennis
Wings Island, Brewster	0	nd	nd	0	MAS
Paine's Creek, 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 Landing, Brewster	0	nd	nd	0	MAS
Point of Rocks Landing, Brewster	0 ^r	nd	nd	0	MAS
Ellis Landing, Brewster	0	nd	nd	0	MAS
Linell Landing Beach, Brewster	0	nd	nd	0	MAS
Crosby Landing Beach, Brewster	3	3.5 ^s	0	3.5 ^s	MAS
Mants Landing, Brewster	0	nd	nd	0	MAS
Grey Neck Road Beach, Harwich	0	nd	nd	0	MAS
Allens Harbor, Harwich	0	1 ^t	2	1 ^t	MAS
Belmont Condos, Harwich	0	1	0	1	MAS
Bank St./Merkel Beach/Wychmere, Harwichport	0	3 ^t	0	3 ^t	MAS
Saquatucket Bluffs, Harwich	1	1 ^t	2	1 ^t	MAS
Red River Beach, Harwich	1	1	3	1	MAS
LOWER CAPE					
Pleasant St. Beach, Chatham	0	0	0	0	MAS
Forest Beach, Chatham	1	1	0	1	MAS
Cockle Cove, Chatham	0	0	0	0	MAS
Ridgevale Beach, Chatham	2	2	2	2	MAS

Location	Number of pairs		No. chicks fledged ^c	No. pairs with fledge data ^c	Source ^d
	Index Count ^a	Total Count ^b			
Harding Shores, Chatham	0	0	0	0	MAS
Harding Beach, Chatham	4	4	5	4	MAS
Harding Beach Point, Chatham ^u	0	0	0	0	MAS
North Monomoy Island, Chatham	1	1	0	1	USFWS
Minimoy Island, Chatham ^v	0	1	0	1	USFWS
South Monomoy Island, Chatham	29	32	23	32	USFWS
South Beach, Chatham	51	51	33	51	MAS
Morris Island dredge spoil, Chatham	0	0	0	0	MAS
Tern Island, Chatham	0	0	0	0	MAS
Clafin Landing/ Chatham Bars Inn, Chatham	0	nd	nd	0	MAS
Linnell Lane, Chatham	0	nd	nd	0	MAS
North Beach Island, Chatham	11	12	1	12	Chatham
North (Nauset) Beach, Chatham	2	2	0	2	Orleans
North (Nauset) Beach, Orleans	5	5	10	5	Orleans
Nauset Spit (Heights), Orleans	21	22	21	22	Orleans
New Island, Orleans/Eastham	0	0	0	0	NPS, Orleans
Skaket Beach, Orleans	1	1	0	1	Orleans
Rock Harbor (north side), Eastham	0	nd	nd	0	MAS
First Encounter Beach, Eastham	1	1	3	1	MAS
So. Sunken Meadow Spit, Eastham	5	5	2	5	MAS
Coast Guard Beach, Eastham	7	7	12	7	NPS
Nauset Light Beach, Eastham	0	0	0	0	NPS
Marconi Beach, Wellfleet	5	5	3	5	NPS
Marconi Station, Wellfleet	4	4	0	4	NPS
Lecount Hollow, Wellfleet	2	2	1	2	NPS
White Crest Beach, Wellfleet	0	0	0	0	NPS
Cahoon Hollow, Wellfleet	1	1	0	1	NPS

Location	Number of pairs		No. chicks fledged ^c	No. pairs with fledge data ^c	Source ^d
	Index Count ^a	Total Count ^b			
Lieutenant Island, Wellfleet	2	2	5	2	MAS
Indian Neck /Fox Is. WMA, Wellfleet	2	2	0	2	MAS, DFW
Jeremy Point/Great Is., Wellfleet ^w	11 ^x	11 ^x	4	11 ^x	NPS
Duck Harbor, Wellfleet ^w	2 ^x	7 ^x	7	7 ^x	NPS
Bound Brook, Wellfleet ^w	2	2	0	2	NPS
Ryder Beach, Truro	0	0	0	0	NPS
Pamet Harbor-South (Fisher's Beach), Truro	3	3	5	3	MAS
Pamet Harbor-North (Corn Hill Beach), Truro	5	5	6	5	MAS
Pond Village Beach, Truro	nd	nd	nd	nd	nd
Pilgrim Beach/Beach Point, Truro	2	2	2	2	MAS
Newcomb Hollow, Wellfleet/ Truro	0	1	0	1	NPS
Ballston Beach, Truro	3	3	5	3	NPS
Longnook Beach, Truro	0	0	0	0	NPS
Coast Guard Beach, Truro	1	1	0	1	NPS
Dead Forest / Head of the Meadow / High Head, Truro	13	14	5	14	NPS
Race Point-South Beach, Provincetown / Truro ^y	10	11	8	11	NPS
Race Point-North Beach, Provincetown ^z	13	13	9	13	NPS
Long Point/Wood End, Provincetown	7	9	6	9	NPS
Herring Cove Beach, Provincetown ^{aa}	0	0	0	0	NPS
BRISTOL COUNTY					
Stony Point Dike, Wareham	1	1	3	1	ACOE
Long Beach Point, Wareham	1	1	2	1	MAS
Little Harbor Beach, Wareham	1	1	4	1	MAS
Ram Is., Mattapoisett	0	0	0	0	DFW
Strawberry Point, Mattapoisett	1	1	nd	0	MAS

Location	Number of pairs		No. chicks fledged ^c	No. pairs with fledge data ^c	Source ^d
	Index Count ^a	Total Count ^b			
West Island, Fairhaven	4	4	9	4	LCES
Winsegansett Heights, Fairhaven	0	0	0	0	LCES
Round Hill Beach, Dartmouth	0	0	0	0	MAS
Salters Pond, Dartmouth	1	2	1	2	MAS
Nonquitt, Dartmouth	1	1	4	1	MAS
Demarest Lloyd State Park, Dartmouth	3	3	0	3	LCES
Little Beach/Barney's Joy, Dartmouth	13	14	21	14	MAS
Gooseberry Neck, Westport	1	1 ^{bb}	0 ^{bb}	1	LCES
Horseneck Beach, Westport	11	11	16	11	LCES, MAS
Acoaxet, Westport	0	0	0	0	TNC-RI
Cockeast Pond, Westport	0	0	0	0	TNC-RI
Richmond Pond, Westport	1	1	3	1	TNC-RI
Bay Point, Swansea	0	0	0	0	A. Waring
ELIZABETH ISLANDS					
Naushon Island	0 ^{cc}	nd ^{cc}	nd ^{cc}	0 ^{cc}	DFW
Pasque Island-Robinson's Hole	1 ^{dd}	1 ^{dd}	nd ^{dd}	0 ^{dd}	DFW
Pasque Island-Cobbly	nd	nd	nd	nd	nd
Pasque Island-Quicks Hole	nd	nd	nd	nd	nd
Nashawena Island-Quicks Hole	2 ^{ee}	2 ^{ee}	nd ^{ee}	0 ^{ee}	DFW
Nashawena Island-Canapitsit	nd	nd	nd	nd	nd
Cuttyhunk Island, Gosnold	0 ^{ff}	nd ^{ff}	nd	0 ^{ff}	DFW
Penikese Island, Gosnold	0	0	0	0	DFW
MARTHA'S VINEYARD					
Eastville Beach, Oak Bluffs	0	0 ^{gg}	0	0	MAS
Harthaven, Oak Bluffs	2	2	0	2	MAS

Location	Number of pairs		No. chicks fledged ^c	No. pairs with fledge data ^c	Source ^d
	Index Count ^a	Total Count ^b			
Sylvia State Beach, Edgartown / Oak Bluffs	3	3	2	3	MAS
Big Gravel Is., Oak Bluffs	0	nd	nd	0	MAS
Sarson's Is., Oak Bluffs	nd	nd	nd	nd	MAS
Haystack Is., Edgartown	nd	nd	nd	nd	MAS
Cow Bay, Edgartown	0 ^{hh}	0 ^{hh}	nd	0	MAS
Yorke – Allen Point, Edgartown	0	nd	nd	0	MAS
Eel Pond / Little Beach / Lighthouse Beach, Edgartown	1	1	0	1	MAS
Chappaquiddick Point Beach, Chappaquiddick	0	0	0	0	MVLB
Cape Pogue Elbow / The Narrows, Chappaquiddick	4	4	0	4	TTOR
Little Neck, Chappaquiddick	0	0	0	0	TTOR
Arruda's Point / The Jetties, Chappaquiddick	0	1	0	1	TTOR
Leland / East Beaches / Poucha Pond, Chappaquiddick	3	4	1	4	TTOR, MVLB
Wasque, Chappaquiddick	0	0	0	0	TTOR
Norton Point Beach, Chappaquiddick	0	0	0	0	TTOR
Norton Point Beach, Edgartown	5	5	3	5	TTOR
South Beach, Edgartown	0	nd	nd	0	MAS
Jobs Neck / Crackatuxet Pond, Edgartown	nd	nd	nd	nd	nd
Edgartown Great Pond, Edgartown	0	1	1	1	MAS, MVLB
Oyster/Paqua Ponds, Edgartown	0	0	0	0	MAS
Watcha Pond, W. Tisbury	1	2	1	2	MAS
Tisbury Great Pond / Quansoo / Long Point, Chilmark	4	4	3	4	MAS, MVLB
Black Point Pond, Chilmark	1	1	0	1	MAS
Chilmark Pond, Chilmark	1	1	1	1	MAS
Lucy Vincent Beach, Chilmark	0	nd	nd	0	MAS
Stonewall Beach, Chilmark	0	0	0	0	MAS
Squibnocket Beach, Chilmark	0 ⁱⁱ	2	0	2	MAS

Location	Number of pairs		No. chicks fledged ^c	No. pairs with fledge data ^c	Source ^d
	Index Count ^a	Total Count ^b			
Long Beach, Aquinnah	0	nd	nd	0	MAS
Moshup Trail Beach/Philbin Beach/ Moshup Beach Overlook, Aquinnah	0	nd	nd	0	MAS, MVLB
Dogfish Bar, Aquinnah	6	6	8	6	MAS, L. Johnson
Lobsterville Beach, Aquinnah	3	3	0	3	MAS
Menemsha Beach, Chilmark	0	nd	nd	0	MAS
Lambert's Cove, West Tisbury	0 ^{jj}	nd ^{jj}	nd	0	nd
Cedar Tree Neck, W. Tisbury	nd	nd	nd	nd	nd
Great Rock Bight Preserve, Chilmark	0	0	0	0	MVLB
Sepiessa Point Reservation, West Tisbury	0	0	0	0	MVLB
Tashmoo, Tisbury	3	3	2	3	MAS
Wilfred's Pond / Mink Meadows Beach, Tisbury	2	2	1	2	MAS, MVLB
Northern Pines Shores, Tisbury	nd	nd	nd	nd	nd
Maciel Marine / Lagoon Pond, Vineyard Haven	0	0	0	0	MAS
Nomans Land	0	0	0	0	USFWS
NANTUCKET					
Great Point	0	0	0	0	TTOR
The Galls	3	3	0	3	TTOR
Coskata-West Beach ^{kk}	2	2	1	2	TTOR
Coatue ^{ll}	5	5	5	5	NCF
Coskata-East Beach ^{mm}	0	0	0	0	TTOR
Coskata Inlet/The Haulover ^{ll, mm}	0	1	0	1	NCF
Wauwinet	1	1	0	1	MAS
Squam Pond / Squam Road	2 ⁿⁿ	2 ⁿⁿ	3	2 ⁿⁿ	MAS, NCF
Quidnet/Sesachacha Pond	2 ⁿⁿ	2 ⁿⁿ	0	2 ⁿⁿ	MAS

Location	Number of pairs		No. chicks fledged ^c	No. pairs with fledge data ^c	Source ^d
	Index Count ^a	Total Count ^b			
Low Beach/Tom Nevers ^{oo}	0 ^{pp}	0 ^{pp}	0	0	Nantucket
Surfside	0	0	0	0	Nantucket
Hummock Pond	0	0 ^{qq}	0	0	NCF
Esther Is. / Smith Point, Nantucket ^{rr}	2	3	0	3	Nantucket
Eel Point ^{ll}	7	7 ^{ss}	6	7	NCF
Dionis Beach	0	0	0	0	Nantucket
Jetties Beach	3	3	3	3	Nantucket
Monomoy, Nantucket	0	0	0	0	NCF
UMass Field Station, Nantucket	0	0	0	0	NCF
Quaise Point	0	0	0	0	NCF
Ram Island (Polpis Harbor)	0	0	0	0	NCF
Long Pond	nd	nd	nd	nd	nd
Madaket Beach	0	0	0	0	Nantucket, NCF
Tuckernuck Island	7	7	6	7	TLT
Muskeget Island	4	4 ^{tt}	6	4	R. Veit, CSI
UNADJUSTED TOTALS	574	611.5 ^{uu}	536	607.5 ^{vv}	
ADJUSTED TOTALS	-	593^{ww}	-	589^{xx}	

^a *Index Count* = number of pairs counted between June 1-9, 2009, 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 ≥ 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.

^d Source = the primary source that provided monitoring data: ACOE = U.S. Army Corps of Engineers, Barnstable = Town of Barnstable, Chatham = Town of Chatham, CSI = College of Staten Island, 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, LCES = 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.

^e For this compilation, North Salisbury Beach is defined as the length of beach from the Massachusetts/New Hampshire border south to the center of the town of Salisbury Beach; South Salisbury Beach is the length of beach from the center of the town of Salisbury Beach south to the Merrimack River.

^f At Crane Beach, Ipswich, the male of pair # 4 was found freshly dead on June 1, 2009. A necropsy found the bird underweight with blood in its lungs.

^g At Coffin's Beach, Gloucester, a single Piping Plover was observed on May 19, 2009.

^h nd = no data available

ⁱ Saquish, Plymouth was reported as part of Duxbury Beach prior to 2001.

^j Saquish, Plymouth, was surveyed only once, on June 8, 2009. On that date, a MassAudubon monitor observed a single, foraging Piping Plover at the south tip of Saquish.

^k Ellisville includes both Ellisville State Park and the private beach along the south side of Ellisville Harbor.

^l At Scusset Beach, pair # 1 (nest lost to crow predation on May 21) was believed to have subsequently moved to Sagamore Beach, where they nested and were tracked as pair # 5. This pair is tallied in the *Index Count* for Sagamore Beach and in *Total Counts* for both Scusset and Sagamore beaches, but is tallied only once in statewide *Total Count* and *Number of pairs with fledge data*.

^m At Menauhant Yacht Club Beach, Falmouth, Piping Plovers were observed feeding along the shoreline periodically from April 16 through at least the end of June. Lack of observed nesting activity may have been due to lack of proactive symbolic fencing to establish undisturbed habitat at this site.

ⁿ Scorton Shores includes the Sandwich portion of Bodfish Park.

^o Grays Beach, Yarmouth, was infrequently monitored in 2009, so it is possible that nesting occurred but went undetected. At the west end, Piping Plover tracks were observed on April 25. At the east end, one Piping Plover was observed on May 29 and a single plover performing aerial courtship displays chased off 2 other Piping Plovers on June 5. No Piping Plovers were observed on June 27.

^p Great Island - Causeway Beach, Yarmouth was visited 5 times between May 14 and June 25, 2009. One Piping Plover was observed on June 8, 2009, and Piping Plover tracks were present on June 18.

^q At Chapin Beach, Dennis, a pair that was observed only between April 27 and May 12 is suspected to have subsequently moved east to Mayflower Beach. This pair is tallied in the *Total Count* and *Number of pairs with fledge data* for each site and in the *Index Count* for Mayflower Beach, but only once in the statewide *Total Count* and *Number of pairs with fledge data*.

^r A single adult Piping Plover and scrapes were observed 0.7 mile west of Point of Rocks Landing, Brewster on June 9, 2009, the only date this site was visited.

^s At Crosby Landing Beach, Brewster, evidence observed in the field indicated that the female of pair # 1 was depredated. We believe that the male subsequently re-nested with a female believed to be a different bird, based on markedly different plumage patterns. Therefore, the *Total Count* and *Number of pairs with fledge data* are reported as 3.5 pairs for this site.

^t At Wychmere / Merkel / Bank Street beaches in Harwich, 3 pairs nested in late April, but subsequently lost their nests on or about 4-6 May, 16-19 May, and 27 May, respectively. None of these pairs re-nested at this site, but 2 of these pairs are suspected to have re-nested at Allens' Harbor and Saquatucket Bluffs, which are nearby. These 2 pairs are included in *Total Count* and *Number of pairs with fledge data* for each of the sites at which they occurred, but only once in statewide tallies.

^u Harding Beach Point, Chatham, is also referred to as "Morris Island Dike".

^v "Minimoy" Island, Chatham, is a small island that has emerged during the past decade and lies west of the north end of South Monomoy Island, Chatham.

^w Data for Duck Harbor and Bound Brook in Wellfleet and Truro were reported as part of Jeremy Point / Great Island prior to 2001.

^x At Duck Harbor, Wellfleet, 7 pairs nested, but 5 of these left prior to the *Index Count*. Of these 5 pairs, 3 were believed to have relocated to Great Island, one to Jeremy Point, and one to an unknown location. The 4 pairs that relocated to Jeremy Point/Great Island are included in site-specific totals for both Duck Harbor and Jeremy Point/Great Island, but are tallied only once in the statewide tallies for *Total Count* and *Number of pairs with fledge data*.

^y Race Point - South includes the "Armstrong" and Exit 9" sections of beach.

^z Data reported for Race Point North, Provincetown, include pairs nesting along the western side of Hatches Harbor.

^{aa} A pair of Piping Plovers nested at Herring Cove Beach, Provincetown in 2006 and 2007 and sporadically in earlier years. However, prior to 2007 any plovers observed there were tallied as part of the Wood End / Long Point site.

^{bb} At Gooseberry Neck, Westport, an incubating adult was found dead near its 4-egg clutch on June 8; predation was suspected as the cause of death. The surviving member of the pair continued to incubate, and 3 of 4 eggs hatched on June 17 after a 29 or 30-day incubation period. None of the 3 hatchlings survived to fledge, the longest surviving chick was last seen on June 26.

^{cc} On Naushon Island, no Piping Plovers were observed on June 25, 2009 during surveys of the following traditional or potential nesting beaches: Tarpaulin Cove (surveyed on foot), West Beach and Crescent Beach (both scanned from boat 200 feet offshore)

- ^{dd} Pasque Island – Robinson’s Hole was surveyed on June 25, 2009.
- ^{ee} Quicks Hole Beach on Nashawena Island was surveyed on June 25, 2009.
- ^{ff} No Piping Plovers were observed during a survey of the following sites on Cuttyhunk Island on June 24, 2009: Barge Beach, Copicut Beach (the north side of the harbor entrance, across the channel from Barge Beach), the bathing beach west of the town harbor, and the beach on the east side of the inlet to Westend Pond.
- ^{gg} At Eastville Beach, Oak Bluffs, a single Piping Plover believed to be a male was observed for ≤ 2 weeks in April.
- ^{hh} At Cow Bay Beach, Edgartown, no Piping Plovers were observed during surveys on April 7 and 20, May 1, and June 4.
- ⁱⁱ At Squibnocket Beach, Aquinnah, during once-per-week surveys from May to mid-June, only a single Piping Plover (believed to be a male) was seen.
- ^{jj} At Lamberts Cove, West Tisbury, staff of The Nature Conservancy reportedly observed a courting pair of Piping Plovers in early June, but the birds were not subsequently observed by MassAudubon shorebird monitors on June 3 or during subsequent surveys in June. This site was not surveyed in April or May.
- ^{kk} 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.
- ^{ll} On Nantucket Island at Coatue, the Haulover, and Eel Point, a Snowy Owl was present until early or mid-May, 2009. Although no Piping Plover mortalities were attributed to the owl, observers believed that its presence distracted and disturbed the plovers enough to cause late nesting.
- ^{mmm} Coskata-East Beach refers to the beach along the eastern (Atlantic) side of Coskata, including the vicinity of the former washover at The Glades. Coskata Inlet is the inlet from Nantucket Harbor into Coskata Pond.
- ⁿⁿ At Sesachacha Pond, pair no. 1, that lost its nest (1A) around May 19, was suspected to have re-nested nearby in the southern portion of the Squam Pond /Squam Road site (2-egg clutch found on June 17). We suspect this pair was the one that was observed at both sites during the June 1-9 Index Count period. This pair is included in the *Index Count*, *Total Count*, and *No. pairs with fledge data* for both sites, but is tallied only once in the state totals for each of these.
- ^{oo} Low Beach / Tom Nevers is the length of beach on the southeastern shore of Nantucket that extends from Siasconset south and west and includes the beach in front of Tom Nevers Head.
- ^{pp} On Nantucket, at Codfish Park, Siasconset, a single Piping Plover was observed foraging between June 2 and 12; at Tom Nevers a single plover was observed foraging between June 4 and 9.

^{qq} At Hummock Pond, Nantucket, although no evidence of nesting was detected, 1 Piping Plover, believed to be a male, was observed on April 1, 8, 10, 17 and 27 and May 10 and 24. A second bird, believed to be a female, was observed with the first bird on April 13.

^{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 Eel Point, Nantucket, in addition to 7 nesting pairs of Piping Plovers, a single male was observed performing aerial courtship displays on June 13, 19, and 20, and an apparent unpaired female was also observed on June 20. Both birds flew south across Madaket Harbor toward Smith Point / Esther's Island on June 20.

^{tt} At Muskeget Island, in addition to the 4 breeding pairs that were reported, an apparent unpaired adult was also observed.

^{uu} The *Unadjusted Total Count* is the sum of the *Total Counts* reported for each site.

^{vv} The *Unadjusted Total Number of pairs with fledge data* is the sum of the *Number of pairs with fledge data* reported for each site.

^{ww} The *Adjusted Total Count* is the average of the *Index Count* and the *Unadjusted Total Count*, rounded to the nearest whole number of pairs.

^{xx} The *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.