

2022 New Jersey Beach-Nesting Bird Project Report



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**NJ DEP Fish and Wildlife
Endangered and Nongame Species Program**



*Skimmers and Terns on Horseshoe Island.
Photo courtesy of Teri Bowers*

The New Jersey DEP Fish and Wildlife – Endangered and Nongame Species Program (NJFW) is responsible for the monitoring and management of beach-nesting birds on all state, county, and municipal sites and the collation of statewide data (including federal and private properties).

This report offers a summary of nesting in 2022 for the four primary species that comprise this group in NJ – Piping Plover (federally threatened, state endangered), Black Skimmer (state endangered), Least Tern (state endangered) and American Oystercatcher (species of special concern).

Due to a constraint on resources, not all potential sites in the state were surveyed for all species. All known nesting sites for Piping Plover and Least Tern were monitored. All known beach-strand nesting sites for Black Skimmer were monitored but no marsh island sites were monitored. All known beach-strand nesting sites for American Oystercatcher were monitored but only a small percentage of marsh island sites were monitored.

Each species has slightly different nesting phenology and habitat requirements. Some species are solitary nesters (plovers and oystercatchers) while others are colonial (terns and skimmers). These differences can lead to not only distinctive management strategies but also to vastly disparate reproductive outcomes (at a given site, one species may be successful while another may fail). It is therefore difficult to formulate conclusions for the group, so results are presented by species.

However, there were some across species commonalities. As in 2021, the Jersey coast experienced a major nor'easter in May. In 2022, the storm was the first week of the month so the impact to nesting birds was lessened compared to 2021. However, the impact to the nesting sites was more severe, as it was a six-day event with extreme flooding, erosion, and high winds. These spring storms, coupled with the tropical storms that tend to define the end of the season, are underscoring the changes the shoreline is experiencing as the influence of climate change and sea-level rise come to the forefront of the coastal landscape.

Despite the bookend storms of the season, flooding was not a major limiting factor statewide for the core part of the season. As is often the case, depredation was the undoing of reproductive success goals, and this was true across all species. The variety of predators that made significant negative impacts to nesting birds was high in 2022 and included red fox, coyote, opossum, raccoon, Laughing Gull, Peregrine Falcon, Great-horned Owl, Fish Crow, Black-crowned Night-heron, and ghost crab. The influence of predators also extended across all age classes – eggs, chicks, and adults. The combination of the high numbers of predators (abundance and diversity) at nearly all sites and their persistence in hunting these species was the major limiting factor for productivity in 2022 for all four species. It should be noted that *direct* human disturbance (nests being stepped on or run over, for example) is not a primary limiting factor in reproductive success solely because of the intense management that partners across the state engage in to prevent these types of losses.

The distribution of beach-nesting birds across the state continued to be species-specific. The pattern of Piping Plovers primarily nesting at the highly desirable federal sites in the central and northern portion of the state continued and the pair decline from 2021 meant sites elsewhere in the state were abandoned or posted lower pair numbers, as birds appeared to filter into openings at the federal sites. Unfortunately, the

decline was steep enough that even some federal sites posted losses. Black Skimmers distributed themselves into multiple major colonies early in the season, an important change from primarily converging on just one super-site (Seaview Harbor Marina). Least Terns and American Oystercatchers continued to be distributed rather evenly throughout the state.

Continuing another recent trend, the only species where the majority of individuals nested on federal properties was Piping Plover; the other three species do not show this pattern. There is not an obvious reason for this difference, but as Piping Plovers are the only of the four species that must have suitable foraging habitat close to the nest (their chicks have to feed themselves, while the other species can/do forage away from the immediate nest area and bring food back to their young) it continues to raise questions about the quality of foraging habitat and abundance of prey items at federal versus non-federal sites and, in particular, how beach replenishments and beach grooming practices may be influencing site selection for Piping Plovers. On the flip side, as sea-levels rise and communities scramble to keep their beaches high and dry via beach replenishments and other means, it is not hard to imagine that the birds will have to exploit this artificially maintained habitat (as they did in Deal and Long Branch this year) and the conflicts with humans will continue to grow in coming decades.

Of special note on the habitat front were the Barnegat Light Restoration Area and Horseshoe Island. Thanks to vegetation management efforts by Conserve Wildlife Foundation of NJ (CWF), Rutgers University, and the USFWS – NJ Field Office, the Barnegat Light Restoration Area site suitability continued and reproductive success for plovers was double that of the statewide number. In winter 2022, NJFW (with support from EB Forsythe NWR and CWF) successfully petitioned the Tidelands Resource Council for a five-year agreement for management rights of Horseshoe Island, an offshore island east of Little Egg Inlet. As a result, a seasonal restriction to all human disturbance was enacted. These efforts translated into even higher use of the site by breeding (including nearly the whole state's population of Black Skimmers when other colonies failed) and migrant birds than was observed 2021. Details on the season at Horseshoe Island will be made available in a standalone report (including nesting results for Royal and Common Terns).

Banding of beach-nesting bird species continued on a much-reduced scale in 2022. A modest number of plovers associated with the Barnegat Light Restoration Area and at a few specific sites in Cape May County were marked in 2022. Due to extremely low reproductive success, no beach-strand American Oystercatchers and only a few Black Skimmers were banded (by The Wetlands Institute) this season.

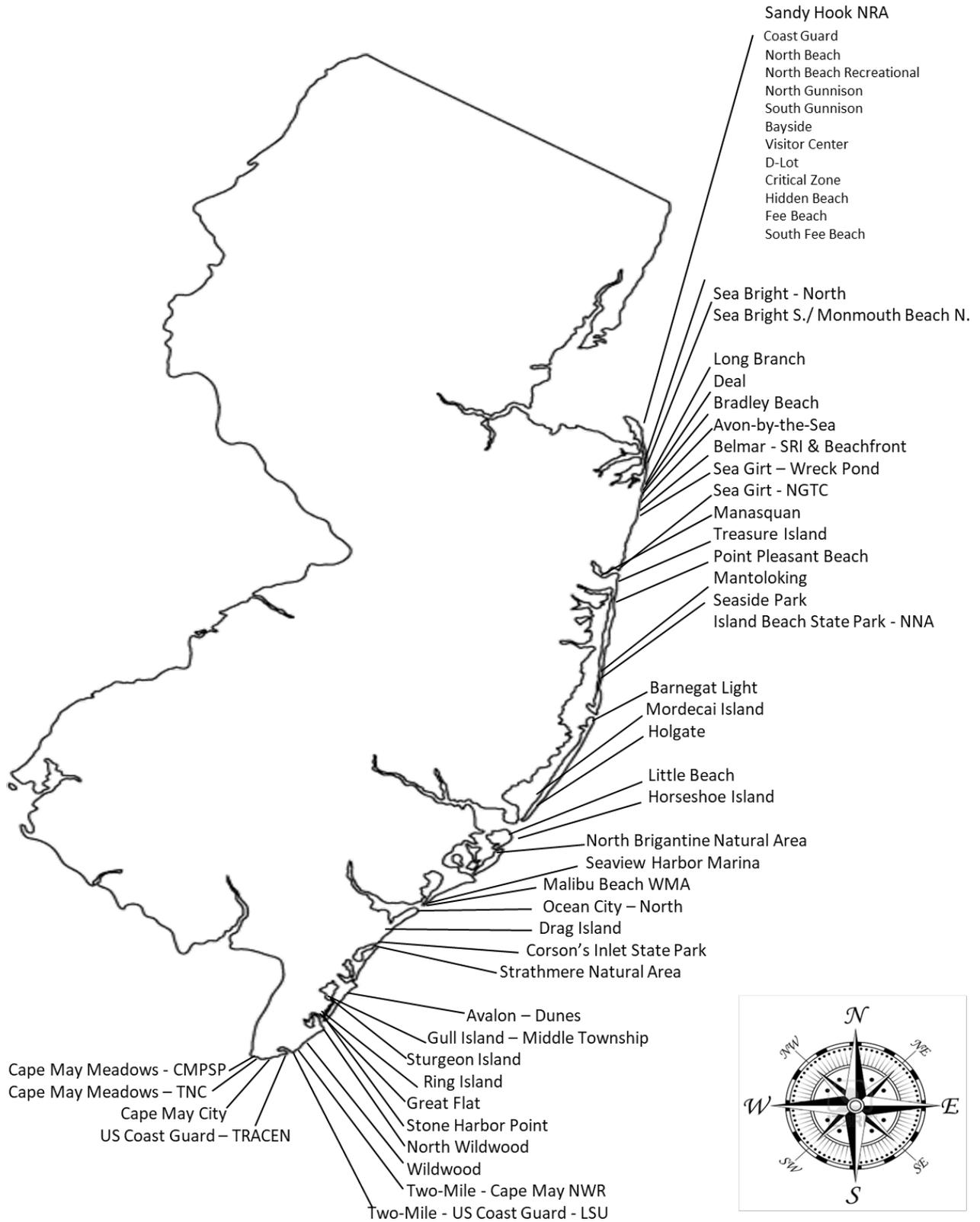
In difficult years like this, with low productivity and seemingly intractable problems, the NJFW wishes to express its profound gratitude to our seasonal staff and all the cooperators, interns, and volunteers that worked tirelessly to ensure that our beach-nesting bird species remain part of the coastal landscape into the future.

Special thanks to Rebecca Arsenault for her help in compiling data in this report.

Data from partners was provided by USNPS -Gateway National Recreation Area – Sandy Hook Unit, USFWS – Edwin B. Forsythe National Wildlife Refuge & Cape May National Wildlife Refuge, the Conserve Wildlife Foundation of New Jersey, The Nature Conservancy, The Wetlands Institute, and the US Coast Guard.

Two related reports are available for 2022; one is focused solely on Piping Plover (available November 2022) and a second on Horseshoe Island (available Jan 2023). Either can be requested through NJFW or located on the NJFW website.

New Jersey Beach Nesting Bird Sites: 2022



** This map represents all the Atlantic Coast sites where breeding and breeding outcomes documented. It does not show sites that were monitored but no active nesting detected or sites that nesting did/may have occurred but where there was no monitoring, as was largely the case for the marsh islands of the Atlantic Coast.*

Piping Plover Nesting Summary

- One hundred and eighteen (118) pairs of Piping Plovers nested in New Jersey in 2022, a 14% decrease from 2021 (137) and a 16% increase from 2020 (103). The decrease from 2021 is attributed to the lower productivity that season and again highlights the highly volatile nature of NJ's population.
- Pairs nested at 26 sites statewide, a decrease from 28 in 2021 but higher than 20 in 2020. The distribution continues to heavily favor the federal properties in the north and central part of the coast (46% at EB Forsythe NWR, 28% at Gateway NRA – Sandy Hook Unit).
- The 118 pairs laid 170 nests. Of those nests, 71 hatched (42%), 94 failed (55%) and five had an unknown outcome (3%). Of the 94 that failed, 54 were lost to predators (57% of failures), nine to flooding (10% of failures), 18 to abandonment (19% of failures), four were blown over (4% of failures), and nine had undetermined cause of failure (10% of failures).
- Statewide pair-nest success (the percentage of pairs that successfully hatch at least one nest) decreased again in 2022 compared to 2021 (59% vs. 64%, respectively) and was lower than the period since federal listing (69%).
- The statewide productivity rate was 0.85 fledglings/pair, the same as in 2021. Prior to 2021, the last time it dipped below 1.20 fledglings/pair was in 2013 (also 0.85 fledglings/pair). The productivity goal is 1.50 fledglings/pair and rates below 1.00 fledglings/pair may lead to a population decrease.
- Seventy (70) nests were exclosed, or 41% of nesting attempts. The exclosed hatch rate was 49%. The abandonment rate for exclosed nests was 23% (abandonments can suggest an adult mortality event). In one case an adult was killed at an exclosed nest that later hatched and it is strongly suspected an adult was killed in another instance where the nest still hatched (these situations are not included in the 23% metric, as the nests were not abandoned). Exclosures (predator cages) are known to increase the likelihood of plover nests hatching but also increase the likelihood of adult mortality. Adult mortality was higher than average at exclosures in 2022, highlighting the importance of weighing the decision on when and where to deploy them. The unexclosed hatch rate was 37%. Of the nests not exclosed, 41% were lost to predators.
- The majority of plovers (74%) are still nesting at two federal properties (Gateway NRA – Sandy Hook Unit and EB Forsythe NWR). The continued funneling of birds to these two areas is not a sustainable path to recovery.
- The significant decrease in pairs was not unexpected (due to 2021 productivity) but still concerning. In recent years, a lower population has sometimes been paired with a higher number of bachelor birds (who may help bolster a population the following year) and that was the case in 2022 (although the number was more modest than in some years, when it has been more than double 2022's number), leading to further concerns for the stability and future of the population.

New Jersey Piping Plover Nesting Summary by Site: 2022

SITE	Pairs	Pairs Hatched	Chicks Fledged	Pair Success	Fledge Rate	SP Fledge Rate
Sandy Hook NRA	33	21	28	0.64	0.85	1.33
<i>Coast Guard</i>	1	1	3	1.00	3.00	3.00
<i>North Beach</i>	10	9	11	0.90	1.10	1.22
<i>North Gunnison</i>	7	3	3	0.43	0.43	1.00
<i>South Gunnison</i>	4	3	4	0.75	1.00	1.33
<i>D-Lot</i>	1	0	0	0.00	0.00	0.00
<i>Critical Zone</i>	5	3	6	0.60	1.20	2.00
<i>Hidden Beach</i>	1	0	0	0.00	0.00	0.00
<i>Fee Beach</i>	3	1	0	0.33	0.00	0.00
<i>South Fee Beach</i>	1	1	1	1.00	1.00	1.00
Sea Bright - North	1	0	0	0.00	0.00	0.00
Monmouth Beach – North ¹	3	3	1	1.00	0.33	0.33
Long Branch	1	0	0	0.00	0.00	0.00
Deal	1	0	0	0.00	0.00	0.00
Region 2 Subtotal	39	24	29	0.62	0.74	1.21
Sea Girt – Wreck Pond	1	0	0	0.00	0.00	0.00
Sea Girt - NGTC	1	1	0	1.00	0.00	0.00
Seaside Park	1	1	4	1.00	4.00	4.00
Island Beach SP NNA	3	1	0	0.33	0.00	0.00
Barnegat Light ²	7	5	9	0.71	1.29	1.80
Region 3 Subtotal	13	8	13	0.62	1.00	1.63
EB Forsythe NWR	54	30	49	0.56	0.91	1.63
<i>Holgate</i>	48	30	49	0.63	1.02	1.63
<i>Little Beach</i>	6	0	0	0.00	0.00	0.00
North Brigantine NA	1	0	0	0.00	0.00	0.00
Region 4 Subtotal	55	30	49	0.55	0.89	1.63
Malibu Beach WMA	1	1	1	1.00	1.00	1.00
Ocean City North	4	3	3	0.75	0.75	1.00
Region 5 Subtotal	5	4	4	0.80	0.80	1.00
Corson's Inlet SP	3	2	4	0.67	1.33	2.00
Strathmere NA	1	1	1	1.00	1.00	1.00
Region 6 Subtotal	4	3	5	0.75	1.25	1.67
Stone Harbor Point	2	1	0	0.50	0.00	0.00
Region 7 Subtotal	2	1	0	0.50	0.00	0.00
NJFW sites TOTAL	31	19	23	0.61	0.74	1.21
All NJ sites TOTAL	118	70	100	0.59	0.85	1.43
# Active Sites	26					

¹This site includes Sea Bright – South and Monmouth Beach – North

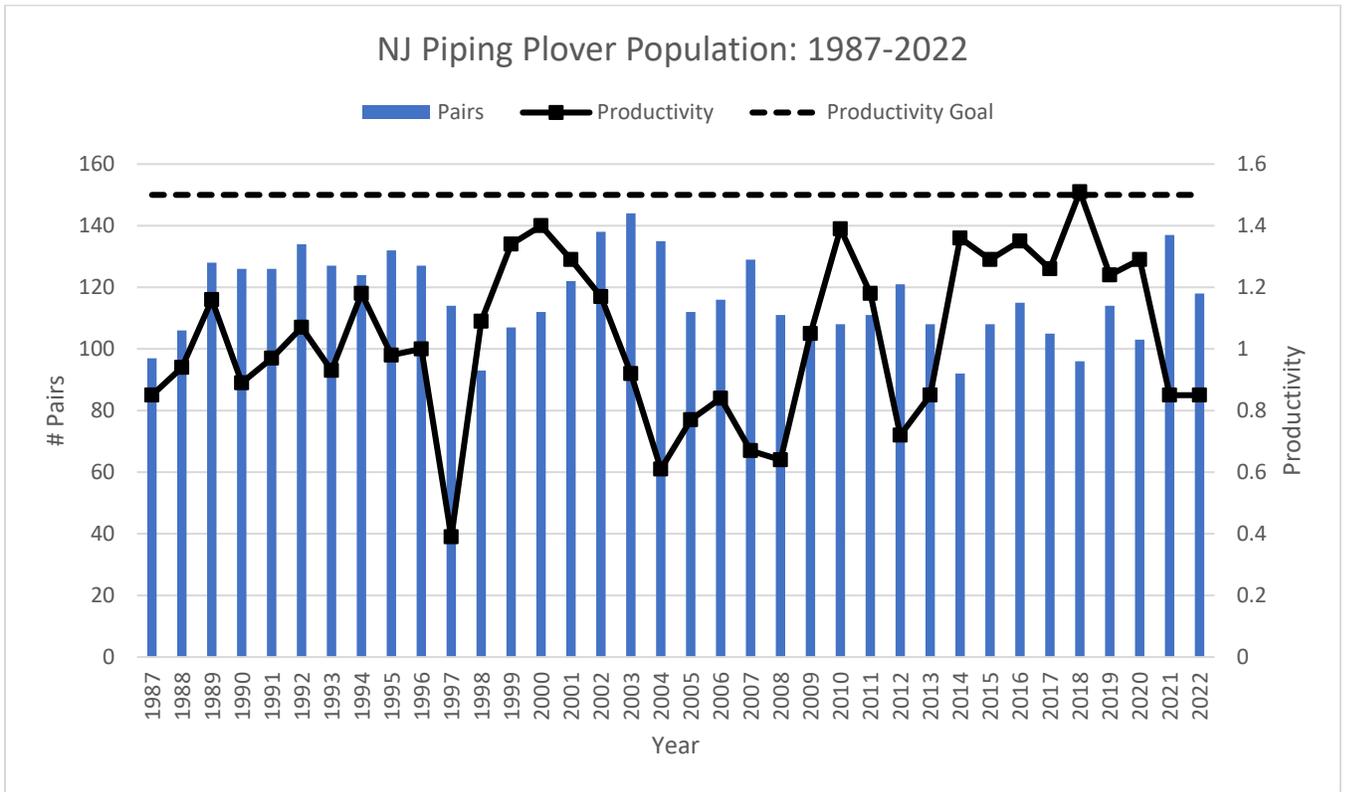
² This site includes Borough of Barnegat Light and Barnegat Light Restoration Area (BLRA). BLRA fledge rate was 1.6 fledglings/pair

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.

New Jersey Piping Plover Population: 1987-2022



Black Skimmer Nesting Summary

- Black Skimmer breeding bird counts were conducted approximately every week at active sites from arrival (mid-May) until nesting ceased (September) on beaches along the entire Atlantic coast. Marsh islands were not surveyed this year, but there was no evidence to suggest significant numbers of birds nested in this habitat. Active nesting (at least one nest with eggs) was observed at seven sites. All sites were visited 3-7x/week for management and outreach for the duration of the nesting season.
- A total of 2,434 adults were present at active sites. This figure is the cumulative total of site counts that occurred in the peak survey period, which took place 19-25 June. The sum of the peak adult number from each site was 3,982. The larger the difference between these two numbers, the more likely it is there was failure at any given colony and then relocation/re-nesting to another colony; that was the case this year.
- A peak count of 977 incubating adult Black Skimmers were tallied in the 24-30 July survey period. The incubation number was lower than might be expected given the number of adults present and was almost certainly lower than how many nested. As is generally the case, vegetation at Seaview Harbor Marina (SHM) and Stone Harbor Point (SHP) blocked observers from garnering the most accurate count of these ground nesters but walk-through colony counts are not safe or effective at these highly vegetated sites.
- Black skimmer statewide productivity appeared to be moderate-low with 412 fledglings produced statewide. This translates to 0.42 fledglings/pair if calculated on the peak incubating adult count (977). If we simply halve the peak period total adult number (1,217) and use that as pair count, the productivity is 0.34 fledglings/pair. The true rate is likely somewhere in the middle.
- Early in the season, Black Skimmers were more evenly distributed in the state than they have been in many years. Rather than the majority of birds at Seaview Harbor Marina, and continuing a trend started in 2021, the birds were spread out at three major colonies; Horseshoe Island, SHM, and SHP. Once the colonies at SHM and SHP failed (due to predators), nearly the entire population of skimmers in NJ continued their nesting season at Horseshoe Island (until storms in September ended the season prematurely), further cementing its current importance to the state's population.
- Due to the failures at SHM and SHP, banding efforts by The Wetlands Institute (TWI) and NJFW were largely cancelled this year. The primary exception was the three adults who were outfitted with GPS pin-point tags at Stone Harbor Point by TWI. Due to this work and previous year's banding efforts, biologists were able to confirm failed nesters from SHM and SHP re-nested at Horseshoe Island. Data from the pin-point tag effort is preliminary and not yet available but shows great promise. For example, for the first time, biologists were able collect spatial data showing the behavior of failed birds when making decision on where to re-nest.
- Over the course 2022, 70 individuals banded in NJ from 2016-2022 were observed either on migration or wintering grounds. Skimmers banded in NJ were observed in DE, VA, NC, SC, GA, and FL. A total of 314 skimmers have been banded in NJ since 2016.
- Please note that the data in the following table is presented both in terms of peak tallies of each site *and* the peak counts statewide in the week-long survey windows. It is presented by site so that the peak use of any given location can be understood. However, simply tallying these peaks can lead to double counting individuals since this species is known to use multiple sites in one year (e.g. a colony fails at one site and they re-nest at another site.) so the statewide peak window count is an effort to reduce that issue and add context to the site total figures.

New Jersey Black Skimmer Nesting Summary by Site: 2022

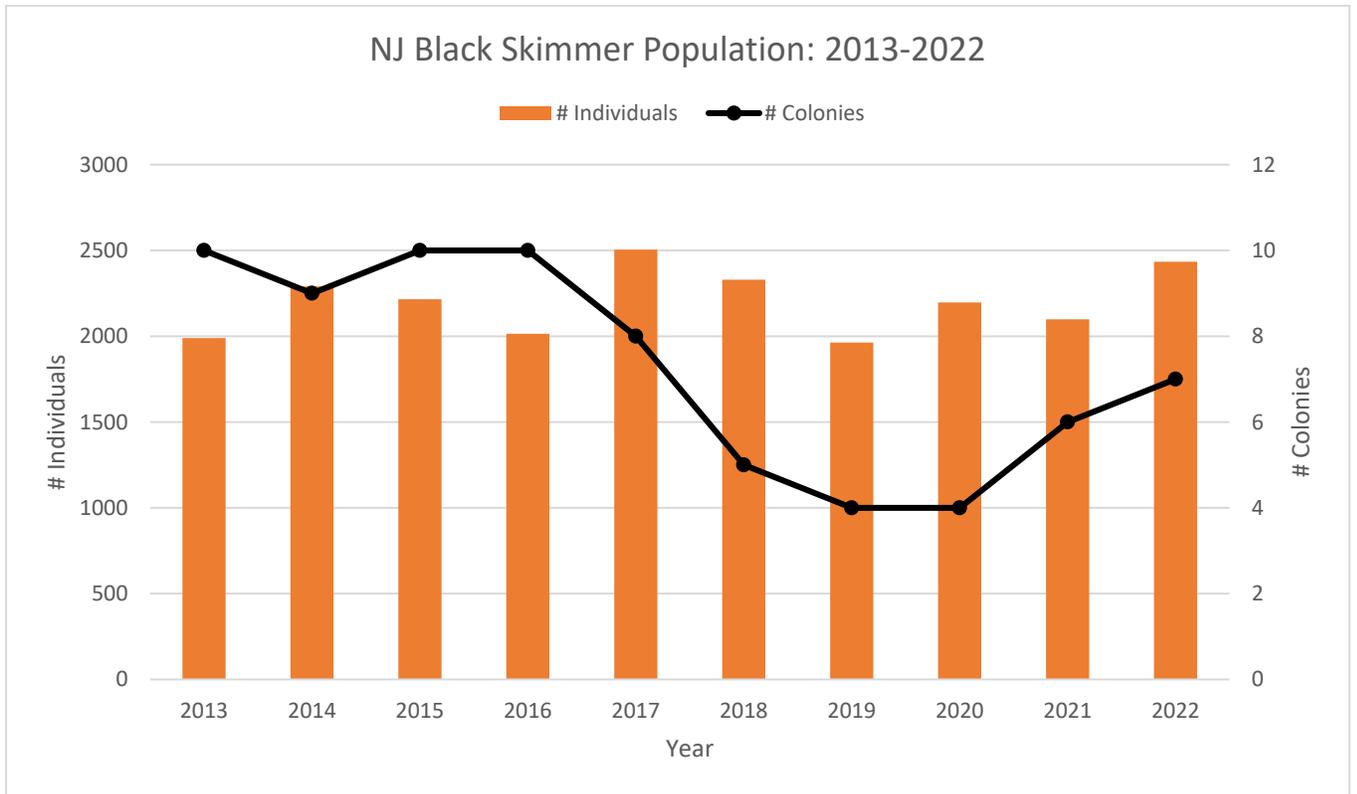
SITE	Peak Total Adult Count	Peak Incubating Adult Count	Chicks Fledged	Fledge Rate
Point Pleasant Beach	69	27	1	0.04
Holgate – EB Forsythe NWR	125	37	9	0.24
Horseshoe Island ¹	2086	1030	402	0.39
Seaview Harbor Marina	980	316	0	0.00
Ocean City - North	39	6	0	0.00
Stone Harbor Point	664	123	0	0.00
SCMM – The Nature Conservancy	19	7	0	0.00
NJFW sites TOTAL	3838	1502	403	--
All NJ sites TOTAL	3982	1546	412	--
Statewide Peak Window Count	2434	977	--	--
	(6/19-6/25)	(7/24-7/30)		
# Active Sites	7			

“**Fledge Rate**” equals the number of chicks fledged per incubating adult. This number should be considered an estimate as there is not a high degree of confidence in the incubating adult and fledge number as these data points are very difficult to collect. Because of this difficulty, there is no statewide fledge rate tallied here.

“**Peak Total Adult Count**” & “**Peak Incubating Adult Count**” are the highest adult counts observed at any point during the breeding season. “**Statewide Peak Window Count**” represents the highest tally for one one-week survey window. This species exhibits a high degree of intra-year movements so both numbers are important to understand the distribution of adults and habitat use (on site and state levels) in NJ.

¹ This site is jointly managed by NJFW and EB Forsythe NWR/Conserve Wildlife Foundation of NJ

New Jersey Black Skimmer Population: 2013-2022



Note: The number of colonies only includes sites where active nesting was documented.

Least Tern Nesting Summary

- Least Tern breeding bird surveys were conducted every week from mid-May until the end of August at beaches along the entire Atlantic coast. Active colonies (those where \geq one pair was observed with eggs) were located at 18 sites and observations were made at these locations for the duration of the season. Sites were visited 3-7x/week for management and outreach for the duration of the nesting season.
- A total of 1,169 adults were present at active sites. This figure is the cumulative total of site counts that occurred in the peak survey period, which took place 5-11 June. The summed peak adult number from each site was 1,761. A large difference between these two numbers can suggest failure at a given site and then relocation/re-nesting to another site; this appeared to be the case in 2022.
- A peak count of 682 incubating adult Least Terns were observed in the 5-11 June survey period. Productivity was low for Least Terns with 144 fledglings produced statewide at 0.21 fledglings/pair, based on the peak number of incubating adults. Primary causes for colony losses were predators and some flooding.
- The number of active Least Tern colonies (18) decreased in 2022 compared to 2021 (26) and was similar to 2020 (18). Although a lower colony count than last year, the species continues to be distributed rather evenly across sites and the state, in terms of location and number of individuals in colonies, and this is a positive attribute for this species. However, only 27% of sites produced fledglings, and even at most of those sites the productivity rates were very low. To wit, 68% of fledges were produced from just one landowner (EB Forsythe NWR – Holgate).
- Predators continue to be the primary limiting factor for this species. Nearly every colony sustained catastrophic or near catastrophic loss by a variety of predators, causing the birds to re-nest multiple times. Due to their colonial and garrulous nature, they are easily located by predators. As with all terns, they will dive-bomb intruders, but their diminutive size often makes their defenses unsuccessful against predators, who are generally much larger. Species managers are continuing to work on addressing this issue, but this has proven to be an especially difficult issue for this species.
- The relative stability of this population over the last decade is somewhat perplexing, given years of what appears to be poor productivity. Least Terns live a long time, which is beneficial for the individuals who nest in NJ and rarely find widespread success. This species is not banded, so biologists cannot track them to determine if the population is being propped up by immigrants from other states. If immigration is not occurring, there is a sense that a decline should be expected in coming years.
- Please note that the data in the following table is presented both in terms of peak tallies of each site *and* the peak counts statewide in the week-long survey windows. It is presented by site so that the use of any given location can be understood. However, simply tallying these peaks can lead to double counting individuals since this species is known to use multiple sites in one year (e.g. a colony fails at one site and they re-nest at another site.) so the statewide peak window count is an effort to reduce that issue and add context to the site total figures.

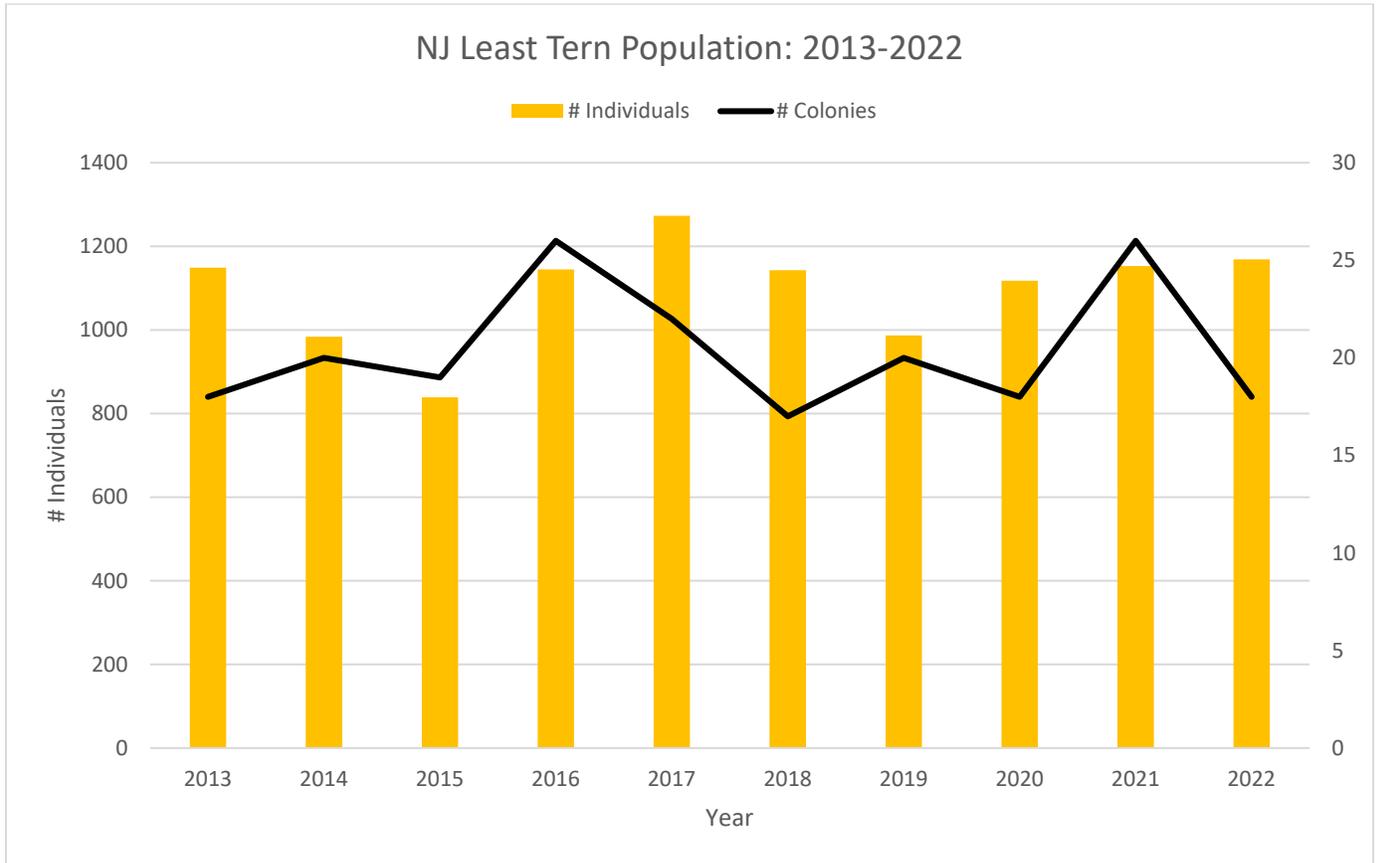
New Jersey Least Tern Nesting Summary by Site: 2022

SITE	Site Peak Total Adult Count	Site Peak Incubating Adult Count	Chicks Fledged	Fledge Rate
<i>Sandy Hook - GNRA</i>				
North Beach Rec	14	4	0	0.00
Critical Zone	12	2	0	0.00
Monmouth Beach - North/SBSO	30	3	0	0.00
Long Branch	56	6	0	0.00
Deal	213	77	0	0.00
Belmar – Shark River Inlet	2	1	0	0.00
Point Pleasant Beach	196	109	29	0.27
Mantoloking	11	5	0	0.00
Barnegat Light (Restoration Area)	22	10	0	0.00
<i>EB Forsythe NWR</i>				
Holgate – Northern Overwash	215	62	11	0.18
Holgate – Inlet	245	101	87	0.86
Horseshoe Island ¹	371	245	9	0.04
Malibu Beach WMA	9	1	0	0.00
Ocean City – North	51	26	0	0.00
Corson’s Inlet State Park	26	11	0	0.00
Strathmere Natural Area	7	6	0	0.00
<i>South Cape May Meadows</i>				
The Nature Conservancy	255	152	8	0.05
Cape May Point State Park	26	11	0	0.00
NJFW sites TOTAL	1020	511	38	--
All NJ sites TOTAL	1761	832	144	--
Statewide Peak Window Count	1169	682	--	--
	(6/5-6/11)	(6/5-6/11)		
# Active Sites	18			

- “Fledge Rate” equals the number of chicks fledged per incubating adult. This number should be considered an estimate as there is not a high degree of confidence in the incubating adult and fledge numbers. As these data points are very difficult to collect.
- “Peak Total Adult Count” & “Peak Incubating Adult Count” are the highest adult counts observed at any point during the breeding season. “Statewide Peak Window Count” represents the highest tally for one two-week survey window. This species exhibits a high degree of intra-year movements so both numbers are important to understand the distribution of adults and habitat use (on site and state levels) in NJ.

¹ This site is jointly managed by NJFW and EB Forsythe NWR/Conserve Wildlife Foundation of NJ

New Jersey Least Tern population: 2013-2022



Note: The number of colonies only includes sites where active nesting was documented.

American Oystercatcher Nesting Summary

- Although American Oystercatchers are a management priority in areas of high human disturbance, resource limitations dictate that the data collected on this non-listed species is not comprehensive to the state; it is well known that many individuals nest in the marsh, but the vast majority are not tracked. The locations listed in the table are all monitored sites with reproductive information available and were visited between 1x/week (or less) to 7x/week.
- There was another increase in the number of pairs that were monitored by NJFW and partners compared to 2022 (174 vs. 169 pairs). However, since there is not yet an ability to monitor all of the pairs in the state, it is difficult to put this into context. A better index may be to look at just Atlantic coast beach-strand pairs, where a longer and more comprehensive dataset exists. In 2022, there was a slight decrease in beach-strand pairs to 138 (143 in 2021). However, the utilization of beach-strand habitat has increased dramatically from when there were 53 pairs monitored in 2003. The nesting sites with the highest pair numbers on the beach-strand in 2022 were Holgate (40), Stone Harbor Point (21), Sandy Hook (20), and Horseshoe Island (10). Of the 174 pairs, just 51 pairs (29%) hatched at least one egg.
- There were 320 nesting attempts but only 51 nests hatched (16%). Of the failed nests, 52% were lost to predators, 26% to flooding, 20% to an undetermined cause (many of these are likely predators, but there was not enough evidence to confirm), 1.5% to abandonment, and 0.5% to being blown over.
- The American Oystercatcher Working Group recommends a reproductive goal of 0.50 fledglings/pair but the reproductive output of monitored pairs in 2022 was only 0.30 fledglings/pair. Some of this rate is explained by the effect of the low hatch rate and hence the lost reproductive potential (only 83 chicks hatched from those 320 nesting attempts). For the chicks that did hatch, it was difficult to pinpoint the cause of chick loss, but it was almost certainly driven by predators. Just two sites (Holgate and Horseshoe Island) fledged 71% of the state's fledglings.
- NJFW and The Wetlands Institute did not band any beach-strand American Oystercatchers this year, due to the extremely low reproductive success that resulted in fewer opportunities to trap incubating adults and band their young.
- Of the four species, American Oystercatchers continue to show the greatest elasticity in their nesting, utilizing natural areas of marsh islands and beaches. They also use a greater variety of atypical areas – highly groomed beaches, rooftops, and grassy strips in parking lots among them. The number of pairs that are monitored by NJFW and partners continues to increase each year but the reasons for the increase are not fully understood. Reproductive success at monitored sites does not suggest that the population is increasing. Some of the increase could be due to pairs shifting to the beach-strand, where focused monitoring is occurring, and they are now being captured in datasets (when they may have been absent from it when in marsh). It could be due to a continuing effort among partners to increase monitoring of marsh and bayside pairs. As is observed with other species, there could be some immigration from other states. It is also possible that the reproductive output needed to increase this population is lower than previously presumed. More work is needed to understand the factors at play.

New Jersey American Oystercatcher Nesting Summary by Site: 2022

All Monitored Sites

SITE	Pairs	Pairs Hatched	Chicks Fledged	Pair Success	Fledge Rate
Sandy Hook NRA	20	0	0	0.00	0.00
<i>Coast Guard</i>	2	0	0	0.00	0.00
<i>North Beach</i>	3	0	0	0.00	0.00
<i>North Gunnison</i>	4	0	0	0.00	0.00
<i>South Gunnison</i>	2	0	0	0.00	0.00
<i>Bayside</i>	1	0	0	0.00	0.00
<i>Visitor's Center</i>	1	0	0	0.00	0.00
<i>Critical Zone</i>	2	0	0	0.00	0.00
<i>Hidden Beach</i>	1	0	0	0.00	0.00
<i>Fee Beach</i>	1	0	0	0.00	0.00
<i>South Fee Beach</i>	1	0	0	0.00	0.00
Monmouth Beach North ¹	1	0	0	0.00	0.00
Region 2 Subtotal	21	0	0	0.00	0.00
Long Branch	1	0	0	0.00	0.00
Bradley Beach	1	1	0	1.00	0.00
Avon	1	0	0	0.00	0.00
Belmar-Shark River Inlet	1	0	0	0.00	0.00
Belmar – Beachfront	1	0	0	0.00	0.00
Sea Girt – Wreck Pond	1	0	0	0.00	0.00
Manasquan	1	0	0	0.00	0.00
Treasure Island	1	1	2	1.00	2.00
Point Pleasant	1	1	1	1.00	1.00
Barneгат Light	3	1	1	0.33	0.33
Region 3 Subtotal	13	4	4	0.31	0.31
Mordecai Island	2	1	2	0.50	1.00
Holgate	40 ²	24	27	0.60	0.68
Tucker's Island	1 ²	0	0	0.00	0.00
Little Beach	8 ²	0	0	0.00	0.00
Horseshoe Island	10	8	10	0.80	1.00
Region 4 Subtotal	59	33	39	0.56	0.66
Seaview Harbor Marina	1	0	0	0.00	0.00
Malibu WMA	3	0	0	0.00	0.00
Region 5 Subtotal	4	0	0	0.00	0.00
Ocean City – North	1	0	0	0.00	0.00
Drag Island	5	0	0	0.00	0.00
Corson's Inlet State Park	2	0	0	0.00	0.00
Strathmere NA	1	0	0	0.00	0.00
Avalon – Dunes	1	1	1	1.00	1.00
Region 6 Subtotal	10	1	1	0.10	0.10
Gull Island – Middle Township	13	2	1	0.15	0.08
Sturgeon Island	3	0	0	0.00	0.00
Ring Island	8	5	3	0.63	0.38
Great Flat	3	0	0	0.00	0.00
Stone Harbor Point	21	0	0	0.00	0.00
North Wildwood	1	1	1	1.00	1.00
Wildwood	1	1	0	1.00	0.00
Two-Mile Beach	8	1	3	0.13	0.38
<i>Cape May NWR</i>	4	1	3	0.25	0.75
<i>USCG LSU</i>	4	0	0	0.00	0.00
Coast Guard-TRACEN	2	2	0	1.00	0.00
Cape May City	2	0	0	0.00	0.00
Cape May Meadows	5	1	0	0.20	0.00
<i>The Nature Conservancy</i>	3	1	0	0.33	0.00
<i>Cape May Point State Park</i>	2	0	0	0.00	0.00
Region 7 Subtotal	67	13	8	0.19	0.12
All NJ sites TOTAL	174	51	52	0.29	0.30
# Active Sites	46				

¹ This site includes Sea Bright – South and Monmouth Beach – North

² The same pair nested at two nearby sites. Therefore “subtotals” and “totals” are less than sum of individual sites.