



NEW YORK CITY AUDUBON

HARBOR HERONS PROJECT: 2004 NESTING SURVEY

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Executive Summary

New York City Audubon's Harbor Herons Project annual survey was conducted between May 24 and June 2, 2004, by a team led by New York City Audubon (NYC Audubon). Seventeen islands throughout the New York/New Jersey harbor are included in this project, although not all islands are surveyed annually. In 2004, 15 islands were either surveyed directly or indirectly by a research team, consisting of a consultant (Paul Kerlinger), NYC Audubon volunteers, and staff from New York City Department of Parks and Recreation, the Jamaica Bay Guardian (American Littoral Society) and a graduate student from the College of Staten Island. The primary objective of the project is to monitor and track the population status of herons, egrets, ibis, cormorants, and other nesting birds within the study area. The 2004 survey marks the 20th consecutive year of the Harbor Herons Project.

The islands surveyed in the spring of 2004 included Shooters and Prall's islands and Isle of Meadows in the Arthur Kill-Kill van Kull complex; Hoffman and Swinburne islands off southern Staten Island; Canarsie Pol, Ruffle Bar, Subway Island, and Little Egg Marsh in Jamaica Bay; North Brother, South Brother, U Thant, and Mill Rock in the East River; Goose Island in the Hutchinson River; and Huckleberry Island in Long Island Sound (Westchester County). The dozen or so cormorants that nest on that island constitute a very small proportion of those birds in the New York/New Jersey harbor and the numbers have been almost constant for nearly a decade. One new island, Subway Island, was examined for nesting by long-legged waders and cormorants in 2004. That island is located just east of the Marine Park Bridge in Jamaica Bay. White and Riker's islands were not surveyed in 2004 and Little Egg Marsh was surveyed completely for the first time. The islands are publicly owned (by the City of New York and the National Park Service, Gateway National Recreation Area) with the exception of South Brother and Huckleberry Islands, which are currently owned privately.

Eight species of herons, egrets, and ibis nested on 7 (perhaps 8) islands in the harbor and Double-crested Cormorants nested on 6 islands and three channel markers. As in all previous surveys, Black-crowned Night-herons were the most numerous nesting species of long-legged wader (841 nests, 49.2%) after which were Glossy Ibis (350 nests; 20.4%), Snowy and Great egrets in about equal numbers (230 nests – 13.4% and 240 nests – 14.0%, respectively), Little Blue Heron (11 nests, <1%), Cattle Egret (6 nests, <<1%), Yellow-crowned Night-heron (7 nests, <<1%) and Tri-colored Heron (2 nests, <<1%). These numbers are nearly 7% lower than the 2003 survey total, and lower than counts in the early to mid-1990s when about 2,000 nests were present on only five islands. Islands in the Arthur Kill-Kill van Kull complex hosted very few nests (N ~ 15 Black-crowned Night-heron nests on Prall's Island) and there was no evidence that any of those nests were successful in 2004. There may have been a Black-crowned Night-heron nest on Mill Rock. Nesting on Hoffman Island were again very numerous and there was good nesting success on that island, as was the case on Goose Island, Canarsie Pol, and South Brother Island. Numbers of Black-crowned Night-heron nests on North Brother Island and all herons and egrets on Huckleberry Island declined precipitously after being stable for several years. Cattle Egrets have experienced the largest decline over the year, although the numbers of nests went up greatly to a total of 6 nests on South Brother and Hoffman Islands. Overall, it seems that the populations of long-legged waders are remaining relatively stable, although various species have shown short term increases and others, most notably Black-crowned Night-

herons, have shown declines. The presence of 2 Great Blue Herons on Canarsie Pol during the nesting season is intriguing because this species has not been shown to nest on any islands in the harbor in the past 20+ years. It is also interesting that Green Herons have not nested on the islands for more than 5 years.

A total of 877 Double-crested Cormorant nests were found on islands (Swinburne, Hoffman, Shooter's, South Brother, U Thant, and Huckleberry islands) and several channel markers in the Arthur Kill. The population of this species has decreased for the past two years and the number of nests counted in 2004 is 27.1% lower than in 2002. The declines were registered mostly on South Brother and Swinburne islands. The expansion of these birds from Swinburne onto Hoffman Island in 2002 continues with a few more nests on Hoffman Island in 2004. It is possible that the 221 fewer nests found in 2004 as opposed to 2003 may reflect movement to an as yet identified nesting location in or near the New York/New Jersey harbor.

As in 2003, New York City Parks and Recreation (Urban Park Rangers and Natural Resources Group), Jamaica Bay Guardian (Littoral Society), and ConocoPhillips-Bayway Refinery provided safe boat transportation to the islands. The Harbor Herons Project for 2004 was funded by Audubon New York, ConocoPhillips-Bayway Refinery, and the New York-New Jersey Harbor Estuary Program.

In addition to surveying islands in the New York/New Jersey harbor, a Power Point presentation was created and presented at a variety of meetings. Those presentations were made at the April 29 of 2004, Birds of the Hudson River Conference, American Museum of Natural History (Hudson River Environmental Society) and at the May 8, 2004 presentation to the staff and board of directors of the Hudson River Foundation.

The following recommendations are made for the continued protection of heron, egret, and ibis populations nesting in the New York/New Jersey harbor and surrounding areas.

- Develop a long-term plan for population monitoring and providing stewardship for those harbor herons islands included in NYC Audubon's project. The plan should include identifying potential long-term funding sources for the project.
- Continue to monitor habitat and participate in habitat restoration and enhancement projects on islands covered by this project. (Recommendations made between 1998 and 2002 in annual reports from this project are now being implemented on North Brother Island in 2004-2005 by New York City Parks and Recreation, Audubon New York, and NYC Audubon.)
- Integrate information on heron, egret, and ibis foraging areas in the harbor and adjacent areas with population information. Work by Andy Bernick from College of Staten Island and other researches will prove critical to ongoing research by NYC Audubon.
- Examine population interchange with New Jersey, Long Island, and Westchester Heronries – especially on islands like Bannister Island, east of Jamaica Bay and colonies

along the New Jersey shore.

- Using existing slide/PowerPoint programs, prepare updated programs about the harbor herons to educate New York City residents regarding the harbor islands and their role as important nesting habitats for herons, egrets, ibis, and cormorants, as well as critical stopover sites for migrating songbirds.

- Conduct a Photographic Analysis of Vegetation Change on South Brother and Other Islands. Mike Feller, NYCPR Natural Resources Group, has photographed South Brother and other islands for more than a decade. Those photographs offer, perhaps, the only record of vegetation succession and change on the harbor islands. By putting together a time-series of photographs from different locations on South Brother and other islands, a more quantitative assessment of vegetation succession and change will be available. Such a record would permit better planning and management of the islands.

Introduction

A nesting survey on herons, egrets, ibis, cormorants, and some other waterbirds was conducted in the New York/New Jersey harbor during May and June 2004 by a team of supervised by the New York City Audubon (NYC Audubon). The 2004 survey of herons, egrets, ibis, and cormorants marks the 20th consecutive year (21st nonconsecutive year). The survey is one of the primary activities of NYC Audubon's Harbor Herons Project, which also includes educational boat tours and a citizen science monitoring program. The purpose of the survey is to determine and monitor the nesting status of long-legged waders, cormorants, and some other birds on islands in the harbor. The survey counts adults, nests, eggs, and young, and is meant to be a census of the colonial waterbirds nesting on islands in the New York/New Jersey harbor. Not all nests are accessible to surveyors, so the numbers reported each year are population estimates that can be considered a census. Monitoring the numbers of nesting pairs of these birds is a means of determining the long-term status and health of populations of these species. A standardized methodology has been used for two decades, producing data that have made it possible to determine whether the populations of each of the species involved are stable, decreasing, or increasing. In addition, the numbers provide an indication as to the stability of populations on individual islands in the harbor. The nesting counts provide a geographic and numerical overview of how many and where long-legged waders and cormorants nest within the harbor. From the data gathered over the years by NYC Audubon, management strategies and stewardship policies have been developed and implemented.

Only 5 islands were surveyed during the first ten years of New York City Audubon's Harbor Herons surveys. The islands surveyed in the early-mid 1980s through the mid 1990s included the Brother Islands in the East River and Shooters, Prall's, and Isle of Meadows in the Arthur Kill. Other islands were being surveyed during portions of this period, but the data were collected by other researchers using slightly different methods. Goose and Huckleberry Islands which were being surveyed by Dave Kunstler of the New York City Parks and Recreation (NYCPR) and the islands of Jamaica Bay, which were being surveyed by Don Riepe, then of the National Park Service's (NPS) Jamaica Bay Sanctuary. These three entities (NYC Audubon, NYCPR, and NPS) formed an informal collaborative in the late 1990s after which, data were collected as a team and it was agreed that data would be shared among the team members. During the last five plus years, NYCPR, NYC Audubon, and NPS have collaborated and conducted the surveys together. These changes in the Harbor Herons Project have resulted in a geographic expansion, as well as the scientific scope of research. To date, 17 islands have been surveyed and about 13-14 are surveyed annually (Table 1), depending on need and access to the islands.

In spring 2004, the Harbor Herons collaborative led by NYC Audubon surveyed the islands. That collaborative included two nonprofit conservation organizations (NYC Audubon and Wildlife Trust), federal agency (NPS), a city agency (NYCPR), a corporation (ConocoPhillips-Bayway Refinery), and one university (College of Staten Island) surveyed the islands. The Wildlife Trust is the newest member of the collaborative, with Dr. Scott Newman as the lead researcher. ConocoPhillips-Bayway Refinery provided boat transportation to islands in the Arthur Kill and Kill van Kull. NYCPR provided boat transportation and logistical support to islands in the East River, Arthur Kill-Kill van Kull, Hutchinson River, and Long Island Sound.

The Jamaica Bay Guardian (American Littoral Society) provided boat transportation to the Jamaica Bay islands. Andy Bernick, a graduate student from College of Staten Island studying the foraging behavior of herons provided assistance during the surveys and information on foraging behavior of the long-legged waders. The cooperative spirit of these groups working together has helped reach a broader audience than in previous years and has fostered greater interest in the herons and the islands among a large group of nonprofit organizations, government agencies, the media, and interested citizens of New York and New Jersey.

A total of nearly 25 people participated in the 2004 Harbor Herons project, including boat captains, volunteers, and biologists. This is the largest number of people ever participating in these surveys and indicates tremendous interest and enthusiasm. The project definitely is a success, with respect to human interest and bringing attention to the harbor herons.

The methods used were similar or the same as those in previous years. Researchers in teams of 1 to 8 individuals combed the islands searching for nests. A team consists of one person using a long handled mirror to look into nests (for counting eggs and young), a second person records the data, and up to two or three other people who search for nests and make sure nests are not missed or counted more repeatedly. Two teams were used to survey the larger heronries. After locating nests it was determined if they were active. The criteria used to determine if a nest was “active” included the presence of adults on or near the nest, evidence of fresh construction, and the presence of eggs or nestlings. Active nests were identified to the species that was using them when possible. Also, it was determined whether eggs were present, how many eggs were in the nest, and how many young were in or near the nest. In addition, other information was sometimes gathered. In hundreds of cases nests were too high to examine their contents with long-handled mirrors. Nests up to about 18 feet (~6 m) were examined with these mirrors as often as possible. Nests too high to see into were usually recorded as being active, based on construction or the presence of adults, but other information about eggs and young could not be determined or recorded. However, a few of these nests were sparsely built, allowing eggs and young to be seen through the bottom or side of a nest. Evaluation of these nests was easiest when large young birds were present.

To reduce impacts from the field research teams to nesting birds, the researchers moved through the colonies quickly. In some cases, not all nests were surveyed because well developed nestlings often jump from the nests or climb up branches and fall trying to escape the researchers. When that happens, the young are returned to the nest. Similarly, when too many large young are present, an estimate of the number of active nests is made on an island or in an area of an island rather than examining every nest.

Slightly different protocols are used to survey cormorants and gulls. Because it is so time consuming and difficult to find and count gull nests on most islands, the number of adults seen are used as an approximation of the number of nests present. A nest is assumed present for each adult seen because one-half of adults are generally foraging away from the nesting colony during daytime. Also, where landing a boat was not possible, such as on U Thant Island, Mill Rock, and Swinburne Island, adult gulls were counted from the boat. This method is also used at the Brother Islands, Huckleberry Island, and Hoffman Island. On North Brother, gulls nest on rooftops and inside the dilapidated buildings making it too hazardous to look for nests. Islands

that support only cormorants (Swinburne Island and parts of Shooter's Island) are examined from a boat because landing on those islands or on the wreckage on which cormorants nest is hazardous. It is also easier and less disturbing to birds to count nests from a boat. Canada Geese and other waterfowl nests are counted incidentally as part of the heron and egret nesting surveys. The counts of these birds are rough estimates, mostly done to determine whether or not these birds are nesting on a particular island.

Transportation and Acknowledgements

Transportation to and from the islands was accomplished via power boat. NYCPR provided a power boat to access Huckleberry, Goose, North, and South Brother islands, Hoffman and Swinburne islands, and Mill Rock. Islands in the Arthur Kill-Kill van Kull were accessed via boat and captain provided by ConocoPhillips-Bayway Refinery. A NYCPR boat also ventured to the islands on the same day as part of the same team effort. A Zodiac from Wildlife Trust helped ferry people from the NYC Police docks on Randall's Island to North and South Brother islands. Islands in Jamaica Bay (Canarsie Pol, Ruffle Bar, Subway Island, and Little Egg Marsh) accessed via power boat provided by the Jamaica Bay Guardian (Littoral Society) with permission from the National Park Service. The New York City Police Department provided boat launching facilities on Randall's Island so that the Brother islands and Mill Rock could be surveyed.

Volunteers and others who participated in the 2004 nest surveys included: E. J. McAdams, Andy Bernick, Mike Feller, Dave Kunstler, Scott Newman, Don Riepe, David Rosane, Michelle Scott, Yigal Gelb, Alex Felson, Alexis Rockman, Dorothy Spears, Jackie Duhon, Eva Callahan, Katherine Mellander, Susan Elbin, Gabriel Willow, and K. Jacob Ruppert III. Captains Artie Rossler, Barry Rosen, and Jerry Warner of ConocoPhillips-Bayway Refinery, provided logistical assistance with respect to boat transport. Alex Summers and Nate McVay from NYCPR captained the Parks boat to several islands and assisted with nest counts.

Bill Tai and Alex Brash, NYCPR, arranged for boat transportation to and from several islands. We wish to acknowledge NYCPR for their continuing support for this project. Also, thanks to the National Park Service for granting access and permits to survey islands in Gateway National Recreation Area. Finally, thanks to Jamaica Bay Guardian (American Littoral Society) for assistance with boat transportation. Financial support for the 2004 Harbor Herons project came from Audubon New York, ConocoPhillips-Bayway Refinery, New York-New Jersey Harbor Estuary Program, and from the members of the New York City Audubon Society.

Results and Discussion

A total of 1,711 nests of 8 species of egrets, herons, and ibis were found on 7 islands (perhaps 8 if a nest was on Mill Rock) in the harbor (Tables 2, 3, 4, and 5). This total represents one fewer species than has historically been found nesting on the islands. Green Heron was not found to nest on the islands. The total number of nests found in 2004 was 1,711, which is 125 nests fewer than in 2003, although nearly 200 nests greater than was found in 2002. This decline is equivalent to 6.8% of the 2003 total. The 1,711 nests found during 2004 is nearly 300 fewer nests found in the early-mid 1990s, which were conducted only on 5 islands. Although populations of most species remain stable, it appears that the overall population of long-legged waders continues to be lower than peak populations documented nearly a decade ago.

Shooters Island and Isle of Meadows in the Arthur Kill and Kill van Kull remain uninhabited by long-legged waders. The numbers of nests on Prall's Island has grown, although there was no evidence of nesting success.

Cormorants nested on 6 islands with a total of 877 nests (Table 6), down 221 nests from 2003, which amounts to a 20.1% decline. Herring and Great Black-backed gulls were found to be nesting on the same islands as in 2003 in similar numbers (Table 7) and they probably nested on Riker's as well.

Long Island Sound - Pelham/New Rochelle, Westchester

Huckleberry Island. Dave Kunstler of NYCPR led a group of 6 biologists and NYC Audubon volunteers to survey Huckleberry Island on May 27, 2004. Conditions included calm waters, fair skies and high temperature in the low 70's F. A nest count revealed only 28 heron and egret nests consisting of 3 different species (Table 3). This total count represents only about one-quarter (23.7%) of the nests present in 2003 and 28.3% of what was present in 2002. In other words, about a 75% decline occurred. This decline is dominated by the fact that Black-crowned Night-heron nests dropped from 66 nests in 2003 to only 11 in 2004. Great Egrets nests were about equal to that found in 2003, but smaller than in 2002. Snowy Egrets dropped precipitously to only 5 nests and no Yellow-crowned nests. One adult Yellow-crowned Night-heron was seen near the island by one of the two boat captains, but there was little to suggest it was a nesting bird as none were seen coming to or leaving the colony.

Double-crested Cormorants were actually more numerous in 2004 as opposed to 2003 and 2002, yet there are still more than 100 fewer nests than in 2001. A total of 324 nests were found of this species, which is 77 more nests than in the previous year. Gull nesting numbers were similar to 2002 and 2003, although slightly fewer Herring and Great Black-backed Gulls were present in 2004. As in previous years, there continue to be, at least, 2 pairs of nesting American Oystercatchers (Table 7) and Canada Goose numbers were similar to those found in previous years were present. There are likely to be at least 8 nests on the on the island, but most nests had already fledged, so it was not possible to determine more accurate numbers.

The numbers of long-legged waders nesting on Huckleberry Island seems to be declining again. There was a major decline several years ago, but the populations seemed to remain stable

for the past 2-3 years. The probable reason for the current decline was evident. Upon reaching the island, hammering was heard at the pavilion at the west end of the island. Two men were re-roofing that pavilion and had been doing other repairs on the island for some time. Their supervisor was not present, so it was not possible to determine how long the crew had been working or whether there were other activities occurring on the island. Neither of the men spoke English well enough to be questioned. With hammering and other human activity (boats offloading roofing and other carpentry supplies), it is quite likely that human disturbance was responsible for the declines in 2004. Also, the trees removed in previous years within the colony makes for less buffering between the pavilion and beach area and the heron and egret nesting areas. Cormorants seem to be less bothered, but that may be because their nests are much higher and they use the Norway maples, oaks, and other larger trees. It is suggested that some outreach to the owners of the island be attempted immediately so that further disturbance during the nesting season does not occur. More importantly, it is suggested that a plan be devised to purchase the island by a state, federal or other entity (Nature Conservancy, etc.). Only through public or private conservation ownership will the integrity of this colony be maintained. It is very likely that without more protection, the island will be abandoned in the near future as a nesting colony for long-legged waders.

East River, Hutchinson River, and Long Island Sound

Goose Island. A team of 6 biologists led by Dave Kunstler, NYCPR, surveyed the heronry on Goose Island on May 27, 2004. The island was accessed via NYCPR boat. The weather during the visit was clear and mild. The bridge-tender at the nearby railroad bridge yelled at the team as we put up on the island, that we needed permission. By the time the nesting survey was completed, a NYC Police boat was at the island, complete with an armed unit. They asked for identification, etc. and told us that in the future, the Harbor Police should be informed when any island was surveyed. Future surveys by NYC Audubon should telephone a schedule to the Harbor Police.

The heronry on Goose Island held about the same numbers of long-legged wader nests as in 2003. A total of 127 nests of 5 or 6 species of long-legged waders were identified and it is possible that a single Great Black-backed Gull nest was present (although it was not found). Three adult Great Black-backed Gulls were present. There were also about one-half dozen or more Canada Goose nests present, along with a few adults. Those nests had already hatched.

The 127 nests of long-legged waders included the same 4 species as in previous years, Black-crowned Night-heron, Yellow-crowned Night-heron, Great Egret, and Snowy Egret, along with a single Glossy Ibis nest and possible Little Blue Heron nest. The latter species has nested in one or more years, whereas ibis have never been recorded nesting on the island. Black-crowns were the most numerous with 45.7% of all nests belonging to this species. Yellow-crowns, with 4 probable nests were more numerous than in past years. Snowy Egrets remain stable or have grown slightly in the past two years and Great Egrets are also stable. These two species accounted for nearly one-half (49.6%) of all nests.

The nesting population of long-legged waders on Goose Island steadily increased during the past 4-5 years, although it would seem that with 127 nests, it has reached its carrying

capacity. There simply do not seem to be enough trees and shrubs to support more than a few more nests. The density of nests on this 1-acre island appears to be the highest in the New York/New Jersey harbor.

South Brother Island. The survey of South Brother Island was conducted on May 28, 2004, via both NYCPR boat and the Wildlife Trust zodiac. Both boats left from the NYPD docks on the Harlem River/Ward's Island. A crew of 8 biologists and volunteers surveyed the island in fair weather.

As complete a count as possible was made of cormorant nests. The count amounted to slightly more than 300 actual nests found, although some areas of the island were not accessible. It was estimated that perhaps 50 nests were missed, yielding a total of 350 cormorant nests. This means the numbers of cormorants are down more than 250-275 nests from previous years. In the early to mid-1990s, nearly 800 cormorant nests were present on the island. The reason for the decline is not known. Disturbance does not seem to be an issue as the long-legged wader nesting numbers were normal. It is possible that there is a new colony somewhere, but none has been reported recently.

South Brother Island has become so overgrown in the central areas of the heronry that it is no longer possible to walk through the underbrush to where the birds nest. Views from the edge of this thick area (from the cormorant nesting areas) reveal hundreds of birds sitting on vegetation and flying/milling around the colony. The sounds of young birds begging for food and visible nests reveal that there are large numbers of nests amongst the tangles. Attempting to go into these tangles and count the nests and young/eggs would result in damage to nests, eggs, and young birds. As was found on North Brother and Canarsie Pol, some of the thickest tangles make the best nesting areas. Walking or crawling through the thick vegetation would likely have a significant adverse impact on the colony.

The numbers of nests reported herein were an estimate based on numbers counted and observed in previous years (Table 4). The numbers of nesting pairs and species composition appeared to be nearly identical to findings from the previous three years. As in 2003, the island supported a high density of nests of five species of herons, egrets, and ibis. No Yellow-crowned Night-herons were observed, although Black-crowned Night-herons accounted for roughly two-thirds (65.6%) of all nesting birds. Together Snowy and Great Egrets accounted for nearly another third (32.8%), and Cattle Egret and Glossy Ibis together accounted for 6 nests. Two of these nests were Cattle Egrets, which had not been found on South Brother Island in the previous three years. Perhaps the species is staging a comeback from its precipitous decline of the past decade. No Little Blue Herons were observed, which is surprising in light of increases on other islands and the fact that this species used to nest on South Brother in 2001 and 2002 (only 1 nest in each year). Overall, the heronry on South Brother Island remains healthy.

The changes in vegetation on the island during the period 1995 to 2004 have been dramatic. In the mid-1990s, the center of the island was somewhat sandy and relatively open habitat with a few trees. Today, the entire center of the island has become overgrown with small and mid-sized trees and they have a massive cover of vines (bittersweet, etc.). This thick tangle of vines and woody vegetation covers virtually all of the center of the island. Mike Feller from

the NYCPR Natural Resources Group has a photographic record of this island, which would be very useful for documenting the changes during the past decade and earlier. Cormorants nest mostly in the larger trees that surround the middle of the island (like a donut). Herons and egrets (mostly Black-crowns) nest in this outer ring of vegetation with the cormorants nesting higher and the herons and egrets nesting lower, as well as in shorter trees and brush. Trees are dying all over the island, a probable result of cormorant feces. As has been stated in past NYC Audubon harbor herons reports, cormorant management may eventually be warranted if they threaten to eliminate the vegetation used by the herons, egrets, and ibis.

North Brother Island. The survey of North Brother Island was done on May 28, 2004, via NYCPR boat and the Wildlife Trust zodiac. A team of 8 biologists and volunteers participated. Late in the day, NYCPR Commissioner Adrian Benepe joined the crew for a tour of the island. The weather was fair and ideal for searching for heron and egret nests.

Unlike previous years, relatively few Black-crowned Night-herons nested on the island. One Yellow-crowned Night-heron was found to be nesting on the island, which is about the norm, although in some years none are found. A decline of Black-crowned Night-heron nests amounting to more than 50% occurred between 2003 and 2004. Only 115 nests of this species were identified. They were mostly on the southwestern and southern portions of the island, within about 100-150 feet of the water. A few were found along the eastern shore of the island. No nests are known to occur in the center of the island.

The nesting areas correspond to the thickest, vine covered areas on the island. Where there are shorter trees, including black cherry, apple, and a few others, there are heron nests, but where there are mature Norway maples, cottonwoods, and basswoods (or European Tilia), there are virtually no heron nests. The nesting areas, especially those south of the southernmost buildings on the island have become overgrown with vines and poison ivy. This thick vegetation makes it almost impossible to find and survey nests without damaging some of them. By tucking their nests up under the canopy of vines (bittersweet, etc.), the Black-crowns are protected and difficult to see. Hearing the adults and young helped identify nests were and were likely to be. The succession of the areas along the southern shore of the island to trees in the 10-20 foot range has made this area more suitable for nesting. This area used to be fairly open and almost a meadow a decade ago. Habitat change on this and other islands had been dramatic during the past decade.

North Brother Island no longer supports a healthy colony of night-herons. The precipitous decline in the past 2 years is similar to the declines observed on Isle of Meadows and Shooters Island in the late 1990s. It seems that the gull numbers remain about constant after the decline several years ago, although they no longer nest on the ground, except in a few places around the periphery of the island. Habitat restoration as suggested in previous reports is still recommended, but with the recent decline, such restoration should be done very carefully and in the appropriate season when nesting birds are not present.

Mill Rock. Mill Rock, located in the East River, near the confluence with the Harlem River was surveyed via the New York City Department of Parks and Recreation Boston Whaler and a Zodiac type boat from the Wildlife Trust. The island was viewed from the water, although

vegetation did not permit observing actual nests. There was an adult Black-crowned Night-heron present, perching just inside the vegetation, but it was not determined if it was nesting. No other herons, egrets, or ibis were observed. A Black-crowned Night-heron nest was found during 2003, after the regular survey concluded that the island was not inhabited by nesting long-legged waders. Several years ago, it was predicted by the senior author of this report that this island could become a heronry in the near future. The vegetation is marginally acceptable to herons, egrets, and ibis and is certainly suitable to cormorants. In addition to the night-heron, at least two dozen gulls, both Great Black-backed and Herring, appeared to be nesting on the island in the grass adjacent to the rocky shore.

U Thant Island. This island was surveyed by E.J. McAdams and NYC Audubon volunteers on May 22, 2004 from a New York Water Taxi. Sixteen cormorant nests were observed on that day and there were numbers of gulls that were difficult to count. The site was surveyed again later in the season at which time there were more cormorants nesting on the island. The count of 16 nests is up a few nests over previous years. The birds nested in the tree that is on the island, and later were observed in nesting activities on the steel structure/sculpture on the island.

Staten Island – Arthur Kill and Kill van Kull

Shooter's Island. – The island was surveyed on June 2, 2004, by research team consisting of 7 biologists and NYC Audubon volunteers. Both the New York City Parks and Recreation boat and ConocoPhillips-Bayway Refinery boats were used. The weather was excellent for detecting the nesting of herons, egrets, ibis, cormorants, and gulls. Two crews examined the island. One crew, consisting of 3 volunteers spent nearly one hour searching the old colony area, while a second crew, consisting of 4 people examined the human encampment area and perimeter of portions of the island. No active nests or nests that appeared to be viable were detected. No adult birds were observed either during the visit to the island interior and traditional nesting areas, nor were any observed during a boat tour around the island perimeter. The Osprey nest on pilings at the east end of the island was still present and two adults were observed. The behavior of the birds suggested eggs or small young were present. This is the third year that an Osprey nest has been present on Shooter's Island (technically on pilings just off the island). Nesting songbirds heard and seen on the island were virtually the same as in previous years.

There were no gulls nesting on the island, nor were any observed near the island that appeared to be nesting birds. The island has now been abandoned by herons, egrets, ibis, and gulls for 7 about years. It is possible that Green Heron and Yellow-crowned Night-herons still may nest in places on the island, but that is unlikely given that they have not been recorded within the island interior in several years, nor have they been observed by Andy Bernick coming to or leaving the islands in the past 2 years.

The Double-crested Cormorant colony situated on dry docks and other wreckage off the west end of the island yielded about 31 active nests in 2004, along with 14 other nests on 2 channel markers nearby. This is down from the 75 nests in 2002. The numbers of cormorants now present on Shooters Island and nearby channel markers represents about 40% of the numbers of nests present on the dry docks alone in the mid to late 1990s.

The human encampment near the south side of Shooters Island appeared to be inactive. There were no signs of recent activity (cut vegetation, ashes in the fires pit, fresh trash).

Shooters Island should be monitored cautiously in the future. If long-legged waders attempt to nest, they should not be disturbed. If there is evidence that the colony has been re-established, surveys may continue on a very careful basis. The island should definitely be posted annually to keep trespassers away.

Pralls Island. A thorough search of the entire length of Prall's Island and a cruise around the perimeter of the island on June 2, 2004, revealed more evidence of heron, egret, or ibis nesting than in the past several years. Both the ConocoPhillips-Bayway Refinery and NYCPR boats delivered a crew to the island. A total of 7 people surveyed the island during fair weather. The crews searched for nests in both traditional nesting areas and other areas. The entire island was searched.

Although more nests were found than in previous years, there was no sign of successful reproduction. At least 15 and as many as 30 nests were present. All of these nests were in the birch groves and other dense vegetation at the northern end of the island. This area historically supported large numbers of nests. There were not as many birch trees standing as there were 5 years previously. Many died, presumably as a result of fungal infections. The area at the center of the island (the old apple tree) did not have any nests, nor was there any sign of recent nesting activity. No other nests were found that looked like they were built within the past 5 years.

The presence of at least 15 nests and adults, all Black-crowned Night-herons demonstrated attempts to reproduce. No young or eggs were found in nests and no fledglings were observed near the colony. Several eggs were found on the forest floor beneath nests. These could have been dropped from nests after hatching, although predation could also explain the egg shell presence. The eggs did look like some had actually hatched, so it is possible that young had already fledged and left or it is possible that they were preyed upon.

It was encouraging to see so many recently constructed nests, especially in the old colony areas. It has been more than 8 years since so many nests were present. Care should be taken in 2005 when surveying for nests. Quick checks should be made at the central and southern areas where nesting traditionally occurred and a short, but thorough examination of the northern end of the island should be made. Care should be taken to not disturb the night-herons, although it is also important to determine why nesting success was not better.

Isle of Meadows. A team of 7 biologists and volunteers was delivered to the island on June 2, 2004 by both the ConocoPhillips-Bayway Refinery and NYCPR boats. The team searched the traditional heronry areas at the island interior, and walked by other potential nesting areas. Weather for surveying was excellent. Not a single adult heron, egret, ibis, or cormorant was observed, nor were any nests that looked like they had been active in several years. Nests found were deteriorating and consisted of rotten wood. No adult long-legged waders were observed entering the old colony areas during the visit or while waiting for the ConocoPhillips-Bayway Refinery boat to pick up the field teams. There was also no evidence of gull nesting in the interior of the island or along the marshy edge of the islands on the Arthur Kill.

South Staten Island - Offshore

Hoffman Island. On May 25, 2004, Hoffman Island was surveyed by a team of 4 biologists and volunteers. The weather for the survey cooperated with light breezes, calm seas, and mild temperatures, although fog set in making navigation somewhat problematic. A trip on the previous day was cancelled because of dense fog.

Hoffman Island remains the second largest heronry in the New York/New Jersey harbor. Six species of long-legged waders nested on Hoffman Island with a total of 500 nests identified (Table 5). The numbers of nesting waders on Hoffman Island in 2004 is slightly greater than in 2003, although 13 nests fewer than in 2002. Since 2001, more than 400 nests have been present on the island and productivity appears to be very high. The isolation of this colony is one of its greatest assets.

Black-crowned Night-herons were the most numerous of the wading birds accounting for 204 nests, which is down 70 nests from 2003 and 95 nests from 2002. This species seems to be decreasing on several other islands as well. Black-crowned Night-heron relative abundance on the island has also declined from 58.6% in 2002 and 58.0% in 2003 to 40.8% in 2004. Great and Snowy egrets increased greatly from 2002 and 2003. Great Egrets increased 19.8% over 2002 levels and 36.7% over 2003 levels. Snowy Egrets more than doubled their nest numbers in 2004 as opposed to 2002 and 2003, and the percentage increase over 2001 was 42.9%. This and the previous species appear to be increasing slightly throughout the harbor.

Although no Tricolored Herons were observed in 2004, it is likely that there were Little Blue Heron nests present on the island. This estimate is based on shore-counts by Andy Bernick from Staten Island, as well as the numbers of adults observed on the day of the survey. Ibis declined slightly from 2003 and 2002, whereas Cattle Egret nests increased to 4 over the single nest found in 2003, and 3 nests found in 2001 and 2002.

The number of cormorants on this island increased again between 2003 and 2004. There were 18 and 25 pairs in 2002 and 2004, respectively, whereas a total of 34 nests were present in 2004. This represents a steady increase for four years. Because Hoffman Island has larger trees and greater area for nesting, the colony of cormorants on Hoffman Island will likely expand in the coming years. Hopefully, this potential increase will not have negative impacts on the vegetation in which herons, egrets, and ibis nest.

Herring and Great Black-backed Gulls, as well as Canada Geese continue to nest on the island. Herring Gull numbers were slightly down, from 80 adults in 2003 to only 47 adults in 2004. The 2004 total is also far lower than the totals for 2001 and 2002. Great Black-backed Gull numbers also declined slightly, from 135 in 2003 and 185 in 2002, to only 112 in 2004, which is close to the total found in 2001.

Swinburne Island. The survey of Swinburne Island on May 25, 2004, revealed a second year of decline in the number of cormorants nesting. From 210 nests in 2002 and 142 nests in 2003, the

number of nests dropped to only 108 in 2004. There also appeared to be fewer adults at the island in 2004. The number of nests found is similar to the number found in 2001, so it appears that the colony on Swinburne Island is declining. The reason for this decline is not known. If the decline continues, visits to the island should be made to determine whether there is an obvious reason for that decline. The number of Herring and Black-backed gulls found on Swinburne Island does not seem to have changed greatly in 2004 from previous years.

Because the number of cormorant nests on adjacent Hoffman Island has increased from 0 in 2001 to 34 in 2004, the actual number of nests on the two islands combined has not declined to as great a degree as indicated above. There were actually 142 nests on the two islands in 2004, which is still lower than the total of 167 nests on the two islands in 2003.

Jamaica Bay

Canarsie Pol. The survey on May 25, 2004, revealed a probable total of about 544 nests. A total of 7 species of long-legged waders nested on the island (Table 5). The only long-legged waders absent were Cattle Egret and Green Heron. A team of 4 (later 5) biologists surveyed the island. Access was provided by the Jamaica Bay Guardian (American Littoral Society) boat, captained by Don Riepe. Conditions were ideal for surveying nests, although the thickness of the vegetation made it virtually impossible to find all nests. Instead of a direct nest count, flush counts were made. Most nests were located in the traditional nesting areas along the southern shore of the island. To determine the probable number of nests, the south shore was walked and one person entered the island every few hundred yards. Adult waders were counted as they flew out of the thick shrub and vine areas. These areas also have heavy Phragmites, making walking very difficult.

There seems to be a patchwork of nesting areas along the southern shore, about 50-100 yards inland from the water. Most nests are at the east end of the island to about the center of the island. None were found at the west end of the island and no nests were present along the north shore. Glossy Ibis numbers were again very large, with some 280 probable nests present. This is up from 250 in 2003 and from only 60 in 2002. Black-crowned Night-heron numbers were similar to 2003, although about 10 fewer nests were likely. An increase in Great Egrets was evident, although Snowy Egret numbers held constant. Two Tricolored Heron nests were present, up from 1 in 2003, but slightly lower than the 6 found in 2002. Two Yellow-crowned Night-herons and 4 Little Blue Heron nests were probably present.

Canarsie Pol continues to be the largest heronry in the New York/New Jersey harbor. The expansions in recent years may be a function of abandonments on islands in the Arthur Kill-Kill van Kull complex. The vegetation on the island seems to be excellent for nesting, and the island is posted by the National Park Service. Although some boats do land on the islands, the colonies are virtually inviolate by virtue of the impenetrable vegetation and tall poison ivy and *Rubus sp. canes*. The Phragmites hampers entry from the southern shoreline.

Ruffle Bar. Although a formal survey of Ruffle Bar was not conducted during the 2004 survey season, Don Riepe and National Park Service biologists are regularly on or near the island during

spring. No long-legged waders or cormorants have been observed nesting on the island in the past decade and the activity observed by Riepe and others has not suggested nesting in 2004. Observations of this island should continue, but systematic surveys are not currently warranted given the low level of activity on this island. Perhaps a systematic search should be done in 2006 or 2007, or continued observations of the island by boat by Riepe and National Park Service biologists. In light of the absence of nesting activity in the past few years, it is unlikely that this island will be occupied unless long-legged waders abandon another island colony. Given that habitat present on Ruffle Bar appears to be suitable, it is surprising that no long-legged waders nest on the island.

White Island. The 2004 survey did not include searches of White Island. Previous searches have not revealed active or inactive nests of long-legged waders, gulls, or cormorants, so it is not necessary to conduct full surveys of this island annually. The island should be surveyed in 2006 or 2007, unless information suggesting that nesting by these birds is occurring is forthcoming.

Subway Island. This narrow island is barely an island. It is adjacent to the subway bridge that spans Jamaica Bay. The island is covered with various grasses and forbs. There are few sandy patches inland from the beaches. Tree patches are scattered here and there on the island, although none are really dense or large. The island hosts more than 100 Herring and Great Black-backed Gull nests, along with perhaps a dozen Oystercatcher nests. Don Riepe, two National Park Service biologists, a volunteer and this author surveyed the island for gull and oystercatcher nests on May 25, 2004.

Although the island is not currently occupied by nesting herons, egrets, or ibis, some of the habitat looks almost suitable or marginally suitable for this species. The island does get some visitation, although that is not permitted legally. The patches of trees could easily support Yellow-crowned Night-heron nesting in the near future and as the tree patches grow larger and denser, other herons, egrets, and ibis may also commence nesting. The habitat is likely to be suitable within about a decade. The National Park Service appears to own this island.

Little Egg Marsh. Located to the south and east of Canarsie Pol, Little Egg Marsh is not a marsh, but a sandy island made from dredge spoil. It belongs to the National Park Service. Although there is no known heronry on this island, a single Great Egret nest was observed there in a black cherry tree in 2002. The opportunity to visit this island on May 25, 2004, with Don Riepe, and three other volunteers (including biologists from the National Park Service) was used to assess the heron nesting habitat on that island. The island is used heavily by nesting gulls and there were nearly a dozen Oystercatcher nests present. Also present were slightly more than a dozen Common Terns, although no nests could be found.

Little Egg Marsh is rapidly becoming vegetated. Today it is about one-half bare sand and one-half grasses, forbs, and there is a scattering of shrubs present. Trees now growing include eastern red cedar, Ailanthus, black cherry, sumac, and a few others. In a few places, groves of trees are forming, which may be suitable for heron and egret nesting in the not too distant future. Today, the habitat is not suitable because it is too sparse. The elevation of this island above mean high tide is greater than of the islands on which herons and egrets nest, so it would seem like a prime candidate as a nesting colony as trees become more numerous and larger. As that

happens, gull nests are likely to become fewer. It is possible that the island could support tree plantings that would speed the process of establishing habitat suitable for a heronry. The types of trees and shrubs that could be planted include black cherry, bayberry, gray birch, and eastern red cedar. All of these species are known to support nesting herons in New York or New Jersey.

Species Accounts and Population Trends

The species accounts that follow summarize overall numbers of each species in the harbor and provide insight regarding their numbers on each of the islands in relation to other islands. The numbers of nests found in 2004 are also compared to the numbers for each species found during surveys in previous years. These numbers represent short term data sets, so they may not be accurate portraits of overall species trends. Care must be taken when interpreting the numbers of each species, especially with respect to short term changes. However, by examining short term changes that are embedded in changes over the past one to two decades of surveys in the New York/New Jersey harbor, some indications of rapid or sustained patterns and changes can be ascertained. For example, the decline of Black-crowned Night-herons of 23.1% in the past year is reason for concern. The finding that such a decline has occurred should raise a warning flag about this species, suggesting that something is happening and that management and research may be warranted. For other species, such as Snowy Egrets, population stability is suggested, or that there may even be an increase in the species' population over the past few years. The data cannot be considered alone, but should be examined in light of other studies that are being conducted on these birds in the New York/New Jersey harbor and regionally.

Black-crowned Night-heron. The 841 nests of Black-crowned Night-herons represents a fairly large decline of this species. This represents less than one-half of all long-legged waders, whereas in past years, Black-crowns accounted for between about 60 and 65% of nesting birds. While some other species have increased slightly in the past three years, these birds have actually declined by 252 nests (23.1%) from 2003. These birds were found nesting on 7 (possibly 8, including Mill Rock) islands in the harbor in 2004. The greatest number of nests in 2004 was 250 on South Brother Island. Declines of 70 nests on Hoffman Island, 55 nests on Huckleberry Island, and 123 nests on North Brother Island account for most of the decline from 2003. The finding of more than 15 seemingly active nests on Prall's Island was the only place where increases were noted, although few of the nests on Prall's Island were likely to have been successful. The abandonment of nesting by this species on other islands in the Arthur Kill in the 1990s and the large decline on North Brother suggests that there may be an overall decline occurring in this species. It is difficult to understand how islands such as Goose and South Brother can be so productive (many eggs and young, and stable numbers of nests), while other islands fluctuate so greatly. Determining the reason for these fluctuations would be extremely helpful in determining conservation policy for these birds, as well as developing long-term management plans for the islands in general.

Yellow-crowned Night-heron. The total of 7 nests of Yellow-crowned Night-herons on the islands of the New York/New Jersey harbor is similar to what has been found in the past 10 years. In some years, the numbers have been greater, whereas the numbers have been as low as 2 nesting pairs. It should be remembered that Yellow-crowned Night-herons in the New York/New Jersey harbor are near the northern terminus of their nesting distribution, which

explains in part, the small numbers of nests found in the harbor by the NYC Audubon team. Yellow-crowns were found on Goose Island (4 nests), South Brother (2 nests), and Canarsie Pol (2 nests), as opposed to 5 islands in 2003.

It should be stated that Yellow-crowned Night-herons are not always colonial nesters with other species. They sometimes form small colonies consisting only of Yellow-crowns and sometimes pairs nest in isolation. There are reports of individuals of this species from many parts of the city, including mainland situations and even some backyards. Harborwide, the population of this species seems relatively stable. Determining the precise number of pairs present in the metropolitan area is not possible via the harbor herons surveys, although those surveys probably can be used as indicators of overall health of this species in the greater area.

Great Egret. Although annual changes in the number of individuals nesting on some individual islands in the harbor changes dramatically from year to year, the overall harbor population of Great Egrets seems to be stable. An increase in nests from 183 in 2003 and 216 in 2001 to 230 in 2004 represents an increase of 25.7% and 6.5%, respectively. Noteworthy changes on individual islands from 2003 to 2004 included a more than 50% decline on Huckleberry Island, a 22.5% increase on Hoffman Island, and a 66.7% increase on Canarsie Pol.

Snowy Egret. The 240 Snowy Egret nests estimated for 2004 represents a slight increase from 2001-2003. In those years, between 204 and 225 nests were located, so the 2004 total represents an increase of between 6.7% to 17.6%. The numbers of nests of this species is the most constant among the long-legged waders in the harbor. This suggests that the population is stable, and may have grown slightly in the past few years. It declined only on Huckleberry Island between 2003 and 2004, from 38 to only 5 nests. On Hoffman Island, the numbers jumped from 44 and 45 in 2002 and 2003 to 100 nests in 2004. It remained about the same on Canarsie Pol. Like other species, the numbers change from year to year on individual islands, although overall the numbers do not fluctuate greatly throughout the harbor as a whole.

Little Blue Heron. The 11 Little Blue Heron nests identified during the 2004 survey represents the highest number of this species found to date. This is more than twice what has been found by the harbor herons surveys in the past 5 years, suggesting that this species may be moving farther northward. There were 4 pairs of these birds on Canarsie Pol and 6 on Hoffman Island. The other pair was found on Goose Island, although no nesting was confirmed. Those birds were not observed during the survey, but were reported by a neighbor who watches the colony. It could easily have been missed on the survey day and it has been present on Goose Island in previous years. It is possible that the population of this species is expanding up the coast and it would be interesting to know if it has been reported nesting from Connecticut or farther northeast.

Tricolored Heron. Like the Yellow-crowned Night-heron and Little Blue Heron, Tricolored Herons are more southerly species. Despite their listing as species of concern or threatened by some northeastern states, these species are very common farther south. The New York/New Jersey harbor may be the farthest north along the coast that this species nests. Both Tricolored Heron nests were on Canarsie Pol. The two nests identified is down from a previous high of 6 nests in 2002, but greater than the single nest found in the 2003 survey. The species has been seen during the nesting season once on Shooters Island, as well as Hoffman Island, but it is most

regularly reported from Jamaica Bay on Canarsie Pol. The fact that there are so few of these birds suggests that some small numbers may be missed in given years. This could explain why the numbers vary so much from year to year.

Cattle Egret. From only one Cattle Egret nest found in the 2003 survey to 6 nests in 2004 is encouraging. This species declined from more than 100 nesting pairs in the mid-early 1990s to almost nothing in the early 2000s. Two nests were found on South Brother and 4 on Hoffman Island in 2004. No nests of this species had been seen on South Brother in more than 5 years. Up to 3 nests had been found on Hoffman in 2001 and 2003, suggesting this island is still the stronghold for this species. The presence of new nests on South Brother suggests some expansion in the harbor. Because the population has declined more than 90% in the past decade, Cattle Egrets are still considered to be in decline in the New York/New Jersey harbor.

Green Heron – Although Green Herons seem to be relatively common nesters in the metropolitan area, they have not been found nesting on the harbor islands for several years. They may simply escape detection, however, they may also nest in other places, off the islands. This species commonly nests outside of colonies and is found in many areas where there are no heronries nearby. It is not known if this species' population is stable in the metropolitan area.

Glossy Ibis – Glossy Ibis seem to be making a remarkable comeback in the New York/New Jersey harbor. The 350 nests estimated to be present in 2004 is the largest number reported from the harbor in more than 7 years. A total of 21 more nests were found in 2004 as opposed to 2003. Most of the nests (80%) were found on Canarsie Pol, as was the case in 2003. On that island, the numbers increased approximately 12% in the past year. Another 65 nests were found on Hoffman Island, which is a loss of about 10 nests from 2003. Hoffman and Canarsie Pol account for 98.5% of all Glossy Ibis nests in the NY/NJ harbor. The other nests are found on South Brother (4 nests) and Goose Island (1 nest). The nest on Goose Island was the first ever recorded there.

Double-crested Cormorant. The numbers of cormorants nesting in the harbor declined for the second time in recent years. They have now declined in two consecutive years. From slightly more than 1,200 nests in 2002, the harbor population has declined by 27.1% (down 326 nests). The largest decline was on South Brother Island where an estimated 600-625 nests in 2002 and 2003, declined to only about 350 nests in 2004. Declines also were registered at Swinburne Island where the counts have gone from 210 in 2002 to 142 in 2003, and only 108 in 2004. A reduced population continues on Shooters Island, although on Huckleberry Island, the numbers of cormorant nests increased by 77 nests (31.2%). The nesting numbers on U Thant increased slightly from 11 nests in 2003 to 16 nests in 2004. The overall decline, puts the numbers of cormorants nesting in the New York/New Jersey harbor slightly lower than 1995 levels when 976 nesting pairs were present. Thus, since 1995, the population has declined 10.7%. It is not known if this is significant. It is possible that the 200+ fewer cormorants at South Brother may simply be nesting elsewhere, although we have not heard of any new colonies or any rapid expansion at colonies near the New York/New Jersey harbor area.

Herring Gull. Herring Gull numbers have declined dramatically on some of the harbor islands surveyed annually by NYC Audubon. None of the hundreds of nests on the Arthur Kill and Kill van Kull exist today. Nesting on those three islands has simply ended. On other islands, the numbers have been relatively stable. Without more intensive nest counts or taking several counts of adults at the islands, a more definitive estimate of population stability cannot be made. However, it seems that the numbers of Herring Gulls nesting on Hoffman, Swinburne, the islands in the East River, and in Long Island Sound are relatively stable, with some possible slight declines. The numbers of adult birds counted on Hoffman, for example may be declining as is the case on Swinburne, and Huckleberry Islands. The latter island dropped from 65 adult Herring Gulls observed in 2004 (with similar numbers in the two previous years) to only 5 adults counted in 2004. The presence of workmen on that island in the spring of 2004 may explain that decline. That decline mirrored the decline of nesting herons and egrets on the island that occurred between 2003 and 2004, again suggesting disturbance as a factor in those declines.

Great Black-backed Gull. The numbers of Great Black-backed Gulls on the islands surveyed by NYC Audubon remain relatively stable. In some other areas of the northeastern United States, the numbers of nesting Great Black-backed Gulls have actually increased.

Note on Osprey Nesting in the Arthur Kill-Kill van Kull. Two active Osprey nests were observed in the Arthur Kill-Kill van Kull river complex during the 2004 surveys. A nest on a piling at the east/northeast end of Shooters Island contained young during the June 2, 2004, site visit. That nest has now been active for three years. A second nest was observed on a nesting platform that is north and slightly east of Prall's Island. That nest was also active and has been present for, at least, 2-3 years. It is located in a salt marsh. A third nest was found several years ago, down the Arthur Kill towards the Outer Bridge. That nest, located on an old crane on the Staten Island side of the river, was not examined during the 2004 survey, nor were searches made for nests at the boneyard (sunken ship) area on the Staten Island side of the river.

Recommendations

- Develop a long-term plan for population monitoring and providing stewardship for those harbor herons islands included in NYC Audubon's project. The plan should include identifying potential long-term funding sources for the project.
- Continue to monitor habitat and participate in habitat restoration and enhancement projects on islands covered by this project. (Recommendations made between 1998 and 2002 in annual reports from this project are now being implemented on North Brother Island in 2004-2005 by New York City Parks and Recreation, Audubon New York, and NYC Audubon.)
- Integrate information on heron, egret, and ibis foraging areas in the harbor and adjacent areas with population information. Work by Andy Bernick from College of Staten Island and other researches will prove critical to ongoing research by NYC Audubon.
- Examine population interchange with New Jersey, Long Island, and Westchester Heronries – especially on islands like Bannister Island, east of Jamaica Bay and colonies along the New Jersey shore.
- Using existing slide/PowerPoint programs, prepare updated programs about the harbor herons to educate New York City residents regarding the harbor islands and their role as important nesting habitats for herons, egrets, ibis, and cormorants, as well as critical stopover sites for migrating songbirds.
- Conduct a Photographic Analysis of Vegetation Change on South Brother and Other Islands. Mike Feller, NYCPR Natural Resources Group, has photographed South Brother and other islands for more than a decade. Those photographs offer, perhaps, the only record of vegetation succession and change on the harbor islands. By putting together a time-series of photographs from different locations on South Brother and other islands, a more quantitative assessment of vegetation succession and change will be available. Such a record would permit better planning and management of the islands.

Table 1. Summary of islands, survey dates, and island ownership for the New York City Audubon Society Harbor Herons Project, May-June 2004.

Island Surveyed	Date	Number of Observers	Ownership
<u>Long Island Sound</u>			
Goose Island	May 27	6	NYC Parks & Recreation
Huckleberry Island	May 27	6	NYC Athletic Club
<u>East River*</u>			
North Brother	May 28	8	NYC Parks & Recreation
South Brother	May 28	8	Private
Mill Rock	May 28	4 from boat	NYC Parks & Recreation
U Thant Island	May 22	4 from boat	NYC Parks & Recreation
Riker's Island	Not Surveyed		NYC Dept. of Corrections
<u>Jamaica Bay</u>			
Canarsie Pol	May 24	6	U.S. National Park Service
Ruffle Bar	Not Surveyed		U.S. National Park Service
White Island	Not Surveyed		NYC Parks & Recreation
Subway Island	May 25	5	U. S. National Park Service
Little Egg Marsh	May 25	5	U. S. National Park Service
<u>South Staten Island</u>			
Hoffman Island*	May 25	4	U.S. National Park Service
Swinburne Island	May 25	4 from boat	U.S. National Park Service
<u>Arthur Kill-Kill van Kull</u>			
Shooter's Island	June 2	7	NYC Parks & Recreation
Pralls Island	June 2	8	NYC Parks & Recreation
Isle of Meadows	June 2	8	NYC Parks & Recreation

* May 24 trip to Hoffman Island canceled because of fog. May 25 trip to Hoffman Island from Jamaica Bay canceled because of fog. Andy Bernick group leaving from Staten Island did not encounter fog. Riker's Island, surveyed once in 1996, does not support nesting herons, egrets, ibis, or cormorants.

Table 2. Summary of heron, egret, ibis, and cormorant nests on all islands of the New York/New Jersey Harbor, May-June 2001, 2002, 2003, and 2004. *Totals include unidentified wader nests.

	<u>2001</u>	<u>2002</u>	<u>2003</u>	2004
Black-crowned Night-heron	1,049	944	1,093	841
Yellow-crowned Night-heron	2	6	8	7
Great Egret	216	214	183	230
Snowy Egret	225	204	217	240
Cattle Egret	3	3	1	6
Little Blue Heron	4	4	4	11
Tricolored Heron	2	6	1	2
Green Heron	0	0	0	0
Glossy Ibis	125	141	329	350
*Total	1,655	1,522	1,836	1,711
Double-crested Cormorant	1,178	1,203	1,098	877

Table 3. Summary of heron, egret, and ibis nesting in May-June 2001, 2002, 2003, and 2004 on Goose Island in the Hutchinson River and Huckleberry Islands in Long Island Sound. Data were collected with David Kunstler, New York City Department of Parks and Recreation.

	<u>Long Island Sound</u>				<u>Hutchinson River</u>			
	<u>Huckleberry Island</u>				<u>Goose Island</u>			
	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>
Black-crowned Night-heron	78	28	66	11	51	63	66	58
Yellow-crowned Night-heron	0	0	2	0	1	3	2	4
Great Egret	22	28	12	12	10	23	15	21
Snowy Egret	40	43	38	5	12	28	40	42
Little Blue Heron	0	0	0	0	1	0	0	1?
Glossy Ibis	0	0	0	0	0	0	0	1
Totals	140	99	118	28	75	104	123	127

Table 4. Summary of heron, egret, and ibis nesting on North and South Brother Islands in the upper East River near the Harlem River and Long Island Sound, May-June 2001, 2002, 2003 and 2004.

	<u>North Brother</u>				<u>South Brother*</u>			
	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>
Black-crowned Night-heron	242	225	238	115	240	250	250	250
Yellow-crowned Night-heron	0	0	1	1	0	0	0	0
Great Egret	0	0	0	0	55	60	60	60
Snowy Egret	2?	0	0	0	65	65	65	65
Little Blue Heron	0	0	0	0	1	1	0	0
Cattle Egret	0	0	0	0	0	0	0	2
Glossy Ibis	0	0	0	0	6+	8	4+	4
Unidentified	0	0	0	0	10	0	0	0
	244	225	239	116	377+	384	379+	381

* The 2004 survey count for South Brother Island is an estimate based on counts from the previous years and counts of adults seen during the May 28, 2004 visit to the island. At the time of the survey, young were well developed and began jumping from the nests when the survey commenced. Also, vegetation in the long-legged wader colony has become so thick that walking among the nests is not possible without stepping on nests or knocking them to the ground. Therefore, a thorough survey of nests, eggs, and young would have incurred significant impact to the colony.

Table 5. Summary of heron, egret, and ibis nesting on Hoffman Island off southern Staten Island and Canarsie Pol in Jamaica Bay. May-June 2001, 2002, 2003, and 2004. Counts of nests were not made in 2003 or 2004 on Canarsie Pol because the vegetation is simply too thick to walk through. Numbers in the tables represent adult birds flushed from nesting areas that were identified via nest observations and behavior of adults.

<u>Species</u>	<u>Hoffman Island</u>				<u>Canarsie Pol</u>			
	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>
Black-crowned Night-heron	208	301	274	204	50	65	198	188
Yellow-crowned Night-heron	0	2	2	0	0	1	1	2
Great Egret	54	81	71	97	35	22	24+	40+
Snowy Egret	70	44	45	100	25	24	29+	28+
Cattle Egret	3	3	1	4	0	0	0	0
Little Blue Heron	1	1	3	6	0	2	1	4
Tricolored Heron	1?	0	0	0	1	6	1?	2
Glossy Ibis	51	81	75	65	45	60	250	280
Unidentified	15	0	1	24	0	0	0	0
Total	403	513	472	500	156	180	504	544

Table 6. Summary of Double-crested Cormorant nesting in the New York/New Jersey harbor, May-June 2001, 2002, 2003, and 2004 (data from NYC Audubon Harbor Herons Project and Dave Kunstler, New York City Parks & Recreation).

<u>Island</u>	<u>Year – Number of Cormorant Nests</u>			
	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>
Shooter’s Island	73	75	48*	45*
Huckleberry Island	455	289	247	324
South Brother Island	525	600	625**	350
U Thant Island	10	11	11**	16
Hoffman Island	0	18	~25	34
Swinburne Island	115	210+	142	108
Total	1,178	1,203	1,098	877

*Includes 17 and 14 nests, in 2003 and 2004 respectively, on channel markers in the Arthur Kill between the Bayonne Bridge and Outer Bridge Crossing.

**Estimated based on numbers present in previous years.

Table 7. Summary of Great Black-backed and Herring Gull nesting on selected islands of the New York/New Jersey harbor, May-June 2001, 2002, and 2003. Canarsie Pol and Ruffle Bar both host large nesting populations of both species of gulls (other researches monitor those colonies). Also, large numbers of gulls nest on both Subway Island and Little Egg Marsh and are counted by other researchers. There was no sign of nesting on Prall’s Island, and Isle of Meadows. U Thant Island was not surveyed in 2004.

	<u>Herring Gull</u>				<u>Great Black-backed Gull</u>			
	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>
Shooter’s Island	0	0	1+	0	0	0	1+	0
Huckleberry Island	76	38	65	5	51	76	55	2
Goose Island	0	0	0	0	1	1	1	0
Mill Rock	8	20	15	15	1	36	10	8
South Brother Island	40	38	35	40	15	32	28	40
North Brother Island	32	126	100+	100+	26	52	50+	50+
U Thant Island*	0	0	0	--	10+	16	12	--
Hoffman Island	115+	75	80	47	70+	185	135	112
Swinburne Island	130	82	86	84	80	72	55	6

