

**SUMMARY OF THE 2005 THREATENED AND ENDANGERED
SPECIES MANAGEMENT PROGRAM AT BREEZY POINT
DISTRICT, GATEWAY NRA, NY**

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Abstract: Fifteen pairs of breeding piping plover (Charadrius melodus) were monitored from mid-March through the end of August on three sections of beach at Gateway National Recreation Area's Breezy Point District with additional observations of migrating plovers through September 16, 2005. The piping plovers began laying eggs on or before April 27, and continued until June 17. Hatching dates ranged from May 28 through July 12. Hatching success (number of eggs hatched/number of eggs laid) for all areas was 33%. Eggs in ten out of twenty-two nests hatched, while nine were depredated and three were abandoned. Fledging dates ranged from June 27 to August 8. Fledging success was 48%. Total productivity for the Breezy Point Site was 0.8, with 12 chicks fledging from 15 pairs of plovers.

The number of breeding common terns (Sterna hirundo) decreased to the lowest number since 1990. Black skimmers (Rynchops niger) were not present for the third year in a row. Least terns (Sterna antillarum) did not nest on Gateway beaches for the second time since 1982.

Seabeach amaranth (Amaranthus pumilus) numbers continue to increase with a total of 1488 plants. The number of seabeach knotweed (Polygonum glaucum) plants totaled 244.

INTRODUCTION

The Atlantic Coast population of the piping plover was added to the United States List of Endangered and Threatened Wildlife and Plants in January of 1986 as a Threatened Species. In 1989, after several years of scientific study and consultation with U.S. Fish and Wildlife Service, Gateway National Recreation Area implemented a piping plover management plan. The intent of the plan is to maintain a level of reproduction that will sustain a viable population. This is achieved by minimizing activities that have a negative impact on piping plover productivity. The current report is the seventeenth installment in a series of annual summaries of piping plover and colonial shorebird activity at the Breezy Point Site of Gateway National Recreation Area, NY. New York rare coastal plants occurring in the study area are now included in the annual report.

1. PIPING PLOVER

1.1 Study Area

Four sections of beach at Gateway National Recreation Area's Breezy Point District were monitored for piping plovers in 2005. The site includes the Breezy Point Tip, West Beach, Fort Tilden and Jacob Riis Park. The Tip is divided into three sections for ease of identification: the Bayside (the Rockaway Inlet from 222nd St to the jetty rocks), the Surf Club (east of the Sand Access Road to the Breezy Point Cooperative border), and the Oceanside (west of the Sand Access Road to the rock jetty) (Map 1).

1.2 Methods

In late winter and early spring, symbolic fencing (string with flagging attached to metal posts with informational signs) and regulation signs were installed around the traditional breeding grounds except Jacob Riis Park. Monitoring activities were conducted from mid-March through

the end of August. Early-spring through late-summer monitoring activities included recording dates and behavioral observations of arrival, territory establishment, courtship displays and rituals, mating, egg laying and chick rearing. In addition, monitors noted the presence and abundance of avian and mammalian predators and their negative impacts to the breeding plovers. Impacts on the plovers' breeding behavior and productivity by human activity and other possible disturbances also were noted.

The Breezy Point Tip, Jacob Riis Park and West Beach were monitored daily by one permanent employee and two seasonal employees. The beach at Fort Tilden was checked on occasion. In addition, an intern from the Student Conservation Association assisted from late May through mid-August.

Most nests were located during the process of egg laying or incubation by closely monitoring plover behavior. When nests were located, observations continued to determine the approximate hatch date. Once incubation started, observations focused on the progress of the nests towards hatching. Disturbances, depredation and interesting behavioral observations were noted.

Predator exclosures were used on 17 nests. Exclosures were constructed with galvanized wire mesh (2in.x 4in.opening), approximately 3-4ft. high with a 10ft.-diameter circle. The top was covered with plastic bird netting (3/4in. opening). In order to discourage birds from perching on top of the exclosure, the top loop of the exclosure was cut to create spikes. Four metal posts were driven into the ground below the top and attached to the wire mesh to hold it in place.

1.3 Results of Biological Monitoring

1.3.1 Seasonal Chronology

The first plovers were observed at West Beach on March 24. By late April through the beginning of June, plovers paired up and were laying eggs. Plover seasonal movement south along the Atlantic Coast was evident in late July and continued into mid-September.

1.3.2 Breeding Chronology

In 2005, 10 pairs of plovers nested at the Breezy Point Tip (five pairs on the Bayside, four on the Oceanside and one on the Surf Club beach), two pairs at West Beach and three pairs at Jacob Riis Park (Table 1). There were 22 nests throughout Breezy Point Site in 2005 (Maps 2, 3, and 4). On April 28, the first nest was found at Jacob Riis Park so egg laying must have started on April 27 or earlier since the nest contained two eggs. The last nest was a second attempt by a pair on the Bayside that was completed on June 17. For all areas combined, nesting activity peaked with 12 nests from May 8 through May 14 (Figure 1). Six pairs were known to have renested after losing their first clutch, while one of those pairs renested for a third time after losing the second nest. Hatching dates ranged from May 28 to July 12. Fledging dates ranged from June 27 to August 8, 2005.

1.3.3 Breeding Number

Fifteen pairs of piping plovers were monitored on the combined three sections of the Breezy Point Site (Figure 2). This is three more pairs compared to the twelve that have nested since 2002. Jacob Riis Park acquired a third pair of plovers for the first time (Map 4).

1.3.4 Hatching Success

The combined hatching success (total number of eggs hatched divided by total number of eggs laid) for all sections was 33%. Eggs in ten out of twenty-two nests hatched, while nine were depredated and three were abandoned. The hatching success was 38% for the Oceanside, 0% for the Surf Club, and 61% for the Bayside. At West Beach the hatching success was 0%, and at Jacob Riis Park it was 19% (Table 1).

1.3.5 Chick Mortality

Thirteen of the twenty-five chicks (52%) died (Table 3).

Ten chicks disappeared within the first five days, one during day six through ten, and two during day eleven through fifteen. The highest mortality occurred during the first week after hatching.

1.3.6 Fledging Success

Only 12 out of 25 chicks survived this year. Fledging success (the number of chicks fledged divided by the number of chicks hatched) for all sites combined was 48% (Table 2 and Figure 3).

1.3.7 Total Productivity

The number of chicks fledged per nesting pair for all sites was 0.8 (twelve chicks from fifteen pairs) (Figure 3).

1.3.8 Nest Failures and Egg Loss

A total of twelve out of twenty-two nests (55%) did not hatch eggs during the 2005 season. Nest failures were attributed to:

1.3.8.1 Abandonment

Three nests were abandoned at West Beach. Two nests were found abandoned with cat tracks circling the enclosure. It is also likely that the third nest was abandoned due to the presence of cats within the breeding area.

1.3.8.2 Depredation

Nine nests were depredated. Rats were responsible for destroying five nests and also for removing eggs from other nests. Oystercatchers were responsible for destroying two nests at Riis and crow tracks were found around one nest at Riis.

1.3.8.3 Unknown Causes

One nest located at Jacob Riis Beach was lost to unknown causes. The eggs disappeared and due to weather conditions, tracks were not visible.

1.4 Management Activities

1.4.1 Use of Exclosures

The U.S. Fish and Wildlife Service requires that exclosures are designed and installed according to specific criteria (Piping Plover Atlantic Coast Population Revised Recovery Plan, 1996, Appendix F). The National Park Service constructed and installed the exclosures to meet all these specifications.

This year, seventeen out of twenty-two nests were exclosed. Five nests at Jacob Riis Park were not exclosed because of past vandalism by humans in those locations.

1.4.2 Volunteer and Staff Support

This year, there was one volunteer day to assist staff with the installation of the symbolic fencing and the removal of litter and debris from the breeding area. Eight individuals from the American Museum of Natural History's Ecology Club participated. Four other individuals volunteered 30 hours throughout the breeding season.

Columbia University's Wildlife Trust Intern program was unable to support the Unit's Threatened and Endangered Species program in 2005. They have expressed interest to attempt to fund the program for 2006.

Once again in 2005, the Unit's Interpretation Division regularly assisted the resource management staff in an effort to increase public outreach and education. A seasonal staff member came out to the site during several busy summer weekends to interpret the natural resources and management policies especially to the members of the Surf Club and visitors to Jacob Riis Park.

A Student Conservation Association Intern assisted staff with piping plover monitoring efforts from late May through mid-August.

1.4.3 Predator Control/Management

1.4.3.1 Feral cats, Opossums, Raccoons, Rats

There were approximately 161 trap nights during 2005 (one trap night = one trap set for one night). The trapping resulted in the capture of 11 cats (Felis felis), 10 opossums (Didelphis marsupialis) and three raccoons (Procyon lotor). The cats were taken to the Center for Animal Care and Control (C.A.C.C.) in Brooklyn. The opossums and raccoons were released near the northeastern boundary of the Breezy Point Site. Additionally, two Norway rats (Rattus norvegicus) were caught.

Cat tracks were continuously observed throughout the breeding habitat despite our diligent efforts to capture and remove them.

1.4.3.2 Crows

It has been determined that it is too time consuming at current staffing levels to carry out the American and fish crow (Corvus brachyrhynchos, Corvus ossifragus) management plan (Appendix A). Extensive time and effort are needed to locate and remove first, second, and sometimes third nesting attempts. Several pairs of nesting crows were observed in the interior of the Breezy Point Tip. The number of nesting crows has remained stable despite the presence of West Nile Virus. While the removal of crows from the breeding grounds remains an integral part of a complete management plan, additional staff will be needed to carry out the plan in the future.

1.4.3.3 Gulls

In an attempt to reduce or eliminate the nesting and loafing herring gull (Larus argentatus) and greater black-backed gull (Larus marinus) from the Breezy Point Tip area, the park implemented a full management program in 1992. Pyrotechnics were used until 1997 to discourage nesting. Since then, nest and egg destruction has been used to control the population and discourage future nesting. Numbers of nesting gulls continued to drop, from 500 pairs in 1992 to this year's one pair (Figure 4). There was one pair of breeding adults found during a sweep through the colony. The first sweep counted one nest with one egg. A second sweep resulted in no nests found.

1.5 General Observations and Discussion

1.5.1 Vandalism and Violations

In the seventeenth year of the plover management program, there continue to be visitors who are either unaware of the posted regulations or who chose not to comply. This is the sixth year that an attempt was made to document the type of violation and the frequency of occurrence although only one seasonal staff member recorded violations on a regular basis. Violations were recorded from March 15-August 31st. Of most concern were the 110 pet violations. Several individuals from the Breezy Point Cooperative continuously walked their dogs off leash on the bayside section on the Tip where five pairs of plovers nested. Dog tracks were noted behind the symbolic fence and on the beachfront in the same vicinity of piping plover chicks.

Recorded Violations in 2005

Violation	# of Occurrences
Jogging	25
Pets	110
Personal Water Craft	12
Motor Vehicles	11
Kite Flying	4
Ball Playing	1
Barbecue	0
Picnicking	0
Trespassing in closed areas	3
Total violations	166

Since staff members are not on the beach 24 hours a day, it is likely that the total of 166 violations is only a portion of those occurring. It is clearly important to have adequate staff coverage at the Breezy Point Tip to stop violations from occurring by educating the visitors and notifying park police. It also indicates the continued need for increased law enforcement. Law enforcement patrols are necessary in order to minimize the disturbances to the breeding birds and maximize the potential for an increase in productivity.

The violation of "trespassing" was added to the chart in 2004. This violation occurs when someone enters into the breeding areas that are closed off by fencing and signs.

1.5.2 Aerial Disturbances

In an on-going effort to minimize the disturbance to the nesting birds at the Tip, the Jamaica Bay Unit continues to communicate with the New York City Police Department Aviation Unit. The Jamaica Bay Unit requested that the NYPD redirect the flight patterns of their helicopters in order to reduce disturbance.

Low-flying helicopters from other sources continue to cause disturbances to nesting birds.

1.5.3 Vegetation Encroachment

The vegetation, primarily American beachgrass (*Ammophila breviguilata*) continues to increase and spread seaward towards the high tide line (Map 5). This decreases the available habitat for the plovers, terns, and skimmers, and causes increasingly difficult visitor access issues. In an effort to address this situation, the park agreed to take part in a three-year adaptive management plan (AMP) designed by Dr. Brook Lauro from St. John's University. This AMP should help the park determine the feasibility and effectiveness of mechanically removing sections of beach grass in several locations along the shoreline of the Breezy Point Tip. Currently, the park is working on the final stages of an Environmental Assessment as required by NEPA.

It is likely that as a result of the movement of vegetation towards the high tide line, there were very few common tern nests in front of the primary dune system and none in the adjacent swale this year. Common terns nesting on NPS property dropped significantly.

1.5.4 Free-Roaming Domestic and Feral Cats

Free-roaming domestic and feral cats continue to utilize park property for hunting. Staff continues to observe cats and cat tracks throughout the park. It appears that several plover nests were abandoned at West Beach as a result of cats circling the nest exclosures. Since two of the breeding pairs were not seen after the cat tracks were observed, it is possible that one or several adult plovers were killed by the cats.

1.5.5 The Surf Club

During the 2005 season, there was no need for the installation of an alternate walkway for the Surf Club members to access the beach area as plover nests were not nearby.

2. COLONIAL SHOREBIRD NESTING

Colonial shorebird nesting at the Breezy Point tip dates back to the late 1960's (Post and Gochfeld 1978). There isn't much known about the site prior to 1968. The site has hosted breeding common terns, least terns, black skimmers and several pairs of roseate terns over several decades (Table 4). The level of protection has increased since the piping plover management plan was implemented in 1989 with increased fencing and additional restrictions on recreational activities.

2.1 Common Terns

The common tern (*Sterna hirundo*) is listed as a New York State Threatened Species. In 2005, common tern numbers were the lowest since 1990. There were very few nests out on the beachfront this season. A large part of the colony has shifted eastward to the Breezy Point Cooperative property, where the beach is wider and sparsely vegetated.

2.2 Least Terns

The least tern (*Sterna antillarum*) is listed as a New York State Threatened Species. This season there were no observations of nesting least terns on NPS beaches. This is only the second time since park staff began collecting nesting data, that least tern nesting was not observed on park beaches.

2.3 Black Skimmers

The black skimmer (*Rynchops niger*) is listed as a New York State Species of Special Concern. For the third season in a row, there were no black skimmers nesting at the Breezy Point Tip. The encroachment of thick vegetation appears to have decreased habitat suitability for this species. Many of the skimmers have shifted nesting eastward to the wider, sparsely vegetated beaches of the Breezy Point Cooperative property.

2.4 Roseate Terns

Several Federally listed (Endangered) roseate terns (*Sterna dougallii*) were observed on several occasions during May and June, but it is believed that they were transients, and did not nest on NPS beaches.

3. RARE AND ENDANGERED COASTAL PLANTS

3.1 Seabeach Amaranth

In 2005, a record number of Federally listed (Threatened) seabeach amaranth (*Amaranthus pumilus*) plants, were found at the Breezy Point District (Table 5). Over 1300 plants were found by NPS staff and an SCA intern at Jacob Riis Park, while smaller numbers were located at West Beach, Fort Tilden, and the Breezy Point Tip, giving an overall total of 1488 plants (Map 6). The amaranth plants growing at Riis were in the areas fenced off for piping plover and oystercatcher nests. These fenced off areas were not raked during the amaranth growing period. In areas where daily beach raking occurred, no amaranth plants were located.

3.2 Seabeach knotweed

As per a request from the USFWS Long Island Field Office and the New York Natural Heritage Program, park staff is reporting numbers of seabeach knotweed (Polygonum glaucum), a coastal annual plant considered rare in New York, to The Nature Conservancy (Table 5). NPS staff and an SCA intern located 212 knotweed plants at the Breezy Point Tip and 32 plants at Jacob Riis beach in 2005 (Table 5).

4. MONITORING AND MANAGEMENT RECOMMENDATIONS FOR 2006

Our experiences during the 2005 nesting season lead us to make the following recommendations for improving piping plover, colonial shorebird and rare and endangered coastal plant management:

- Move forward with the adaptive management plan for the Breezy Point Tip.
- Work with U.S.P.P. to establish increased presence at the Tip and improve communications.
- Investigate methods to reduce the number of free roaming domestic and feral cats.
- Consider using exclosures at Jacob Riis Park to increase the egg hatching rate.
- Work with the Unit IPM Coordinator and implement rat control.

REFERENCES

Post, P. and M. Gochfeld. 1978. Recolonization by Common Terns at Breezy Point, New York. Proc. Colonial Waterbird Group 1978: 128-136.

U.S. Fish and Wildlife Service. 1996. Piping Plover Atlantic Coast Population Revised Recovery Plan. U.S. Fish and Wildlife Service, Region 5, Hadley, Massachusetts. 266pp.

TABLE 1.
ABUNDANCE AND REPRODUCTIVE SUCCESS OF PIPING PLOVERS IN 2005 AT EACH INDIVIDUAL
BEACH IN THE BREEZY POINT DISTRICT OF GATEWAY NATIONAL RECREATION AREA, NY

Site	# Pairs	# Nests	# Eggs	# Eggs hatched (%)	# Fledged (%)	Productivity: # Chicks fledged/pair
Breezy Point Tip:						
Oceanside	4	7	21	8 (38)	4 (50)	1.0
Surf Club	1	1	4	0	0	0.0
Bayside	5	6	23	14 (61)	8 (57)	1.6
West Beach	2	3	12	0	0	0
Riis Park	3	5	16	3 (19)	0	0
Total	15	22	76	25 (33)	12 (48)	0.8

TABLE 2.
PRODUCTIVITY OF PIPING FLOWERS 1988-2005 AT THE BREEZY POINT DISTRICT, GATEWAY
NRA, NY

Year	# Pairs	# Eggs	# Eggs hatched (%)	# Fledged (%)	# Chicks fledged/pair
1988	18	44	25 (57)	6 (24)	0.33
1989	14	67	48 (72)	20 (42)	1.43
1990	19	94	43 (46)	20 (47)	1.05
1991	17	66	33 (50)	20 (61)	1.18
1992	17	76	28 (37)	12 (43)	0.71
1993	15	65	41 (63)	23 (56)	1.53
1994	16	88	48 (55)	12 (25)	0.75
1995	16	84	26 (31)	5 (19)	0.31
1996	11	41	22 (54)	2 (9)	0.18
1997	7	28	12 (43)	3 (25)	0.43
1998	11	51	19 (37)	13 (68)	1.18
1999	9	47	22 (47)	16 (73)	1.78
2000	14	54	34 (63)	13 (38)	0.93
2001	11	45	29(64)	9(31)	0.82
2002	12	60	43 (72)	23 (54)	1.92
2003	12	47	17 (36)	12 (71)	1.00
2004	12	55	37 (67)	13 (35)	1.08
2005	15	77	25 (32)	12 (48)	0.8

TABLE 3.
MORTALITY AND SURVIVAL OF PIPING PLOVER CHICKS IN 2005 AT THE BREEZY POINT DISTRICT,
GATEWAY NRA, NY

chick age in days	# Chicks alive at start of age interval	# Chicks that disappeared	Chick mortality as % of original 25 chicks	Chick mortality as % of the chicks alive at the start of the age interval	Chick survival as % of the chicks alive at the start of the age interval
0 to 5	25	10	40	40	60
6 to 10	15	1	4	7	93
11 to 15	14	2	8	14	86
16 to 20	12	0	0	0	100
21 to 25	12	0	0	0	100
26 to 30	12	0	0	0	100
	12 chicks survived	13 chicks died	Total= 52% of the chicks died		

TABLE 4.
POPULATION OF NESTING COLONIAL SHOREBIRDS AT THE BREEZY POINT DISTRICT,
GATEWAY NRA, NY

Year	Least Tern	Common Tern	Roseate Tern	Black Skimmer
1982	550	0	0	0
1983	377	0	0	0
1984	109	0	0	0
1985	132	2	0	0
1986	200	0	0	0
1987	215	0	0	0
1988	558	30	0	0
1989	356	70	0	12
1990	554	571+	0	86
1991	1128	1350	0	321
1992	530	2600+	0	352
1993	250	3000+	4	360+
1994	200	4000+	2	400
1995	30	3000	2	475
1996	30	2150	4	400
1997	8	2670	4	560
1998	40	3700	6	300
1999	0	1850	2	230
2000	20	3800	0	450
2001	60	1725	0	750
2002	150	1675	0	530
2003	11	1900	0	0
2004	44	2550	0	0
2005	0	600	0	0

TABLE 5**SEABEACH AMARANTH AND SEABEACH KNOTWEED COUNTS FOR BREEZY POINT SITE, GATEWAY NRA, NY**

Seabeach amaranth																
Site	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Breezy Point Tip	1	3	26	30	0	1	3	15	25	12	77	131	138	20	37	117
Fort Tilden									2	0	1	10	1	2	2	71
Jacob Riis Park	NS	NS	NS	NS	1	0	0	NS	2	0	0	4	10	223	688	1300
Totals	1	3	26	30	1	1	3	15	29	12	78	145	149	245	727	1488
Seabeach knotweed																
Site																
Breezy Point Tip	NS	NS	NS	NS	162	NS	NS	NS	NS	NS	NS	NS	NS	171	122	212
Fort Tilden	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	1	0	0
Jacob Riis Park	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	3	5	32
Totals					162									175	127	244

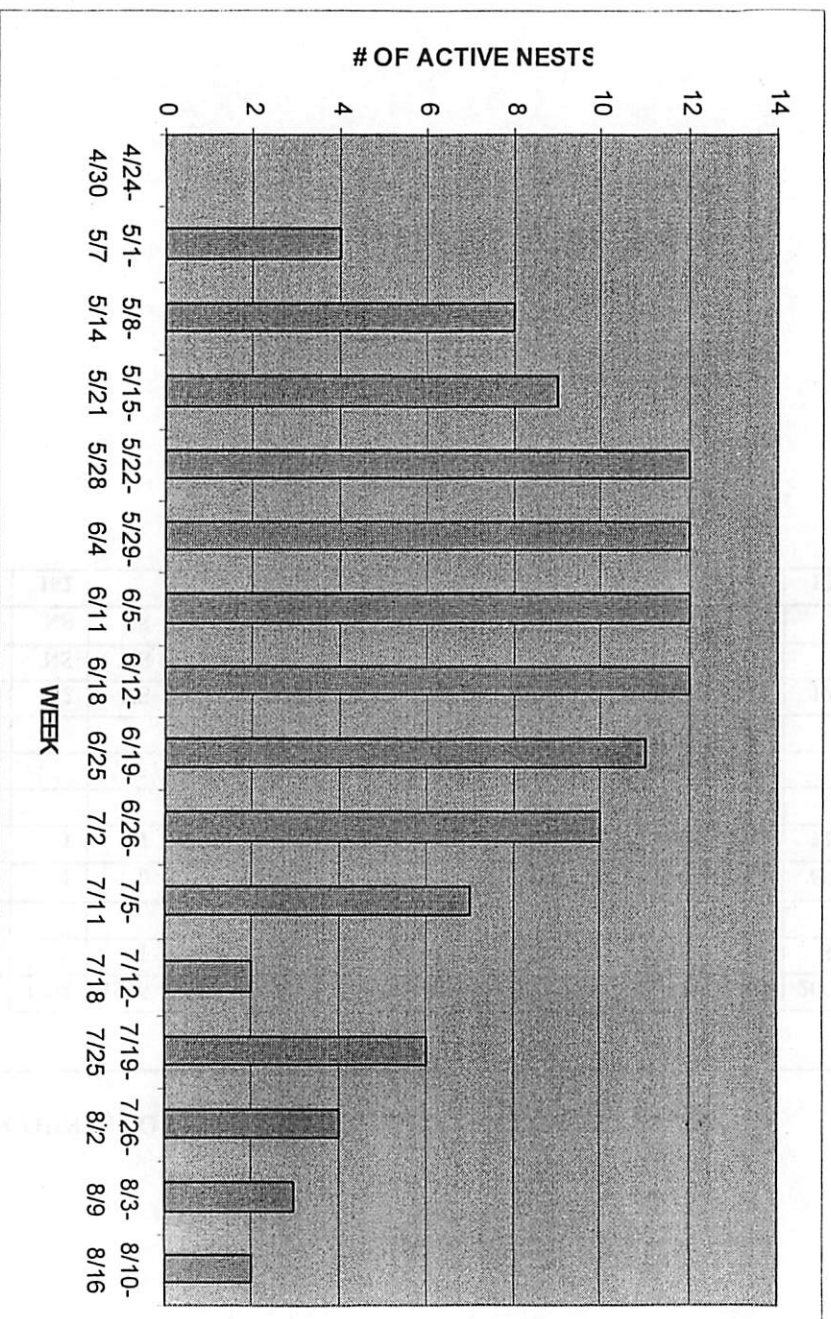


Figure 1. Active piping plover nests on a weekly basis in the 2005 breeding season at the Breezy Point District, Gateway NRA. The most active nesting period was from May 22 through June 18.

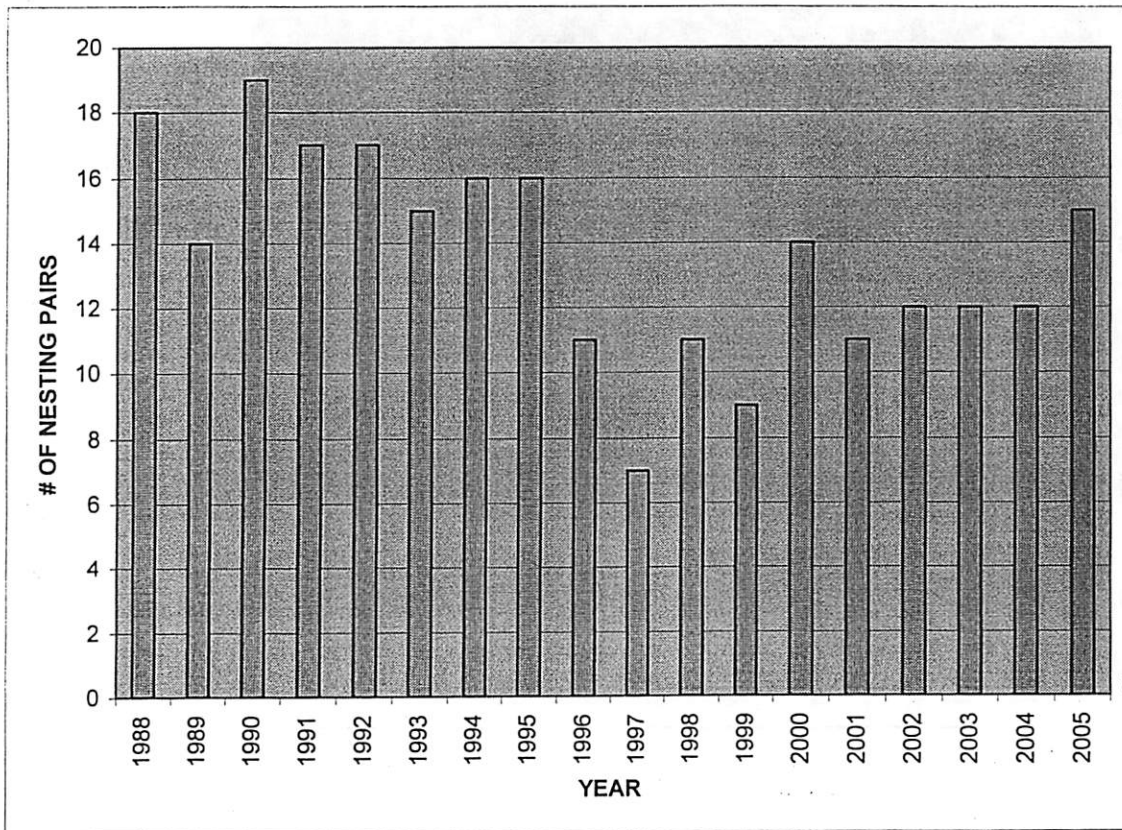


Figure 2. Number of nesting pairs of piping plover at the Breezy Point District, Gateway NRA, from 1988 through 2005.

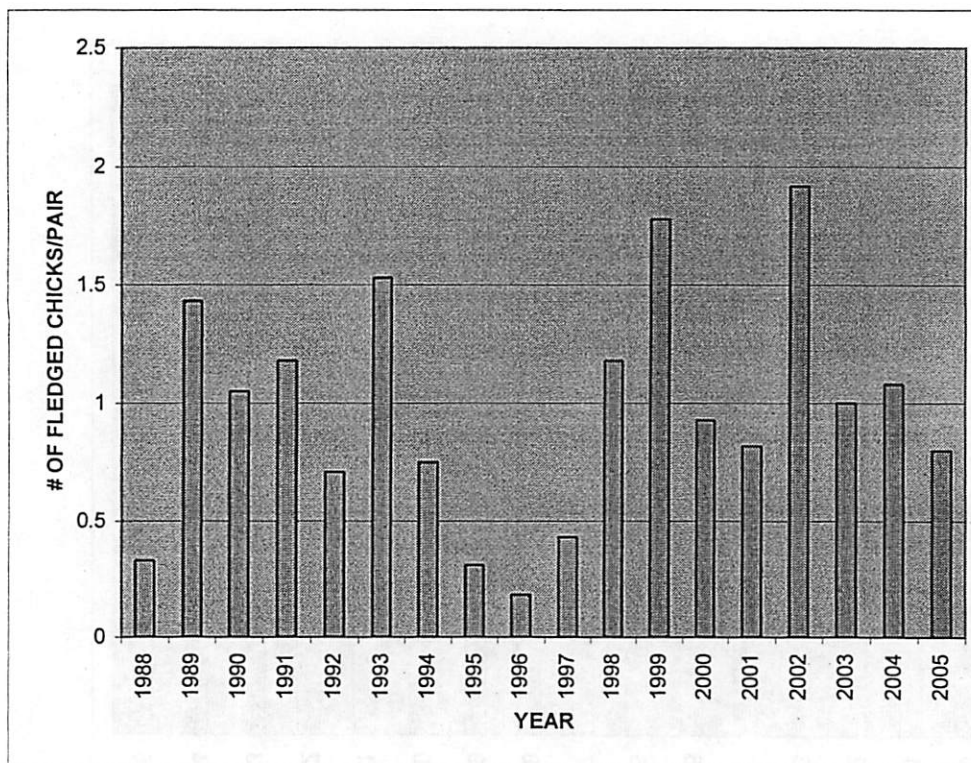


Figure 3. Annual piping plover productivity (number of fledged chicks per pair) at the Breezy Point District, Gateway NRA. From 1988 through 2005.

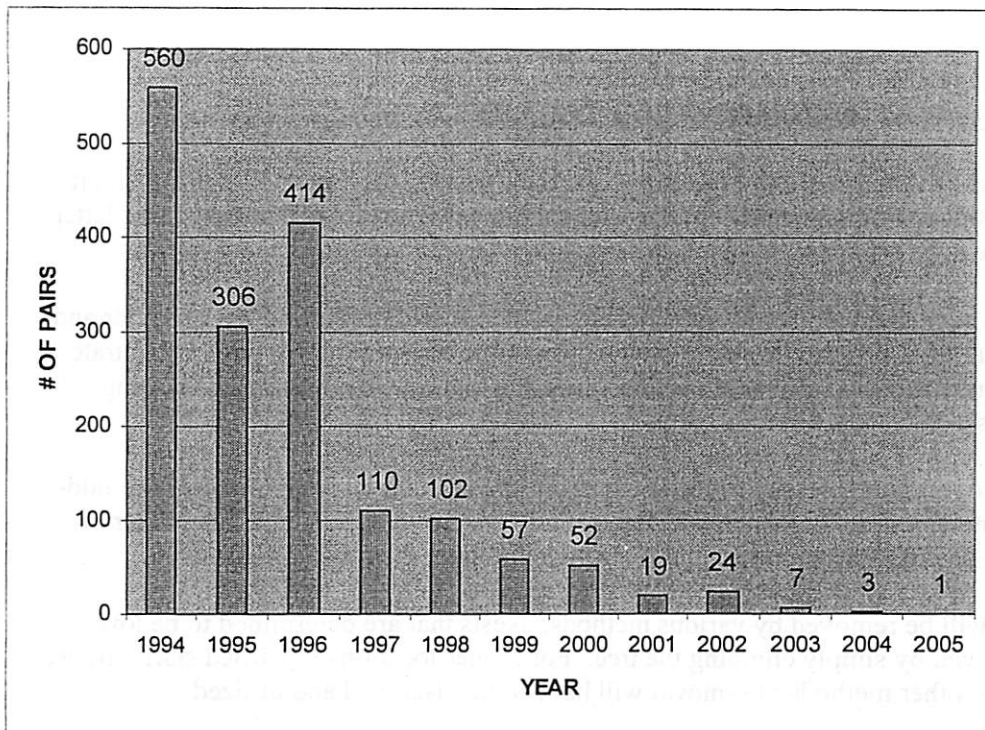


Figure 4. Estimate of the number of breeding pairs of gulls, primarily herring gull and on occasion, a few greater black-backed gulls, at the Breezy Point District, Gateway NRA, from 1994 through 2005

Appendix A

CROW MANAGEMENT FOR THE BREEZY POINT TIP

Locate breeding pairs of American and Fish crows and their nests at the Breezy Point Tip and if time allows, at the Breezy Point Yacht Club, Riis and Ft. Tilden. The crows that nest at the latter locations may forage at Riis Park and West Beach, posing a threat to nesting piping plovers.

Once the nests have been located, the resource management staff will monitor crow behavior and remove the nests with eggs prior to hatching. Since this is time consuming, we will concentrate our monitoring and nest removal efforts at the Tip where the highest concentration of nesting piping plovers exists.

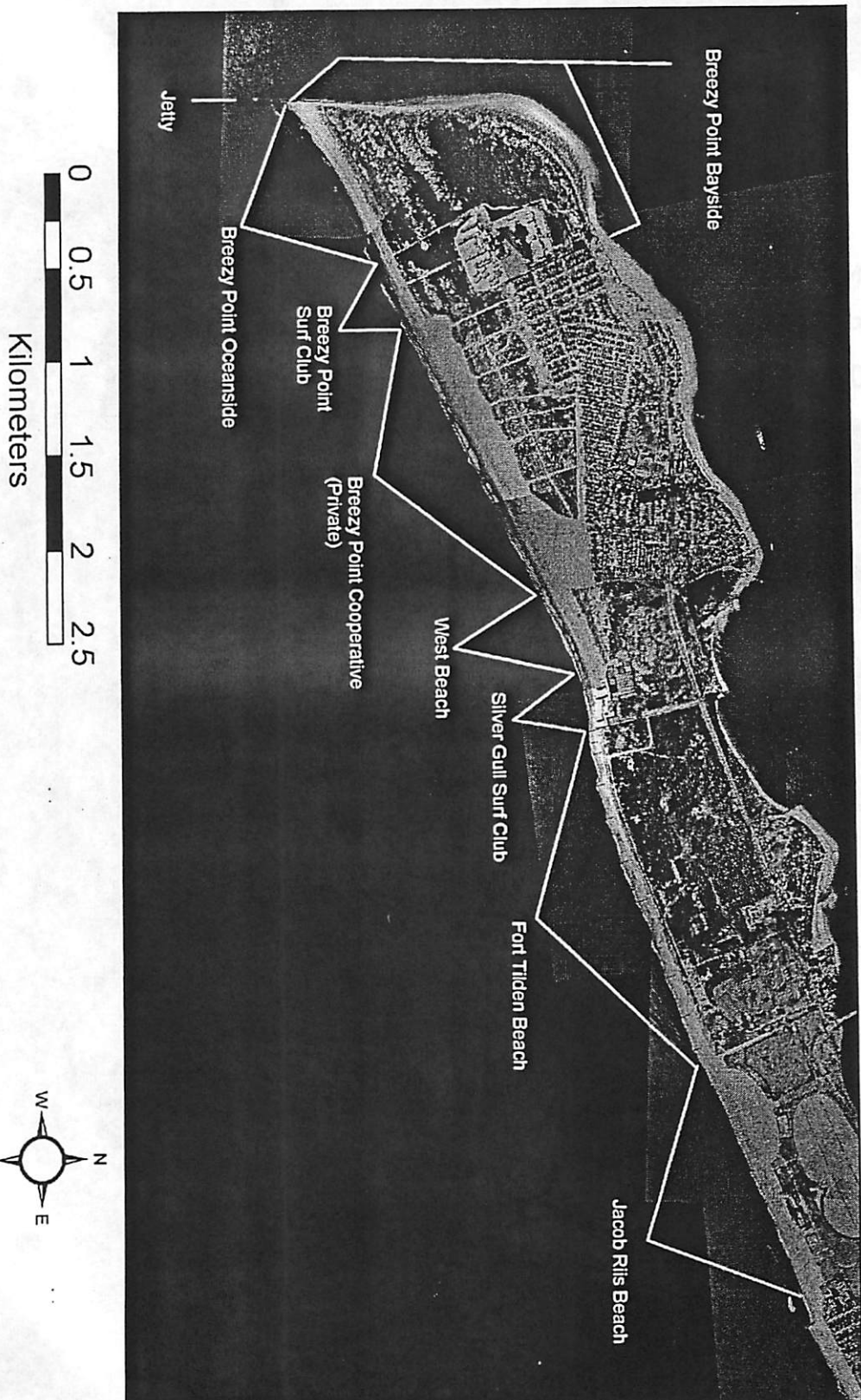
According to Dr. Brook Lauro's research, American crow eggs can hatch from mid-April to mid-May (first nest attempts, renests will have later dates) and Fish crow eggs tend to hatch later in May. The staff will need to start monitoring crow activity no later than the end of March.

The eggs and nests will be removed by various methods. Nests that are determined to be low enough will be removed by simply climbing the tree. For higher locations, qualified staff will use tree-climbing gear or other methods of removal will have to be discussed and utilized.

The resource management staff will keep records of all activities. Communication will remain open between Dr. Brook Lauro and the Natural Resource Management Specialist for guidance and suggestions if offered.

Gateway NRA Breezy Point District

Map 1.

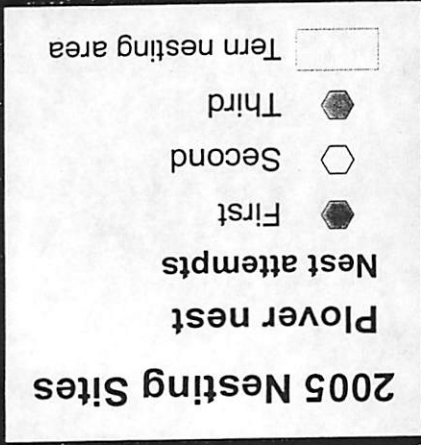


Map 2: Breezy Point Tip

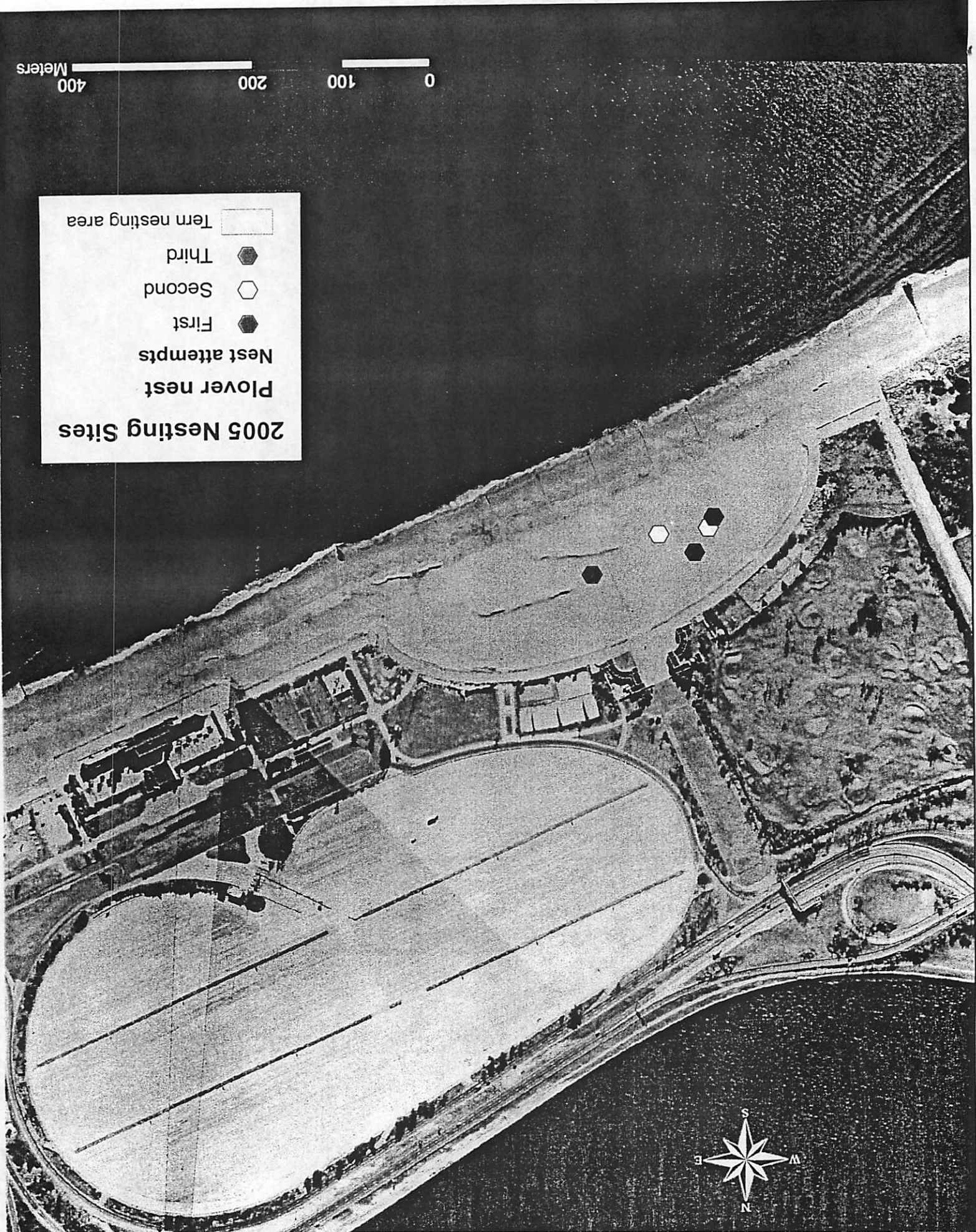


Map 3: West Beach

0 100 200 400 Meters

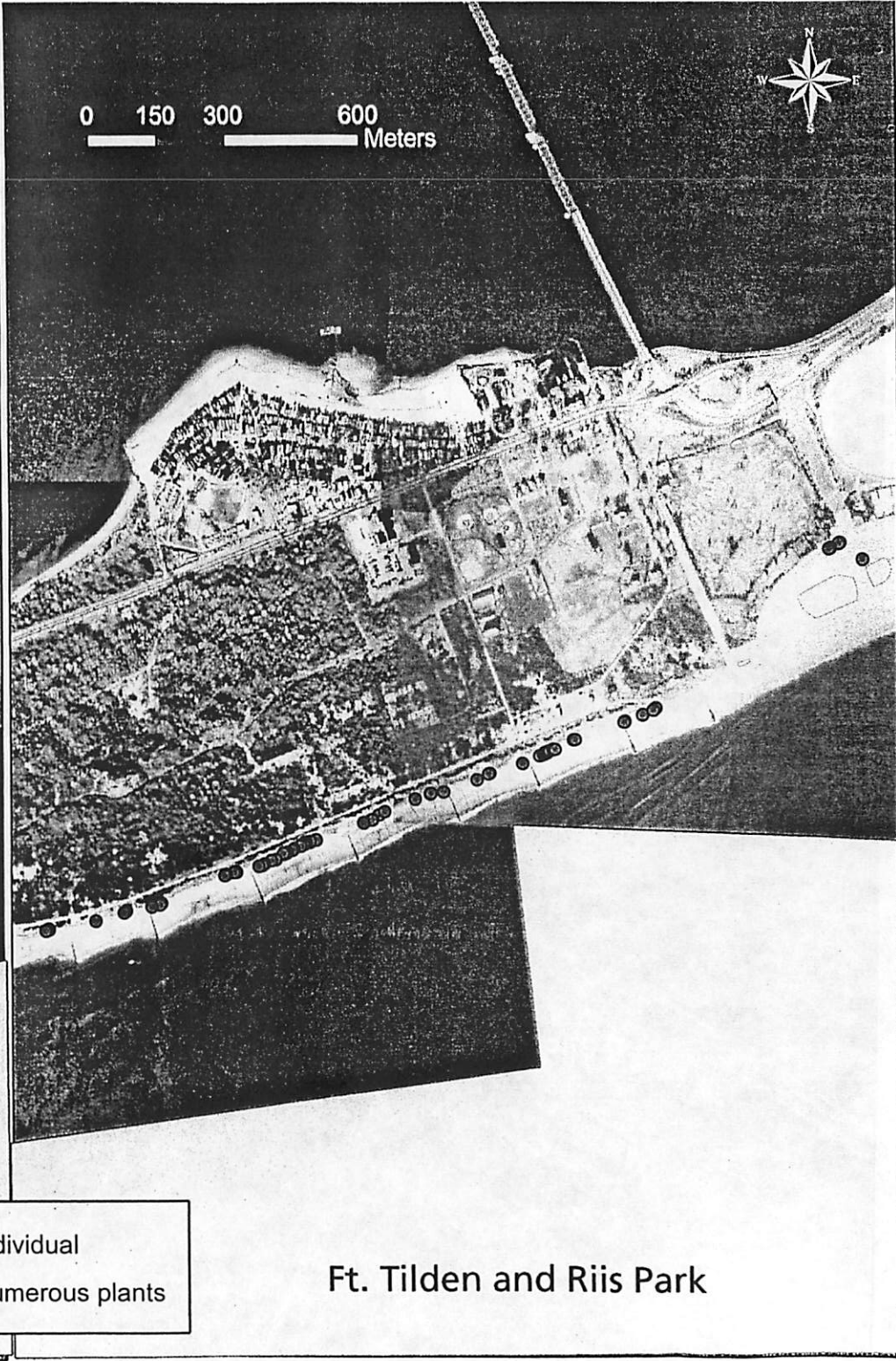
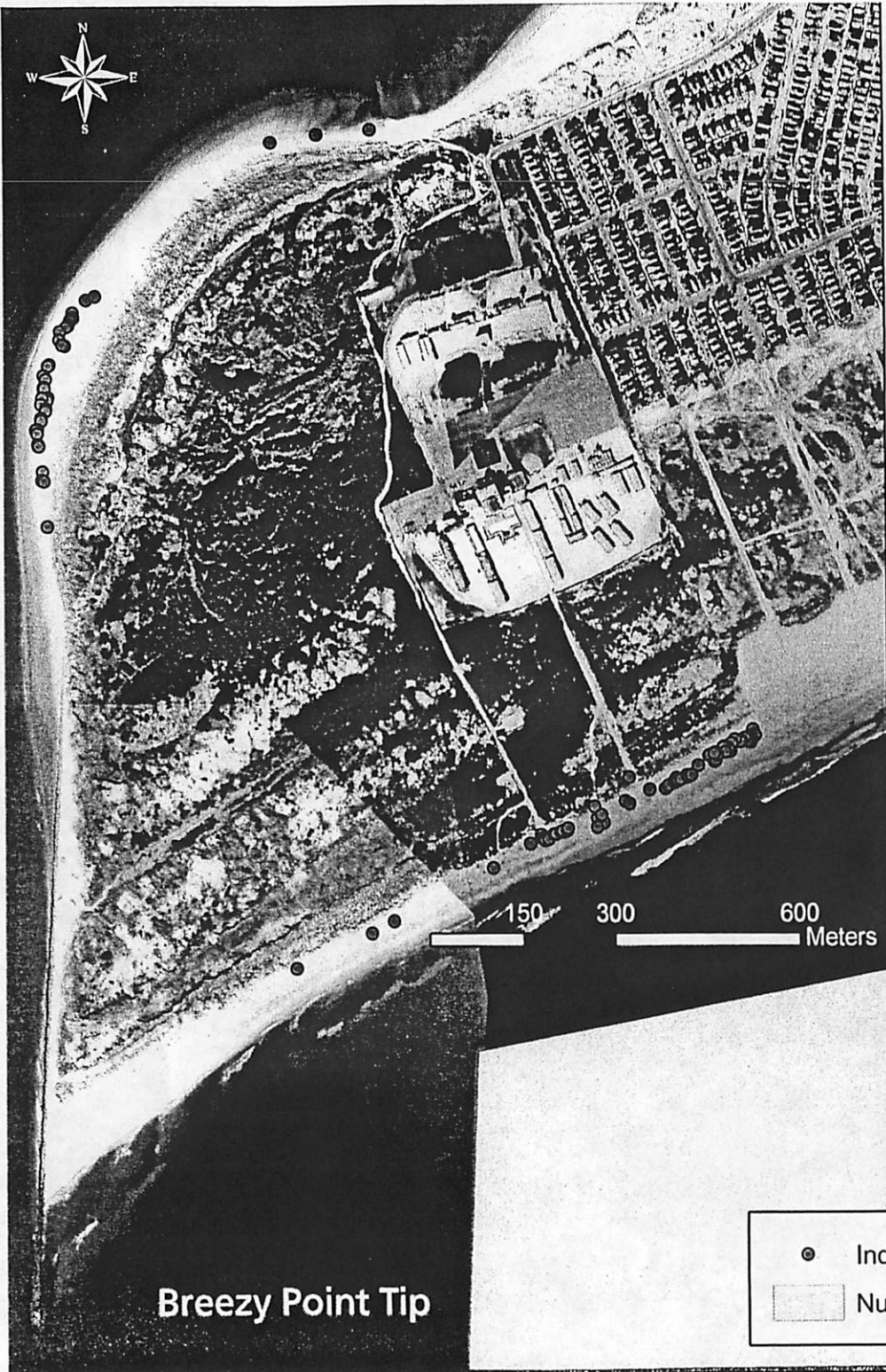


Map 4: Riis Park





Breezy Point Tip Habitat Enhancement Sites



Seabeach Amaranth, Breezy Point District, 2005

Map 6 25