STATUS OF PIPING PLOVERS IN MASSACHUSETTS - 1992 SUMMARY

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Observers reported a total of 213 breeding pairs of Piping Plovers (Charadrius melodus) at 58 sites in Massachusetts in 1992 (Table 1). Breeding pairs are defined as pairs observed with either a nest or unfledged chicks or that exhibit site tenacity and evidence of pair bonding and territoriality. Observer effort in 1992, measured as number of sites surveyed and intensity of census effort at each site, was roughly comparable to previous efforts since 1986. In at least 2 instances, pairs that nested unsuccessfully were believed to have moved to new sites and renested. These pairs were included in counts of pairs at both sites where they nested, but were counted only once in the overall state total (Table 1). Also not included in the state total were 2 birds seen for only 3 days at Tisbury Great Pond on Martha's Vineyard, and a single bird that was present at Cockeast Pond in Westport.

The 1992 total of 213 pairs is the highest count of Piping Plovers recorded in Massachusetts since comprehensive statewide surveys began in 1985, and represents an increase of 53 pairs over the 1991 count of 160 pairs (Table 2). Numbers increased in 6 of 7 regions of the state; only Martha's Vineyard/Elizabeth Islands decreased by 1 pair. The largest increases came on the Lower Cape (from 50 to 84 pairs in 1991 vs. 1992) and the Upper Cape (from 21 to 32 pairs).

In addition to estimating total pairs present during the breeding season, cooperators also censused pairs at all but 2 occupied sites and 41 potential sites during this year's standardized "index count" period of 30 May to 7 June. The 1992 index count was 207 pairs, compared to a total count of 213 pairs and a 1991 index count of 148 pairs. Cuttyhunk Island and Muskeget Island were censused on 9 June and 14 June, respectively. Nests or chicks observed during those visits confirmed that at least 5 of 6 pairs on Cuttyhunk and 4 of 5 pairs on Muskeget were present during the index count period.

Numbers of unpaired or non-breeding birds also appeared to increase slightly in 1992. Observers at 10 sites reported the presence of 1 or 2 birds which they did not believe nested. A flock of 4 to 10 plovers, in addition to 3 nesting pairs, was present at Springhill Beach in Sandwich for several weeks in June. At South Beach Island in Chatham, 4 pairs that were

censused during the index count period were not seen on subsequent visits, and so were not included in the total count.

Mean number of pairs per occupied site in 1992 was 3.7 (range = 1 - 16). Maximum numbers of pairs occurred at Crane Beach (16), Nauset Spit 14), the South Beach of the North District of Cape Cod National Seashore (14), Little Beach/Barney's Joy (10), Horseneck Beach (10), and Sandy Neck (10). Forty of 58 sites had ≤ 3 pairs and accounted for 33% of all breeding pairs.

Overall mean productivity for Massachusetts in 1992 was 2.03 chicks fledged per pair, based on estimates of fledging success for 206 of 213 (97%) pairs at 56 of 58 sites (Table 1). This is the highest productivity recorded since we began compiling these data in 1987 (Table 2). From late April or early May through early August, when nesting and brood-rearing occurred, cooperators reported that 57 of 60 sites (88%) were monitored at least 1-2 times per week and 41 of 60 sites (69%) were monitored at least 3-4 times per week (Table 3).

Productivity estimates for specific regions of the state were: North Shore (2.29 chicks fledged/pair), South Shore (1.50), Upper Cape (1.97), Lower Cape (2.26), Buzzards Bay (1.42), Martha's Vineyard/Elizabeth Islands (1.90), and Nantucket (1.75). A chick was considered fledged if it survived ≥ 25 days or was observed in flight, whichever came first.

Abandonment was the most common identified cause of nest loss, followed by overwash and predation by gulls (Larus spp.) and Common Crows (Corvus brachyrynchos) (Table 4). Thirteen of 175 (7%) nests protected with exclosures were abandoned, as were 4 of 60 (7%) unprotecteed nests (Table 5). Of 17 total nest abandonments, available evidence indicated or strongly suggested that 5 were caused by depredation or disturbance of 1 of the adult plovers by predators, 2 by human disturbance, and 2 by heavy rain and wind (Table 5). Suspected predators of adults were raptors (2) and a feral cat (1). Disturbance by a feral cat was suspected to have caused the predator-induced abandonment.

As usual, specific causes of chick mortality were more difficult to confirm. One 5 day-old chick was crushed by an off-road vehicle on East Beach on Chappaquiddick Island on 24 June 1992. Seven chicks on CCNS and 4 chicks at Harthaven on Martha's Vineyard disappeared after a day and night of heavy rains and strong, cold winds on 1 June. On Nauset Spit, 4 newly-hatched chicks were believed lost to gulls that were gathered outside the predator exclosure around the nest.

Suspected but unconfirmed causes of chick mortality at other beaches included predation by Red Foxes (Vulpes vulpes) and gulls, exposure to heavy rain, human disturbance, and off-road

vehicles. Cooperators on the Lower Cape reported that Red Foxes continued less abundant than in the 1980's, possibly as a result of immigration by Eastern Coyotes (Canis latrans). Elsewhere, heavy fox activity was reported on the Upper Cape at Springhill Beach, and on the North Shore on Plum Island and at Crane Beach.

Wire predator exclosures were used to protect 168 of 221 (76%) nests. Nest success (percentage of nests hatching ≥ 1 egg) was 82% for nests within exclosures compared to 62% for nests without exclosures (Table 6). Seventy-six percent of eggs protected by exclosures hatched, compared to only 47% of unprotected eggs (Table 7).

Eleven different designs of predator exclosures were used in 1992 (Table 8). Nests protected by the 2 most common types of triangular exclosures (n = 19, 13) were 95% and 92% successful. Circular exclosures were used more frequently and on more beaches. Nests protected by the 4 most common types of circular exclosures (n = 12 to 70) were 77 to 92% successful. Three of 33 (9%) nests in triangular exclosures were abandoned, as were 10 of 118 (8%) nests in circular exclosures (Table 9).

Covered exclosures were more effective than uncovered designs in protecting plover nests from gull predation on beaches in Chatham and Orleans. At 4 sites within 8 km of the large gull colony at Monomoy National Wildlife Refuge (South Beach Island, Tern Island, North Beach, and Nauset Spit), 6 of 17 nests inside circular exclosures without covers were depredated by gulls, compared to 0 of 13 nests protected by circular exclosures with covers.

Again in 1992, many individuals, state and federal agencies, towns, and private conservation organizations participated in and contributed to conservation efforts on behalf of Piping Plovers and other coastal birds in Massachusetts. Our sincere thanks to all.

30 November 1992

Table 1. Abundance, distribution, and productivity of Piping Plovers in Massachusetts, 1992.

Location	Number of pairs: Index count[a]	Number of pairs: Total count[b]	No. chicks fledged[c]	No. pairs for which fledge data reported	Source[d]
NORTH SHORE					
Salisbury Beach, Salisbury	0	nd[e]	nd	-	SM
Parker River NWR, Newbury/Rowley	5	5	13	5	JH,RS
Sandy Point St. Res., Ipswich	3	3[f]	3	3	JH,RS
Crane Beach, Ipswich	14	16[f]	39	16	DR
SOUTH SHORE					
Third Cliff, Scituate	2	2	4	2	SH
Fourth Cliff, Scituate	1	1	0	1	SH
Duxbury Beach, Duxbury	2	2	1	2	SH
Plymouth Beach, Plymouth	2	2	3	2	SH
Scusset Beach, Sagamore	2	3[g]	7	3	HB,CS
UPPER CAPE					
Black Beach, Falmouth	0	nd	nd	-	BB
Washburn Island, Falmouth	1	1	0	1	FL
South Cape Beach, Mashpee	3	3	nd	nd	FL
Popponesset Beach, Mashpee	2	3	6	3	HB,CS
Town Neck Beach, Sandwich	2	2	3	2	HB,CS
Springhill Beach, Sandwich	3	3[g]	4	3	HB,CS
East Sandwich Beach, Sandwich	0	0	-	-	ES
Scorton Creek, Sandwich	4	4	5	4	ES
Sandy Neck, Barnstable	10	10	21	10	ES
Sampson's Is.-Dead Neck, Barnstable	1	1	3	1	HB,AE
Long Beach, Barnstable	1	1	2	1	HB
Kalmus Park Beach, Hyannis	2	2	6	2	HB
Gray's Beach, Yarmouth	0	0	-	-	HB
Seagull Beach, Yarmouth	1	1	4	1	HB
Radio City, Yarmouth	0	0	-	-	HB
Great Island, Yarmouth	1	1	3	1	HB
West Dennis Beach, Dennis	0	0	-	-	HB

Table 1. Continued.

Location	Number of pairs: Index count	Number of pairs: Total count	No. chicks fledged	No. pairs for which fledge data reported	Source
Chapin Beach, Dennis	0	0	-	-	ES
Quivett Creek, Brewster	0	0	-	-	HB,SM
Wings Island, Brewster	0	nd	nd	nd	HB,SM
Town Beach, Brewster	0	nd	nd	nd	HB,SM
Namskaket Creek, Brewster	0	nd	nd	nd	HB,SM
LOWER CAPE					
Forest Beach, Chatham	0	nd	nd	nd	SM
Cockle Cove, Chatham	0	nd	nd	nd	SM
Harding Beach, Chatham	2	2	4	2	HB,LB
Harding Beach Point, Chatham	0	0	-	-	HB,LB
North Monomoy Island, Chatham	0	0	-	-	SW
South Monomoy Island, Chatham	2	3	4	3	SW
South Beach Island, Chatham	12	8	13	8	HB,LB
Tern Island, Chatham	0	1	0	1	HB,LB
Nauset Beach, Chatham	5	6	12	6	HB,LB
Nauset Beach, Orleans	7	7	16	7	MG
Nauset Spit (Heights), Orleans	13	14	40	14	MG
New Island, Orleans	0	0	0	-	HB,LB
Coast Guard Beach, Eastham	7	8	19	8	JB
Marconi Beach, Wellfleet	7[h]	7[h]	19	7	JB
Great Island, Wellfleet	0	0	0	-	JB
Jeremy Point, Wellfleet	4	4	7	4	JB
Pamet Harbor, Truro	0	0	0	-	HB
Beach Point, Truro	0	0	0	-	HB
Corn Hill Beach, Truro	0	0	0	-	HB
Pilgrim Beach, Truro	0	0	0	-	HB
Ballston Beach, Truro	1	1	3	1	AB,KJ
High Head, Truro	3	3	6	3	KJ
South Beach, Provincetown/Truro[i]	11	14	33	14	KJ

Table 1. Continued.

Location	Number of pairs: Index count	Number of pairs: Total count	No. chicks fledged	No. pairs for for which fledge data available	Source
Race Point Beach, Provincetown	4	4	7	4	AB,KJ
Long Pt. (Wood End), Provincetown	2	2	7	2	AB,KJ
BUZZARDS BAY					
Stony Point Dike, Wareham	0	0	-	-	ES
Long Beach Point, Wareham	nd	nd	nd	nd	-
Little Harbor Beach, Wareham	0	nd	nd	-	BB
West Island, Fairhaven	1	1	3	1	JH
Winsegansett Heights, Fairhaven	1	1	2	1	JH
Round Hill Beach, Dartmouth	0	0	0	-	JH
Salter's Pond, Dartmouth	0	0	0	-	JH
Demarest-Lloyd State Park, Darmouth	1	1	0	1	MA,JH
Little Beach/Barney's Joy, Dartmouth	10	10	18	10	MA,JH
Gooseberry Neck, Westport	2	2	5	2	MA,JH
Horseneck Beach, Westport	10	10	9	10	MA,JH
Acoaxet, Westport	0	0	0	-	DF
Cockeast Pond, Westport	0[j]	0[j]	-	-	DF
Richmond Pond, Westport	1	1	0	1	DF
Bay Point, Swansea	0	0	-	-	AW
MARTHA'S VINEYARD/ELIZABETH ISLANDS					
Harthaven, Oak Bluffs	2	2	4	2	DS,RJ
Eel Pond/Little Beach, Edgartown	0	0	0	-	DS
Silvia State Beach, Edgartown	0	0	0	-	DS
Tisbury Great Pond (Quansoo), Chilmark	0	0[k]	-	-	RJ
Edgartown Great Pond, Edgartown	0	0	-	-	DS
Norton Point, Edgartown	2	2	4	2	DS
Wasque, Chappaquiddick	1	1	0	1	LJ,TW,TC
East Beach, Chappaquidick	1	1	2	1	LJ,TW,TC
Cape Pogue (Little Neck), Chappaq.	0	0	0	-	LJ,TW,TC

Table 1. Continued.

Location	Number of pairs: Index count	Number of pairs: Total count	No. chicks fledged	No. pairs for for which fledge data reported	Source
Squibnocket, Chilmark	2	2	3	2	DS,RJ
Long Beach, Gay Head	1	1	2	1	DS,RJ
Dogfish Bar/Lobsterville, Gay Head	2	2	5	2	DS,PB
Tashmoo, Tisbury	1	1	1	1	DS,PB
Nomans Land	nd	nd	nd	-	-
Naushon Island	0	nd	nd	-	JHa
Pasque Island	3	3	6	2	JHa
Nashawena Island	2	2	nd	-	JHa
Cuttyhunk Island	6	6	9	5	BB,SM
NANTUCKET					
Great Point	6	6	12	6	ML
The Galls	2	2	1	2	ML
Coskata Inlet (Coatue)	0	0	0	-	ML
Quidnet	0	0	0		ML
Siasconset Beach	0	0	0	-	ML
Low Beach	0	0	0	-	ML
Tom Nevers Head	0	0	0	-	ML
Surfside	0	0	0	-	ML
Smith Point	1	1	1	1	ML
Tuckernuck Island	2	2	0	2	ML
Muskeget Island	5	5	14	5	ML
TOTALS	**207**	**213**[fs]	**418**	**206**[fs]	

Table 1. Continued.

[a] Index count = total territorial pairs counted between 30 May and 7 June 1992, the standard Atlantic coast index count period.

[b] Total count = estimate of total number of territorial pairs counted during entire 1992 breeding season.

[c] Fledging is defined as chicks ≥ 25 days of age or observed in flight, whichever comes first.

[d] Key to sources: AB = April Ballam, AE = Anneliese Eckhardt, AW = Anthony Waring, BB = Brad Blodget, CS = Catherine Skelton, DR = David Rimmer, DF = David Fontes, DS = Deborah Swanson, ES = Eric Strauss, FL = Francis LeBaron, HB = Henry Barbour, JB = Jennifer Brown, JH = John Hill, JHa = Jeremy Hatch, JHe = Joann Healey, KJ = Kyle Jones, LB = Laura Bertoldi, LJ = Luanne Johnson, MA = Michelle Anderson, MG = Mark Genaris, ML = Marcia Litchfield, PB = Peter Batchelder, RJ = Richard Johnson, RS = Robert Springfield, SH = Scott Hecker, SM = Scott Melvin, SW = Sharon Ware, TC = Tom Chase, TW = Tina Whitman.

[e] nd = no data available.

[f] One pair was believed to have moved from Sandy Point State Reservation to Crane Beach; it was only counted once in state total and total pairs for which fledging data were reported.

[g] One pair was believed to have moved from Springhill Beach to Scusset Beach; it was only counted once in state total and total pairs for which fledging data were reported.

[h] Includes a pair that nested south of LeCount Hollow.

[i] South Beach includes all of outer beach between High Head and Race Point Beach, including locations referred to as Mission Bell, Frenchie's, Exit 9, and Armstrong Cut in previous years.

[j] Did not include in index or total counts a single, apparently unpaired bird at Cockeast Pond.

[k] Did not include in total count 2 birds observed at Tisbury-Great Pond for only 3 days.

Table 2. Summary of abundance and productivity of Piping Plovers in Massachusetts, 1986-1992.

Year	Total count[a]	Index count[b]	Mean chicks fledged/pair	No. (% of total) pairs with fledge data
1992	213	207	2.03	206 (97)
1991	160	148	1.72	156 (98)
1990	140	111	1.38	125 (89)
1989	137	-	1.59	123 (90)
1988	134	-	1.29	114 (85)
1987	126	-	1.07	89 (71)
1986	139	-	-	-
1985	131	-	-	-

[a] Total count = best estimate of total territorial pairs present during entire breeding season.

[b] Index count = total territorial pairs counted during 9-day standardized count period (30 May - 7 June 1992).

Table 3. Frequency of monitoring at 60 beaches in Massachusetts where Piping Plovers were present during the 1992 breeding season.

Frequency of monitoring	No. of beaches	(%)
> 4 visits/week	19	(32)
3-4 visits/week	22	(37)
1-2 visits/week	12	(20)
1 visit/2 weeks	3	(5)
1 visit/month	3	(5)
< 1 visit/month	1	(2)
Total	60	(100)

Table 4. Causes of Piping Plover nest loss in Massachusetts, 1992.

Cause of nest loss	Number of nests		
	With exclosure	Without exclosure	Total
Abandonment	13	4	17
Overwash	5	7	12
Gull	6	4	10
Crow	6	4	10
Unidentified avian	1	0	1
Fox	0	1	1
Flooded	2	1	3
Infertile eggs	1	1	2
Unknown	4	5	9
Total	38	27	65

Table 5. Suspected causes of Piping Plover nest abandonment in Massachusetts, 1992.

Cause of nest abandonment	Number of nests		
	With exclosure	Without exclosure	Total
Adult depredated	3	1	4
Adult disturbed by predator	1	0	1
Human disturbance	1	1	2
Heavy rain/wind	1	1	2
Unknown	7	1	8
Total	13	4	17

Table 6. Effects of predator exclosures on success of Piping Plover nests in Massachusetts, 1992[a]

Fate of nests	Number of nests (%) With exclosure		Number of nests (%) Without exclosure	
Successful[b]	137	(82)	33	(62)
Unsuccessful	31	(18)	20	(38)
Total	168	(100)	53	(100)

[a] Not included are 7 nests with exclosures and 8 nests without exclosures that were lost to tidal overwash or flooding from heavy rains.
[b] Nests were considered successful if they hatched ≥ 1 egg.

Table 7. Effects of predator exclosures on hatching success of 764 Piping Plover eggs in Massachusetts, 1992.

Fate of eggs	Number of eggs (%) With exclosure		Number of eggs (%) Without exclosure	
Hatched	489	(76)	56	(47)
Depredated/failed	156	(24)	63	(53)
Total	645	(100)	119	(100)

Table 8. Success[a] of Piping Plover nests using different designs of predator exclosures in Massachusetts, 1992.

Design[b]	Number of beaches	Number of nests[d]		
		Successful	Unsuccessful	Total
Triangle				
4x33', 2x2", covered	3	18	1	19
4x33', 2x4", covered	7	12	1	13
4x33', 2x2", uncovered	1	0	1	1
4x16'. 2x2", covered	1	0	1	1
Circle				
3x10', 2x4", uncovered	20	57	13	70
3x10', 2x4", covered	7	20	6	26
4x10', 2x4", uncovered	4	14	4	18
4x 8', 2x4", uncovered	2	11	1	12
4x10', 2x2", covered	1	2	2	4
3x 6', 2x4", uncovered	1	0	1	1
Fenced Tern Colony	2	3	0	3

[a] Nests are considered successful if they hatch ≥ 1 egg.

[b] Exclosure design features include height x length (triangle) or height x diameter (circle), mesh size, and whether the top was covered or uncovered with string, monofilament line, or wire. Fencing placed around tern colonies was 2x4" mesh, 1 was 1,200' in circumference, 1 was a 80'x250' rectangle.

[c] Number of beaches on which a particular exclosure design was used.

[d] Not included are 7 nests lost to high tide overwash or flooding from heavy rains.

Table 9 . Designs of predator exclosures used at Piping Plover nests that were abandoned in Massachusetts, 1992.

Exclosure design	Number of nests	
	Enclosed	Abandoned
Triangle		
4x33', 2x2", cover	19	1
4x33', 2x4", cover	13	1
4x16', 2x2", cover	1	1
Circle		
3x10', 2x4", no cover	70	5
3x10', 2x4", cover	26	2
4x10', 2x4", no cover	18	1
4x10', 2x2", cover	4	2