

Fire Island National Seashore

**THREATENED & ENDANGERED SPECIES
MONITORING PROGRAM
2019 SUMMARY**



Prepared by:
Lindsay Ries, Farrah Leone, Claudia White and Jacqueline Johnson

Fire Island National Seashore
120 Laurel Street
Patchogue, NY 11772

Contents

Introduction.....	3
Methods and Results.....	4
Piping Plovers	4
Colonial Waterbird Surveys (Terns and Other Waterbirds)	8
Seabeach Amaranth and Seabeach Knotweed.....	9
Asiatic Sand Sedge.....	10
Discussion	11
Disturbances	11
Management of T&ES Data	0
WORKS CITED	17
Appendix A: Tables and Figures.....	18
Table 1: Historic Productivity of Piping Plovers at FIIS.....	18
Table 2: FIIS 2019 Overall Piping Plover Productivity.....	19
Table 3: Piping Plover Banding Information for 2019 from Virginia Tech Study.....	20
Figure 1: Piping Plover Breeding Pair Productivity (2005-2019).	21
Figure 2: Status of Eggs Laid in 2019.	22
Figure 3: Chart displaying historical values for Seabeach Amaranth and Seabeach Knotweed on FIIS (2003-2019).....	23
Table 4: NYSDEC’s Long Island Colonial Waterbird Surveys in 2019.	24
Appendix B: Maps.....	25
Map 1: Map of Fire Island National Seashore	25
Map 2: Fire Island Lighthouse locations of Piping Plovers in 2019.	26
Map 3: Fire Island Sunken Forest locations of Piping Plovers in 2019.	27
Map 4: Fire Island Wilderness locations of Piping Plovers in 2019.....	28
Map 5: Fire Island Wilderness locations of Piping Plovers in 2019: Close-up of West End.	29
Map 6: Fire Island Wilderness locations of Piping Plovers in 2019: Close-up of East End.	30
Appendix C: GPS locations	31
Piping Plover Nests	31
Seabeach Amaranth Individuals 2019	32
Seabeach Knotweed Individuals 2019.....	37

Introduction

Fire Island National Seashore (the Seashore; FIIS) is a National Park unit located south of Long Island, New York. Federal and state-listed threatened and endangered species (T&ES) were monitored in 2019 as part of the Threatened and Endangered Species Program monitoring effort conducted at FIIS. T&ES species of interest include the piping plover (*Charadrius melodus*), least tern (*Sterna antillarum*), common tern (*Sterna hirundo*), seabeach amaranth (*Amaranthus pumilus*), seabeach knotweed (*Polygonum glaucum*) and northern long-eared bat (*Myotis septentrionalis*). In addition, searches for the non-native, invasive plant Asiatic sand sedge (*Carex kobomugi*) were also done in tandem to T&ES beach plant surveys.

A total of 28 piping plover nesting pairs were recorded within the Seashore. 56 chicks successfully fledged, causing a productivity of 1.9 for piping plovers in 2019. Virginia Tech continues to study piping plovers as part of their research funded by the Army Corp of Engineers through the Fire Island Inlet to Moriches Inlet (FIMI) project which began in 2016, and data was shared throughout the season. In addition, 134 seabeach amaranth and 45 seabeach knotweed plants were documented throughout FIIS.

Long Island Colonial Waterbird Surveys through the New York State Department of Environmental Conservation (NYSDEC-LICWS) were also conducted by FIIS staff on Fire Island and the surrounding smaller, bay islands. There are two survey windows in June for Terns and Black Skimmers at all sites, and every three years a Gull and Wading Birds survey is conducted May 17th – 30th. This year all 3 surveys were conducted at as many sites as possible. Ridge Island continues to support the largest numbers of common terns, with 470 and 400 nesting birds counted during each survey window, respectively.

Methods and Results

Piping Plovers

1.1. Methods

In accordance with the U.S. Fish and Wildlife Service (USFWS) guidelines, pre-season habitat fencing (symbolic fencing) was constructed and established in early April, prior to the onset of the piping plover breeding season. Areas to be fenced were determined through the compilation of nest/plant data collected from previous years, early season plover observations, and through visual assessments of habitat. Areas where birds are seen regularly are more intensely monitored (for example, the Fire Island Wilderness) and symbolic fencing is erected and adjusted accordingly. Breeding pairs of plovers are identified using binoculars and observed for specific territorial, courtship and nesting behaviors. These behaviors include (but are not limited to) parallel runs, aerial displays, scraping, broken-wing display, and vocalization (Cairns 1982).

Upon discovery of a nest, an alphanumeric tag is used to identify each nesting pair and nest; a number and year are assigned chronologically, using an “A” for first nesting attempt, “B” for second, and so on (eg. 1A-19). Regardless of nest location along FIDS shore, all nests were protected within symbolic fencing borders creating a buffer zone of no less than then 50 meters on all sides.

Monitoring efforts for nesting activity are increased after pairing or copulation is observed. Field biologists lead intensive daily monitoring observations for the purpose of quickly identifying nests. This effort helps ensure accurate estimation of hatch and fledge dates. An average hatch date of 27 days from the full clutch date is determined utilizing a chart produced by the New York State Department of Environmental Conservation (NYSDEC). Daily brood monitoring is initiated after the first piping plover egg hatches. Chicks are either considered fledged when witnessed 25 days after they have hatched or when a sustained flight of 15 meters is observed before then. When a nest is situated near a vehicle beach access route, a fledge date of 35 days is implemented and driving restrictions are extended to ensure the safety of the brood (USFWS 1996).

1.2. Results

A total of 28 nesting pairs were documented, from which there came 32 nesting attempts throughout Fire Island National Seashore. Fourteen plover pairs nested in OPWA-East (Otis Pike Wilderness Area - east of Old Inlet). Birds making multiple attempts in this area included pair 3 (2 attempts) and pair 5 (3 attempts). Nests 3B and 5C were successful.

Nine pairs nested in OPWA-West (Otis Pike Wilderness Area west of Old Inlet) with pair 20 making two attempts to hatch. Nest 20B was successful. A male adult from nest 26A (Tagged: 41L) died presumably due to predation. Four pairs nested on Lighthouse Beach: 11A, 12A, 16A, and 28A which was found late in the season on July 2nd. One chick from 11A (Tagged: LMP) was attacked by a predator and was found dead on July 17th. Lastly, one pair (13A) nested in Sailors Haven and produced 3 chicks. It is presumed that potentially one adult and one chick was predated from this brood, indicated by a pile of adult and

chick feathers found by the exclosure, and only one adult was observed with the brood afterwards.

A total of 118 eggs were laid not including nest 26A, where we discovered the brood after the chicks already hatched. Of the 118 eggs laid, 83 total eggs hatched, with the remainder failing as a result of weather and predation as explained further in the Discussion section. Twenty-four nests hatched and 54 chicks went on to fledge, yielding a productivity of 1.9 for 28 breeding pairs (Table 1).

A breakdown of the number of eggs hatched (and unhatched) can be found in Figure 2, and maps of nest locations are in Appendix B.

Below is a summary of each nesting attempt:

Nest 1A-19 was found with 3 eggs on April 25th by Virginia Tech researchers in OPWA-East. On May 1st the nest was exclosed with a full clutch of 4 eggs. Nest 1A-19 failed on May 14th after being buried by sand that built up around the exclosure following a storm that produced high tides and strong winds.

Nest 2A-19 was found with 2 eggs on May 2nd by Virginia Tech researchers in OPWA-East. On May 6th the nest was exclosed with a full clutch of 4 eggs. Nest 2A-19 failed on June 19th after being abandoned.

Nest 3A-19 was found with 1 egg on May 2nd by Virginia Tech researchers in OPWA-East. On May 6th the nest was exclosed with 1 egg. Nest 3A-19 remained with 1 egg until it failed on May 14th after being buried by sand that built up around the exclosure following a storm that produced high tides and strong winds. Adults remained defensive around the nest.

Nest 3B-19 was a re-nest found with 1 egg on May 19th by Virginia Tech researchers shortly after nest 3A-19 failed in OPWA-East. On May 20th the nest was exclosed with 1 egg. Nest 3B-19 hatched on June 19th with 1 chick. The one chick went on to fledge on July 14th.

Nest 4A-19 was found with 2 eggs on May 7th by Virginia Tech researchers in OPWA-East. The nest was exclosed with 2 eggs on May 8th. Nest 4A-19 failed on May 14th after being buried by sand that built up around the exclosure following a storm that produced high tides and strong winds.

Nest 5A-19 was found with a full clutch of 4 eggs on May 7th by Virginia Tech researchers in OPWA-East. Nest 5A-19 failed on May 14th after being buried by sand that built up around the exclosure following a storm that produced high tides and strong winds.

Nest 5B-19 was found with a full clutch of 4 eggs on May 31st in OPWA-East. The nest failed on June 5th, soon after being found. The nest was seen with signs of predation on that day. There were no eggs remaining and animal tracks were present.

Nest 5C-19 was found with 3 eggs on June 15th by Virginia Tech researchers in OPWA-East. The nest was exclosed on June 26th with 3 eggs. All 3 chicks hatched on July 13th. The adult female abandoned chicks in late July and was seen in OPWA-West on July 22nd. The adult male was observed on July 24th

with one chick and was seen with 1-2 chicks afterwards. Of the chicks that hatched, one fledged on August 7th.

Nest 6A-19 was found with 2 eggs on May 11th by Virginia Tech researchers in OPWA-East. The nest was exclosed with a full clutch of 4 eggs on May 14th. All 4 chicks hatched on June 9th. At times throughout monitoring, the brood was seen up to ~100m west of their exclosure. All 4 chicks went on to fledge on July 4th.

Nest 7A-19 was found with 1 egg on May 15th by Virginia Tech researchers in OPWA-West. The nest was exclosed on May 23rd with a full clutch of 4 eggs. All 4 eggs hatched on June 17th. This brood was situated closely to nest 19A-19 and was difficult to distinguish at times. Of the hatchlings, one went on to fledge on July 12th.

Nest 8A-19 was found with 2 eggs on May 19th by Virginia Tech researchers in OPWA-East. The nest was exclosed on May 22nd with a full clutch of 4 eggs. All 4 eggs hatched on June 17th. One chick went on to fledge on July 12th.

Nest 9A-19 was found with a full clutch of 4 eggs on May 19th by Virginia Tech researchers in OPWA-East. The nest was exclosed on May 20th. The nest failed on June 17th after eggs were seen scattered and somewhat buried around nest scrape in exclosure.

Nest 10A-19 was found with a full clutch of 4 eggs on May 19th by Virginia Tech researchers in OPWA-East. The nest was exclosed on May 20th. Least terns also occupied this area and nested. Chicks were difficult to detect during monitoring, possibly hiding from terns. All 4 chicks hatched on June 15th and 3 went on to fledge on July 10th.

Nest 11A-19 was found with 1 egg on May 22nd by Virginia Tech researchers in Lighthouse Beach. The nest was exclosed with a full clutch of 4 eggs on May 29th. All 4 chicks hatched on June 23rd. On July 17th, one chick was found dead, the cause being predation. The remaining 3 chicks fledged on July 18th.

Nest 12A-19 was found with a full clutch of 4 eggs on May 25th by Virginia Tech researchers behind dune in Lighthouse Beach. The nest was exclosed on May 29th. This brood consistently stayed on or behind the dunes. Of the 4 eggs, 3 hatched on June 17th. One chick fledged on July 12th.

Nest 13A-19 was found with 1 egg on May 25th in Sailors Haven. The nest was exclosed with 3 eggs on May 29th and a full clutch of 4 eggs was seen on June 1st. Of the 4 eggs, 3 hatched on June 24th. This nest was in an area with a high density of beachgoers. The chicks were difficult to detect and at times were seen hiding in dune grass and under wooden debris. It is assumed that an adult and a chick died due to predation on or around July 3rd. 2 chicks went on to fledge on July 21st.

Nest 14A-19 was found with 3 eggs on May 26th by Virginia Tech researchers in OPWA-East. The nest was exclosed with a full clutch of 4 eggs on May 31st, and all 4 eggs hatched on June 23rd. Three of the chicks fledged on July 18th.

Nest 15A-19 was found with 3 eggs on May 26th by Virginia Tech researchers in OPWA-East. The nest was exclosed with 3 eggs on May 31st. A 4th egg was seen on June 4th, and all eggs hatched on June 22nd. One chick was seemingly not afraid of humans and proceeded to walk towards monitors while adults nudged other chicks away. Two chicks went on to fledge on July 17th.

Nest 16A-19 was found with a full clutch of 4 eggs on May 27th by Virginia Tech researchers in Lighthouse Beach. The nest was exclosed on May 29th. All 4 of those eggs hatched on June 19th. The brood was consistently observed east of the exclosure. One chick fledged on July 14th.

Nest 17A-19 was found with a full clutch of 4 eggs on May 27th by Virginia Tech researchers in OPWA-West. The nest was exclosed on May 30th. Three of the eggs hatched on June 23rd and 2 chicks fledged on July 15th.

Nest 18A-19 was found with 3 eggs on May 29th by Virginia Tech researchers in OPWA-East. The nest was exclosed with a full clutch of 4 eggs on May 31st that eventually hatched on June 26th. On July 21st, 3 chicks fledged.

Nest 19A-19 was found with 1 egg on May 29th by Virginia Tech researchers in OPWA-West, and a full clutch of 4 eggs was hatched on July 1st. All 4 chicks went on to fledge on July 26th.

Nest 20A-19 was found with a full clutch of 4 eggs on June 4th by Virginia Tech researchers in OPWA-West on an island ~10m from shore just northwest of Old Inlet Breach. On June 5th, a yolk was seen in the sand nearby. Adults were still incubating the remaining 3 eggs. The nest failed on June 10th, soon after being found.

Nest 20B-19 was a re-nest of 20A found with 2 eggs on June 17th by Virginia Tech researchers in OPWA-West. The nest was exclosed on June 19th with 3 eggs. Two of the 3 eggs hatched on July 16th. Both chicks fledged on August 10th.

Nest 21A-19 was found on June 5th by Virginia Tech researchers in OPWA-West. The nest was exclosed with a full clutch of 4 eggs on June 12th. Each of the 4 eggs hatched on July 3rd. Three of the chicks fledged on July 28th.

Nest 22A-19 was found on June 5th by Virginia Tech researchers in OPWA-West. The nest was exclosed with a full clutch of 4 eggs on June 12th, and 4 eggs hatched on July 3rd. Of the 4 hatchlings, 3 fledged on July 28th.

Nest 23A-19 was found with 2 eggs on June 5th by Virginia Tech researchers in OPWA-East. The nest was exclosed on June 6th with 3 eggs. The nest ended up having 4 eggs and on June 7th 3 of the eggs hatched. All 3 hatchlings went on to fledge on July 31st.

Nest 24A-19 was found with 3 eggs on June 5th by Virginia Tech researchers in OPWA-West. The nest was exclosed on June 12th with a full clutch of 4 eggs. All 4 eggs hatched on July 1st and all fledged on July 28th.

Nest 25A-19 was found with a full clutch of 4 eggs on June 15th by Virginia Tech researchers in OPWA-East. The nest was then exclosed on June 26th. Three of the 4 eggs hatched on July 13th. The nest was determined as hatched/failed on July 26th after not seeing the brood in over 9 days.

Nest 26A-19 was found as a plover brood with 2 chicks on June 24th in OPWA-West. Through monitoring, a 3rd chick was identified on July 1st. On July 15th the adult male was found dead, the cause being predation. On July 18th all 3 of the chicks went on to fledge.

Nest 27A-19 was found with a full clutch of 4 eggs on June 26th in OPWA-West, and all eggs hatched on July 10th. The brood was consistently seen far east of the exclosure, at times up to ~150m. Two of the hatchlings fledged on August 4th.

Nest 28A-19 was found with 3 eggs on July 2nd by Virginia Tech researchers on Lighthouse Beach. The nest was exclosed on July 9th with 3 eggs. Two of the 3 eggs hatched on July 22nd. The brood quickly moved west and was seen near nest 16A-19 consistently prior to their fledge date. One chick fledged on August 16th.

Colonial Waterbird Surveys (Terns and Other Waterbirds)

1.3. Methods

In 2019 there was a NYSDEC's LICWS Gull and Wading Bird survey window, and a Tern and Black skimmer survey window. A gull/wading bird survey is conducted every 3 years during a May 17th – May 31st survey window. In addition, two tern and black skimmer surveys were conducted in June between the 1st and the 30th.

Many of the sites surveyed are located on Fire Island's ocean and bay beaches between the Lighthouse Tract and Smith Point County Park. Several bay islands that are monitored fall within the boundaries of the Seashore, including: East Fire Island, Hospital Island, Islip Spoil Island, John Boyle Island, Long Cove, Pelican Island, Ridge Island, Sexton Island, and West Fire Island. These bay islands can only be accessed by motorboat, canoe, or kayak; therefore, access may be limited by inclement weather, remoteness of location, and time constraints.

1.4. Results

For the Gull and Wading Bird survey, gull species were nesting on most of the bay islands. Species included herring gulls and great black-backed gulls for John Boyle Island, Ridge Island, Sexton Island, and Islip Spoil Island, with a high of 440 herring gulls nesting on Ridge Island. In addition, laughing gulls were abundant on Sexton Island with 320 individuals (Table 4). John Boyle Island continues to support a diversity of wading birds, which included glossy ibis (60), great egrets (18), Black-crowned night herons (15) and little blue herons (1). Double-crested cormorants were nesting on three of the bay island sites: Fire Island Wilderness, Long Cove (12), Ridge Island (88) and Sexton Island (26) (Table 4).

For the Tern/Black Skimmer survey windows, FIIS staff recorded numbers of breeding least terns (LETE) and common terns (COTE). Unfortunately, no roseate terns or black skimmers were observed at any of the sites. Most survey sites were visited during both survey windows. In total, 15 different sites were surveyed throughout the month-long effort (Table 4) including 9 bay islands and 6 sections of Fire Island. LETE populations are on the rebound after no birds observed nesting on Fire Island's ocean beaches in earlier years. In 2016 it was noted that a small number (4-8 LETEs) were nesting in the OPWA-East, and in 2019 approximately 150 nesting LETEs were observed (Table 4).

COTE colonies were only observed on East Fire Island (280), Long Cove (4), and Ridge Island (470/400). These numbers are comparable to the past several years. Unfortunately, COTEs have not re-colonized Sexton Island, with laughing gulls dominating the nesting area that previously supported COTEs (Table 4).

There were also several American Oystercatcher (AMOY) nests detected within LICWS sites, with a formal survey conducted May 17th- May 30th. Thirteen pairs were observed throughout all of the LICWS sites. During the time of the survey, OPWA-East already had two AMOY chicks hatched. AMOYs continue to nest on Fire Island's ocean beaches in the same upper beach habitat as piping plovers.

Seabeach Amaranth and Seabeach Knotweed

1.5. Methods

Seabeach amaranth and seabeach knotweed begin to germinate on FIIS in early July. These plants tend to grow in early successional beach/dune habitat—the same type preferred by piping plovers and least terns for nesting. Symbolic fencing established for plover and tern nesting habitat remain up during the germination period for amaranth and knotweed. Fencing is added and/or may be adjusted after initial sweep counts to provide a buffer around plants with signage specific to seabeach amaranth. Field biologists conduct sweep counts throughout FIIS, both on foot and using an ORV, traveling parallel to the toe of the dune.

This year the survey windows were as follows:

- Survey window 1: 7/10 – 7/21 (*Seabeach amaranth*)
- Survey window 2: 8/7 – 8/18 (*Seabeach amaranth, seabeach knotweed and Asiatic sand sedge*)

After the second survey window individual amaranth plants are typically re-visited every 2 weeks throughout the fall season, until senescence. Data taken includes location (GPS location), plant condition, evidence of browsing, percent browsed, maximum lateral spread, reproductive status, potential threats, weather conditions, and general observations requested by the U.S. Fish and Wildlife Service. Since 2014 every amaranth plant (when feasible) has been exclosed to protect it from deer browsing. For knotweed, data collected includes location (GPS location) and reproductive status.

1.6. Results

Seabeach amaranth

A total of (134) seabeach amaranth plants were found in several sweep counts on FIIS throughout July and August. However, poor notetaking in 2019 did not allow for individual survivorship, growth and reproduction to be confidently tracked throughout the growing season. Therefore, only initial locations, measurements and observations during the survey windows will be reported.

Sites from the LICWS were recognized and reported as such for seabeach amaranth: Fire Island Lighthouse (41 plants), Fire Island Villages (36 plants), Fire Island Sunken Forest (33 plants), Fire Island Pines (19 plants) and the Fire Island Wilderness (5 plants). Both federal and non-federal tracts of land were surveyed in 2019.

An enclosure was constructed around 22 out of 134 (16 %) to protect them from browsing by white-tailed deer (*Odocoileus virginianus*). Early season storms prevented the enclosing of additional plants. A range of seabeach amaranth plant sizes were observed; the largest was 53.5 cm in diameter at the widest point and the smallest was 1 cm. This resulted in an average size of approximately 11 cm. Unfortunately no plants were reproductive (flowering/fruiting) when first observed in July. All seabeach amaranth data is in Appendix C.

Seabeach knotweed

Survey windows were conducted concurrently for seabeach amaranth and seabeach knotweed. A total of 45 knotweed plants were counted and marked throughout FIIS (Figure 4). Sites that contained seabeach knotweed included Fire Island Lighthouse (30 plants), Fire Island Villages (3 plants), Fire Island Sunken Forest (1 plant), Fire Island Pines (1 plant) and Fire Island Wilderness (10 plants). Both federal and non-federal tracts of land were surveyed in 2019. 44 out of the 45 plants were reproductive (flowering). All seabeach knotweed data is in Appendix C.

Asiatic Sand Sedge

1.7. Methods

Asiatic sand sedge is a perennial sedge that is native to coastal areas of northeastern Asia. It grows on primary dunes and on upper parts of beach wash flats that have recently been disturbed by ocean storms. Asiatic sand sedge thrives in the same habitat as piping plovers and seabeach amaranth. It can outcompete native species and spread rapidly throughout the island. Due to its potential impact on local species, monitoring and treatment of the species has been incorporated into the T&ES Monitoring Program.

Monitoring for Asiatic sand sedge occurs during the two survey windows for seabeach amaranth and seabeach knotweed (7/10 – 7/21 and 8/7 – 8/18). When found, the sand sedge was marked with a pin flag for future removal and GPS points of its location are taken. To remove the plants, they were carefully dug out by hand and shovel to ensure that none of the plant – particularly the stem - was left

behind. Plants were put in black garbage bags, tied, and placed in dumpsters for landfills. This disposal plan was recommended by the FIIS Park Biologist and it will be compared to previous removals since 2013, using a combination of chemical and mechanical removal treatments.

1.8. Results

A total of 86 Asiatic sand sedge plants were found during the second survey window (8/6 - 8/18). Sites from the LICWS were recognized and reported as such for Asiatic sand sedge: Fire Island Lighthouse (40 plants), Fire Island Villages (3 plants), Fire Island Sunken Forest (0 plants), Fire Island Pines (2 plants) and Fire Island Wilderness (40 plants; 14/40 were east of the Old Inlet breach).

Sedge removal began on August 16th, when all 40 plants were removed from Lighthouse beach. On August 21st all three sedges were removed from Robbins Rest, and on August 22nd the 2 plants were removed from Davis Park. Lastly, on August 29th 14 sedge plants were removed in Fire Island Wilderness, all east of the Old Inlet breach. The remaining 26 clumps of sedge were not removed west of the Old Inlet breach due to time constraints and the complexity of removal in such a concentrated patch.

Discussion

Disturbances

1. Failed piping plover nests

Several piping plover nests failed in 2019, with one storm in particular that overwashed and buried nests. There were 4 nests – all east of the Old Inlet breach - that failed due to a storm that brought heavy winds and high tides in mid-May (May 11th-12th). The failed nests included 1A, 3A, 4A, and 5A. All were declared ‘failed’ on May 14th because eggs were buried or overwashed from the storm. Unfortunately, only 2 of these pairs re-nested after losing their nests despite it being so early in the nesting season.

Nests 2A and 9A were abandoned due to reasons unknown on June 19th, although FIIS staff assumes predator pressure for 9A. A yolk was found near nest 20A while the adults attempted to incubate the three remaining eggs. Nest 20A failed on June 10th, but fortunately they re-nested and were then successful in fledging chicks.

Red foxes are considered one of the major predators of shorebirds (and their nests) on Fire Island. However, the threat of Red Fox to piping plovers in the 2019 season has drastically decreased as compared to previous seasons. Mange was observed east of the Old Inlet breach and throughout Smith Point County Park in the summer/fall/winter of 2015 and has greatly impacted the red fox population on the eastern side of the island. In more recent years, the disease spread to western sections of the

Seashore. It appears to have greatly decreased the population and less Red Fox (sightings and tracks/sign) were observed in 2018 and 2019.

2. Beach driving closures

FIIS staff follows USFWS (1996) guidelines for beach driving. For example, full-sized vehicles shall not be permitted on beaches where unfledged chicks are found, and that beach access points/dune crossings found within 1000 meters of a nest with chicks be closed to all traffic until those chicks are fledged (35 days after hatching for chicks near vehicle areas). The FIIS Wildlife Biologist continued the Plover Hotline (631-687-5030), first established in 2010, which was regularly updated with information on dune crossing/beach closures to vehicles. Adequate warning of closures (2-3 weeks) was given for established nests, when possible.

The following beach driving closures went into effect in 2019:

- The Kismet cut was closed, and drivers had to use the interior route from Kismet to Atlantique from June 21st through August 25th.
- The eastern Sailors Haven driving cut (Cherry Grove cut) was closed from June 24th through July 28th. Drivers could not access east of Sailors Haven.

Most beach drivers complied with the beach driving closures. However, there was a lack of compliance with Suffolk County Police Department (SCPD) vehicles and they were regularly observed driving full-sized vehicles in closed areas with plover chicks. NRM staff began keeping a vehicle log where they noted date, time, vehicle type, license plate information, and the exact closed area (beach or driving cut) the vehicle was driving through. This information was presented at a FIIS interdivisional meeting at the end of the season, and it was decided there was a need to meet with SCPD before the 2020 season to discuss issues and solutions to ensure the protection of piping plover chicks in 2020.

3. Plover mortalities

- *41L* – This bird belonged to the 26A brood, however it was discovered between 26A and 27A in Long Cove. After consulting with the Virginia Shorebird Program researchers, we suggest it was first killed by a larger animal (possibly a raptor) and then a Ghost Crab attempted to drag the remains in its burrow.



Figure 1: Plover 41L from 26A found in Ghost Crab burrow.



Figure 2: Plover 41L close up in the burrow.

- *Chick (LMP)* – Plover chick LMP was found on July 7th underneath the fencing of Lighthouse Beach. The body was found closer to 16A but the bird actually belonged to the 11A brood. It is believed that this bird was also predated due to the wound on its stomach.



Figure 3: Plover LMP found outside of Lighthouse beach.



Figure 4: LMP close up of stomach injury.

- *13A Adult and Unknown chick* – On June 3rd, our staff noticed adult and hatchling feather lining the fence near 13A. Since that date, there has only been one adult and two chicks seen. Our staff never found the remains of these birds but we speculate death due to predation.

Management of T&ES Data

Annual reports for T&ES are completed and all (since 2003) have been posted on the NPS Integrated Resource Management Applications (IRMA) Portal, which is accessible to the public at <https://irma.nps.gov/DataStore/>. In addition, FIIS staff is continuing to standardize and organize GIS

spatial data for T&ES from 1999-2018, which will also be posted to the NPS IRMA site and accessible to the public by November 2020. All data gathered for T&ES is inputted into Microsoft Excel spreadsheets, which are located on the network drive by year in the Natural Resource Management folder.

All GPS data from the 2019 season is stored on the NPS ArcGIS Online Portal (AGOL), under the group, "Fire Island Crew". The Park Biologist is currently working with the I&M network to better organize and standardize our GPS data for the new NPS AGOL system/database, which should be ready by April 2021.

WORKS CITED

Cairns, W. 1982. *Biology and Behavior of Breeding Piping Plovers*. Wilson Bulletin 94(4): 531-545.

National Park Service. December 2016. *Fire Island National Seashore General Management Plan Environmental Impact Statement*.

Neuman K.K., Page G.W., Stenzel L.E., Warriner J.C. & Warriner J.S. 2004. *Effect of mammalian predator management on snowy plover breeding success*. Waterbirds 27: 257-263

NPS Integrated Resource Management Applications Portal. 2017. National Park Service. Accessed on 10/24/18 at: <https://irma.nps.gov/DataStore/>

U.S. Fish and Wildlife Service. 1996. Piping Plover (*Charadrius melodus*), Atlantic Coast Population, Revised Recovery Plan. Technical/Agency Draft. Hadley, Massachusetts.

Appendix A: Tables and Figures

<u>Year</u>	<u>Breeding Pairs</u>	<u>Nest Attempts</u>	<u>Productive Pairs</u>	<u>Eggs Hatched</u>	<u>Hatchlings per Breeding Pair</u>	<u>Chicks Fledged</u>	<u>Chicks Fledged per Nest Attempt</u>	<u>Chicks Fledged per Pair</u>
1993	7	7	0	0	0	0	0	0
1994	3	4	0	0	0	0	0	0
1995	9	2	1	N/A ¹	N/A	2	1	0.2
1996	2	1	1	N/A	N/A	1	1	0.5
1997	1	1	0	0	0	0	0	0
1998	1	1	1	N/A	N/A	1	1	1
1999	3	2	2	N/A	N/A	5	2.5	1.7
2000	3	3	3	N/A	N/A	9	3	3
2001	4	4	4	N/A	N/A	11	2.8	2.8
2002	10	11	9	33	3.3	28	2.6	2.8
2003	20	22	15	64	3.2	35	1.6	1.8
2004	17	18	15	57	3.4	37	2.1	2.2
2005	17	20	14	54	3.2	40	2	2.4
2006	21	26	15	46	2.2	32	1.2	1.5
2007	25	35	11	45	1.8	18	0.5	0.7
2008	15	26	8	32	2.1	20	0.8	1.3
2009	19	24	9	53	2.8	13	0.5	0.7
2010	16	23	9	38	2.2	17	0.7	1.1
2011	14	16	10	38	2.7	21	1.3	1.9
2012	12	17	8	35	2.9	15	0.9	1.3
2013	11	13	3	35	3.2	7	0.5	0.6
2014	8	12	3	15	1.9	7	0.6	0.9
2015	3	5	2	6	2.0	5	1.0	1.7
2016	9	10	6	25	2.8	16	1.6	1.8
2017	11	14	7	37	3.4	17	1.2	1.5
2018	11	13	11	37	3.7	29	2.2	2.6
2019	28	32	23	83	2.9	54	1.6	1.9
Average	11	13	7	35	2.4	16	1.3	1.4

Table 1: Historic Productivity of Piping Plovers at FIIS

Nest	Area	Status	Date found	Exclosed?	# of eggs laid	Est/Actual hatch date	# of chicks	Fledge date (+25 days)
1A	Wilderness East	Failed – Overwashed	4/25	Yes	4	*		*
2A	Wilderness East	Failed – Abandoned	5/2	Yes	4	6/1		*
3A	Wilderness East	Failed – Overwashed	5/2	*	4	*		*
3B	Wilderness East	FLEDGED	5/19	Yes	1	6/19	1	7/14
4A	Wilderness East	Failed – Overwashed	5/7	Yes	4	*		*
5A	Wilderness East	Failed – Overwashed	5/7	No	4	*		*
5B	Wilderness East	Failed – Predated	5/31	No	4	*		*
5C	Wilderness East	FLEDGED	6/15	No	4	7/13	1	8/7
6A	Wilderness East	FLEDGED	5/11	Yes	4	6/9	4	7/4
7A	Wilderness West	FLEDGED	5/15	Yes	4	6/17	1	7/12
8A	Wilderness East	FLEDGED	5/19	Yes	4	6/17	1	7/12
9A	Wilderness East	Failed – Abandoned	5/19	Yes	4	6/15		*
10A	Wilderness East	FLEDGED	5/19	Yes	4	6/15	3	7/10
11A	Lighthouse	FLEDGED	5/22	Yes	4	6/23	3	7/18
12A	Lighthouse	FLEDGED	5/25	Yes	4	6/17	1	7/12
13A	Sailors Haven	FLEDGED	5/25	Yes	4	6/26	2	7/21
14A	Wilderness East	FLEDGED	5/26	Yes	4	6/23	3	7/18
15A	Wilderness East	FLEDGED	5/26	Yes	4	6/22	2	7/17
16A	Lighthouse	FLEDGED	5/27	Yes	4	6/19	1	7/14
17A	Wilderness West	FLEDGED	5/27	Yes	4	6/20	3	7/15
18A	Wilderness East	FLEDGED	5/29	Yes	4	6/26	3	7/21
19A	Wilderness West	FLEDGED	5/29	No	4	7/1	4	7/26
20A	Wilderness West	Failed - Unknown	6/4	No	3	7/1		*
20B	Wilderness West	FLEDGED	6/17	Yes	3	7/16	2	8/10
21A	Wilderness West	FLEDGED	6/5	Yes	4	7/3	3	7/28
22A	Wilderness West	FLEDGED	6/5	Yes	4	7/3	3	7/28
23A	Wilderness East	FLEDGED	6/5	Yes	4	7/6	3	7/31
24A	Wilderness West	FLEDGED	6/5	Yes	4	7/3	4	7/28
25A	Wilderness East	Hatched/Failed	6/15	Yes	4	7/12	0	8/6
26A	Wilderness West	FLEDGED	6/24	No	*	6/23	3	7/18
27A	Wilderness West	FLEDGED	6/24	No	4	7/10	2	8/4
28A	Lighthouse	FLEDGED	7/2	Yes	3	7/22	1	8/16

Table 2: FIIS 2019 Overall Piping Plover Productivity

NPS Nest ID	Site	Female	Male	Chick1	Chick2	Chick3	Chick4
1A	Wilderness East	UNKNOWN	UNKNOWN	-	-	-	-
2A	Wilderness East	GF(2AN)	GF(PC1)	-	-	-	-
3A	Wilderness East	UNKNOWN	UNKNOWN	-	-	-	-
4A	Wilderness East	UNKNOWN	UNKNOWN	-	-	-	-
5A	Wilderness East	UNKNOWN	UNKNOWN	-	-	-	-
6A	Wilderness East	GF(70E)	GF(LAT)	GF(288)	GF(257)	GF(055)	GF(407)
7A	Wilderness WEST	GF(7XH)	GF(322)	GF(C17)	GF(J95)	GF(619)	
8A	Wilderness East	GF(K8V)	GF(KY1)	GF(M21)	GF(1UL)	GF(36U)	GF(X52)
3B	Wilderness East	GF(6UP)	GF(PY3)	GF(64P)			
9A	Wilderness East	GF(JCY)	UNKNOWN	-	-	-	-
10A	Wilderness East	GF(YTV)	GF(1EL)	GF(6C3)	GF(2U3)	GF(1YN)	GF(0A6)
14A	Wilderness East	GF(A1Y)	GF(LMT)	GF(3Y5)	GF(XYJ)	GF(PJJ)	
15A	Wilderness East	GF(CU6)	GF(NYL)	GF(YM2)	GF(9TK)	GF(LKX)	GF(3MU)
17A	Wilderness WEST	GF(86M)	GF(VLP)	GF(575)	GF(M39)	GF(LH7)	
18A	Wilderness East	GF(389)	GF(4MN)	GF(TXK)	GF(2MV)	GF(7LK)	GF(217)
19A	Wilderness WEST	GF(EY1)	GF(50V)	GF(1YJ)	GF(XJK)	GF(237)	GF(9HM)
5B	Wilderness East	UNKNOWN	UNKNOWN	-	-	-	-
20A	Wilderness WEST	UNKNOWN	GF(962)	-	-	-	-
21A	Wilderness WEST	GF(L48)	GF(3UX)	GF(E61)	GF(9L8)	GF(2VK)	GF(A27)
22A	Wilderness WEST	GF(934)	GF(NJL)	GF(0TJ)	GF(TCX)	GF(8Y1)	GF(5YA)
23A	Wilderness East	GF(4CJ)	GF(0J1)	GF(X3E)	GF(N2P)	GF(01Y)	GF(0XU)
24A	Wilderness WEST	YALG	GF(N1T)	GF(28L)	GF(2J7)	GF(L9V)	GF(YL5)
25A	Wilderness East	GF(KAY)	GF(PAT)	GF(CH7)	GF(E5K)	GF(A9C)	
5C	Wilderness East	GF(NE5)	GF(PA6)	GF(LVM)	GF(ELU)	GF(JYK)	
20B	Wilderness WEST	GF(PVK)	GF(962)	GF(HN9)	GF(H10)		
11A	Lighthouse beach	GF(PAY)	GF(0N8)	GF(7V3)	GF(LUJ)	GF(LMP)	FLEDGED
12A	Lighthouse beach	GF(PP1)	GF(4YT)	GF(565)	GF(EE1)	-	
16A	Lighthouse beach	GF(51T)	GF(TJJ)	GF(4XK)	UNKNOWN	-	
25A	Lighthouse beach	GF(750)	GF(K7J)	GF(1XV)	-	-	

Table 3: Piping Plover Banding Information for 2019 from Virginia Tech Study. GF = Green Flag. Please refer to Virginia Tech's Annual Report 2019 for more information (when available can be found on NPS IRMA site).

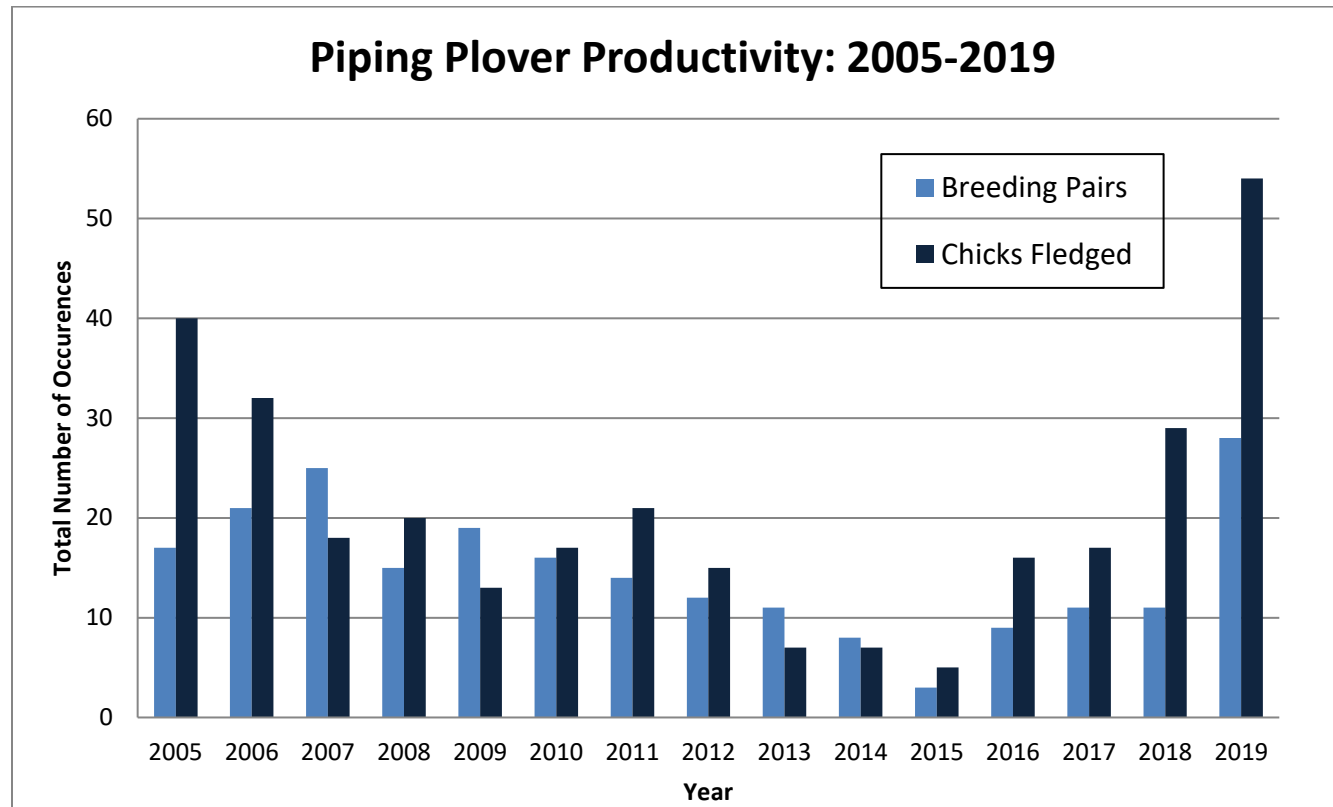


Figure 1: Piping Plover Breeding Pair Productivity (2005-2019). The number of piping plover breeding pairs and the number of chicks fledged at FIIS, 2005-2019

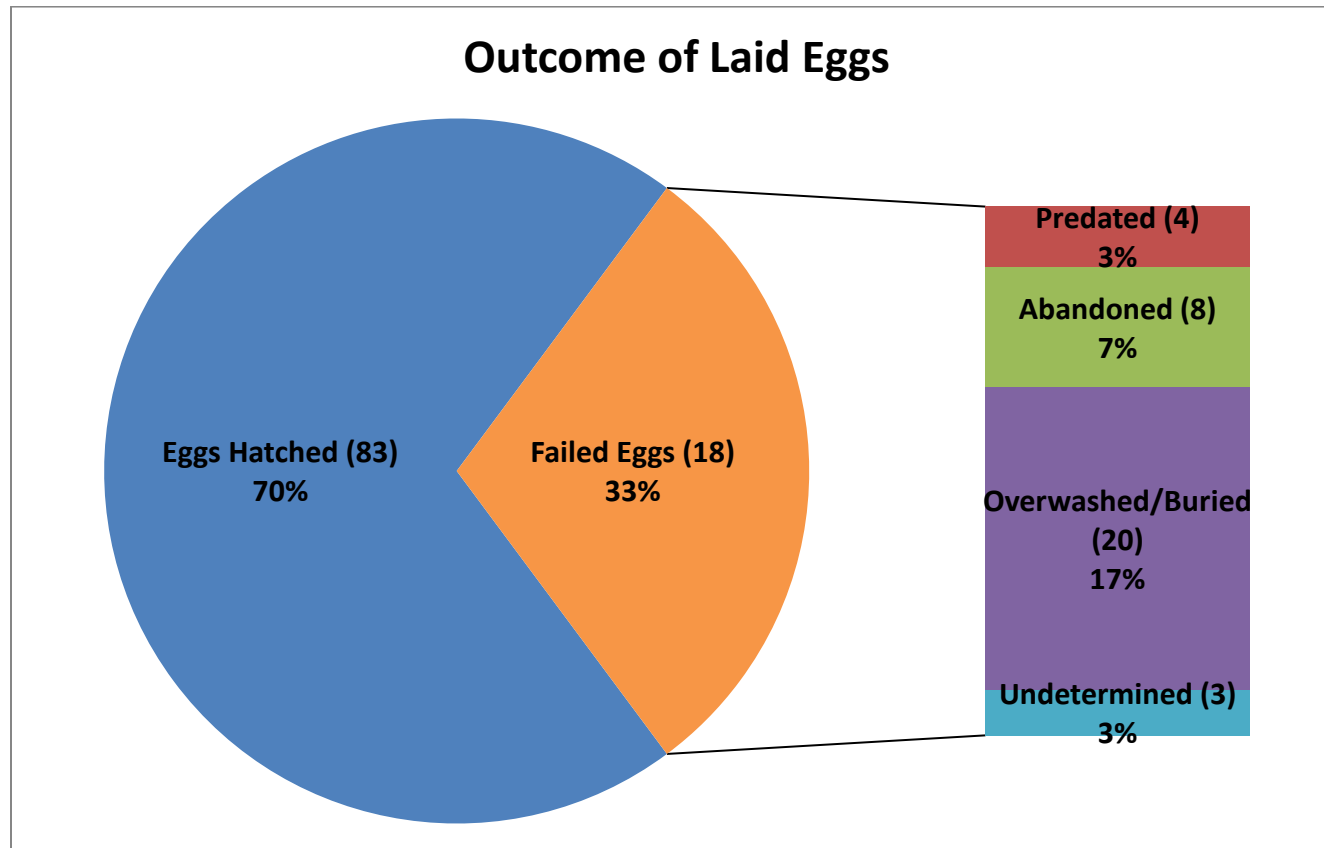


Figure 2: Status of Eggs Laid in 2019.

**The eggs from 26A are not included in the final numbers because the staff discovered the brood after all the chicks hatched.*

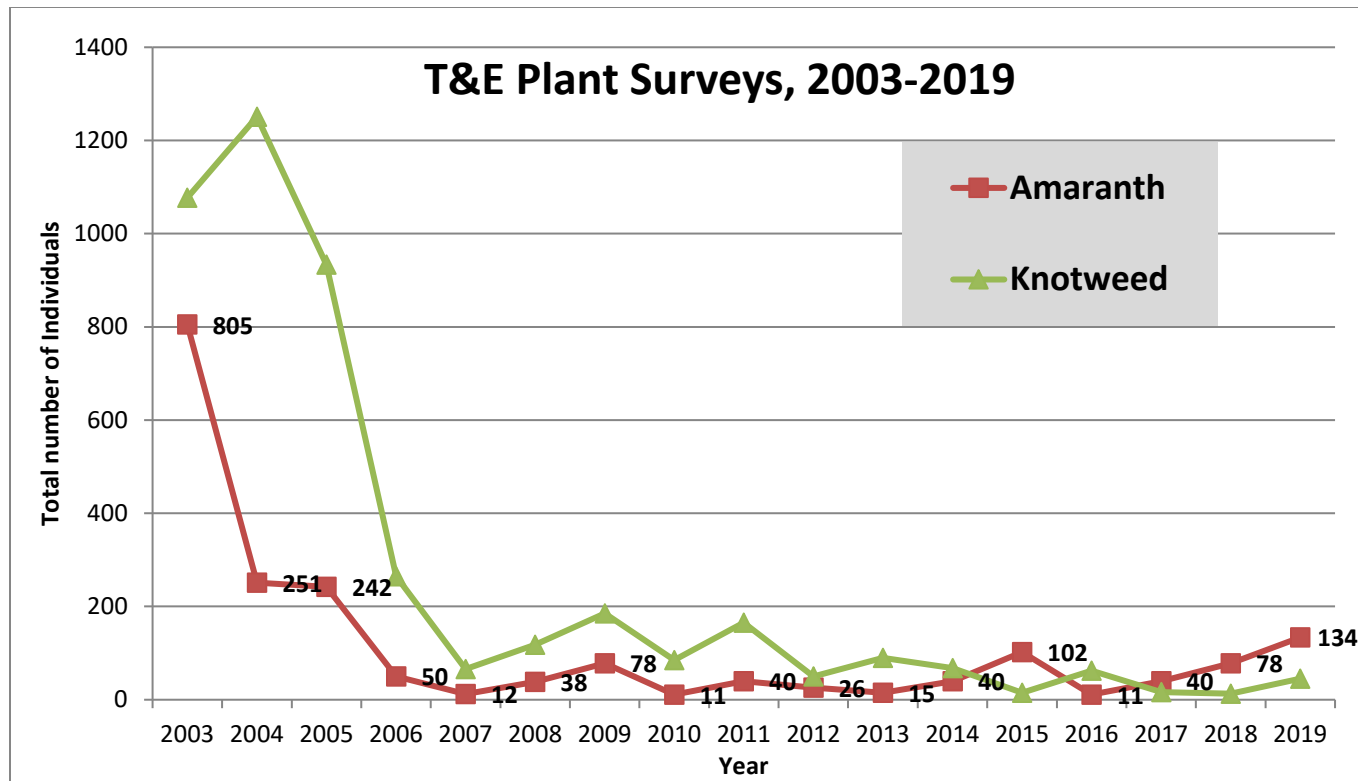


Figure 3: Chart displaying historical values for Seabeach Amaranth and Seabeach Knotweed on FIIS (2003-2019).
The x-axis represents the year and the y-axis is the total number of plants counted. Values are only shown for amaranth labels.

Gull and Wading Bird Survey (May 17 – May 31)								
Site / Species	HEGU	GBBG	LAGU	GREG	BCNH	LIBH	GLIB	DCCO
East Fire Island	No Survey							
Hospital Island	-	-	-	-	-	-	-	
John Boyle Island	94	77	-	18	15	1	60	-
Fire Island Wilderness, Long Cove	7	-	-	-	-	-	-	12
Pelican Island	-	-	-	-	-	-	-	-
Ridge Island	440	100	-	-	-	-	-	88
Sexton Island	28	8	320	-	-	-	-	26
Islip Spoil Island	350	150	-	1	-	-	-	-
Fire Island Wilderness, Watch Hill	-	-	-	-	-	-	-	-
West Fire Island	-	-	-	-	-	-	-	-

Tern Survey (June)	1st	2 nd	1st	2 nd	1st	2 nd
Site / Species	COTE		LETE		BLSK	
East Fire Island	-	280	-	-	-	-
Fire Island Pines	-	-	-	-	-	-
Fire Island Sunken Forest	-	-	-	-	-	-
Fire Island Villages	-	-	-	-	-	-
Hospital Island	-	-	-	-	-	-
John Boyle Island	-	-	-	-	-	-
Fire Island Lighthouse	-	-	-	8	-	-
Fire Island Wilderness, Long Cove	NS	4	-	-	-	-
Fire Island Wilderness*	-	-	165	150	-	-
Pelican Island	-	-	-	-	-	-
Ridge Island	470	400	-	-	-	-
Sexton Island	-	-	-	-	-	-
Islip Spoil Island	-	-	-	-	-	-
Fire Island Wilderness, Watch Hill	NS	-	NS	-	NS	-
West Fire Island	-	-	-	-	-	-

Table 4: NYSDEC's Long Island Colonial Waterbird Surveys in 2019. Sites are listed. Gull and Wading Bird surveys include only bay islands and bayside area sites of Fire Island. Tern and black skimmer surveys are conducted twice in June, Window 1: June 1-15 and Window 2: June 16-30. Species codes: COTE = Common Tern, LETE= Least Tern, BLSK = Black Skimmer, HEGU = Herring Gull, GBBG = Great Black-back Gull, LAGU = Laughing Gull, GREG = Great Egret, LIBH = Little Blue Heron, DCCO = Double-crested Cormorant, and GLIB = Glossy Ibis (* = Davis Park included in Wilderness survey)

Appendix B: Maps

Map 1: Map of Fire Island National Seashore

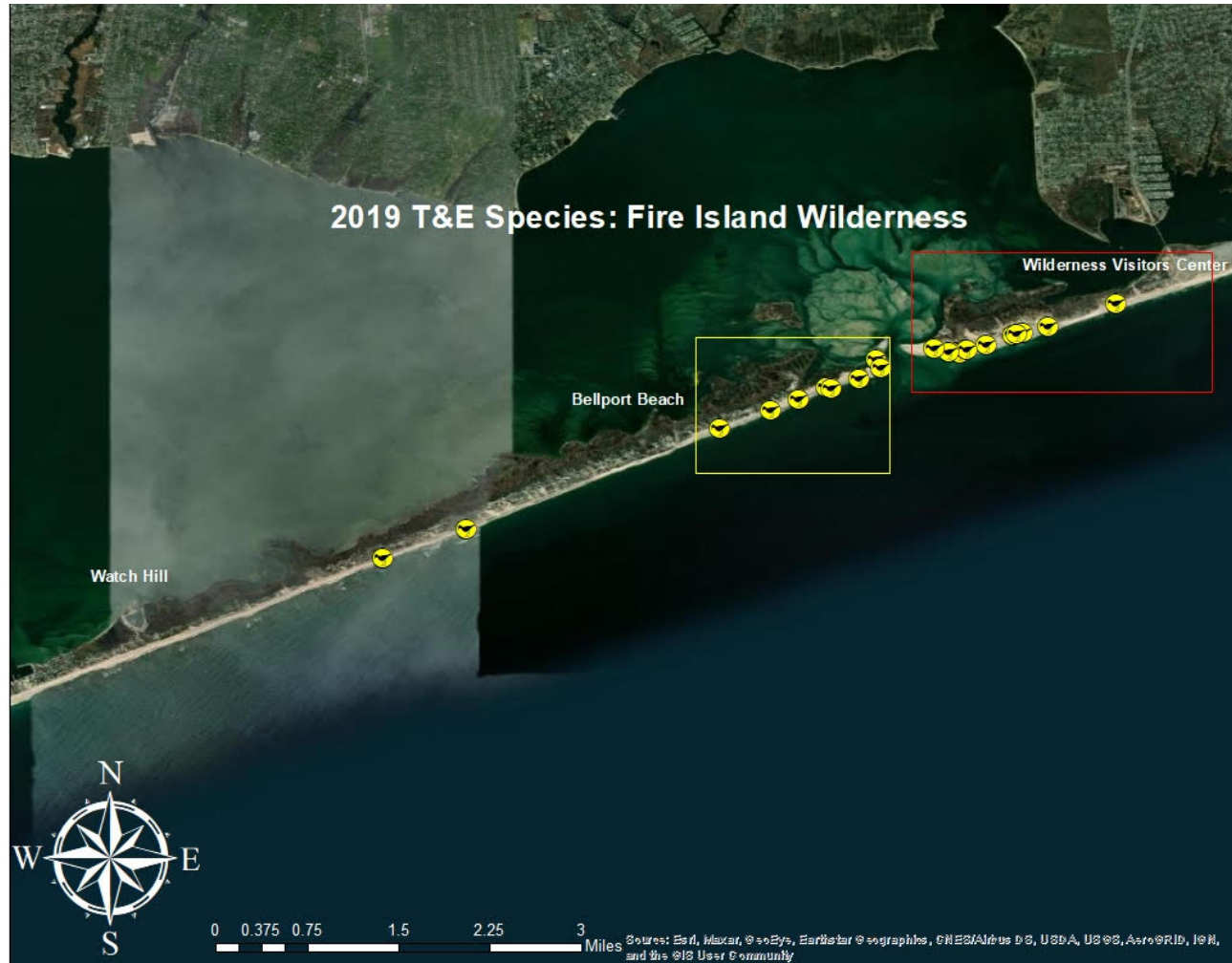




Map 2: Fire Island Lighthouse locations of Piping Plovers in 2019. Maps are organized by Long Island Colonial Waterbird Survey areas.



Map 3: Fire Island Sunken Forest locations of Piping Plovers in 2019. Maps are organized by Long Island Colonial Waterbird Survey areas.



Map 4: Fire Island Wilderness locations of Piping Plovers in 2019. Maps are organized by Long Island Colonial Waterbird Survey areas.



Map 5: Fire Island Wilderness locations of Piping Plovers in 2019: Close-up of West End. Maps are organized by Long Island Colonial Waterbird Survey areas.



Map 6: Fire Island Wilderness locations of Piping Plovers in 2019: Close-up of East End. Maps are organized by Long Island Colonial Waterbird Survey areas.

Appendix C: GPS locations

Piping Plover Nests

Nest	Species	SiteName	LocationDescription	UTMx	UTMy	Fate	eggs_laid	Exclosed	Date_Excl	Date_Hatch	eggs_hatch	chicks_fld	Date_fail
1A-19	Piping Plover	Fire Island Wilderness	Wilderness East (Section 9)	678645	4510573	Failed	4	Yes	5/1/2019	.	0	0	5/14/2019
2A-19	Piping Plover	Fire Island Wilderness	Wilderness East (Section 9)	678555	4510544	Failed	4	Yes	5/6/2019	.	0	0	6/19/2019
3A-19	Piping Plover	Fire Island Wilderness	Wilderness East (Section 8)	678288	4510405	Failed	4	Yes	5/6/2019	.	0	0	5/14/2019
3B-19	Piping Plover	Fire Island Wilderness	Wilderness East (Section 8)	678318	4510425	Fledged	1	Yes	5/20/2019	6/19/19	1	1	.
4A-19	Piping Plover	Fire Island Wilderness	Wilderness East (Section 8)	678081	4510331	Failed	4	Yes	5/8/2019	.	0	0	5/14/2019
5A-19	Piping Plover	Fire Island Wilderness	Wilderness East (Section 8)	677999	4510307	Failed	4	No	.	.	0	0	5/14/2019
5B-19	Piping Plover	Fire Island Wilderness	Wilderness East (Section 8)	678067	4510338	Failed	4	No	.	.	0	0	6/5/2019
5C-19	Piping Plover	Fire Island Wilderness	Wilderness East (Section 8)	678022	4510283	Fledged	4	No	6/26/2019	7/13/19	3	1	.
6A-19	Piping Plover	Fire Island Wilderness	Wilderness East (Section 10)	679576	4510989	Fledged	4	Yes	5/14/2019	6/9/19	4	4	.
7A-19	Piping Plover	Fire Island Wilderness	Wilderness West (Section 7)	676693	4509814	Fledged	4	Yes	5/23/2019	6/17/19	4	1	.
8A-19	Piping Plover	Fire Island Wilderness	Wilderness East (Section 9)	678675	4510599	Fledged	4	Yes	5/22/2019	6/7/19	4	1	.
9A-19	Piping Plover	Fire Island Wilderness	Wilderness East (Section 8)	678097	4510342	Failed	4	Yes	5/20/2019	6/15/19	0	0	6/17/2019
10A-19	Piping Plover	Fire Island Wilderness	Wilderness East (Section 9)	678733	4510611	Fledged	4	Yes	5/20/2019	6/15/19	4	3	.
11A-19	Piping Plover	Lighthouse Beach	~225 meters west of Kismet cut	651504	4499443	Fledged	4	Yes	5/29/2019	6/23/19	4	3	.
12A-19	Piping Plover	Lighthouse Beach	~1,630 meters west of Kismet cut	650440	4499167	Fledged	4	Yes	5/29/2019	6/17/19	3	1	.
13A-19	Piping Plover	Sailors Haven	~135 meters southwest of CG cut	660989	4502423	Fledged	4	Yes	5/29/2019	6/26/19	4	2	.
14A-19	Piping Plover	Fire Island Wilderness	Wilderness East (Section 9)	678905	4510655	Fledged	4	Yes	5/31/2019	6/23/19	4	3	.
15A-19	Piping Plover	Fire Island Wilderness	Wilderness East (Section 8)	678093	4510330	Fledged	4	Yes	5/31/2019	6/22/19	4	2	.
16A-19	Piping Plover	Lighthouse Beach	~1,180 meters west of Kismet cut	650801	4499235	Fledged	4	Yes	5/29/2019	6/19/19	3	1	.
17A-19	Piping Plover	Fire Island Wilderness	Wilderness West (Section 7)	675639	4509236	Fledged	4	Yes	5/31/2019	6/20/19	3	3	.
18A-19	Piping Plover	Fire Island Wilderness	Wilderness East (Section 8)	677909	4510293	Fledged	4	Yes	5/31/2019	6/26/19	4	3	.
19A-19	Piping Plover	Fire Island Wilderness	Wilderness West (Section 7)	676745	4509798	Fledged	4	No	.	7/1/19	4	4	.
20A-19	Piping Plover	Fire Island Wilderness	Wilderness West (Section 7)	677184	4510181	Failed	3	No	.	.	0	0	6/10/2019
20B-19	Piping Plover	Fire Island Wilderness	Wilderness West (Section 7)	677238	4510082	Fledged	3	Yes	6/19/2019	7/16/19	2	2	.
21A-19	Piping Plover	Fire Island Wilderness	Wilderness West (Section 6)	676145	4509497	Fledged	4	Yes	6/12/2019	7/3/19	4	3	.
22A-19	Piping Plover	Fire Island Wilderness	Wilderness West (Section 6)	676414	4509645	Fledged	4	Yes	6/9/2019	7/3/19	4	3	.
23A-19	Piping Plover	Fire Island Wilderness	Wilderness East (Section 7)	677765	4510342	Fledged	4	Yes	6/12/2019	7/6/19	4	3	.
24A-19	Piping Plover	Fire Island Wilderness	Wilderness West (Section 7)	677016	4509934	Fledged	4	Yes	6/26/2019	7/3/19	4	4	.
25A-19	Piping Plover	Fire Island Wilderness	Wilderness East (Section 9)	678585	4510552	Hatched/Failed	4	Yes	6/12/2019	7/12/19	4	0	8/1/2019
26A-19	Piping Plover	Fire Island Wilderness	Wilderness West (Section 3)	N/A	N/A	Fledged	.	No	.	6/23/19	2	3	.
27A-19	Piping Plover	Fire Island Wilderness	Wilderness West (Section 3)	672289	4507440	Fledged	4	No	.	7/10/19	4	2	.
28A-19	Piping Plover	Lighthouse Beach	~500 meters west of Kismet cut	651300	4499382	Fledged	3	Yes	7/9/2019	7/22/19	2	1	.

Seabeach Amaranth Individuals 2019

Plant_ID	Plants	Date_found	Site_name	Size_cm	Rep_status	UTMs (x)	UTMs (y)
LH_01	1	7/11/2019	Fire Island Lighthouse	17.0	NF	651644	4499482
LH_02	1	7/11/2019	Fire Island Lighthouse	7.0	NF	651636	4499478
LH_03	1	7/11/2019	Fire Island Lighthouse	6.5	NF	651629	4499472
LH_04	1	7/11/2019	Fire Island Lighthouse	15.0	NF	651613	4499470
LH_05	1	7/11/2019	Fire Island Lighthouse	13.5	NF	651606	4499470
LH_06	1	7/11/2019	Fire Island Lighthouse	4.0	NF	651606	4499470
LH_07	1	7/11/2019	Fire Island Lighthouse	9.5	NF	651530	4499443
LH_08	1	7/11/2019	Fire Island Lighthouse	6.5	NF	651609	4499471
LH_09	1	7/11/2019	Fire Island Lighthouse	5.0	NF	651602	4499463
LH_10	1	7/11/2019	Fire Island Lighthouse	8.5	NF	651499	4499443
LH_11	1	7/11/2019	Fire Island Lighthouse	2.0	NF	651498	4499443
LH_12	1	7/11/2019	Fire Island Lighthouse	8.0	NF	651498	4499443
LH_13	1	7/11/2019	Fire Island Lighthouse	9.0	NF	651498	4499441
LH_14	1	7/11/2019	Fire Island Lighthouse	7.0	NF	651490	4499438
LH_15	1	7/11/2019	Fire Island Lighthouse	7.5	NF	651490	4499438
LH_16	1	7/11/2019	Fire Island Lighthouse	2.5	NF	651490	4499438
LH_17	1	7/11/2019	Fire Island Lighthouse	6.5	NF	651488	4499436
LH_18	1	7/11/2019	Fire Island Lighthouse	6.0	NF	651216	4499344
LH_19	1	7/11/2019	Fire Island Lighthouse	9.0	NF	651161	4499341
LH_20	1	7/11/2019	Fire Island Lighthouse	8.0	NF	651158	4499340
LH_21	1	7/11/2019	Fire Island Lighthouse	5.0	NF	651095	4499297
LH_22	1	7/11/2019	Fire Island Lighthouse	11.0	NF	651071	4499288
LH_23	1	7/11/2019	Fire Island Lighthouse	5.0	NF	651069	4499287
LH_24	1	7/11/2019	Fire Island Lighthouse	3.5	NF	650433	4499115
LH_25	1	7/11/2019	Fire Island Lighthouse	4.0	NF	650421	4499105
LH_26	1	7/11/2019	Fire Island Lighthouse	6.0	NF	650369	4499093
LH_27	1	7/11/2019	Fire Island Lighthouse	6.0	NF	650343	4499088

LH_28	1	7/14/2019	Fire Island Lighthouse	3.0	NF	651658	4499481
LH_29	1	7/14/2019	Fire Island Lighthouse	4.0	NF	651658	4499483
LH_30	1	8/7/2019	Fire Island Lighthouse	6.0	NF	*	*
LH_31	1	8/7/2019	Fire Island Lighthouse	5.0	NF	650356	4499087
LH_32	1	8/7/2019	Fire Island Lighthouse	27.0	NF	*	*
LH_33	1	8/7/2019	Fire Island Lighthouse	9.0	NF	650400	4499095
LH_34	1	8/7/2019	Fire Island Lighthouse	3.8	NF	650843	4499244
LH_35	1	8/7/2019	Fire Island Lighthouse	3.5	NF	651160	4499333
LH_36	1	8/7/2019	Fire Island Lighthouse	5.5	NF	651317	4499375
LH_37	1	8/7/2019	Fire Island Lighthouse	6.0	NF	651448	4499406
LH_38	1	8/7/2019	Fire Island Lighthouse	10.0	NF	651574	4499459
LH_39	1	8/7/2019	Fire Island Lighthouse	18.5	NF	651622	4499470
LH_40	1	8/16/2019	Fire Island Lighthouse	12.5	NF	651624	4499484
LH_41	1	8/16/2019	Fire Island Lighthouse	10.0	NF	651624	4499484
FIP_01	1	7/22/2019	Fire Island Pines	15.5	NF	664372	4503598
FIP_02	1	7/22/2019	Fire Island Pines	6.5	NF	664348	4503593
FIP_03	1	7/22/2019	Fire Island Pines	6.0	NF	663851	4503417
FIP_04	1	7/22/2019	Fire Island Pines	9.0	NF	663852	4503417
FIP_05	1	7/22/2019	Fire Island Pines	3.0	NF	664460	4503634
FIP_06	1	7/22/2019	Fire Island Pines	5.0	NF	664462	4503637
EFIP_01	1	7/22/2019	Fire Island Pines	15.0	NF	664477	4503647
EFIP_02	1	7/22/2019	Fire Island Pines	14.0	NF	664479	4503649
EFIP_03	1	7/22/2019	Fire Island Pines	18.0	NF	664480	4503648
EFIP_04	1	7/22/2019	Fire Island Pines	9.0	NF	664526	4503655
EFIP_05	1	7/22/2019	Fire Island Pines	6.0	NF	664571	4503677
EFIP_06	1	7/22/2019	Fire Island Pines	3.0	NF	664581	4503678
EFIP_07	1	7/22/2019	Fire Island Pines	16.0	NF	664582	4503679
EFIP_08	1	7/22/2019	Fire Island Pines	11.0	NF	664834	4503785
EFIP_09	1	7/22/2019	Fire Island Pines	11.0	NF	665439	4504070
EFIP_10	1	7/22/2019	Fire Island Pines	11.0	NF	666031	4504321

WI_01	1	7/22/2019	Fire Island Pines	16.0	NF	667075	4504765
WI_02	1	7/22/2019	Fire Island Pines	24.0	NF	667076	4504767
WI_03	1	7/22/2019	Fire Island Pines	19.0	NF	667717	4505062
SH_01	1	7/11/2019	Fire Island Sunken Forest	12.0	NF	659466	4501973
SH_02	1	7/11/2019	Fire Island Sunken Forest	13.0	NF	659743	4502059
SH_03	1	7/11/2019	Fire Island Sunken Forest	7.5	NF	659792	4502082
SH_04	1	7/11/2019	Fire Island Sunken Forest	4.5	NF	659803	4502085
SH_05	1	7/11/2019	Fire Island Sunken Forest	6.5	NF	659809	4502085
SH_06	1	7/11/2019	Fire Island Sunken Forest	12.5	NF	659803	4502085
SH_07	1	7/11/2019	Fire Island Sunken Forest	9.0	NF	659809	4502085
SH_08	1	7/11/2019	Fire Island Sunken Forest	*	NF	660338	4502256
SH_09	1	7/11/2019	Fire Island Sunken Forest	*	NF	660338	4502254
SH_10	1	7/16/2019	Fire Island Sunken Forest	26.5	NF	659626	4502022
SH_11	1	7/16/2019	Fire Island Sunken Forest	3.0	NF	659805	4502084
SH_12	1	7/16/2019	Fire Island Sunken Forest	2.5	NF	659799	4502087
SH_13	1	7/16/2019	Fire Island Sunken Forest	2.0	NF	659798	4502086
SH_14	1	7/16/2019	Fire Island Sunken Forest	5.5	NF	659800	4502086
SH_15	1	7/16/2019	Fire Island Sunken Forest	1.0	NF	660337	4502255
SH_16	1	7/16/2019	Fire Island Sunken Forest	6.0	NF	660342	4502261
SH_17	1	7/16/2019	Fire Island Sunken Forest	2.5	NF	660335	4502256
SH_18	1	7/16/2019	Fire Island Sunken Forest	1.5	NF	660334	4502256
SH_19	3	7/16/2019	Fire Island Sunken Forest	4.0	NF	660334	4502256
SH_20	7	7/16/2019	Fire Island Sunken Forest	7.0	NF	660335	4502257
SH_21	1	7/16/2019	Fire Island Sunken Forest	1.5	NF	660336	4502255
SH_22	1	7/16/2019	Fire Island Sunken Forest	2.0	NF	660335	4502255
SH_23	1	7/16/2019	Fire Island Sunken Forest	1.0	NF	660336	4502255
SH_24	1	7/16/2019	Fire Island Sunken Forest	5.0	NF	660331	4502257
SH_25	1	7/17/2019	Fire Island Sunken Forest	16.0	NF	660910	4502409
SH_26	1	7/17/2019	Fire Island Sunken Forest	3.5	NF	660932	4502416
SH_27	1	7/17/2019	Fire Island Sunken Forest	6.5	NF	660938	4502421

SH_28	1	8/14/2019	Fire Island Sunken Forest	5.5	NF	659435	4501970
SH_29	1	8/14/2019	Fire Island Sunken Forest	16.5	NF	659969	4502126
SH_30	1	8/14/2019	Fire Island Sunken Forest	1.5	NF	660333	4502259
SH_31	1	8/14/2019	Fire Island Sunken Forest	5.0	NF	660561	4502323
SH_33	1	8/14/2019	Fire Island Sunken Forest	30.5	NF	660695	4502348
FIV_01	1	7/11/2019	Fire Island Villages	19.0	NF	655417	4500718
FIV_02	1	7/11/2019	Fire Island Villages	21.0	NF	655417	4500718
FIV_03	1	7/11/2019	Fire Island Villages	14.5	NF	655428	4500721
POW_1	1	7/16/2019	Fire Island Villages	47.0	NF	657893	4501470
POW_2	1	7/16/2019	Fire Island Villages	39.5	NF	657969	4501497
POW_3	1	7/16/2019	Fire Island Villages	9.0	NF	658098	4501546
POW_4	1	7/16/2019	Fire Island Villages	25.0	NF	658095	4501547
POW_5	1	7/16/2019	Fire Island Villages	14.0	NF	658109	4501550
POW_6	1	7/16/2019	Fire Island Villages	9.0	NF	658162	4501568
POW_7	1	7/16/2019	Fire Island Villages	13.0	NF	658167	4501571
POW_8	1	7/16/2019	Fire Island Villages	21.5	NF	658170	4501570
POW_9	1	7/16/2019	Fire Island Villages	22.5	NF	658170	4501570
POW_10	1	7/16/2019	Fire Island Villages	25.0	NF	658174	4501572
POW_11	1	7/16/2019	Fire Island Villages	8.0	NF	658181	4501576
POW_12	1	7/16/2019	Fire Island Villages	4.0	NF	658181	4501577
POW_13	1	7/16/2019	Fire Island Villages	4.0	NF	658181	4501577
POW_14	1	7/16/2019	Fire Island Villages	14.0	NF	658182	4501576
POW_15	1	7/16/2019	Fire Island Villages	9.5	NF	658183	4501576
POW_16	1	7/16/2019	Fire Island Villages	17.0	NF	658184	4501577
POW_17	1	7/16/2019	Fire Island Villages	53.0	NF	658189	4501572
POW_18	1	7/16/2019	Fire Island Villages	5.0	NF	658183	4501579
POW_19	1	7/16/2019	Fire Island Villages	3.5	NF	658187	4501581
POW_20	1	7/16/2019	Fire Island Villages	5.0	NF	658186	4501582
POW_21	1	7/16/2019	Fire Island Villages	53.5	NF	658186	4501581
POW_22	1	7/16/2019	Fire Island Villages	24.0	NF	658191	4501583

POW_23	1	7/16/2019	Fire Island Villages	7.0	NF	658195	4501582
POW_24	1	7/16/2019	Fire Island Villages	26.5	NF	*	*
FH_01	1	7/17/2019	Fire Island Villages	3.5	NF	653198	4500023
FH_02	1	8/9/2019	Fire Island Villages	4.0	NF	*	*
ATL_01	1	8/12/2019	Fire Island Villages	7.5	NF	654685	4500512
OB_01	1	8/12/2019	Fire Island Villages	5.0	NF	*	*
OBP_01	1	8/12/2019	Fire Island Villages	20.0	NF	*	*
RR_01	1	8/12/2019	Fire Island Villages	13.0	NF	654936	4500585
RR_02	1	8/12/2019	Fire Island Villages	13.5	NF	654951	4500593
RR_03	1	8/12/2019	Fire Island Villages	3.5	NF	654990	4500611
RR_04	1	8/12/2019	Fire Island Villages	4.0	NF	655084	4500654
FIW_1	1	7/15/2019	Fire Island Wilderness	8.0	NF	659466	4501973
FIW_2	1	7/15/2019	Fire Island Wilderness	7.0	*	659743	4502059
FIW_3	1	7/15/2019	Fire Island Wilderness	9.0	NF	659792	4502082
FIW_4	1	8/15/2019	Fire Island Wilderness	10.5	NF	675526	4509162
FIW_5	1	8/15/2019	Fire Island Wilderness	12.5	NF	675607	4509203

Seabeach Knotweed Individuals 2019

Knotweed ID (FID)	# of plants	Date	Site Name (LICWS)	Reproductive?	UTMs (x)	UTMs (y)
LH_01	1	8/7/2019	Fire Island Lighthouse	Y	650219	4499052
LH_02	1	8/7/2019	Fire Island Lighthouse	Y	650444	4499123
LH_03	1	8/7/2019	Fire Island Lighthouse	Y	650804	4499235
LH_04	1	8/7/2019	Fire Island Lighthouse	Y	650807	4499232
LH_05	1	8/7/2019	Fire Island Lighthouse	Y	650808	4499233
LH_06	1	8/7/2019	Fire Island Lighthouse	Y	650809	4499233
LH_07	1	8/7/2019	Fire Island Lighthouse	Y	650812	4499228
LH_08	1	8/7/2019	Fire Island Lighthouse	Y	650816	4499231
LH_09	1	8/7/2019	Fire Island Lighthouse	Y	650816	4499229
LH_10	1	8/7/2019	Fire Island Lighthouse	Y	650842	4499243
LH_11	1	8/7/2019	Fire Island Lighthouse	Y	650844	4499244
LH_12	1	8/7/2019	Fire Island Lighthouse	Y	650852	4499245
LH_13	1	8/7/2019	Fire Island Lighthouse	Y	650851	4499247
LH_14	1	8/7/2019	Fire Island Lighthouse	Y	650854	4499248
LH_15	1	8/7/2019	Fire Island Lighthouse	Y	650855	4499249
LH_16	1	8/7/2019	Fire Island Lighthouse	Y	650856	4499250
LH_17	1	8/7/2019	Fire Island Lighthouse	Y	650890	4499260
LH_18	1	8/7/2019	Fire Island Lighthouse	Y	650894	4499261
LH_19	1	8/7/2019	Fire Island Lighthouse	N	650892	4499260
LH_20	1	8/7/2019	Fire Island Lighthouse	Y	650995	4499290
LH_21	1	8/7/2019	Fire Island Lighthouse	Y	650894	4499261
LH_22	1	8/7/2019	Fire Island Lighthouse	Y	651156	4499329
LH_23	1	8/7/2019	Fire Island Lighthouse	Y	651163	4499342
LH_24	1	8/7/2019	Fire Island Lighthouse	Y	651278	4499366
LH_25	1	8/7/2019	Fire Island Lighthouse	Y	651314	4499371
LH_26	1	8/7/2019	Fire Island Lighthouse	Y	651316	4499374
LH_27	1	8/7/2019	Fire Island Lighthouse	Y	651424	4499411
LH_28	1	8/7/2019	Fire Island Lighthouse	Y	651432	4499421
LH_29	1	8/16/2019	Fire Island Lighthouse	Y	650890	4499260
LH_30	1	8/16/2019	Fire Island Lighthouse	Y	650889	4499260
EW_01	1	8/9/2019	Fire Island Wilderness	Y	679892	4511089
EW_02	1	8/9/2019	Fire Island Wilderness	Y	679847	4511076
EW_03	1	8/9/2019	Fire Island Wilderness	Y	679597	4510994
EW_04	1	8/9/2019	Fire Island Wilderness	Y	679529	4510965
EW_05	1	8/9/2019	Fire Island Wilderness	Y	678916	4510674
EW_06	1	8/9/2019	Fire Island Wilderness	Y	678633	4510546
EW_07	1	8/9/2019	Fire Island Wilderness	Y	678519	4510546
EW_08	1	8/9/2019	Fire Island Wilderness	Y	678521	4510507
EW_09	1	8/9/2019	Fire Island Wilderness	Y	678050	4510318
EW_10	1	8/9/2019	Fire Island Wilderness	Y	677864	4510302
CG_01	1	8/14/2019	Fire Island Pines	Y	661304	4502531
SH_01	1	8/14/2019	Fire Island Sunken Forest	Y	660561	4502322
RR_01	1	8/12/2019	Fire Island Villages	Y	655108	4500652
RR_02	1	8/12/2019	Fire Island Villages	Y	655159	4500650
RR_03	1	8/12/2019	Fire Island Villages	Y	655110	4500658