

Piping Plover Nesting Results in New Jersey: 2014

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Photo Courtesy of Sam Galick

SUMMARY OF FINDINGS:

Ninety-two (92) pairs of piping plovers nested in New Jersey in 2014, a 15% decrease compared to 2013 (108 pairs). Except for moderate spikes in 2007 and 2012, the population trend has been flat over the past 10 years (Figure 1). Furthermore, the number of nesting pairs has been below the long-term average since federal listing (118 pairs) in 8 of the last 10 years and substantially below the peak count of 144 pairs in 2003.

The total number of adults recorded for the entire nesting season (186) was nearly the same as the count during the date-restricted survey conducted June 1-9 (184). The number of pairs tallied during the entire nesting season (92) was just slightly higher than the pairs recorded during the date-restricted census (86). Typically in New Jersey, pairs detected during the date-restricted survey are well below the final season count; likewise, with the total adults to a lesser degree. Greater consistency between the two counts this year is the result of a more intensive and comprehensive survey effort at Holgate and Little Beach throughout the breeding season – in previous years most of the difference between the two survey results was due to variations in the survey protocols used by the USFWS – Edwin B. Forsythe NWR.

As has been the case in recent years, Northern Monmouth County, as a region, continued to account for the largest percentage of pairs in the state (49 pairs or 53% of the statewide total). Nearly all of those pairs nested at Sandy Hook (47 pairs or 51% of the statewide total). The central coast region comprised of Holgate, Little Beach, and North Brigantine Natural Area accounted for the next highest concentration of nesting pairs (29 pairs or 32% of the statewide total). Cape May County, the southernmost region of the state, consisting of Ocean City to Cape May Point, continued its long-term downward population trend, with just 11 pairs in 2014 compared to 43 in 2004.

Looking at the individual sites, there were mostly minor fluctuations in pairs in 2014 versus 2013. The major exception was Little Beach, which decreased to 14 pairs in 2014 (vs. 23 in 2013). However, it is believed at least some of that drop is the result of increases in survey intensity and quality in 2014 of this relatively remote location, which resulted in more accurate tracking of nests and pairs. Stone Harbor Point and North Brigantine Natural Area continued a long-term downward abundance trend, hosting 4 and 3 active pairs, respectively, in 2014, down from peaks of 17 pairs in 2007 and 2003, respectively.

Pairs nested at 21 sites, the same as in 2013, but well below the peak count of 30 sites recorded in both 2004 and 2005. The New Jersey Division of Fish and Wildlife (NJDFW) monitored 12 of the active nesting sites (57% of the sites statewide), accounting for 19 nesting pairs (21% of the nesting pairs statewide). NJDFW typically monitors about half of the state's active sites (i.e., sites where nests are located), but the total number of active pairs monitored at NJDFW sites continued to drop dramatically in 2014, down from 70 pairs just over a decade ago in 2003. NJDFW also regularly monitored eight other potential breeding sites with historic nesting records and/or highly suitable habitat, as well as several other sites less regularly; however none of those sites yielded nests.

Statewide pair-nest success (the percentage of pairs that successfully hatch at least one nest) was relatively high this year (75%), above last year's rate (67%) and the average for the period since federal listing (67%). This higher than average rate was driven by the Northern Monmouth County region (49 pairs) and Holgate (12 pairs), which had extremely high success with nearly all of their pairs hatching young (90% and 92%, respectively). Looking at just NJDFW-monitored sites, pair-nest success was notably below last year (47% in 2014 vs. 59% in 2013) and the average for NJDFW-monitored sites for the period since federal listing (66%).

The statewide fledgling rate, which includes data collected and provided by all the state cooperators, was 1.36 fledglings per pair. This represents a significant increase from 2013 (0.85 fledglings/pair) and was one of the highest statewide levels recorded since federal listing (Figure 1). Although still below the 1.50 fledglings per pair federal recovery goal, it was above the 1.245 fledglings per pair range-wide threshold for population maintenance established in the USFWS Recovery Plan for the Atlantic Coast population of piping plovers (USFWS, 1996). Productivity at NJDFW-monitored sites rose slightly in 2014 (0.74 fledglings/pair for 19 pairs) compared to 2013 (0.69 fledglings/pair for 29 pairs), but it remained low and those sites collectively, which represent some of the more heavily recreated and disturbed sites, continued to be less productive than the state as a whole.

As is typical, productivity varied considerably by individual site and region. The Northern Monmouth County region fledged 1.43 chicks per pair (49 pairs), nearly approaching the federal recovery goal of 1.50 chicks fledged per pair. This strong regional trend is largely the result of robust productivity at Sandy Hook (1.40 fledglings/pair for 47 pairs). Within Sandy Hook, the North Beach site remained particularly productive (1.86 fledglings/pair based on 14 pairs), with adjacent North Gunnison also recording strong results in 2014 (1.63 fledglings/pair based on 8 pairs). The Holgate, Little Beach, and North Brigantine Natural Area region saw the greatest gain in productivity in 2014; its rate of 1.69 fledglings per pair (29 pairs) exceeded the federal recovery goal and nearly tripled the output recorded in 2013 (0.59 fledglings/pair). Of particular note, Holgate fledged 2.33 chicks per pair (12 pairs); to a large degree, it is believed this high rate was the result of pairs shifting their nesting at the site into productive overwash habitat created by Superstorm Sandy. The combined Edwin B. Forsythe NWR sites of Holgate and Little Beach produced 1.73 fledglings per pair (26 pairs). The Cape May County region continued its recent trend of very low productivity; in 2014 no chicks fledged across the entire region from Ocean City to Cape May Point (11 pairs), the first time since federal listing that the entire region failed to successfully fledge chicks.

Predation was the leading known cause of nest failure statewide, accounting for just over half (24 nests or 52%) of the failed nests (46). Of the nests destroyed by predators, 59% were attributed to mammals and 8% to avian species, with 33% being undetermined as to the species. Abandonment was the next leading causes of nest failure (15 nests or 33%), followed by flooding (6 nests or 13%). The probable cause of nest failure could not be determined for one of the failed nests (2%). Direct observation of chick mortality is rare, so a thorough assessment of chick loss was not possible.

CONCLUSION:

New Jersey's statewide piping plover breeding population reached a historic low of 92 pairs in 2014, as viewed over the period since federal listing. Furthermore, it has been below average in 8 of the last 10 years after reaching a peak of 144 pairs in 2003. Those declines are largely the result of persistent poor productivity at a number of the state's sites, especially the municipal beaches and state park sites, where recreational activities and disturbance are highest. Without strong productivity at Sandy Hook, which has accounted for 40-50% of the state's total pairs in the past five years, the population decline might be even greater. Continued strong productivity at Sandy Hook is critical overall, but will not lead to statewide recovery alone.

Of particular concern, NJDFW-monitored sites, again those municipal and state sites that are most heavily impacted by human disturbance and proximity to predator activity, have shown dramatic declines over the past decade or so, from 70 pairs (and 49% of the statewide total) in 2003 to just 19 pairs (and 21% of the statewide total) in 2014. Although these sites will continue to remain the greatest challenge in the state in terms of site management and achieving high productivity, reversing this decline is essential to recovering the statewide population. Increasing pairs and productivity at the state-owned sites, notably North Brigantine Natural Area and Cape May Point State Park (in conjunction with The Nature Conservancy's Cape May Meadows), should be an especially high priority. Finally, Holgate and Little Beach, the units of the Edwin B. Forsythe NWR where little to no human disturbance occurs and some of the most highly suitable habitat conditions exist, should also be a high priority to maximize productivity and increase pair totals. A robust recovery would ideally be geographically distributed across the state, but given the challenges at the recreational beaches, significant resources need to be directed to those sites with the highest potential to increase our state's population.

Despite the alarming drop in breeding pairs in 2014, New Jersey recorded one of its highest levels of piping plover productivity (1.36 fledglings/pair) on record since federal listing and it was above the level believed necessary to increase the population. The high productivity was driven by strong fledgling output at Sandy Hook, which accounted for 51% of the state's pairs, but also at the Edwin B. Forsythe NWR sites, especially Holgate. Increases in productivity at the Forsythe sites, which resulted, in part, due to enhanced habitat suitability as a result of Superstorm Sandy, are especially encouraging. If previous trends hold, the statewide increase in productivity this year should result in an increase in the New Jersey's piping plover breeding population next year. However, any long-term increase or recovery will depend on maintaining higher productivity over a sustained period.

LITERATURE CITED:

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: 2005-2014.

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
<i>Sandy Hook NRA</i>	22	22	30	32 ¹	35	45	49	50	43	47
<i>Coast Guard</i>	3	4	4	4	4	5	4	4	3	4
<i>North Beach</i>	6	4	8	8	9	13	14	14	13	14
<i>North Gunnison</i>	2	3	4	7	9	9	9	13	8	8
<i>South Gunnison</i>	0	0	1	2	5	5	4	5	7	9
<i>D-Lot</i>	0	0	0	0	0	0	1	0	0	0
<i>Skeleton Hill Island</i>	0	0	0	0	0	0	1	0	0	0
<i>Critical Zone</i>	3	3	4	4	2	6	5	6	5	4
<i>Hidden Beach</i>	3	3	4	2	3	3	5	4	3	4
<i>Fee Beach</i>	4	4	4	5 ¹	3	3	5	3	4	4
<i>South Fee Beach</i>	1	1	1	2 ¹	0	1	1	1	0	0
Sea Bright North	7	7	8	8	6	3	2	2	0	0
Monmouth Beach North	3	3	1	1	1	2	0	0	2	1
Seven Presidents Park	1	2	3	3	2	2	2	0	0	1
Region 2 subtotal	33	34	42	44	44	52	53	52	45	49
Belmar – Shark River Inlet	0	0	0	0	0	0	0	0	0	1
Sea Girt - Wreck Pond	1	0	1	0	1	0	0	1	0	0
Sea Girt - NGTC	0	0	1	0	0	0	0	0	0	0
Island Beach SP - Dike	2	0	0	0	0	0	0	0	0	0
Barneгат Light	4	3	4	3	1	3	3	1	2	1
Region 3 subtotal	7	3	6	3	2	3	3	2	2	2
<i>Holgate</i>	13	16	14	11	7	10	6	14	12	12
<i>Little Beach</i>	11	12	17	12	10	13	17	18	23	14
North Brigantine NA	8	8	8	8	6	3	5	8	6	3
Region 4 subtotal	32	36	39	31	23	26	28	40	41	29
Seaview Harbor Marina	1	0	0	0	0	0	1	1	1	0
Malibu WMA	0	0	0	0	0	0	0	0	0	1
Ocean City - North	1 ¹	0	0	0	0	0	0	0	0	0
Ocean City - Center	5	7	4	3	1	0	1	0	0	0
Region 5 subtotal	6	7	4	3	1	0	2	1	1	1
Corson's Inlet SP	2	2	2	1	2	0	0	0	0	0
Strathmere NA	1	1	0	0	0	1	1	1	2 ¹	1
Strathmere (Upper Twp.)	1	0	0	0	0	1	2	2	4 ¹	2
Townsend's Inlet	1	0	0	0	0	0	0	0	0	0
Avalon - Dunes	5	4	5	4	4	5	5	5	3	3 ¹
Region 6 subtotal	10	7	7	5	6	7	8	8	8	6
Stone Harbor Point	10	17	17	11	15	9	10	9	6	4 ¹
Champagne Island	1	2	1	0	0	0	0	0	0	0
N. Wildwood-Hereford Inlet	3	3	2	1	2	2	1	1	1	1
<i>Two-Mile Beach</i>	1	1	2	0	0	1	0	0	0	0
<i>Cape May NWR</i>	0	0	1	0	0	0	0	0	0	0
<i>Coast Guard - LSU</i>	1	1	1	0	0	1	0	0	0	0
Coast Guard - TRACEN	3	0	2	1	0	0	0	2	1 ¹	0
Cape May City	0	0	0	1	1	0	0	0	1 ¹	0
Cape May Meadows	5	6	7	11	11	8	6	6	3	1
<i>The Nature Conservancy</i>	4 ¹	3	4	7	7	5	4	3	1	0
Cape May Point SP	2 ¹	3	3	4	4	3	2	3	2	1
Region 7 subtotal	23	29	31	25	29	20	17	18	11	6
Total Pairs	111	116	129	111	105	108	111	121	108	92
Pairs at NJDFW sites	61	62	62	49	46	34	35	36	29	19

Note: Sites in italics were monitored by agencies other than NJDFW: Sandy Hook NRA by the 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 - Delaware Bayshores Office.

¹The same pair nested at two nearby sites. Therefore “subtotals” and “totals” may be less than sum of individual sites.

Table 2. New Jersey piping plover window census results: June 1-9 2014.

	State Census Count			Final Season Count		
	# Pairs	# Unpaired Adults	# Total Adults	# Pairs	# Unpaired Adults	# Total Adults
Sandy Hook Coast Guard	4	0	8	4	0	8
Sandy Hook North Beach	12	0	24	14	0	28
Sandy Hook North Beach Rec. Beach	1	0	2	0	0	0
Sandy Hook North Gunnison	8	0	16	8	0	16
Sandy Hook South Gunnison	9	0	18	9	0	18
Sandy Hook Critical Zone	4	0	8	4	0	8
Sandy Hook Hidden Beach	4	0	8	4	0	8
Sandy Hook Fee Beach	4	0	8	4	0	8
Sandy Hook South Fee Beach	0	0	0	0	0	0
Sea Bright North	0	0	0	0	0	0
Monmouth Beach North	1	0	2	1	0	2
Monmouth Beach South	0	0	0	0	0	0
Seven Presidents Park	1	0	2	1	0	2
Long Branch	0	0	0	0	0	0
Region 2 subtotal	48	0	96	49	0	98
Belmar - Shark River Inlet	0	0	0	1	0	2
Sea Girt - Wreck Pond	0	0	0	0	0	0
Sea Girt - NGTC	0	0	0	0	0	0
Island Beach SP – Northern NA	0	0	0	0	0	0
Island Beach SP – Southern NA	0	0	0	0	0	0
Barneгат Light	1	1	3	1	1	3
Region 3 subtotal	1	1	3	2	1	5
Holgate	14	3	31	12	0	24
Little Beach	12	5	29	14	0	28
North Brigantine NA	3	0	6	3	1	7
Region 4 subtotal	29	8	66	29	1	59
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
Malibu WMA	0	0	0	1	0	2
Ocean City - North	0	0	0	0	0	0
Ocean City - Center	0	0	0	0	0	0
Region 5 subtotal	0	0	0	1	0	2
Corson's Inlet SP	0	0	0	0	0	0
Strathmere Natural Area	1	0	2	1	0	2
Strathmere (Upper Twp.)	1	1	3	2	0	4
Townsend's Inlet	0	0	0	0	0	0
Whale Beach	0	0	0	0	0	0
Sea Isle	0	0	0	0	0	0
Avalon - North	0	0	0	0	0	0
Avalon - Dunes	2	1	5	3 ¹	0	6
Stone Harbor - Oceanfront	0	0	0	0	0	0
Region 6 subtotal	4	2	10	6	0	12
Stone Harbor Point	3	1	7	4 ¹	0	8
N. Wildwood - Hereford Inlet	0	0	0	1	0	2
2-Mile Beach - NWR	0	0	0	0	0	0
2-Mile Beach - LSU	0	0	0	0	0	0
Coast Guard - TRACEN	0	0	0	0	0	0
Cape May City	0	0	0	0	0	0
Cape May Meadows - TNC	0	0	0	0	0	0
Cape May Meadows - CMPSP	1	0	2	1	0	2
Cape May Point Borough	0	0	0	0	0	0
Region 7 subtotal	4	1	9	6	0	10
Total	86	12	184	92	2	186

¹ The same pair nested at two nearby sites. Therefore “subtotals” and “totals” may be less than sum of individual sites.

Table 3. New Jersey piping plover nesting summary by sites: 2014.

SITE	2014					
	Pairs	Pairs Hatched	Chicks Fledged	Pair Success	Fledge Rate	SP Fledge Rate
Sandy Hook NRA	47	42	66	0.89	1.40	1.57
<i>Coast Guard</i>	4	4	1	1.00	0.25	0.25
<i>North Beach</i>	14	14	26	1.00	1.86	1.86
<i>North Gunnison</i>	8	8	13	1.00	1.63	1.63
<i>South Gunnison</i>	9	6	10	0.67	1.11	1.67
<i>Critical Zone</i>	4	4	4	1.00	1.00	1.00
<i>Hidden Beach</i>	4	3	6	0.75	1.50	2.00
<i>Fee Beach</i>	4	3	6	0.75	1.50	2.00
Monmouth Beach North	1	1	2	1.00	2.00	2.00
7 President's Park	1	1	2	1.00	2.00	2.00
Region 2 Subtotal	49	44	70	0.90	1.43	1.59
Belmar - Shark River Inlet	1	0	0	0.00	0.00	0.00
Barneгат Light	1	1	3	1.00	3.00	3.00
Region 3 Subtotal	2	1	3	0.50	1.50	3.00
Holgate	12	11	28	0.92	2.33	2.55
Little Beach	14	7	17	0.50	1.21	2.43
North Brigantine NA	3	2	4	0.67	1.33	2.00
Region 4 Subtotal	29	20	49	0.69	1.69	2.45
Malibu WMA	1	1	3	1.00	3.00	3.00
Region 5 Subtotal	1	1	3	1.00	3.00	3.00
Strathmere NA	1	0	0	0.00	0.00	0.00
Strathmere (Upper Twp)	2	0	0	0.00	0.00	0.00
Avalon Dunes	3 ¹	1	0	0.33	0.00	0.00
Region 6 Subtotal	6	1	0	0.17	0.00	0.00
Stone Harbor Point	4 ¹	2	0	0.50	0.00	0.00
N. Wildwood - Hereford	1	0	0	0.00	0.00	0.00
Cape May Meadows	1	0	0	0.00	0.00	0.00
Cape May Point SP	1	0	0	0.00	0.00	0.00
Region 7 Subtotal	6	2	0	0.33	0.00	0.00
All NJ sites TOTAL	92	69	125	0.75	1.36	1.81
NJDFW sites TOTAL	19	9	14	0.47	0.74	1.56
# Active Sites	21					

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

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

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

¹The same pair nested at two nearby sites. Therefore "subtotals" and "totals" may be less than sum of individual sites.

Figure 1. New Jersey piping plover population: 1987-2014.

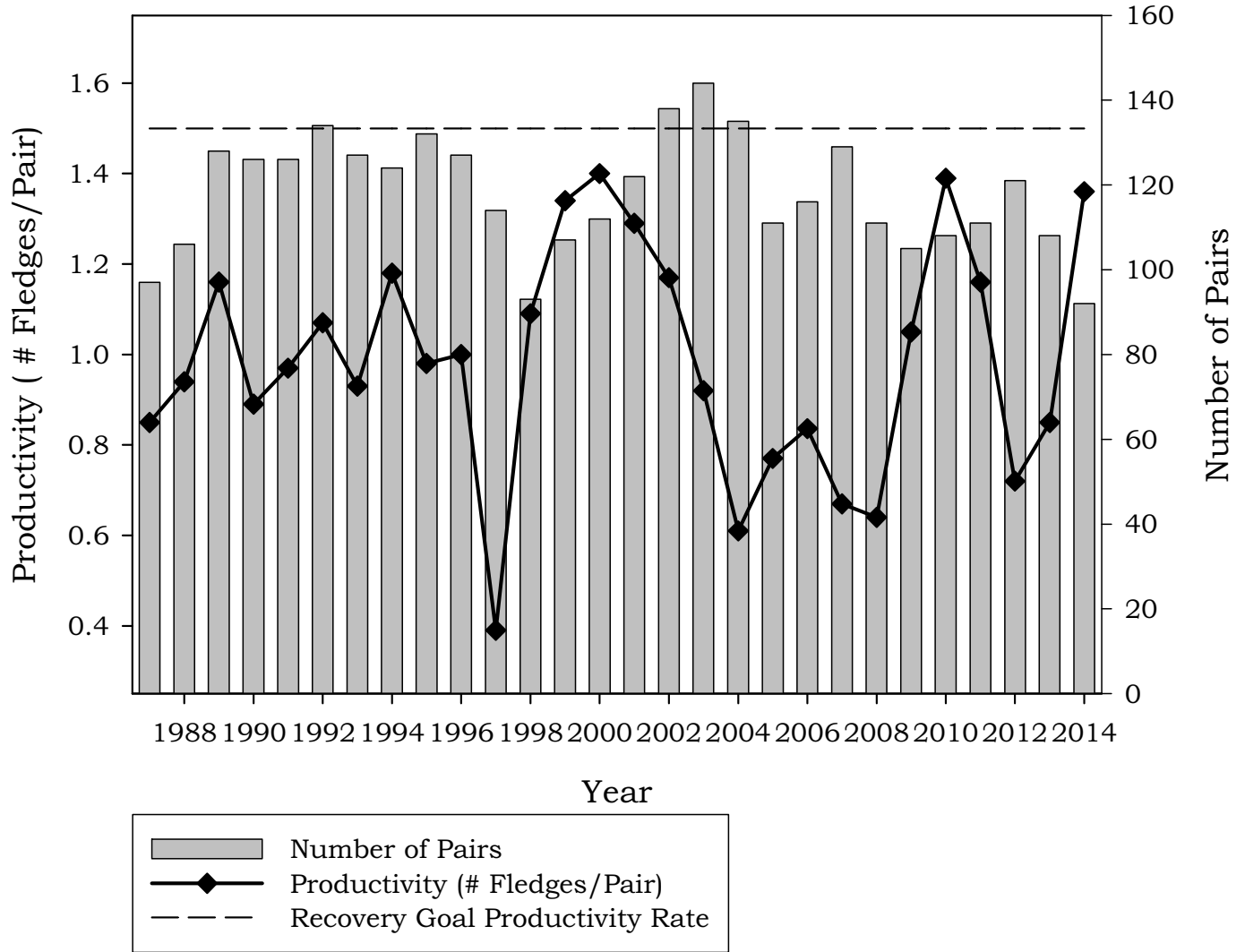


Figure 2. Causes of piping plover nest failure in New Jersey: 2014.

N=46

