Piping Plover Nesting Results in New Jersey: 2016

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Photo Courtesy of Kevin Knutsen

SUMMARY OF FINDINGS:

One hundred fifteen (115) pairs of piping plovers nested in New Jersey in 2016, a 6% increase from 2015 (108 pairs) and a strong 25% increase from 2014 when pairs were at their lowest since federal list (92 pairs). Despite the increase, the current number of nesting pairs remains slightly below the long-term average since federal listing (118 pairs) and significantly below the peak count of 144 pairs in 2003.

The total number of adults recorded for the entire nesting season (232) was slightly higher than the adults present during the date-restricted survey conducted June 1-9 (226). Likewise, the number of pairs tallied during the entire nesting season (115) was somewhat higher than the pairs present during the date-restricted census (109). This is consistent with the long-term pattern in New Jersey, the date-restricted pair and total adult counts are typically below the final season counts, although the degree has varied from year to year.

Northern Monmouth County, as a region, accounted for the largest percentage of pairs in the state, with just over half of the statewide population (63 pairs or 55% of the statewide total). Most of those pairs nested at Sandy Hook (51 pairs or 44% of the statewide total). However, the other sites in Northern Monmouth County (Sea Bright, Monmouth Beach, and Seven Presidents Oceanfront Park) saw a notable jump in pairs, from 2 pairs the previous two seasons to 12 pairs in 2016. That bump largely accounted for the overall statewide increase this year. The region comprised of Holgate, Little Beach, and North Brigantine Natural Area accounted for the other significant proportion of the statewide population (42 pairs or 37% of the statewide total). Although a modest increase in terms of pairs, the area around Barnegat Inlet increased to 4 pairs, compared to just 1 pair in 2015. Cape May County, the southernmost region of the state, consisting of Ocean City to Cape May Point, accounted for just 6 pairs in 2016, part of a continuing downward trend from 43 pairs in 2004 at its peak.

Looking at the individual sites, there were only modest changes in pairs in 2016 versus 2015, with the most significant sites largely remaining the same. However, Sea Bright and Monmouth Beach saw notable increases, up to 6 and 5 pairs, respectively, compared to 1 at each site the previous year. Of special note, a pair nested at Island Beach State Park, the first nesting at that site since 2005 and the first time on oceanfront habitat in the Park in 25 years.

Pairs nested at 20 sites statewide, up one site from 2015 (19), but still well below the peak count of 30 sites recorded in both 2004 and 2005. New Jersey Division of Fish and Wildlife (NJDFW) monitored 8 of the active nesting sites (40% of the sites statewide). NJDFW also regularly monitored 12 other potential breeding sites with historic nesting records and/or highly suitable habitat, as well as several other sites on a less frequent basis; however none of those sites yielded nests. NJDFW-monitored sites accounted for 27 nesting pairs (23% of the nesting pairs statewide), up from just 17 pairs (16%) in 2015, which had been the lowest recorded since federal listing. This increase reverses a decade long downward trend of active pairs at NJDFW sites, however, the number of sites is still well below previous levels. In 2006, for instance, statewide pairs (116) were about the same as in 2016 (115 pairs), but NJDFW-monitored sites accounted for 62 pairs or 53% of the statewide population.

Statewide pair-nest success (the percentage of pairs that successfully hatch at least one nest) was extremely high this year (90%), well above the average for the period since federal listing (68%). Pair nest success was largely high across all the sites; of the sites with a significant number of pairs only Little Beach was notably lower (67% for 12 pairs), although even at that it was on par with long-term statewide averages and an increase for the site from the previous year (36% for 14 pairs). Looking at just NJDFW-monitored sites, pair-nest success was significantly higher than last year (93% versus 65% in 2015) and also well above average for NJDFW-monitored sites for the period since federal listing (66%).

NJDFW and the other state cooperators were able determine the cause of nest failure in the majority of cases (39 of 43 or 91% of the failed nests). Predation was the leading known cause of nest failure statewide, accounting for about half (49% or 21) of the failed nests. Of the nests that failed due to predators, two-thirds (67%) were attributed to mammals and 19% to avian species, with 14% being undetermined as to the exact species. Flooding caused about one-quarter of the nest failures (26% or 11 nests). Abandonment was the cause of 16% (7) of the failed nests. The cause of nest failure could not be determined for 4 (9%) of the failed nests. A detailed assessment of the causes of chick loss could not be made.

The statewide fledgling rate, which includes data collected and provided by all the state cooperators, was 1.35 fledglings per pair, up slightly from 2015 (1.29 fledglings/pair) and on par with 2014 (1.36 fledglings/pair). Although the 2016 productivity level was 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). Furthermore, it was well above the long-term statewide average in New Jersey since federal listing (1.00 fledglings/pair). Productivity at NJDFW-monitored sites (1.89 fledglings/pair for 27 pairs) was above 2015 levels (1.41 fledglings/pair for 17 pairs), although both years were well above the long-term average for NJDFW sites (0.88 fledglings/pair since federal listing). NJDFW-monitored sites also, atypically, ran higher than the statewide average in 2016.

Productivity varied considerably by individual site and region. The Northern Monmouth County region fledged 1.25 chicks per pair (63 pairs), about on par with last year (1.22 fledglings/pair). Sandy Hook's productivity was down slightly from last year (1.12 fledglings/pair in 2016 versus 1.19 fledglings/pair in 2015), but was notably down from 2014 (1.40 fledglings/pair). The other Northern Monmouth County sites (Sea Bright, Monmouth Beach, and Seven Presidents Oceanfront Park) collectively recorded an especially high productivity rate (1.83 fledglings/pair for 12 pairs). Productivity for the Holgate, Little Beach, and North Brigantine Natural Area region was down slightly from the previous year (1.41 fledglings/pair in 2016 versus 1.49 in 2015), however, it

was still a very robust level. Holgate fledged 1.71 chicks per pair, continuing a trend of particularly high productivity since Hurricane Sandy created highly suitable (overwash) habitat at the site (1.54 fledgling/pair in 2015 and 2.33 in 2014). Little Beach was one of the poorer sites statewide in terms of productivity in 2016 (0.92 fledglings/pair), but the combined Edwin B. Forsythe NWR sites of Holgate and Little Beach still performed well, producing 1.27 fledglings per pair (37 pairs). Although only five pairs nested at North Brigantine Natural Area, it recorded a high rate of 2.60 fledglings per pair, the second consecutive year of extremely high productivity. Pairs clustered around the Barnegat Inlet (1 pair at Island Beach State Park and 3 pairs Barnegat Light) were productive, fledging 2.25 chicks per pair (4 pairs). Cape May County recorded productivity of 1.17 fledglings per pair (6 pairs), up from recent years when productivity was extremely low in this region, but still lower compared to the statewide average this year.

CONCLUSION and DISCUSSION:

New Jersey's statewide piping plover breeding population has increased for two consecutive years, now standing at 115 pairs, after reaching a historic low (since federal listing) of just 92 pairs in 2014. Even with this uptick, the population still remains slightly below long-term averages and well below the peak of 144 pairs. It will take several more years of increases to demonstrate sustained growth and movement towards recovery.

The state's breeding pairs of piping plovers produced the third consecutive year of strong productivity, well above the long term average in New Jersey and above the levels believed necessary to maintain a range-wide stationary population. Collectively the past three years are one of only two times New Jersey has recorded a sustained period of high productivity, the other coming from 1999-2001, which preceded a notable population growth leading to the state's peak population since federal listing. High productivity has historically been difficult to achieve for piping plovers in New Jersey. Even as statewide hatch rates are consistent with levels recorded in other regions across the breeding range, chick survival has been low here. Given that population levels typically increase within a year or two on the heels of high productivity, the recent success is especially promising and suggests New Jersey may be able to continue its population growth in the short term.

Last year saw a troubling concentration of breeding pairs of piping plovers in New Jersey to fewer sites and primarily federally protected/owned lands (Davis, Pover, 2015). For the first time in a decade, pairs were up on municipal and state properties in 2016, reversing that trend and distributing the pairs slightly away from just the federal lands. This is, of course, a "double-edged sword", as reproductive success has typically not been as strong on the municipal sites, which receive the highest levels of recreational use and disturbance. However, in 2016 pairs on municipal, county, and state sites (those monitored and managed by NJDFW), which accounted for about a quarter of the state's pairs, recorded particularly high productivity (1.89 fledglings/pair), helping to spur the high productivity recorded statewide.

NJDFW continues to maintain that while the federal (and state) protected sites are core to piping plover recovery in New Jersey, full recovery cannot be achieved without a wider distribution of breeding along the state's coast. Increased success at sites outside the federal lands in 2016, in particular the Northern Monmouth County sites, which saw a big increase in pairs and managed high fledge rates, demonstrates this is possible under the best case scenario. On the downside, considerable suitable habitat still remains unoccupied (or at a very low density of breeding pairs) in New Jersey, including at some former breeding strongholds. This is most evident in the Cape May County region, which represents most of the southern portion of the state. NJDFW remains hopeful that the recent

productivity success statewide will lead to colonization of some of those sites, but in the meantime it is imperative that a strong monitoring and management regimen continues at these sites to ensure they remain viable options once piping plovers are present again.

LITERATURE CITED:

Davis, Christina, T. Pover 2015. Federal Aid Performance Report: Project E-1-37, Study IV. Job 2-B. Piping Plover Population Survey.

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: 2007-2016.

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Sandy Hook NRA	30	32[1]	35	45	49	50	43	47	53	51
Coast Guard	4	4	4	5	4	4	3	4	3	5
North Beach	8	8	9	13	14	14	13	14	15	14
North Beach Recreational	0	0	0	0	0	0	0	0	0	1
North Gunnison	4	7	9	9	9	13	8	8	10	8
South Gunnison	1	2	5	5	4	5	7	9	8	7
Visitor Center	0	0	0	0	0	0	0	0	0	1
D-Lot	0	0	0	0	1	0	0	0	0	0
Skeleton Hill Island	0	0	0	0	1	0	0	0	0	0
Critical Zone	4	4	2	6	5	6	5	4	7	6
Hidden Beach	4	2	3	3	5	4	3	4	4	4
Fee Beach	4	5[1]	3	3	5	3	4	4	6	4
South Fee Beach	1	2[1]	0	1	1	1	0	0	0	1
Sea Bright North	8	8	6	3	2	2	0	0	1	6
Monmouth Beach North	1	1	1	2	0	0	2	1	1[1]	5
Seven Presidents Park	3	3	2	2	2	0	0	1	1[1]	1
Region 2 subtotal	**42**	**44**	**44**	**52**	**53**	**52**	**45**	**49**	**55**	**63**
Belmar – Shark River Inlet	0	0	0	0	0	0	0	1	0	0
Sea Girt - Wreck Pond	1	0	1	0	0	1	0	0	0	0
Sea Girt - NGTC	1	0	0	0	0	0	0	0	0	0
Island Beach SP SNA	0	0	0	0	0	0	0	0	0	1
Barnegat Light	4	3	1	3	3	1	2	1	1	3
Region 3 subtotal	**6**	**3**	**2**	**3**	**3**	**2**	**2**	**2**	**1**	**4**
EB Forsythe NWR	31	23	17	23	23	32	35	26	38	37
Holgate	14	11	7	10	6	14	12	12	24	25
Little Beach	17	12	10	13	17	18	23	14	14	12
North Brigantine NA	8	8	6	3	5	8	6	3	5	5
Region 4 subtotal	**39**	**31**	**23**	**26**	**28**	**40**	**41**	**29**	**43**	**42**
Seaview Harbor Marina	0	0	0	0	1	1	1	0	1[1]	0
Malibu WMA	0	0	0	0	0	0	0	1	1[1]	0
Ocean City - Center	4	3	1	0	1	0	0	0	0	0
Region 5 subtotal	**4**	**3**	**1**	**0**	**2**	**1**	**1**	**1**	**1**	**0**
Corson's Inlet SP	2	1	2	0	0	0	0	0	0	0
Strathmere NA	0	0	0	1	1	1	2[1]	1	0	0
Strathmere (Upper Twp.)	0	0	0	1	2	2	4[1]	2	0	0
Avalon - Dunes	5	4	4	5	5	5	3	3[1]	2[1]	1
Region 6 subtotal	**7**	**5**	**6**	**7**	**8**	**8**	**8**	**6**	**2**	**1**
Stone Harbor Point	17	11	15	9	10	9	6	4[1]	6[1]	5
Champagne Island	1	0	0	0	0	0	0	0	0	0
N. Wildwood - Hereford	2	1	2	2	1	1	1	1	1	0
Two-Mile Beach	2	0	0	1	0	0	0	0	0	0
Cape May NWR	1	0	0	0	0	0	0	0	0	0
Coast Guard - LSU	1	0	0	1	0	0	0	0	0	0
Coast Guard - TRACEN	2	1	0	0	0	2	1[1]	0	0	0
Cape May City	0	1	1	0	0	0	1[1]	0	0	0
Cape May Meadows	7	11	11	8	6	6	3	1	0	0
The Nature Conservancy	4	7	7	5	4	3	1	0	0	0
Cape May Point SP	3	4	4	3	2	3	2	1	0	0
Region 7 subtotal	**31**	**25**	**29**	**20**	**17**	**18**	**11**	**6**	**6**	**5**
Total Pairs	**129**	**111**	**105**	**108**	**111**	**121**	**108**	**92**	**108**	**115**
Pairs at NJDFW sites	**62**	**49**	**46**	**34**	**35**	**36**	**29**	**19**	**17**	**27**

[1] The 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 2016.

	State Census Count			Final Season Count		
	# Pairs	# Unpaired Adults	# Total Adults	# Pairs	# Unpaired Adults	# Total Adults
Sandy Hook Coast Guard	4	0	8	5	0	9
Sandy Hook North Beach	13	0	26	14	0	28
Sandy Hook North Beach Recreational	1	0	2	1	0	2
Sandy Hook North Gunnison	7	0	14	8	0	16
Sandy Hook South Gunnison	7	0	14	7	0	14
Sandy Hook Visitor Center	0	0	0	1	0	2
Sandy Hook Critical Zone	5	0	10	6	0	12
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	1	0	2	1	0	2
Sea Bright North	7	1	15	6	0	12
Monmouth Beach North	5	1	11	5	1	11
Monmouth Beach South	0	0	0	0	0	0
Seven Presidents Park	1	0	2	1	0	2
Region 2 subtotal	**59**	**2**	**120**	**63**	**0**	**126**
Belmar - Shark River Inlet	0	0	0	0	0	0
Sea Girt - Wreck Pond	0	0	0	0	0	0
Sea Girt - NGTC	1	0	2	0	0	0
Island Beach SP – Northern NA	0	0	0	0	0	0
Island Beach SP – Southern NA	1	0	2	1	0	2
Barnegat Light	3	1	7	3	1	7
Region 3 subtotal	**5**	**1**	**11**	**4**	**0**	**9**
Holgate*	24	1	49	25	0	50
Little Beach*	10	1	21	12	0	24
North Brigantine NA	5	1	11	5	0	10
Region 4 subtotal	**39**	**3**	**81**	**42**	**0**	**84**
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	0	0	0
Ocean City - North	0	0	0	0	0	0
Ocean City - Center	0	0	0	0	0	0
Region 5 subtotal	**0**	**0**	**0**	**0**	**0**	**0**
Corson's Inlet SP	0	0	0	0	0	0
Strathmere Natural Area	0	1	1	0	0	0
Strathmere (Upper Twp.)	0	0	0	0	0	0
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	1	0	2	1	0	2
Stone Harbor - Oceanfront	0	0	0	0	0	0
Region 6 subtotal	**1**	**1**	**3**	**1**	**0**	**2**
Stone Harbor Point	5	1	11	5	0	10
N. Wildwood - Hereford Inlet	0	0	0	0	0	0
2-Mile Beach - USFWS	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	0	0	0	0	0	0
Cape May Point Borough	0	0	0	0	0	0
Region 7 subtotal	**5**	**1**	**11**	**5**	**0**	**10**
Total	**109**	**8**	**226**	**115**	**2**	**232**

*Adjusted from raw counts from one-time survey of site to reflect pairs/individuals present at site during census period.

Table 3. New Jersey piping plover nesting summary by sites: 2016.

	2016					
SITE	Pairs	Pairs Hatched	Chicks Fledged	Pair Success	Fledge Rate	SP Fledge Rate
Sandy Hook NRA	51	49	57	0.96	1.12	1.16
Coast Guard	5	3	5	0.60	1.00	1.67
North Beach	14	14	13	1.00	0.93	0.93
North Beach Recreational	1	1	2	1.00	2.00	2.00
North Gunnison	8	8	8	1.00	1.00	1.00
South Gunnison	7	7	10	1.00	1.43	1.43
Visitor's Center	1	1	0	1.00	0.00	0.00
Critical Zone	6	6	8	1.00	1.33	1.33
Hidden Beach	4	4	4	1.00	1.00	1.00
Fee Beach	4	4	6	1.00	1.50	1.50
South Fee Beach	1	1	2	1.00	2.00	2.00
Sea Bright North	6	6	10	1.00	1.67	1.67
Monmouth Beach North	5	5	10	1.00	2.00	2.00
7 President's Park	1	1	2	1.00	2.00	2.00
Region 2 Subtotal	**63**	**61**	**79**	**0.97**	**1.25**	**1.30**
Island Beach State Park SNA	1	1	2	1.00	2.00	2.00
Barnegat Light	3	3	7	1.00	2.33	2.33
Region 3 Subtotal	**4**	**4**	**9**	**1.00**	**2.25**	**2.25**
EB Forsythe NWR	37	29	47	0.78	1.27	1.62
Holgate	25	21	36	0.84	1.71	1.44
Little Beach	12	8	11	0.67	0.92	1.38
North Brigantine NA	5	5	13	1.00	2.60	2.60
Region 4 Subtotal	**42**	**34**	**60**	**0.76**	**1.41**	**1.85**
Avalon Dunes	1	1	3	1.00	3.00	3.00
Region 6 Subtotal	**1**	**1**	**3**	**1.00**	**3.00**	**3.00**
Stone Harbor Point	5	3	4	0.60	0.80	1.33
Region 7 Subtotal	**5**	**3**	**4**	**0.60**	**0.80**	**1.33**
All NJ sites TOTAL	**115**	**103**	**155**	**0.90**	**1.35**	**1.50**
NJDFW sites TOTAL	**27**	**25**	**51**	**0.93**	**1.89**	**2.04**
# Active Sites	**20**					

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: 1987-2016.

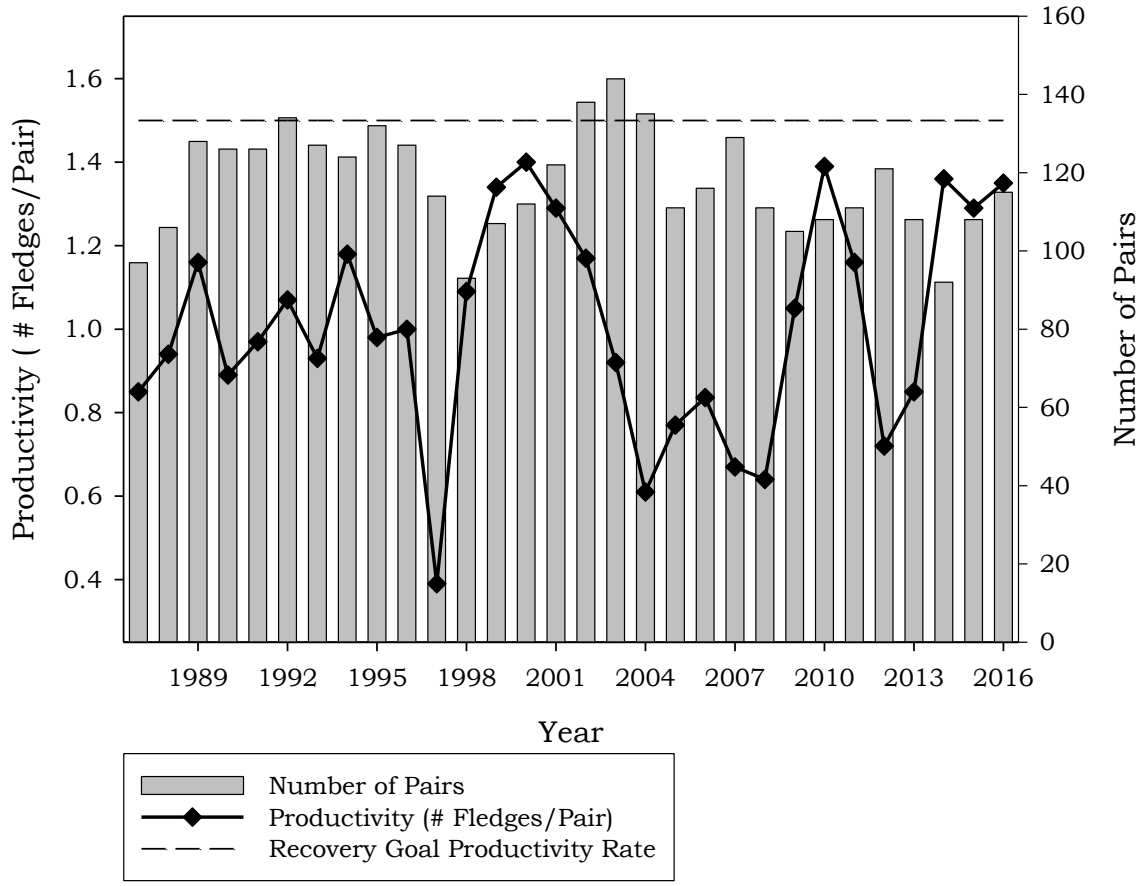

Figure 2. Causes of piping plover nest failure in New Jersey: 2016.