

Piping Plover Nesting Results in New Jersey: 2009

Provided by

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Photo courtesy of Bill Dalton

One hundred five (105) pairs of piping plovers nested in New Jersey in 2009, a 5% decrease from 2008 (111 pairs). The 2009 population was below the average number of pairs in the years since federal listing (120 pairs) and one of the lowest totals for that period.

The total number of adults recorded for the entire nesting season (220) was nearly identical to the total adult count during the date-restricted survey conducted June 1-9 (219). However, the number of pairs tallied during the entire nesting season (105) was somewhat higher than those counted during the date-restricted survey (97), which is a typical pattern in New Jersey. Slight variations in the methodologies used by the U.S. Fish and Wildlife Service (USFWS)—Edwin B. Forsythe National Wildlife Refuge (NWR) in tabulating breeding pairs during the date-restricted survey account for most of the difference between the final season and the census pair counts.

The northern Monmouth County region, especially Sandy Hook, remained a stronghold for nesting pairs (44 pairs region-wide or 42% of the statewide population). The region comprised of Holgate, Little Beach, and North Brigantine Natural Area recorded the most notable drop in pairs (23 in 2009 vs. 31 in 2008 and 39 in 2007). On a site-by-site basis, the number of pairs was fairly consistent compared to last year, with the only notable change being Stone Harbor Point increasing to 15 pairs compared to 11 in 2008. Also worth noting, Cape May Meadows, with 11 pairs, had the same number of pairs in 2009 as in 2008, after having steadily increased each year starting in 2002 with just 2 pairs.

Pairs nested at 22 sites statewide, nearly the same as in 2008 when 23 sites were active, but well below the peak count of 30 sites recorded in both 2004 and 2005. The New Jersey Division of Fish and Wildlife (NJDFW), with support from the Conserve Wildlife Foundation of New Jersey, monitored 13 of the active nesting sites (57% of the sites statewide), which accounted for 46 nesting pairs (44% of the nesting pairs statewide). In addition to the 13 active sites, NJDFW regularly monitored 12 other potential breeding sites. Although no nests were located at those other sites, breeding activity was detected at four sites, including brief territorial behavior at two sites (Island Beach State Park—Oceanfront and USCG—Tracen) and chicks moving to two sites (Monmouth Beach South and Sea Girt—NGTC) from nearby sites where they had nested (Seven Presidents Park and Sea Girt—Wreck Pond, respectively). The National Park Service (NPS) monitored seven active sites

within Gateway National Recreation Area – Sandy Hook Unit, as well as one site that was inactive in 2009 (South Fee). The USFWS-Edwin B. Forsythe NWR monitored two active sites (Holgate and Little Beach). The USFWS-Cape May NWR monitored two sites that ultimately did not have nests (Two-Mile Beach-Cape May NWR and Coast Guard-LSU), although some breeding activity was detected during the season. The Nature Conservancy (TNC) co-monitored one active nesting site, the portion of Cape May Meadows they own.

Pair-nest success (the percentage of pairs that successfully hatch young from at least one nest) for the state was up in 2009 as compared to 2008 (66% vs. 52%, respectively), and above the average for the period since federal listing (58%). Pair-nest success was especially strong in the northern Monmouth County region where three-quarters (75%) of the pairs (44) hatched young. Looking at only NJDFW-monitored sites, pair-nest success was nearly the same in 2009 compared to 2008 (52% vs. 55%, respectively).

The statewide fledgling rate, which incorporates data collected by NJDFW and other state cooperators (USFWS, NPS, and TNC) was 1.05 fledges per pair, significantly higher than in 2008 (0.64 fledges/pair). Productivity at NJDFW-monitored sites (0.48 fledges/pair for 46 pairs) was well below the statewide average and below last year's NJDFW level (0.61 fledges/pair). The poor results at NJDFW-monitored sites in 2009 were, to a large degree, the result of severe flooding at the nesting site with the most pairs in the state (Stone Harbor Point) and at another inlet site managed by NJDFW (North Brigantine Natural Area).

Statewide productivity in 2009 continued the recent trend of being below the 1.24 fledges per pair for population maintenance and even further below the 1.50 fledges per pair recovery goal, as indicated in the USFWS Recovery Plan (USFWS, 1996). However, statewide productivity (1.05 fledges/pair) strongly improved compared to the previous five years, especially the past two years (0.64 and 0.67 fledges/pair in 2008 and 2007, respectively). Furthermore, although the 1.05 chicks fledged per pair in New Jersey in 2009 was still below the USFWS targets for maintaining the population or recovery, productivity above the 1.00 level has generally resulted in population increases (or at least slowed decreases) in subsequent years in New Jersey. In fact, recent analysis of range wide (Atlantic Coast) population and productivity data collected since federal listing indicates there are regional differences in these thresholds. Among the U.S. recovery units, differences are apparent by latitude, with lower annual productivity levels being necessary to create a stationary population as you move from north to south (Hecht and Melvin, 2009). Data from New Jersey suggest a fledgling rate of 0.99 chicks per pair is sufficient to maintain a stationary population in that region (Melvin and Hecht, personal communication). Based on the 2009 fledgling rate, New Jersey might see a rebound in its piping plover population next year, although more sustained higher productivity will be necessary to produce any significant long-term population growth in the state.

Productivity varied considerably by individual site and region, which is a typical pattern. The northern Monmouth County region fledged 1.52 chicks per pair (44 pairs) just above the USFWS recovery goal (1.50 fledges/pair). Robust productivity in that region was largely responsible for the strong increase in productivity on a statewide basis this year: 61% (67 of 110) of the chicks fledged for the entire state came from that region alone. Of note, this was the second year of an intensive predator removal effort at Sandy Hook targeting red fox; that effort appears to be paying dividends as Sandy Hook recorded 1.57 fledges per pair (35 pairs), a strong increase from the recent years prior to the predator control effort when fox activity was high at the site and productivity was much lower. The region comprised of Holgate, Little Beach, and North Brigantine Natural Area recorded productivity of 1.04 fledges per pair (23 pairs), largely a result of especially strong productivity at Little Beach (1.80 fledges/pair for 10 pairs). The southern portion of the state pooled together produced just 0.47 fledges per pair (36 pairs). Stone Harbor Point, which is in the southern region and

had the most nesting pairs (15) of any individual site in the state, fledged just 0.20 chicks per pair. In the southern region, Cape May Meadows fared best with 0.91 fledges per pair (11 pairs), the same as last year, but still somewhat below expectations as this has been a particularly productive site in New Jersey in recent years with productivity at or above USFWS recovery goals between 2004-2007.

Factors impacting piping plover productivity vary considerably from site to site and year to year. Causes of nest failure are typically well documented but brood losses are more difficult to ascertain as direct mortality (or evidence of) is not frequently observed. Flooding was, by far, the leading cause of nest failure statewide in 2009, accounting for 58% of the nests lost. Especially high tides occurred coast wide in late May and again in late June, with several low-lying inlet sites (Stone Harbor Point and North Brigantine Natural Area) that hosted a concentration of nesting piping plovers being particularly hard hit. Nest abandonment was the next highest cause of nest failure (26%), followed by predation (11%), and human disturbance (2%). Two nests (3%) were lost to other causes. Nest predation was notably lower in 2009 than in recent years, in part, because of a reduction in nests destroyed by red fox at Sandy Hook. It is also likely that predation contributed less to nest loss this year because at some sites nests were lost to flooding before predator activity became a factor.

Literature Cited

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Melvin, S. M., A. Hecht. 33rd Annual Meeting – Waterbird Society. November 5, 2009. Cape May, New Jersey.

U.S. Fish & Wildlife Service. 1996. Piping Plover (*Charadrius melodus*), Atlantic Coast Population, Revised Recovery Plan. Hadley, MA. 258 pp.

Table 1. Number of pairs of piping plovers at New Jersey nesting sites: 2000-2009.

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
<i>Sandy Hook NRA</i>	29	31	35	38	32	22	22	30	32 ³	35
<i>Coast Guard</i>	5	6	7	8	7	3	4	4	4	4
<i>North Beach</i>	12	11	9	9	10	6	4	8	8	9
<i>North Gunnison</i>	3	3	4	5	3	2	3	4	7	9
<i>South Gunnison</i>	0	0	1	1	1	0	0	1	2	5
<i>Critical Zone</i>	0	1	2	4	3	3	3	4	4	2
<i>Hidden Beach</i>	3	3	5	4	3	3	3	4	2	3
<i>Fee Beach</i>	6	7	7	6	4	4	4	4	5 ³	3
<i>South Fee Beach</i>	0	0	0	1	1	1	1	1	2 ³	0
Sea Bright North	3	3	5	7	5	7	7	8	8	6
Monmouth Beach North	4	4	3	2	4	3	3	1	1	1
Monmouth Beach South	1	1	1	0	0	0	0	0	0	0
Seven Presidents Park	0	0	0	1	1	1	2	3	3	2
Long Branch	0	0	0	1	0	0	0	0	0	0
Region 2 subtotal	37	39	44	49	42	33	34	42	44	44
Sea Girt - Wreck Pond	0	0	0	1	1	1	0	1	0	1
Sea Girt - NGTC	0	0	1	0	0	0	0	1	0	0
Island Beach SP - Dike	0	0	0	2	3	2	0	0	0	0
Barnegat Light	3	2	3	3	3	4	3	4	3	1
Region 3 subtotal	3	2	4	6	7	7	3	6	3	2
<i>Holgate</i>	19	19	14	13	16	13	16	14	11	7
<i>Little Beach</i>	8	12	17	19	19	11	12	17	12	10
North Brigantine NA	11	12	15	17	8	8	8	8	8	6
Region 4 subtotal	38	43	46	49	43	32	36	39	31	23
Brigantine - Inlet (Cove)	0	0	1	0	0	0	0	0	0	0
Seaview Harbor Marina	0	0	0	0	0	1 ³	0	0	0	0
Ocean City - North	5	8	8	2	1	1 ³	0	0	0	0
Ocean City - Center	8	9	8	8	8	5	7	4	3	1
Region 5 subtotal	13	17	17	10	9	6	7	4	3	1
Corson's Inlet SP	1	1	1	2	3	2	2	2	1	2
Strathmere NA	0	0	0	0	0	1	1	0	0	0
Strathmere (Upper Twp.)	0	0	0	1	1	1	0	0	0	0
Whale Beach	0	0	1	0	0	0	0	0	0	0
Sea Isle - South	0	1	0	0	0	0	0	0	0	0
Townsend's Inlet	0	1	1	1	1	1	0	0	0	0
Avalon - North	1	1	0	0	0	0	0	0	0	0
Avalon - Dunes	3	4	7	8	8	5	4	5	4	4
Region 6 subtotal	5	8	10	12	13	10	7	7	5	6
Stone Harbor Point	5	5	6	6	9	10	17	17	11	15
Champagne Island	0	0	0	0	1	1	2	1	0	0
N.Wildwood - Hereford Inlet	0	0	3	3	4	3	3	2	1	2
<i>Two-Mile Beach</i>	1	1	2	2	1	1	1	2	0	0
<i>Cape May NWR</i>	0	0	0	0	0	0	0	1	0	0
<i>Coast Guard - LSU¹</i>	1	1	2	2	1	1	1	1	0	0
Coast Guard - TRACEN	5	2	3	4	1	3	0	2	1	0
Cape May City	1	2	1	0	1	0	0	0	1	1
Cape May Meadows	4	3	2	3	4	5	6	7	11	11
<i>The Nature Conservancy</i>	3	2	2	2	1	4 ³	3	4	7	7
<i>Cape May Point SP²</i>	1	1	0	1	3	2 ³	3	3	4	4
Region 7 subtotal	16	13	17	18	21	23	29	31	25	29
Total Pairs	112	122	138	144	135	111	116	129	111	105
Pairs at NJDFW sites	52	57	68	70	66	61	62	62	49	46

¹ Prior to 2002 this site was co-monitored by New Jersey Division of Fish and Wildlife (NJDFW).

² Starting in 2003 this site was monitored by NJDFW.

³ The same pair nested at two nearby sites. Therefore "subtotals" and "totals" will be less than sum of individual sites. Note: Sites in *italics* were monitored by agencies other than NJDFW: Sandy Hook by National Park Service, Holgate and Little Beach by USFWS - Edwin B. Forsythe NWR, Two-Mile Beach by USFWS - Cape May NWR, and Cape May Meadows - TNC by The Nature Conservancy by TNC - Delaware Bayshores Office.

Table 2. New Jersey piping plover window census results: June 1-9 2009.

	Window Census Count			Final Season Count		
	# Pairs	# Unpaired Adults	# Total Adults	# Pairs	# Unpaired Adults	# Total Adults
<i>Sandy Hook Coast Guard</i>	3	0	6	4	0	8
<i>Sandy Hook North Beach</i>	9	0	18	9	0	18
<i>Sandy Hook North Gunnison</i>	9	0	18	9	0	18
<i>Sandy Hook South Gunnison</i>	5	0	10	5	0	10
<i>Sandy Hook Critical Zone</i>	2	0	4	2	0	4
<i>Sandy Hook Hidden Beach</i>	4	0	8	3	0	6
<i>Sandy Hook Fee Beach</i>	3	0	6	3	0	6
<i>Sandy Hook South Fee Beach</i>	0	0	0	0	0	0
Sea Bright North	5	1	11	6	0	11
Monmouth Beach North	1	0	2	1	0	2
Monmouth Beach South	0	0	0	0	0	0
Seven Presidents Park	2	0	4	2	0	4
Long Branch	0	0	0	0	0	0
Region 2 subtotal	43	1	87	44	0	87
Belmar - Shark River Inlet	0	0	0	0	0	0
Sea Girt - Wreck Pond	1	0	2	1	0	2
Sea Girt - NGTC	0	0	0	0	0	0
Island Beach SP - Dike	0	0	0	0	0	0
High Bar	0	0	0	0	0	0
Barnegat Light	2	1	5	1	0	2
Region 3 subtotal	3	1	7	2	0	4
<i>Holgate</i>	5	4	14	7	0	14
<i>Little Beach</i>	7	16	30	10	10	30
North Brigantine NA	6	0	12	6	0	12
Region 4 subtotal	18	20	56	23	10	62
Brigantine Beach	0	0	0	0	0	0
Brigantine - Inlet (Cove)	0	0	0	0	0	0
Seaview Harbor Marina	0	0	0	0	0	0
Ocean City - North	0	0	0	0	0	0
Ocean City - Center	1	0	2	1	0	2
Region 5 subtotal	1	0	2	1	0	2
Corson's Inlet SP	2	0	4	2	0	4
Strathmere Natural Area	0	0	0	0	0	0
Strathmere (Upper Twp.)	0	0	0	0	0	0
Townsend's Inlet	0	0	0	0	0	0
Avalon - North	0	0	0	0	0	0
Avalon - Dunes	4	0	8	4	0	8
Region 6 subtotal	6	0	12	6	0	12
Stone Harbor Point	13	1	26	15	0	30
Champagne Island	0	0	0	0	0	0
N. Wildwood - Hereford Inlet	1	1	3	2	0	4
<i>2-Mile Beach - USFWS</i>	0	0	0	0	0	0
<i>2-Mile Beach - LSU</i>	0	0	0	0	0	0
Coast Guard - TRACEN	0	0	0	0	0	0
Cape May City	1	0	2	1	0	2
<i>Cape May Meadows - TNC</i>	7	0	14	7	0	14
Cape May Meadows - CMPSP	4	1	9	4	0	8
Cape May Point - Borough	0	0	0	0	0	0
Region 7 subtotal	26	3	55	29	0	58
Total	97	25	219	105	10	220

Note: Sites in *italics* were surveyed by agencies other than New Jersey Division of Fish and Wildlife: Sandy Hook by National Park Service, Holgate and Little Beach by USFWS - Edwin B. Forsythe NWR, Two-Mile Beach by USFWS – Cape May NWR, and Cape May Meadows – TNC by The Nature Conservancy by TNC - Delaware Bayshores Office.

Table 3. New Jersey piping plover nesting summary by sites: 2009.

SITE	2009					
	# Pairs	# Pairs Hatched	# Chicks Fledged	Pair Success	Fledge Rate	SP Fledge Rate
Sandy Hook NRA	35	26	55	0.74	1.57	2.12
<i>Coast Guard</i>	4	4	6	1.00	1.50	1.50
<i>North Beach</i>	9	7	19	0.78	2.11	2.71
<i>North Gunnison</i>	9	8	16	0.89	1.78	2.00
<i>South Gunnison</i>	5	2	1	0.40	0.20	0.50
<i>Critical Zone</i>	2	1	2	0.50	1.00	2.00
<i>Hidden Beach</i>	3	2	4	0.67	1.33	2.00
<i>Fee Beach</i>	3	2	7	0.67	2.33	3.50
Sea Bright North	6	4	5	0.67	0.83	1.25
Monmouth Beach North	1	1	3	1.00	3.00	3.00
Seven Presidents Park	2	2	4	1.00	2.00	2.00
Region 2 Subtotal	44	33	67	0.75	1.52	2.03
Sea Girt – Wreck Pond	1	1	1	1.00	1.00	1.00
Barnegat Light	1	1	1	1.00	1.00	1.00
Region 3 Subtotal	2	2	2	1.00	1.00	1.00
Holgate	7	5	6	0.71	0.86	1.20
Little Beach	10	7	18	0.70	1.80	2.57
North Brigantine NA	6	0	0	0.00	0.00	0.00
Region 4 Subtotal	23	12	24	0.52	1.04	2.00
Ocean City - Center	1	1	0	1.00	0.00	0.00
Region 5 Subtotal	1	1	0	1.00	0.00	0.00
Corson's Inlet SP	2	2	1	1.00	0.50	0.50
Avalon Dunes	4	3	2	0.75	0.50	0.67
Region 6 Subtotal	6	5	3	0.83	0.50	0.60
Stone Harbor Point	15	4	3	0.27	0.20	0.75
N. Wildwood - Hereford	2	1	1	0.50	0.50	1.00
Cape May City	1	0	0	0.00	0.00	0.00
Cape May Meadows	11	11	10	1.00	0.91	0.91
<i>The Nature Conservancy</i>	7	7	9	1.00	1.29	1.29
<i>Cape May Point SP</i>	4	4	1	1.00	0.25	0.25
Region 7 Subtotal	29	16	14	0.55	0.48	0.88
All NJ sites TOTAL	105	69	110	0.66	1.05	1.59
NJDFW sites TOTAL	46	24	22	0.52	0.48	0.92
# Active Sites	22					

Data for Sandy Hook NRA provided by The National Park Service.

Date for Holgate and Little Beach provided by the U.S. Fish and Wildlife Service - Edwin B. Forsythe NWR.

Data for Cape May Meadows-The Nature Conservancy provided by The Nature Conservancy Delaware Bayshore Office.

All other data provided by the New Jersey Division of Fish and Wildlife – Endangered and Nongame Species Program.

Pair success equals the percentage of pairs that hatched young (at least one chick observed).

Fledge Rate equals the number of chicks fledged per pair.

Successful Pair (SP) Fledge Rate equals the number of chicks fledged per pair that successfully hatched young.

Figure 1. New Jersey piping plover population and productivity: 1987:2009.

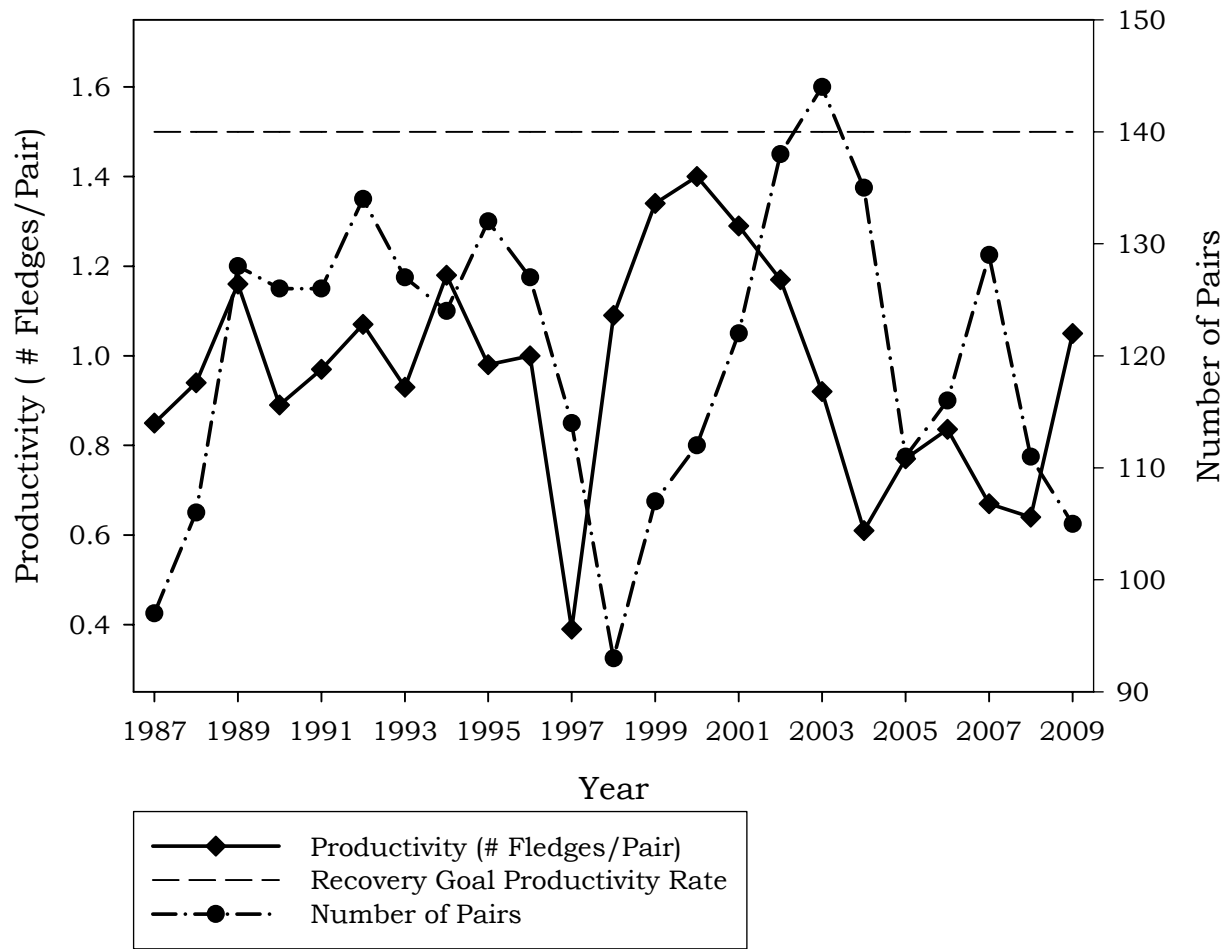


Figure 2. Causes of piping plover nest failure in New Jersey: 2009.

