Piping Plover Nesting Results in New Jersey: 2015

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Photo Courtesy of Northside Jim

SUMMARY OF FINDINGS:

One hundred eight (108) pairs of piping plovers nested in New Jersey in 2015, a 17% increase from 2014 (92, the lowest level since federal listing). Despite the increase, the current number of nesting pairs remains below the long-term average since federal listing (118 pairs) and significantly below the peak count of 144 pairs in 2003. Furthermore, the statewide population trend remains flat to slightly declining over the period since federal listing, once you factor in an initial population "bump" due to an increase in survey intensity immediately following listing).

The total number of adults recorded for the entire nesting season (218) was somewhat higher than during the date-restricted survey conducted June 1-9 (205). Likewise, the number of pairs tallied during the entire nesting season (108) was higher than the pairs recorded during the date-restricted census (95). This is consistent with the pattern in New Jersey, typically the date-restricted pair count is well below the final season count, as is the total adult count to a lesser degree, although in 2014 the two counts were much more closely aligned.

Northern Monmouth County, as a region, continued to account for the largest percentage of pairs in the state, just over half of the statewide population (55 pairs or 51% of the statewide total). Most of those pairs nested at Sandy Hook (53 pairs or 49% of the statewide total). The region comprised of Holgate, Little Beach, and North Brigantine Natural Area also accounted for a significant proportion of the statewide population (43 pairs or 40% 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 trend, accounting for just 8 pairs in 2015, compared to 11 pairs in 2014 and 43 pairs in 2004 at its peak.

Looking at the individual sites, there was little change in pairs in 2015 versus 2014, with the exception of Holgate, which doubled its tally to 24 pairs (versus 12 in 2014). No pairs nested at Strathmere in 2015, for the first time in several years, due to severe beach erosion. Combined with the recent loss of pairs nesting at Corson's Inlet State Park, this is the first year since federal listing that no pairs nested in the Corson's Inlet complex. Likewise, no pairs nested at the South Cape May Meadows in 2015, the first time this occurred since federal listing, as well.

Pairs nested at 19 sites statewide, down from 21 sites in 2014, and well below the peak count of 30 sites recorded in both 2004 and 2005. It was the lowest total since federal listing. NJDFW monitored 10 of the active nesting sites (52% of the sites statewide), accounting for 17 nesting pairs (16% 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 dropped again in 2015, continuing a precipitous downward trend, down from a peak of 70 pairs in 2003. NJDFW also regularly monitored 10 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.

Statewide pair-nest success (the percentage of pairs that successfully hatch at least one nest) was high this year (79%), above the average for the period since federal listing (68%). Pair nest success in the Northern Monmouth County region (55 pairs) was especially high (93%). Of sites with a significant number of pairs, pair-nest success was also strong at Holgate (83% for 24 pairs). However, it was notably low (36%) at Little Beach (14 pairs). Looking at just NJDFW-monitored sites, pair-nest success was notably higher than last year (65% versus 47% in 2014), but about 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 1.29 fledglings per pair, down slightly from 2014 (1.36 fledglings/pair), but still one of the highest statewide levels since federal listing. 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). Furthermore, it was well above the long-term statewide average since federal listing (0.99 fledglings/pair). Productivity at NJDFW-monitored sites nearly doubled in 2015 (1.41 fledglings/pair for 17 pairs) compared to 2014 (0.74 fledglings/pair for 19 pairs), and, atypically, ran higher than the statewide average.

Productivity varied considerably by individual site and region. The Northern Monmouth County region fledged 1.22 chicks per pair (55 pairs), down from last year (1.43 fledglings/pair), but still a robust result. Likewise, Sandy Hook's productivity fell in 2015 (1.19 fledglings/pair for 53 pairs vs. 1.40 fledglings/pair for 47 pairs), but this was still a relatively strong productivity. Within Sandy Hook, the northern sites (Coast Guard to Gunnisons) fared notably better than the southern sites (Critical Zone to Fee) with comparative productivity of 1.31 fledgling per pair versus 0.94 fledglings per pair, respectively. The Holgate, Little Beach, and North Brigantine Natural Area region nearly reached the federal recovery goal with a rate of 1.49 fledglings per pair (43 pairs). Holgate fledged 1.54 chicks per pair (24 pairs), down from the extremely high result in 2014 (2.33 chicks per pair - 12 pairs), but this fledgling output was still a major driver for the high statewide productivity this year. The combined Edwin B. Forsythe NWR sites of Holgate and Little Beach produced 1.37 fledglings per pair (38 pairs). Although only five pairs nested at North Brigantine Natural Area, it recorded a particularly high rate of 2.40 fledglings per pair. Cape May County recorded very low productivity in 2015 (0.13 fledglings/pair for 8 pairs), consistent with the recent trend in that region.

Predation was the leading known cause of nest failure statewide, accounting for 40% (25) of the failed nests (61). Of the nests that failed due to predators, 60% were attributed to mammals and 24% to avian species, with 16% being undetermined as to the exact species. Abandonment was the next leading causes of nest failure (10 nests or 16% of failed nests), followed by flooding (7 nests or 11% of failed nests). Five (5) nests were "over-incubated" and did not hatch and 4 were blown over (8% and 7% of the failed nests, respectively). One nest (2%) failed as result of human causes. The

cause of nest failure could not be determined for 10 (16%) of the failed nests. No systematic assessment of the causes of chick loss could be made.

CONCLUSION and DISCUSSION:

New Jersey's statewide piping plover breeding population stood at 108 pairs in 2015, a sharp reversal of the 92 pairs recorded in 2014 when the state reached a historic low since federal listing. However, even with this increase, the population trend remains largely flat since federal listing and has been consistently below average for the past decade or so.

The state recorded its second 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. Last year's robust productivity likely helped spur the population growth seen in the state this year, as productivity and abundance are typically fairly closely correlated in New Jersey, thus one would expect the population to continue to grow or at least not lose ground next year, as well. While these are positive results, any chance for long-term recovery still rests with sustained higher than average productivity, which has proved difficult to achieve in New Jersey.

A few other trends that raise concerns are the distribution and number of active sites within the state. The state tallied its lowest level of active sites since federal listing. Furthermore, breeding pairs were further concentrated to just a few sites, with Sandy Hook accounting for nearly half the population, and Edwin B. Forsythe National Wildlife Refuge (Holgate and Little Beach) another 35%, so combined those sites hosted nearly 85% of the statewide population. While productivity at these federal sites, where piping plovers can be afforded more stringent protection against human recreational activities and the associated disturbance, needs to be maximized in order to increase the likelihood of piping plover recovery in our state, those sites alone are not likely to allow us to fully attain this. Even those sites will have periodic down years, their habitat suitability may degrade over time, and as pair densities at those sites increase, productivity may drop, thus other breeding sites need to be available and perform more successfully as well.

Pairs at municipal sites continue to decrease, especially in Cape May County, once a stronghold in the state. This is not necessarily surprising given the higher level of recreational disturbance and predator activity that typically occurs at municipal sites, but nonetheless those sites have played an integral role in some years in our state due to the limited habitat availability overall. Of particular concern, no pairs nested at Cape May Point State Park, Corson's Inlet State Park, or Strathmere Natural Area in 2015; those state-owned and managed sites have historically provided important suitable nesting habitat where disturbance can be mitigated more than at the municipal sites. Another state site, North Brigantine Natural Area saw a small increase in pairs and a big jump in productivity in 2015, a positive trend, although that site is still performing well below capacity. The state sites, in particular, need to play a bigger role, both in terms of the number of pairs present and reproductive success, to augment the federal sites, if statewide recovery is to be achieved.

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: 2006-2015.

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Sandy Hook NRA	22	30	32[1]	35	45	49	50	43	47	53
Coast Guard	*4*	*4*	*4*	*4*	*5*	*4*	*4*	*3*	*4*	*3*
North Beach	*4*	*8*	*8*	*9*	*13*	*14*	*14*	*13*	*14*	*15*
North Gunnison	*3*	*4*	*7*	*9*	*9*	*9*	*13*	*8*	*8*	*10*
South Gunnsion	*0*	*1*	*2*	*5*	*5*	*4*	*5*	*7*	*9*	*8*
D-Lot	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*0*
Skeleton Hill Island	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*0*
Critical Zone	*3*	*4*	*4*	*2*	*6*	*5*	*6*	*5*	*4*	*7*
Hidden Beach	*3*	*4*	*2*	*3*	*3*	*5*	*4*	*3*	*4*	*4*
Fee Beach	*4*	*4*	*5[1]*	*3*	*3*	*5*	*3*	*4*	*4*	*6*
South Fee Beach	*1*	*1*	*2[1]*	*0*	*1*	*1*	*1*	*0*	*0*	*0*
Sea Bright North	7	8	8	6	3	2	2	0	0	1
Monmouth Beach North	3	1	1	1	2	0	0	2	1	1[1]
Seven Presidents Park	2	3	3	2	2	2	0	0	1	1[1]
Region 2 subtotal	**34**	**42**	**44**	**44**	**52**	**53**	**52**	**45**	**49**	**55**
Belmar – Shark River Inlet	0	0	0	0	0	0	0	0	1	0
Sea Girt - Wreck Pond	0	1	0	1	0	0	1	0	0	0
Sea Girt - NGTC	0	1	0	0	0	0	0	0	0	0
Barnegat Light	3	4	3	1	3	3	1	2	1	1
Region 3 subtotal	**3**	**6**	**3**	**2**	**3**	**3**	**2**	**2**	**2**	**1**
Holgate	16	14	11	7	10	6	14	12	12	24
Little Beach	12	17	12	10	13	17	18	23	14	14
North Brigantine NA	8	8	8	6	3	5	8	6	3	5
Region 4 subtotal	**36**	**39**	**31**	**23**	**26**	**28**	**40**	**41**	**29**	**43**
Seaview Harbor Marina	0	0	0	0	0	1	1	1	0	1[1]
Malibu WMA	0	0	0	0	0	0	0	0	1	1[1]
Ocean City - Center	7	4	3	1	0	1	0	0	0	0
Region 5 subtotal	**7**	**4**	**3**	**1**	**0**	**2**	**1**	**1**	**1**	**1**
Corson's Inlet SP	2	2	1	2	0	0	0	0	0	0
Strathmere NA	1	0	0	0	1	1	1	2[1]	1	0
Strathmere (Upper Twp.)	0	0	0	0	1	2	2	4[1]	2	0
Avalon - Dunes	4	5	4	4	5	5	5	3	3[1]	2[1]
Region 6 subtotal	**7**	**7**	**5**	**6**	**7**	**8**	**8**	**8**	**6**	**2**
Stone Harbor Point	17	17	11	15	9	10	9	6	4[1]	6[1]
Champagne Island	2	1	0	0	0	0	0	0	0	0
N. Wildwood - Hereford	3	2	1	2	2	1	1	1	1	1
Two-Mile Beach	1	2	0	0	1	0	0	0	0	0
Cape May NWR	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Coast Guard - LSU	*1*	*1*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*0*
Coast Guard - TRACEN	0	2	1	0	0	0	2	1[1]	0	0
Cape May City	0	0	1	1	0	0	0	1[1]	0	0
Cape May Meadows	6	7	11	11	8	6	6	3	1	0
The Nature Conservancy	*3*	*4*	*7*	*7*	*5*	*4*	*3*	*1*	*0*	*0*
Cape May Point SP	*3*	*3*	*4*	*4*	*3*	*2*	*3*	*2*	*1*	*0*
Region 7 subtotal	**29**	**31**	**25**	**29**	**20**	**17**	**18**	**11**	**6**	**7**
Total Pairs	**116**	**129**	**111**	**105**	**108**	**111**	**121**	**108**	**92**	**108**
Pairs at NJDFW sites	**62**	**62**	**49**	**46**	**34**	**35**	**36**	**29**	**19**	**17**

[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 2015.

	State Census Count			Final Season Count		
	# Pairs	# Unpaired Adults	# Total Adults	# Pairs	# Unpaired Adults	# Total Adults
Sandy Hook Coast Guard	3	0	6	3	0	6
Sandy Hook North Beach	14	0	28	15	0	30
Sandy Hook North Gunnison	8	0	16	10	0	20
Sandy Hook South Gunnison	8	0	16	8	0	16
Sandy Hook Critical Zone	7	0	14	7	0	14
Sandy Hook Hidden Beach	4	0	8	4	0	8
Sandy Hook Fee Beach	6	0	12	6	0	12
Sandy Hook South Fee Beach	0	0	0	0	0	0
Sea Bright North	1	1	3	1	1	3
Monmouth Beach North	1	1	3	1[1]	1	3
Monmouth Beach South	0	0	0	0	0	0
Seven Presidents Park	0	1	1	1[1]	0	2
Long Branch	0	0	0	0	0	0
Region 2 subtotal	**52**	**3**	**107**	**55**	**2**	**112**
Belmar - Shark River Inlet	0	0	0	0	0	0
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
Barnegat Light	1	0	2	1	0	2
Region 3 subtotal	**1**	**0**	**2**	**1**	**0**	**2**
Holgate	20	4	44	24	0	48
Little Beach	11	7	29	14	0	28
North Brigantine NA	4	1	9	5	0	10
Region 4 subtotal	**35**	**12**	**82**	**43**	**0**	**86**
Brigantine Beach	0	0	0	0	0	0
Brigantine - Inlet (Cove)	0	0	0	0	0	0
Seaview Harbor Marina	0	0	0	1[1]	0	2
Malibu WMA	1	0	2	1[1]	0	2
Ocean City - North	0	0	0	0	0	0
Ocean City - Center	0	0	0	0	0	0
Region 5 subtotal	**1**	**0**	**2**	**1**	**0**	**2**
Corson's Inlet SP	0	0	0	0	0	0
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
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	2[1]	0	4
Stone Harbor - Oceanfront	0	0	0	0	0	0
Region 6 subtotal	**1**	**0**	**2**	**2**	**0**	**4**
Stone Harbor Point	5	0	10	6[1]	0	12
N. Wildwood - Hereford Inlet	0	0	0	1	0	2
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**	**0**	**10**	**7**	**0**	**14**
Total	**95**	**15**	**205**	**108**	**2**	**218**

Table 3. New Jersey piping plover nesting summary by sites: 2015.

	2015					
SITE	Pairs	Pairs Hatched	Chicks Fledged	Pair Success	Fledge Rate	SP Fledge Rate
Sandy Hook NRA	53	49	63	0.92	1.19	1.29
Coast Guard	3	3	4	1.00	1.33	1.33
North Beach	15	13	16	0.87	1.07	1.23
North Gunnison	10	9	15	0.90	1.50	1.67
South Gunnison	8	8	12	1.00	1.50	1.50
Critical Zone	7	6	5	0.86	0.71	0.83
Hidden Beach	4	4	6	1.00	1.50	1.50
Fee Beach	6	6	5	1.00	0.83	0.83
Sea Bright North	1	1	2	1.00	2.00	2.00
Monmouth Beach North	1[1]	1	2	1.00	2.00	2.00
7 President's Park	1[1]	0	0	0.00	0.00	0.00
Region 2 Subtotal	**55**	**51**	**67**	**0.93**	**1.22**	**1.31**
Barnegat Light	1	1	3	1.00	3.00	3.00
Region 3 Subtotal	**1**	**1**	**3**	**1.00**	**3.00**	**3.00**
Holgate	24	20	37	0.83	1.54	1.85
Little Beach	14	5	15	0.36	1.07	3.00
North Brigantine NA	5	5	12	1.00	2.40	2.40
Region 4 Subtotal	**43**	**30**	**64**	**0.70**	**1.49**	**2.13**
Seaview Harbor Marina	1[1]	1	3	1.00	3.00	3.00
Malibu WMA	1[1]	1	1	1.00	1.00	1.00
Region 5 Subtotal	**1**	**1**	**4**	**1.00**	**4.00**	**4.00**
Avalon Dunes	2[1]	1	0	0.50	0.00	0.00
Region 6 Subtotal	**2**	**1**	**0**	**0.50**	**0.00**	**0.00**
Stone Harbor Point	6[1]	1	1	0.17	0.17	1.00
N. Wildwood - Hereford	1	0	0	0.00	0.00	0.00
Region 7 Subtotal	**7**	**1**	**1**	**0.14**	**0.14**	**1.00**
All NJ sites TOTAL	**108**	**85**	**139**	**0.79**	**1.29**	**1.64**
NJDFW sites TOTAL	**17**	**11**	**24**	**0.65**	**1.41**	**2.18**
# Active Sites	**19**					

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

[1]The 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: 1987-2015.

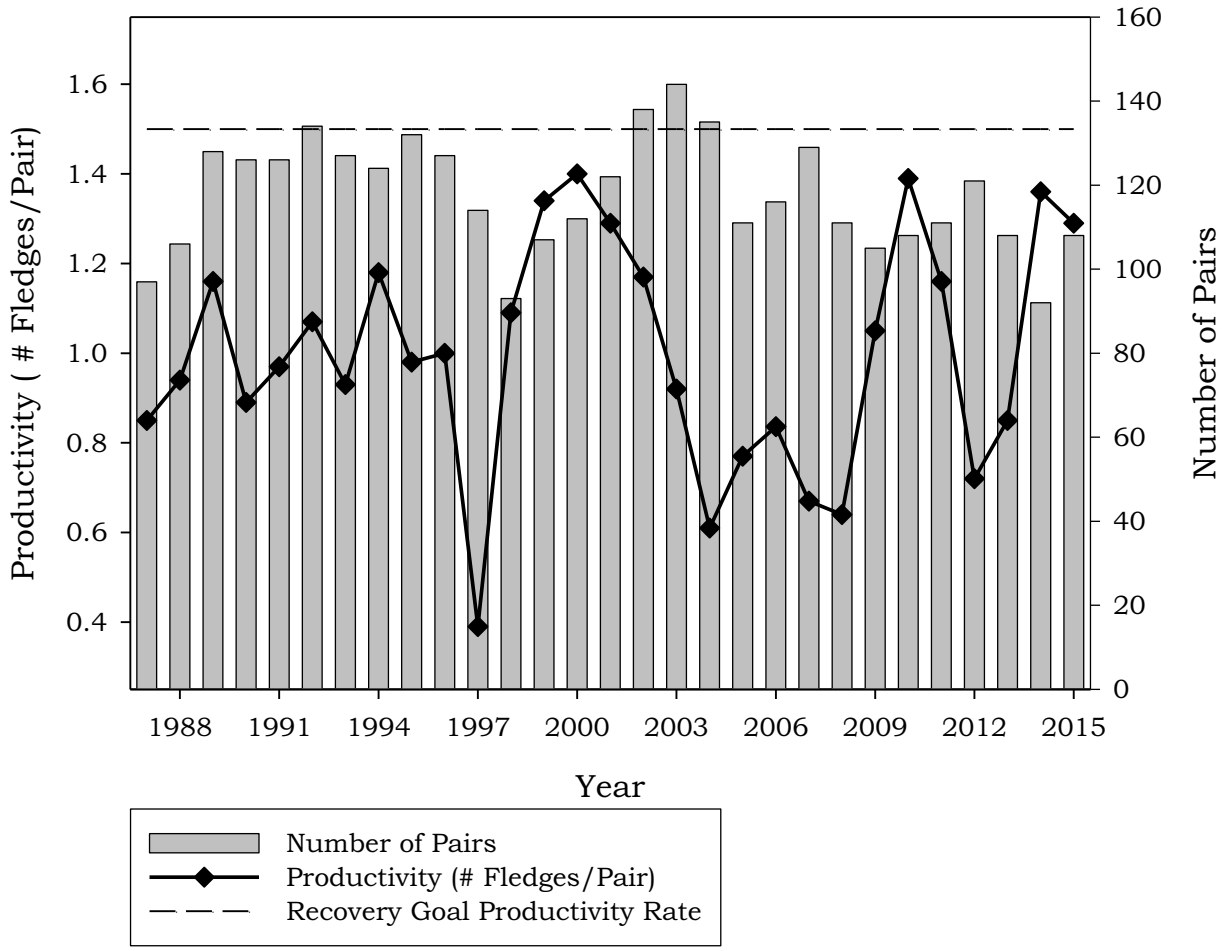

Figure 2. Causes of piping plover nest failure in New Jersey: 2015.