

# Piping Plover Nesting Results in New Jersey: 2011

Provided by  
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Photo courtesy of Robert Lin

One hundred eleven (111) pairs of piping plovers nested in New Jersey in 2011, a 3% increase compared to 2010 (108 pairs). Despite the slight increase this year, the population has changed little over the past four years (111, 105, 108, and 111 pairs from 2008-2011, respectively). The 2011 population remained below the average number of pairs for the years since federal listing (119 pairs) and well below the peak of 144 pairs in 2003.

The total number of adults recorded for the entire nesting season (228) was nearly the same as the count during the date-restricted survey conducted June 1-9 (222). However, the number of pairs tallied during the entire nesting season (111) was higher than those counted during the date-restricted survey (97), which is a typical comparative survey result in New Jersey. Slight variations in the methodologies used by the USFWS – Edwin B. Forsythe 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.

For the second year in a row, Northern Monmouth County accounted for nearly half of the pairs in the state (53 pairs or 48%). Furthermore, most of those pairs nested at Sandy Hook (49 pairs or 44% of the statewide total). Sandy Hook has more than doubled the number of pairs in the past five years (22 pairs in 2006 vs. 49 pairs in 2011). The next highest concentration of piping plovers in the state occurred in the region comprised of Holgate, Little Beach, and North Brigantine Natural Area (28 pairs or 25% of the statewide total). The southernmost region of the state from Stone Harbor Point to Cape May Point continued its decline in pairs over the past several years (17 pairs or 15% of the statewide total in 2011). Overall, there was no significant change in the number of pairs on a regional basis in 2011 compared to 2010.

There was very little change in the number of pairs at individual sites in 2011 compared to 2010. The number of pairs decreased at Holgate (6 in 2011 vs. 10 in 2010), but increased equally at Little Beach (17 in 2011 vs. 13 in 2010). Given the strong breeding site fidelity exhibited by piping plovers and the fact that these two sites are adjacent to one another, the changes may just represent a shift within the region. Cape May Meadows saw a small drop in pairs in 2011 compared to 2010 (6 pairs vs. 8 pairs, respectively), which is primarily notable because it continues a downward trend over

the past two years after a steady increase in pairs starting in 2002 that peaked at 11 pairs in 2008 and 2009. The previous rise in pairs was primarily attributed to a habitat restoration project at the site that specifically focused on benefiting piping plovers; however, predation of nests and chicks by crows, which has resulted in notably lower productivity at the site in recent years may be a factor leading to the current decrease of pairs.

Pairs nested at 24 sites, up slightly from 2010 (22 sites), but still below the peak count of 30 sites recorded in both 2004 and 2005. NJDFW monitored 12 of the active nesting sites (50% of the sites statewide), accounting for 35 nesting pairs (32% of the nesting pairs statewide). NJDFW typically monitors about half of the state's active sites (i.e. sites where nests are located), however, the percentage of active pairs monitored by NJDFW in 2011 remained at one of the lowest levels since federal listing. This downward shift in the percentage of statewide pairs monitored by NJDFW is the result of habitat conditions no longer being suitable at some of the sites monitored by NJDFW, as well as the sharp jump in pairs at Sandy Hook (which is monitored by the National Park Service). NJDFW also regularly monitored 9 other potential breeding sites – some breeding behavior was observed at most (7) of those sites, although no nests were located.

Statewide pair-nest success (the percentage of pairs that successfully hatch at least one nest) was down in 2011 compared to 2010 (77% vs. 84%, respectively), but still well above the average for the period since federal listing (66%). Looking at just NJDFW-monitored sites, pair-nest success was down strongly in 2011 compared to 2010 (63% vs. 79% respectively), but about average for the period since federal listing (67%), and 2010 was an especially strong year for hatch success.

The statewide fledgling rate, which incorporates data collected by all the state cooperators was 1.18 fledges per pair, down from 2010 (1.39 fledges/pair), but it should be noted that 2010 was the highest rate ever recorded on a statewide basis. Although the 2011 statewide productivity rate was below both the 1.50 fledges/pair recovery goal and the 1.24 fledges/pair range wide threshold for population maintenance established in the USFWS Recovery Plan for the Atlantic Coast population of piping plovers (USFWS, 1996), it was still above average for New Jersey for the period since federal listing (1.01 fledges/pair). Productivity at NJDFW-monitored sites (0.77 fledges/pair for 35 pairs) was well below the 2011 statewide average, as well as below the rate for NJDFW-monitored sites in 2010 (0.94 fledges/pair).

Productivity varied considerably by individual site and region. The Northern Monmouth County region fledged 1.47 chicks per pair (53 pairs), just below the USFWS recovery goal (1.50 fledges/pair). A disproportionate number of the statewide total of fledges was produced in Northern Monmouth County (78 out of 131 or 60%). As has been the case the past several years, high productivity in that region, especially Sandy Hook (1.51 fledges/pair for 49 pairs), drove productivity for the entire state. The region comprised of Holgate, Little Beach, and North Brigantine Natural Area recorded productivity of 1.07 fledges per pair (28 pairs), with Holgate being particularly notable (2.50 fledges/pair for 6 pairs). The southern region of the state (Stone Harbor Point to Cape May Point) recorded just 0.53 fledges/pair (17 pairs), largely the result of poor reproductive success at Stone Harbor Point. After a relatively productive year in 2010 (1.44 fledges/pair for 9 pairs), Stone Harbor Point reverted to its more typical low productivity in 2011 (0.40 fledges/pair for 10 pairs).

Factors that impacted piping plover productivity varied by site. Flooding was the leading known cause of nest failure statewide, accounting for just under half (44%) of the nests lost (N=54). Nearly a third (32%) of the failed nests were due to abandonment. Depredation of nests accounted for one in five (20%) of the nests lost, with those losses being primarily from mammalian predators (64%

of the predated nests), followed by avian predators (9%), and the balance being unknown predators (27%). The overall cause of nest failure could not be determined for 4% of the failed nests. Causes of brood loss remain very difficult to detect; therefore, no statewide trend could be determined.

New Jersey's piping plover population trend, which has been flat over the past four years, was particularly discouraging in 2011 because in 2010 we recorded the highest productivity for the state since coordinated monitoring began. Population changes in New Jersey tend to be closely correlated to productivity in the prior year (or two), so we expected to see a sharper population increase in 2011. One factor which may explain why a significant population increase was not seen statewide in 2011 is that the strongest productivity in 2010 (and in recent years) was recorded at Sandy Hook, so population growth was regionally limited. In fact, Sandy Hook has seen a steady population increase since 2006, accelerated the past three years by especially high fledgling rates (i.e. above the USFWS recovery goal of 1.50 chicks/pair in each of the past three years). A historic high of 49 pairs nested at Sandy Hook in 2011, compared to just 22 pairs in 2006, illustrating how population can dramatically increase over a short period of time when robust productivity occurs. Sustaining high productivity across the state (not just at Sandy Hook) and more consistently from year to year remains the biggest challenge in trying to recover the piping plover population statewide in New Jersey.

### **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: 2002-2011.**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
<i>Sandy Hook NRA</i>	35	38	32	22	22	30	32 <sup>1</sup>	35	45	49
<i>Coast Guard</i>	7	8	7	3	4	4	4	4	5	4
<i>North Beach</i>	9	9	10	6	4	8	8	9	13	14
<i>North Gunnison</i>	4	5	3	2	3	4	7	9	9	9
<i>South Gunnison</i>	1	1	1	0	0	1	2	5	5	4
<i>D-Lot</i>	0	0	0	0	0	0	0	0	0	1
<i>Skeleton Hill Island</i>	0	0	0	0	0	0	0	0	0	1
<i>Critical Zone</i>	2	4	3	3	3	4	4	2	6	5
<i>Hidden Beach</i>	5	4	3	3	3	4	2	3	3	5
<i>Fee Beach</i>	7	6	4	4	4	4	5 <sup>1</sup>	3	3	5
<i>South Fee Beach</i>	0	1	1	1	1	1	2 <sup>1</sup>	0	1	1
Sea Bright North	5	7	5	7	7	8	8	6	3	2
Monmouth Beach North	3	2	4	3	3	1	1	1	2	0
Monmouth Beach South	1	0	0	0	0	0	0	0	0	0
Seven Presidents Park	0	1	1	1	2	3	3	2	2	2
Long Branch	0	1	0	0	0	0	0	0	0	0
<b>Region 2 subtotal</b>	<b>44</b>	<b>49</b>	<b>42</b>	<b>33</b>	<b>34</b>	<b>42</b>	<b>44</b>	<b>44</b>	<b>52</b>	<b>53</b>
Sea Girt - Wreck Pond	0	1	1	1	0	1	0	1	0	0
Sea Girt - NGTC	1	0	0	0	0	1	0	0	0	0
Island Beach SP - Dike	0	2	3	2	0	0	0	0	0	0
Barneget Light	3	3	3	4	3	4	3	1	3	3
<b>Region 3 subtotal</b>	<b>4</b>	<b>6</b>	<b>7</b>	<b>7</b>	<b>3</b>	<b>6</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>
<i>Holgate</i>	14	13	16	13	16	14	11	7	10	6
<i>Little Beach</i>	17	19	19	11	12	17	12	10	13	17
North Brigantine NA	15	17	8	8	8	8	8	6	3	5
<b>Region 4 subtotal</b>	<b>46</b>	<b>49</b>	<b>43</b>	<b>32</b>	<b>36</b>	<b>39</b>	<b>31</b>	<b>23</b>	<b>26</b>	<b>28</b>
Brigantine - Inlet (Cove)	1	0	0	0	0	0	0	0	0	0
Seaview Harbor Marina	0	0	0	1 <sup>1</sup>	0	0	0	0	0	1
Ocean City - North	8	2	1	1 <sup>1</sup>	0	0	0	0	0	0
Ocean City - Center	8	8	8	5	7	4	3	1	0	1
<b>Region 5 subtotal</b>	<b>17</b>	<b>10</b>	<b>9</b>	<b>6</b>	<b>7</b>	<b>4</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>2</b>
Corson's Inlet SP	1	2	3	2	2	2	1	2	0	0
Strathmere NA	0	0	0	1	1	0	0	0	1	1
Strathmere (Upper Twp.)	0	1	1	1	0	0	0	0	1	2
Whale Beach	1	0	0	0	0	0	0	0	0	0
Townsend's Inlet	1	1	1	1	0	0	0	0	0	0
Avalon - Dunes	7	8	8	5	4	5	4	4	5	5
<b>Region 6 subtotal</b>	<b>10</b>	<b>12</b>	<b>13</b>	<b>10</b>	<b>7</b>	<b>7</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>
Stone Harbor Point	6	6	9	10	17	17	11	15	9	10
Champagne Island	0	0	1	1	2	1	0	0	0	0
N. Wildwood - Hereford	3	3	4	3	3	2	1	2	2	1
<i>Two-Mile Beach</i>	2	2	1	1	1	2	0	0	1	0
<i>Cape May NWR</i>	0	0	0	0	0	1	0	0	0	0
<i>Coast Guard - LSU</i>	2	2	1	1	1	1	0	0	1	0
Coast Guard - TRACEN	3	4	1	3	0	2	1	0	0	0
Cape May City	1	0	1	0	0	0	1	1	0	0
Cape May Meadows	2	3	4	5	6	7	11	11	8	6
<i>The Nature Conservancy</i>	2	2	1	4 <sup>1</sup>	3	4	7	7	5	4
Cape May Point SP <sup>1</sup>	0	1	3	2 <sup>1</sup>	3	3	4	4	3	2
<b>Region 7 subtotal</b>	<b>17</b>	<b>18</b>	<b>21</b>	<b>23</b>	<b>29</b>	<b>31</b>	<b>25</b>	<b>29</b>	<b>20</b>	<b>17</b>
<b>Total Pairs</b>	<b>138</b>	<b>144</b>	<b>135</b>	<b>111</b>	<b>116</b>	<b>129</b>	<b>111</b>	<b>105</b>	<b>108</b>	<b>111</b>
<b>Pairs at NJDFW sites</b>	<b>68</b>	<b>70</b>	<b>66</b>	<b>61</b>	<b>62</b>	<b>62</b>	<b>49</b>	<b>46</b>	<b>34</b>	<b>35</b>

<sup>1</sup> The same pair nested at two nearby sites. Therefore "subtotals" and "totals" will be less than the sum of individual sites.

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.

**Table 2. New Jersey piping plover window census results: June 1-9 2011.**

	State Census Count			Final Season Count		
	# Pairs	# Unpaired Adults	# Total Adults	# Pairs	# Unpaired Adults	# Total Adults
Sandy Hook Coast Guard	5	0	10	4	0	8
Sandy Hook North Beach	12	1	25	14	0	28
Sandy Hook North Gunnison	8	0	16	9	0	18
Sandy Hook South Gunnison	4	1	9	4	0	8
Sandy Hook D-Lot	1	0	2	1	0	2
Sandy Hook Skeleton Hill Island	1	0	2	1	0	2
Sandy Hook Critical Zone	5	0	10	5	0	10
Sandy Hook Hidden Beach	5	0	10	5	0	10
Sandy Hook Fee Beach	5	0	10	5	0	10
Sandy Hook South Fee Beach	1	0	2	1	0	2
Sea Bright North	0	1	1	2	0	4
Monmouth Beach North	0	0	0	0	0	0
Monmouth Beach South	0	0	0	0	0	0
Seven Presidents Park	1	1	3	2	0	4
Long Branch	0	0	0	0	0	0
<b>Region 2 subtotal</b>	<b>48</b>	<b>4</b>	<b>100</b>	<b>53</b>	<b>0</b>	<b>106</b>
Belmar - Shark River Inlet	0	0	0	0	0	0
Sea Girt - Wreck Pond	0	1	1	0	0	0
Sea Girt - NGTC	0	0	0	0	0	0
Island Beach SP - Dike	0	0	0	0	0	0
Barneгат Light	3	1	7	3	0	6
<b>Region 3 subtotal</b>	<b>3</b>	<b>2</b>	<b>8</b>	<b>3</b>	<b>0</b>	<b>6</b>
Holgate	5	6	16	6	4	18
Little Beach	12	10	34	17	0	34
North Brigantine NA	5	0	10	5	0	10
<b>Region 4 subtotal</b>	<b>22</b>	<b>16</b>	<b>60</b>	<b>28</b>	<b>4</b>	<b>60</b>
Brigantine Beach	0	0	0	0	0	0
Brigantine - Inlet (Cove)	0	0	0	0	0	0
Seaview Harbor Marina	1	0	2	1	0	2
Ocean City - North	0	0	0	0	0	0
Ocean City - Center	1	0	2	1	0	2
<b>Region 5 subtotal</b>	<b>2</b>	<b>0</b>	<b>4</b>	<b>2</b>	<b>0</b>	<b>4</b>
Corson's Inlet SP	0	0	0	0	0	0
Strathmere Natural Area	1	0	2	1	0	2
Strathmere (Upper Twp.)	2	1	5	2	1	4
Townsend's Inlet	0	1	1	0	0	0
Avalon - North	0	0	0	0	0	0
Avalon - Dunes	5	0	10	5	0	10
Stone Harbor - Oceanfront	0	0	0	0	0	0
<b>Region 6 subtotal</b>	<b>8</b>	<b>2</b>	<b>18</b>	<b>8</b>	<b>1</b>	<b>17</b>
Stone Harbor Point	9	1	19	10	0	20
N. Wildwood - Hereford Inlet	0	1	1	1	0	2
2-Mile Beach - USFWS	0	1	1	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	3	1	7	4	0	8
Cape May Meadows - CMPSP	2	0	4	2	1	5
Cape May Point Borough	0	0	0	0	0	0
<b>Region 7 subtotal</b>	<b>14</b>	<b>4</b>	<b>32</b>	<b>17</b>	<b>1</b>	<b>35</b>
<b>Total</b>	<b>97</b>	<b>28</b>	<b>222</b>	<b>111</b>	<b>6</b>	<b>228</b>

**Table 3. New Jersey piping plover nesting summary by sites: 2011.**

SITE	2011					
	Pairs	Pairs Hatched	Chicks Fledged	Pair Success	Fledge Rate	SP Fledge Rate
Sandy Hook NRA	49	42	74	0.86	1.51	1.76
<i>Coast Guard</i>	4	4	7	1.00	1.75	1.75
<i>North Beach</i>	14	13	28	0.93	2.00	2.15
<i>North Gunnison</i>	9	9	9	1.00	1.00	1.00
<i>South Gunnison</i>	4	4	7	1.00	1.75	1.75
<i>D-Lot</i>	1	1	2	1.00	2.00	2.00
<i>Skeleton Hill Island</i>	1	0	0	0.00	0.00	0.00
<i>Critical Zone</i>	5	4	5	0.80	1.00	1.25
<i>Hidden Beach</i>	5	4	11	0.80	2.20	2.75
<i>Fee Beach</i>	5	2	3	0.40	0.60	1.50
<i>South Fee Beach</i>	1	1	2	1.00	2.00	2.00
Sea Bright North	2	0	0	0.00	0.00	0.00
Seven Presidents Park	2	1	4	0.50	2.00	4.00
<b>Region 2 Subtotal</b>	<b>53</b>	<b>43</b>	<b>78</b>	<b>0.81</b>	<b>1.47</b>	<b>1.81</b>
Barneгат Light	3	3	4	1.00	1.33	1.33
<b>Region 3 Subtotal</b>	<b>3</b>	<b>3</b>	<b>4</b>	<b>1.00</b>	<b>1.33</b>	<b>1.33</b>
Holgate	6	6	15	1.00	2.50	2.50
Little Beach	17	12	12	0.71	0.71	1.00
North Brigantine NA	5	4	3	0.80	0.60	0.75
<b>Region 4 Subtotal</b>	<b>28</b>	<b>22</b>	<b>30</b>	<b>0.79</b>	<b>1.07</b>	<b>1.36</b>
Seaview Harbor Marina	1	1	0	1.00	0.00	0.00
Ocean City Center	1	1	0	1.00	0.00	0.00
<b>Region 5 Subtotal</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>1.00</b>	<b>0.00</b>	<b>0.00</b>
Strathmere NA	1	1	3	1.00	3.00	3.00
Strathmere (Upper Twp)	2	2	3	1.00	1.50	1.50
Avalon Dunes	5	4	4	0.80	0.80	1.00
<b>Region 6 Subtotal</b>	<b>8</b>	<b>7</b>	<b>10</b>	<b>0.88</b>	<b>1.25</b>	<b>1.43</b>
Stone Harbor Point	10	3	4	0.30	0.40	1.33
N. Wildwood - Hereford	1	0	0	0.00	0.00	0.00
Cape May Meadows	6	5	5	0.83	0.83	1.00
<i>The Nature Conservancy</i>	4	3	3	0.75	0.75	1.00
Cape May Point SP	2	2	2	1.00	1.00	1.00
<b>Region 7 Subtotal</b>	<b>17</b>	<b>8</b>	<b>9</b>	<b>0.47</b>	<b>0.53</b>	<b>1.13</b>
<b>All NJ sites TOTAL</b>	<b>111</b>	<b>85</b>	<b>131</b>	<b>0.77</b>	<b>1.18</b>	<b>1.54</b>
<b>NJDFW sites TOTAL</b>	<b>35</b>	<b>22</b>	<b>27</b>	<b>0.63</b>	<b>0.77</b>	<b>1.23</b>
<b># Active Sites</b>	<b>24</b>					

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.

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

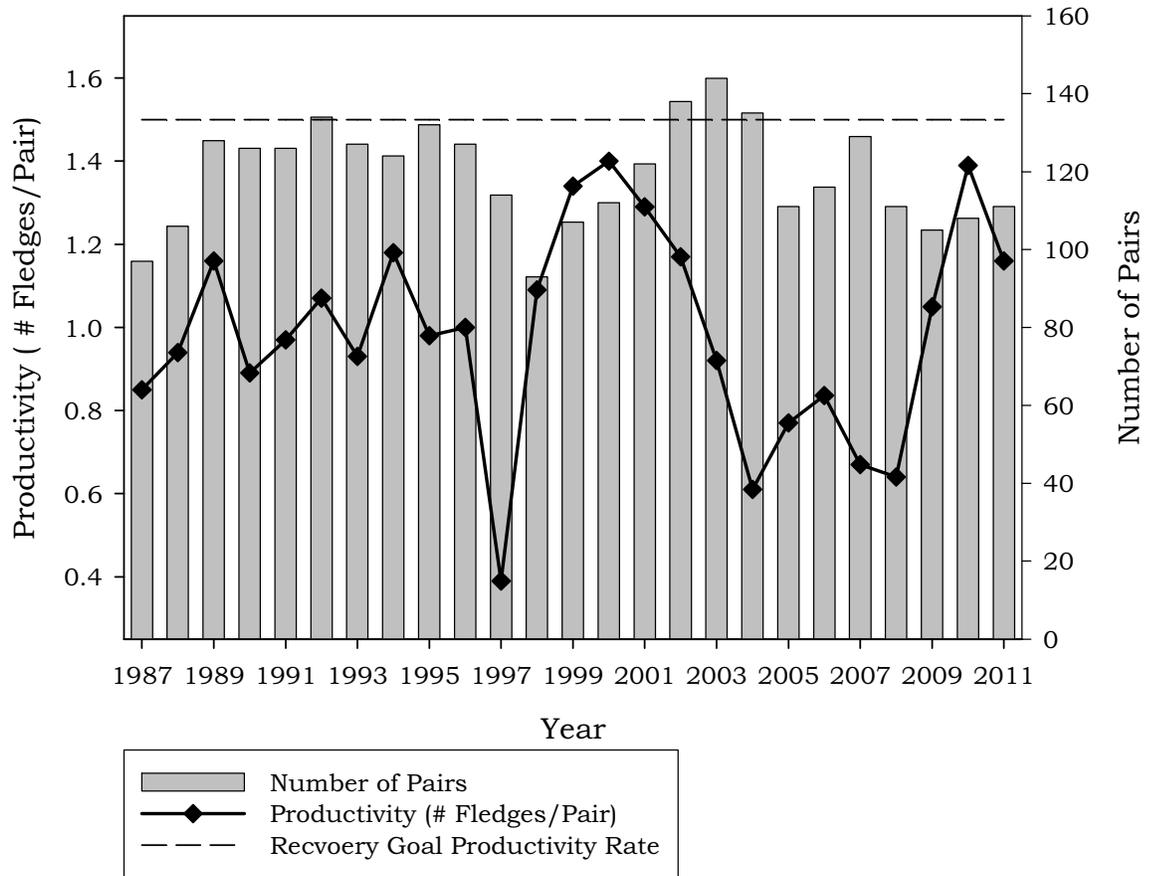
All other data provided by N.J. Division of Fish and Wildlife - Endangered and Nongame Species Program.

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

**Fledge Rate** equals the number of chicks fledges 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: 1987:2011.**



**Figure 2. Causes of piping plover nest failure in New Jersey: 2011.**

N = 54

