NEW YORK CITY AUDUBON

NEW YORK CITY AUDUBON'S HARBOR HERONS PROJECT:

2006 INTERIM NESTING SURVEY

September 28, 2006

Prepared for:

New York City Audubon
E.J. McAdams, Executive Director
71 W. 23rd Street, Room 1529
New York, NY 10010
212-691-7483
www.nycaudubon.org

Prepared by:

Andrew J. Bernick
2856 Fairhaven Avenue
Alexandria, VA 22303-2209
Tel. 347-782-5679
bernick@mail.csi.cuny.edu

With additional data provided by:
Dr. Susan Elbin, Wildlife Trust
and
David S. Künstler, New York City Department of Parks & Recreation,
Van Cortlandt & Pelham Bay Parks Administrators' Office

Funded by:
ConocoPhillips-Bayway Refinery

Abstract

New York City Audubon's Harbor Herons Project interim nesting survey of New York/New Jersey Harbor and surrounding waterways was conducted in May and June 2006. The entire NY/NJ Harbor wader population was not surveyed in 2006. This report summarizes wader and cormorant nesting activity at Shooter's Island, Prall's Island, Isle of Meadows, North Brother Island, South Brother Island, and Mill Rock. Additional data provided on (1) wader and cormorant nesting activity on Huckleberry and Goose islands (David Künstler, NYC Parks), and (2) harborwide Double-crested Cormorant nesting and wader activity on Hoffman Island (Dr. Susan Elbin, Wildlife Trust) is also briefly summarized. In total, seven species of wading birds (Black-crowned Night-Heron, Great Egret, Snowy Egret, Little Blue Heron, Glossy Ibis, Yellow-crowned Night-Heron, and Cattle Egret) were confirmed as breeders on seven islands. South Brother Island was the largest wader colony (485 nests), and Black-crowned Night-Herons were the numerically dominant nesting species (554 nests on six islands). The colony of Black-crowned Night-Herons at Mill Rock increased to 60 nests in 2006, while their nesting activity decreased to 87 nests at North Brother Island. No active wader nests were noted on islands in the Arthur Kill and Kill Van Kull, in spite of recent nesting attempts noted at Prall's Island over the past five years. Double-crested Cormorants nested on or near six islands (1,175 nests total), and showed continued expansion of breeding activity on Hoffman Island (166 nests). The largest Double-crested Cormorant colony was on Huckleberry Island (344 nests). Breeding was confirmed for Little Blue Heron during cormorant surveys on Hoffman Island, which appears to have supported similar numbers of wader nests as recorded in 2004. One Black-crowned Night-Heron nest was noted on Swinburne Island, an island dominated by Double-crested Cormorants. Yellow-crowned Night-Herons were confirmed as nesters at mainland sites in Far Rockaway and Staten Island, totaling 30 nests. The next complete Harbor Herons survey is scheduled for 2007.

Introduction

New York City Audubon's Harbor Herons Project interim nesting survey of islands in New York/New Jersey Harbor and surrounding waterways was conducted in May and June 2006. This marks the second interim survey of the NY/NJ Harbor islands, and the 22st consecutive year for the NYCA's Harbor Herons Project. The primary objective of the 2006 survey was to monitor the population status of wading birds (i.e. herons, egrets, ibis) on select islands in New York/New Jersey Harbor and surrounding waterways, while also noting the presence of other nesting bird species (i.e., cormorants), and any major changes in current nesting habitat.

In 2006, six islands were selected for surveys to: (1) confirm the presence or absence of wader breeding activity on recently abandoned islands in the Arthur Kill-Kill Van Kull complex (Shooter's and Prall's islands, and Isle of Meadows); (2) confirm wader breeding at a recently established colony (Mill Rock); (3) assess wader breeding status on North Brother Island, where NYC Parks and Recreation conducted a habitat restoration project in winter/spring of 2005 and 2006; and (4) monitor existing wader and cormorant populations on South Brother Island.

Islands surveyed (Table 1, Figure 1) in 2006 as part of the interim survey included Shooter's and Prall's islands, and Isle of Meadows in the Arthur Kill-Kill Van Kull complex; North and South Brother Islands, and Mill Rock in the East River area. These islands were surveyed by a research team consisting of survey leader Andrew Bernick, volunteers from NYC Audubon and other organizations, and staff from New York City Department of Parks and Recreation.

In addition, Double-crested Cormorant counts were conducted on all known islands and structures that support nests in NY/NJ Harbor, including Shooter's and South Brother islands (by NYCA with assistance from Wildlife Trust); and Hoffman, Swinburne, U Thant, and Huckleberry islands (by Wildlife Trust). Information on wading bird nesting at Goose Island in the Hutchinson River and Huckleberry Island in Long Island Sound (Westchester County) is drawn from reports by David Künstler (NYC Department of Parks and Recreation, Van Cortlandt & Pelham Bay Parks Administrators' Office; see Künstler 2006, 2006b). Cursory observations of wading birds nesting on Hoffman and Swinburne islands were made by the author in May.

As the entire wader population was not surveyed in 2006, this report summarizes breeding activity on specific islands only. Population trends for individual species are not presented in this report.

In Fall 2004, NYC Audubon made a decision to shift the Harbor Herons Nesting Survey from an annual to a triennial schedule (with the next complete survey scheduled for Spring 2007), and in intervening years to conduct interim surveys on islands of interest. Monitoring wading bird and cormorant nesting populations in NY/NJ Harbor provides both an estimate of the health of local wading bird populations, and a valuable indicator of the overall health of the region's natural resources.

Methods

The 2006 survey followed methods used by former Harbor Herons Project survey leaders Dr. Katherine Parsons (1986-1995) and Dr. Paul Kerlinger (1996-2004). All counts were conducted between 0900 and 1640h, under clear conditions without rainfall, high winds (>8 knots), or temperatures above 80°F.

For wading birds, one or two teams of researchers quickly and systematically searched for nests on each island, initially focusing effort on areas occupied by nesting birds in previous years. A team included two counters (i.e. one person using a telescopic mirror pole (Figure 2) to examine contents of nests up to five meters from the ground, and another to record data), and from one to three spotters, who moved slightly ahead to direct the counters to nests, and keep multiple teams from re-sampling the same nests. A nest was considered active if it contained eggs or young, if there was evidence of recent construction (e.g. fresh twigs or vegetation in nest) or use (e.g. a layer of fresh feces underneath a nest), or by direct observation of adults on or within one meter of a nest. Whenever possible, nests were identified to species by the young, eggs, or nest structure. Nests beyond the reach of the mirror pole were examined with binoculars. If nest contents could still not be confirmed, but other evidence suggested recent activity (e.g. feces, new nest construction), nests were noted as active with contents 'unknown'. Additionally, old or unused nests were noted in the count as 'empty', but not included in the final tally of active nests. The number of eggs and young for each nest were recorded when possible, unless older nestling activity (e.g. leaping from nest, climbing away from nest area) precluded safe observation of nest contents. In this case, nests were only identified to species. Finally, wader nesting habitat (e.g. tree, shrub, or vine species) was noted whenever possible.

For Double-crested Cormorants, surveys were mainly conducted by direct observation (as detailed above), with the exception of Shooter's and U Thant islands, which were surveyed via binoculars by boat and shore, respectively. When possible, cormorant nests occupying trees above or with wader species were noted separately. As in previous years, cormorant nest contents (e.g. number of eggs/young) were not described in detail by the Harbor Herons survey.

In 2006, exhaustive searches for Great Black-backed and Herring gull nests were not conducted. When adults were counted in the vicinity of certain colonies, a nest was assumed present for each adult seen, as one-half of adults are assumed to be foraging away from the nesting colony during daytime (see Kerlinger 2004). All other species (e.g. waterfowl, shorebirds, etc.) were noted on an opportunistic basis, and should not be considered complete counts for a given island. The protocol for these counts will be revised by the author for the 2007 full survey.

Transportation

Boat access to islands and logistical support in the field was provided by Captains Art Roesler and Jerry Woerner of ConocoPhillips-Bayway Refinery's Oil Spill Response Team (for surveys in the Arthur Kill and Kill Van Kull), and by Alexander Summers and Nathaniel McVay of the New York City Department of Parks and Recreation-Natural Resources Group (for all other surveys). NYC Audubon sincerely thanks ConocoPhillips-Bayway Refinery and the NYC Department of Parks and Recreation-Natural Resources Group for their time, fuel, vessels, and able captains.

Dr. Susan Elbin of Wildlife Trust, Richard Chipman of the U.S. Department of Agriculture, and Kevin Seagriff and Steve Schiffer of the National Park Service provided boat transportation to collect additional survey information on Double-crested Cormorants.

Results

For all interim survey and additional islands visited in 2006, a total of 803 nests of six species of wading birds (Black-crowned Night-Heron, Great Egret, Snowy Egret, Glossy Ibis, Yellow-crowned Night-Heron, and Cattle Egret) were confirmed as breeders on seven islands (Tables 2 & 3). A seventh species, Little Blue Heron, was confirmed as nesting on Hoffman Island during cormorant surveys on the island, although a full wading bird census of the island was not conducted. An additional 16 nests were unidentified on two of seven islands.

No wading bird nesting activity was noted on islands in the Arthur Kill and Kill Van Kull (Isle of Meadows, Prall's Island, and Shooter's Island). Reproduction of White-tailed Deer was confirmed on Isle of Meadows and Prall's Island, the first record of this occurrence in the history of the Harbor Herons Project.

A slight decline in nesting activity from the 2005 breeding season was noted for North Brother Island, while the new Black-crowned Night-Heron colony at Mill Rock continued to increase (from 43 to 60 nests), with the possibility of attempted Great Egret nesting early in the breeding season.

Cattle Egret adults were rarely encountered within nesting colonies (one nest at South Brother Island), and appear to have largely abandoned the NY/NJ Harbor area.

Cursory observations of wading birds nesting at Hoffman Island appeared to have similar nesting activity as in recent years (~500 nests), and added an additional confirmed nesting species (Little Blue Heron). Canarsie Pol was not surveyed in 2006. These two islands support the largest Glossy Ibis nesting aggregations, the reason why this species is underrepresented in Tables 2&3.

Goose and Huckleberry Islands continue to support reduced numbers of wading bird nests, and a precipitous decline for Black-crowned Night-Herons on Huckleberry was noted in 2006.

A total of 1,175 Double-crested Cormorant nests were observed on six islands (Hoffman, Swinburne, Shooters, South Brother, Huckleberry, and U Thant Islands; Table 2). No evidence of nesting was found on channel markers surveyed in the harbor. Harbor-wide population trends are not easily described from simple comparison of nest numbers. For instance, the 2006 nesting "increase" at one colony (Swinburne Island) in 2006 is likely the result of a change in survey method (on shore vs. by boat), coupled with a late July count by boat in 2005 (with nests obscured by vegetation. On other islands, increases have been well-described; in 2006, a total of 166 Double-crested Cormorant nests were counted throughout the southern portion of the island, a 39% increase over the previous year—this represents the fifth year of Double-crested Cormorant expansion on Hoffman Island. A summary report on the 2006 nesting season is currently in preparation (Elbin and Bernick 2006).

1. Interim Survey Island Accounts

East River

North Brother Island: The survey of North Brother Island was conducted on 18 May 2006 from 0910-1040h, by the author and seven assistants (Susan Elbin, Gareth Russell, Janine Harris, Colin Grubel, Liz Craig, Nate McVay, and Alex Summers). Also present were Yigal Gelb, Nicole Delacretaz, Mike Feller, and Richard Lee (NY Times). The island was accessed via the NYCDPR Vessel *Parker* and canoe.

A total of 87 active Black-crowned Night-Heron nests were located on the island, and an additional 12 empty, unused nests were located. This represents an 8% decrease in Black-crowned Night-Heron nesting on North Brother from 2005, though increases for this species were observed in two nearby colonies (Mill Rock and South Brother Island). At the time of this survey, most nests contained three to four eggs, with few young nestlings (> one week old) present.

Wader breeding activity continues on the southwestern and southern edges of the island, in areas characterized by: 1) Oriental Bittersweet and other vines tangled around collapsing structures, chain-link fences, and trees; 2) underneath Black Cherry, White Mulberry, and other tree species completely covered by mats of Oriental Bittersweet, and 3) Black Cherry, Gray Birch, and White Mulberry unencumbered by vines. A major habitat restoration project was undertaken by NYC Department of Parks and Recreation in winter and early spring 2005 and 2006, with financial support from Audubon NY (via a National Fish and Wildlife Foundation grant), and assistance from NYC Audubon and other organizations. In 2006, approximately two acres of Norway Maples were cleared adjacent to the Tuberculosis Pavilion on the western side of the island, and native vegetation was planted in this vicinity (Mike Feller, personal communication).

It is important to document habitat changes observed as a result of the ongoing habitat management project. NYC Department of Parks and Recreation—Natural Resources Group has begun this process by creating a GPS map of all Black-crowned Night-Heron nests on the island. If it has not already been produced by NYC Parks, a summary of all planting activity, species

composition and monitoring schedule cut areas, and future goals of the project at North Brother Island should be made available.

South Brother Island: The survey of South Brother Island was conducted on 18 May 2006 from 1205-1400h, by the author and six assistants (Susan Elbin, Gareth Russell, Nicole Delacretaz, Colin Grubel, Liz Craig, and Nate McVay). Also present were Mike Feller and Richard Lee. The island was accessed via the NYCDPR Vessel *Parker* and canoe. Due to time constraints, counts were conducted without close examination of nest contents.

Nevertheless, a total of 471 nests of six wader species (Black-crowned Night-Heron, Great Egret, Snowy Egret, Glossy Ibis, Yellow-crowned Night-Heron , and Cattle Egret; see Table 2) and 14 unidentified wader nests were located throughout the colony, while Double-crested Cormorants (326 nests) primarily occupied, but were not restricted to, the center and northeastern areas of the colony. In general, most wading bird nests contained two to three week old nestlings; South Brother consistently has earlier hatch dates than those of North Brother. Certain areas of the island were difficult to access due to considerable amounts of Oriental Bittersweet and other vines. Adjustments to the sampling protocol will be considered for the 2007 survey protocol redesign.

Nesting habitat for cormorants on South Brother included a stand of locust trees (in the center of the colony, where the majority of nests are located), as well as White Mulberry, Black Cherry, and other tree species covered with Oriental Bittersweet also preferred by wading birds.

On average, survey participants find, *per visit,* up to 10 adult wading birds and cormorants killed by entanglement in fishing line or other debris---this is one of the most unfortunate annual events on these surveys. On South Brother Island alone, four Black-crowned Night-Herons, one Great Egret, and two Double-crested Cormorant adults were found dead due to entanglement in line on or near the nest (Figure 2). Often, an adult is found entangled on or near a nest with unhatched eggs. This is a completely avoidable outcome, provided that proper disposal of old line and hooks is encouraged.

Currently, South Brother Island is owned by a private entity (Hampton Scows). As an important nesting area, this island will not be entirely secure until easements are procured, or it is purchased by a public or private conservation organization. We strongly suggest that South Brother Island, which is the third largest wader and cormorant colony in NY/NJ Harbor, be placed on a priority acquisition list in order to safeguard its future as a key Harbor Herons colony. At the very least, dialogue with the current owners should be actively pursued before 2007, as this is one of the most unique islands in the NY/NJ Harbor area, one where waders and cormorants have bred in close proximity for several years.

Mill Rock: Mill Rock, located near the confluence of the East and Harlem rivers, was surveyed on 18 May 2006 from 1540-1640h, by the author and eight assistants (Susan Elbin, Gareth Russell, Nicole Delacretaz, Yigal Gelb, Colin Grubel, Liz Craig, Alex Summers, and Nate McVay). Access to the island was provided via NYCDPR Vessel *Parker*.

A total of 60 Black-crowned Night-Heron nests and two inactive/empty nests were located in the main body of Mill Rock, mainly in mulberry trees, with a few nests in Black Cherry and one in Staghorn Sumac. The narrow southern spur, which also contained numerous mulberry trees, did not support any nests.

Evidence of Black-crowned Night-Heron nesting was first observed by the author in June and July 2003, during the pilot year of the NYC Audubon Shore Monitoring Program, and was subsequently confirmed in 2005.

On 8 May, E.J. McAdams noted two Great Egret adults on the north and west of the island emerging from what seemed to be low nests on 8 May. On the survey of 18 May, no Great Egret adults were noted on or near Mill Rock, and no Great Egret nests or eggs were identified. This is an intriguing sighting, nonetheless, and we should be vigilant for all evidence supporting the presence of other wader species nesting in this burgeoning colony.

The brick barbeque pit and several park benches present on the northern part of island did not look recently used, although unauthorized access at Mill Rock should be monitored closely. We suggest that this material be removed from the island, to discourage future use.

Staten Island – Arthur Kill and Kill Van Kull

Prall's Island. The island was surveyed on 15 June 2006 by the author and five volunteers (Susan Elbin, Liz Craig, Colin Grubel, Gareth Russell, and Abraham Rosales) from 0930 to 1140h. Access to the island was provided via ConocoPhillips-Bayway Refinery Oil Spill Response Vessel *Baywave II*. One team searched the entire island for nests in both former nesting areas, as well as areas where adults were observed roosting during the 2004 and 2005 surveys (i.e. *Phragmites* stands on the southern tip)

There was no sign of active Black-crowned Night-Heron nesting during this survey, nor during observations conducted in June and July 2006 by Alexander Summers and Nathaniel McVay. A total of 28 empty, inactive nests were located. All of these nests were located approximately five meters up in Gray Birches in the northern half of the island.

On the northern end of the island, we observed a White-tailed Deer fawn resting in the brush. This is compelling evidence for an actively breeding deer population in the Staten Island area; it is not surprising for Prall's Island, where deer trails have been observed for several years.

Additional bird species included Great Horned Owl and American Woodcock. The osprey platform located near the end of River Road on Staten Island was active, with two adults in the vicinity of the nest.

Shooter's Island: The island was surveyed on 15 June 2006 by the author and five volunteers (Susan Elbin, Liz Craig, Colin Grubel, Gareth Russell, and Abraham Rosales) from 1215 to 1320h. Access to the island was provided via ConocoPhillips-Bayway Refinery Oil Spill Response Vessel *Baywave II*. No wading birds were observed in the interior of the island

(Figure 4), or around the island perimeter when surveyed by boat. There continues to be no sign of recent activity at the former human encampment near the south side of Shooter's Island.

The Double-crested Cormorant colony situated on dry docks and other wreckage west of Shooter's Island yielded 54 active nests in 2006. No nests were observed on the nearby channel marker (Marker 18, Kill Van Kull). Cormorant nesting on Shooter's Island drydocks was the highest it has been since 2002, though still represents a marked decline from numbers in the mid-1990s.

Additional species observed on Shooter's Island included singing Wood Thrush, Warbling Vireo, and Cedar Waxwing. Two Herring Gull nests were observed on the dry docks to the west of Shooter's, and three nestlings were confirmed in the Osprey nest on pilings at the east end of the island was still present. This is the fifth year that an Osprey nest has been present on the same piling east of Shooter's Island.

Isle of Meadows: The island was surveyed on 15 June 2006 by the author and five volunteers (Susan Elbin, Liz Craig, Colin Grubel, Gareth Russell, and Abraham Rosales) from 1410 to 1620h. Access to the island was provided via ConocoPhillips-Bayway Refinery Oil Spill Response Vessel *Baywave II*. The traditional colony areas at the island interior were searched, as well as potential nesting areas on the northern section of the island formerly utilized by nesting gulls. No wading birds, cormorants, or gulls were observed, nor were there any nests that looked recently active.

As on Prall's Island, a White-tailed Deer fawn was observed on Isle of Meadows (Figure 3); considering its age, it was undoubtedly born on the island. Populations of White-tailed Deer have been noted on Staten Island for many years, but breeding activity on islands in the Arthur Kill is likely a more recent development.

A large stick nest was discovered near the edge of the formerly active part of the colony. Its size and bulk suggests a raptor or owl nest, although it did not seem recently active (i.e., no whitewash or pellets in the area).

2. Additional Island Accounts

Goose Island: David Künstler (NYCDPR) led the survey of Goose Island with two assistants (Nicole Delacretaz and Tony Rho) on 25 May 2006 from 1100-1500h. The island was accessed by canoe. A total of 108 nests of three species of waders were identified, a slight increase over 2005 totals. Nests included the same three species as in previous years (Black-crowned Night-Heron, Great Egret, and Snowy Egret), and a single Yellow-crowned Night-Heron indicating a probable nesting attempt. Black-crowned Night-Herons were the most numerous (64 nests), an increase of 20 nests over 2005. Great Egret nesting declined slightly from 2005 (from 30 to 22 nests), while Snowy Egret nesting increased slightly from the previous year (from 17 to 21 nests). Detailed information on wader nesting and nest productivity on Goose Island may be found in Künstler (2006).

Huckleberry Island: This survey was conducted on 27 May 2006 by David Künstler, Susan Elbin, Chip Weseloh, Alex Summers, Nate McVay, Yigal Gelb, Liz Craig, and Colin Grubel. The island was accessed by the NYCDPR Vessel *Parker*. Gerry Padian and Johnny Burke of Huckleberry Indians, Inc. provided access and on-site support.

A total of 20 wader nests of two species (Black-crowned Night-Herons and Great Egrets) were located on the east side of the island, a precipitous drop from the late 1990's. While Great Egret nesting was the same as last year (eight nests), a 29% decrease in Black-crowned Night-Heron nests since 2005 was observed, and no Snowy Egret nests were observed. Conversely, the number of Double-crested Cormorant nesting increased slightly, though still represents fewer nests than were present in the late 1990's. As in previous years, American Oystercatchers were present (eight adults), along with Herring (40 adults) and Greater Black-backed (90 adults) gulls. More information on the Huckleberry Island survey may be found in Künstler (2006b).

Due to the wading bird nesting declines and relatively stable Double-crested Cormorant nesting exhibited on Huckleberry Island in recent years, NYC Audubon, Wildlife Trust, and NYC Department of Parks and Recreation feel that it is critical to continue monitoring activities. In the future, we will work closely with the owners of Huckleberry Island to assure necessary researcher access to this island. Huckleberry Island is one of a small number of critical nesting sites for both wading birds and cormorants in the NYC area; through continued collaboration with the Huckleberry Indians, we will work to protect this unique island and its resources.

U Thant Island: This island was surveyed by Dr. Susan Elbin and Liz Craig from shore with binoculars (Manhattan, 37th Street at the East River) on 8 June 2006 under clear conditions. A total of 21 Double-crested Cormorant nests were observed on the island, with 11 nests on the arch sculpture, and the remaining nests in defoliated trees.

Hoffman and Swinburne islands: On 30 May 2006, Double-crested Cormorant counts were conducted at Swinburne Island by Susan Elbin, Richard Chipman, Chip Weseloh, Liz Craig, and Colin Grubel. Wading birds were not fully censused this season. Ground surveys were employed to estimate nest numbers, and nesting trees were temporary marked with flagging to avoid resampling. A total of 166 cormorant nests were observed on Hoffman (an increase of 39% from the previous year), and 264 nests on Swinburne Island.

Double-crested Cormorant nests on Hoffman Island were mainly located in ~10-20 meters up in Black Locust trees, which have not been previously used as nesting trees by wading birds. Since 2005, Double-crested Cormorant nesting expanded across the southern end of the island; while they were in close proximity to wading bird nests in some locations, they did not seem to be directly competing for nesting sites at the present time. This relationship will be closely monitored by Wildlife Trust as part of their NY Bioscape Initiative study.

In summer 2006, color-banding of Double-crested Cormorant nestlings (~200 individuals) on Swinburne Island was conducted by Wildlife Trust. If any orange leg bands with black writing (letter-number) are noted in the NY/NJ Harbor, please contact Dr. Susan Elbin (elbin@wildlifetrust.org) with the leg band code, location, date, and name of observer.

In terms of wading bird nesting, during Wildlife Trust Double-crested Cormorant banding and follow-up surveys, the author located one active Black-crowned Night-Heron nest (3 eggs) on Swinburne Island (14 June 2006), the first confirmation of wading bird nesting on Swinburne Island in several years. On Hoffman Island (12 July 2006), six species of waders (Black-crowned Night-Heron, Great Egret, Snowy Egret, Glossy Ibis, Little Blue Heron, and Yellow-crowned Night-Heron) were confirmed as nesters, and based on a cursory examination of the island. The numbers of wading bird nests for each species seemed similar to 2004 (i.e. approximately 500 wader nests). No Cattle Egret nests or adults were observed on Hoffman Island.

3. Mainland Accounts

The NYC Audubon Harbor Herons nesting surveys traditionally report on nesting activity on island colonies, but two notable examples of mainland Yellow-crowned Night-Heron (YCNH) nesting should be noted. The first example, a nesting colony located at the Redfern Houses in Far Rockaway, grew to 29 nests (Figures 5, 6, and 7). This is its third year in existence, and is the largest YCNH colony recorded for New York City (P.A. Buckley, personal communication, July 2006). Currently, NYC Audubon is establishing a dialogue on the existence and persistence of this colony with the residents and management of the Redfern Houses, the NYC Housing Authority, and the NYC Department of Parks and Recreation.

The second example is a single YCNH nest established in the Randall Manor neighborhood of Staten Island (reported by Tim Violette and Eva Scripps-Callahan). This nesting attempt failed when a storm on 29 June caused nest contents (3 eggs) to be ejected.

Lastly, Hugh Corolla (Hackensack Riverkeeper) informed the author that nesting of both Yellow-crowned and Black-crowned Night-Herons has been reported at several sites in northern New Jersey in recent years. In 2006, Yellow-crowned Night-Herons were confirmed as breeders in Secaucus (at Schmidt's Woods Park and Harmon Cove) and in central Bergen County (vicinity of Waldwick and Allendale); and ~24 Black-crowned Night-Herons nests were located at Laurel Hill County Park in Secaucus.

In future Harbor Herons reports, any confirmed wader nesting reports from NJ will be noted. However, any person with detailed information on wader nesting in northern NJ is encouraged to report it to NJ-DEP's Division of Fish and Wildlife-Endangered and Nongame Species Program (Tel. 609-292-9400).

Conclusions and Recommendations

New York City Audubon's Harbor Herons Project has expanded over the past two years to include several additional programs (i.e. Harbor Herons Monitoring Program and Eco-tours) that allow for greater public participation and awareness of the 'Harbor Herons', and have strengthened NYC Audubon's role as an advocate for conserving NY/NJ Harbor's wading bird populations. New and vital collaborations between NYC Audubon and other organizations (i.e. Wildlife Trust) have formed, and the open forum of NY/NJ Harbor Estuary Program's Harbor

Herons Subcommittee has brought organizations and agencies from New York, New Jersey, and Connecticut to discuss issues of regional importance.

Continued monitoring of wading bird populations through nesting surveys is a necessary step to comprehend species status, population trends, and overall health and persistence of the system. The first step will be to revise the current survey protocol, and summarize existing trend data on Double-crested Cormorants:

- In Fall 2006, a revised survey protocol will be designed by the author to address the constantly changing conditions on colonies in the NY/NJ Harbor area, and sent for review to researchers experienced in colonial waterbird censusing. These surveys will include habitat monitoring and assessment, and a framework for measuring nestling productivity at select islands. Long-term funding is critical to support these triennial nesting surveys, and is currently being sought from both private and public sources.

- In Fall/Winter 2006, a report on Double-crested Cormorant population trends in the NY/NJ Harbor area (1986-2006) will be written by the author, in collaboration with Dr. Susan Elbin of Wildlife Trust.

Additional recommendations are as follows:

- Complete and distribute the Harbor Herons Conservation Plan for external review by the end of 2006 (designed by the NY/NJ HEP Harbor Herons Subcommittee).

- Open/continue dialogue with all agencies responsible for colonial waterbird surveys in New York, New Jersey, and Connecticut, in order to establish a working regional perspective on colonial wading bird and cormorant populations.

- For islands that are currently privately owned (i.e., South Brother and Huckleberry island), continued communication and collaboration with the current owners should be pursued by parties interested in the persistence of wading bird and cormorant populations.

- Discuss the future of the Yellow-crowned Night-Heron colony in Far Rockaway with all stakeholders (residents, management, and conservation agencies), in order to come up with a reasonable solution to this issue.

- Encourage the development of wading bird and cormorant research projects at NY/NJ universities, at high school, undergraduate, and graduate levels.

- Establish a list of research conducted each season on the Harbor Herons or their nesting colonies (see Appendix A).

- Analyze and publish trend data from the 1986-2005 NYC Audubon Harbor Heron Surveys. These data were entered into a database in Summer 2005 by Ariana Harari and Susan Elbin (Wildlife Trust).

- Examine relationships between or among metropolitan NY/NJ area colonies with southern New Jersey, Long Island, and Connecticut, including gene flow, post-fledging dispersal, and natal philopatry.

- Conduct surveys of mammalian and avian predators present on wading bird nesting islands.

- Design a photographic guide of nests, eggs, and young to aid volunteers in identification during nesting surveys. A reference guide to identify nest trees, shrubs, and vines should also be developed, particularly in association with Mike Feller and David Künstler, both of NYCDPR. Guides should be available in PDF format for all volunteers.

Acknowledgements

We thank all volunteers, organizations, and agencies who made the 2006 surveys. Financial support was provided by ConocoPhillips-Bayway Refinery, and from the members of New York City Audubon. In particular, we thank Michael Karlovich of ConocoPhillips-Bayway Refinery for his interest in the Harbor Herons Project.

Volunteers who participated in the 2006 surveys and related efforts included Vonelle Alocco, Christina Aracil, Felicity Arengo, Richard Chipman, Hugh Carolla, Liz Craig, Nicole Delacretaz, Jackie Duhon, Susan Elbin, Mike Feller, Rhonda Foley, Yigal Gelb, Colin Grubel, Natalia Gorobinskaya, Janine Harris, Fred Harvey, David Künstler, Richard Lynch, Nathaniel McVay, Veronica Padula, Katie Profaci, Matt Palmer, Ken Pricer, Alexander Summers, Tony Rho, Art Roesler, Abraham Rosales, Gareth Russell, Zarah Toufique, John Stonick, Steve Schiffer, John Waldman, Laura Waldman, D.V. 'Chip' Weseloh, Justin Whitehurst, and Emily Yurlina.

We wish to acknowledge NYC Department of Parks and Recreation for their continuing support and close involvement in the Harbor Herons Project, particularly Bill Tai, David Künstler, Mike Feller, Alexander Summers, and Nathaniel McVay. The National Park Service allowed access to islands within Gateway National Recreation Area for Wildlife Trust's Double-crested Cormorant study, where information on the status of waders and cormorants on Hoffman and Swinburne islands was acquired. Kim Tripp (National Park Service-Jamaica Bay Institute) provided assistance in the permitting process.

Dr. D.V. 'Chip' Weseloh of the Canadian Wildlife Service, the New York State Department of Environmental Conservation (particularly Dave Adams and Joseph Pane), and Richard Chipman and Ken Pricer of the U.S. Department of Agriculture provided their expertise, insight, and assistance in contemplating and surveying NY/NJ Harbor's Double-crested Cormorant population.

Finally, I personally thank Drs. Paul Buckley, Paul Kerlinger, Katherine Parsons, and Richard Veit for their guidance and support of my studies of wading birds, and for their dedication to the Harbor Herons Project.

Literature Cited

Bernick, A. 2005. New York City Audubon Society's Harbor Herons Project: 2005 Interim Nesting Survey. New York City Audubon.

Elbin, S. and A. Bernick 2006. Double-crested Cormorant nesting activity in the NY/NJ Harbor Estuary (2006). Wildlife Trust, New York, NY. In prep.

Kerlinger, P. 2004. New York City Audubon Society's Harbor Herons Project: 2004 Nesting Survey. New York City Audubon.

Kerlinger, P. 2003. New York City Audubon Society's Harbor Herons Project: 2003 Nesting Survey and Other Activities. New York City Audubon.

Kerlinger, P. 2002. New York City Audubon Society's Harbor Herons Project: 2002 Nesting Survey. New York City Audubon.

Kerlinger, P. 2001. New York City Audubon Society's Harbor Herons Project: Nesting Survey. New York City Audubon.

Künstler, D. 2006. The colonial waterbirds of Goose Island, Pelham Bay Park, Bronx, New York (2006). NYC Department of Parks and Recreation report. Draft.

Künstler, D. 2006b. The colonial waterbirds of Huckleberry Island, New Rochelle, Westchester County, New York (2006). NYC Department of Parks and Recreation report. Draft.

TABLES, FIGURES, AND APPENDICES

Table 1. Survey schedule for wading bird and cormorant counts, May-June 2006.

Island Surveyed	Date	Number of Observers	Ownership
Long Island Sound			
Goose Island*	25 May	3	NYC Parks & Recreation
Huckleberry Island*	30 May	9	Huckleberry Indians, Inc.
East River			
North Brother	18 May	7	NYC Parks & Recreation
South Brother	18 May	6	Hampton Scows
Mill Rock	18 May	8	NYC Parks & Recreation
U Thant Island*	8 June	2	NYC Parks & Recreation
Arthur Kill-Kill van Kull			
Shooter's Island	15 June	4	NYC Parks & Recreation
Pralls Island	15 June	4	NYC Parks & Recreation
Isle of Meadows	15 June	4	NYC Parks & Recreation
Lower New York Harbor			
Hoffman Island*	30 May	5	National Park Service
Swinburne Island*	30 May	5	National Park Service
Jamaica Bay			
Canarsie Pol	N/A	--	National Park Service

* Data on Huckleberry, Goose, U Thant, Hoffman, and Swinburne islands were provided by Dr. Susan Elbin (Wildlife Trust) and David Künstler (NYCDPR, Van Cortlandt & Pelham Bay Parks Administrators' Office). Double-crested Cormorant nests were surveyed following the protocols mentioned in the Methods section of this report.

Table 2. Interim Survey Wading Bird Data, May to June 2006.

2006 Interim Survey -- Wading Bird Nests							
	Shooters	Pralls	Isle of Meadows	N Brother	S Brother	Mill Rock	**Nest total**
Black-crowned Night-Heron	0	0	0	87	330	60	***477***
Great Egret	0	0	0	0	78	0	***78***
Snowy Egret	0	0	0	0	59	0	***59***
Glossy Ibis	0	0	0	0	2	0	***2***
Yellow-crowned Night-Heron	0	0	0	0	1	0	***1***
Little Blue Heron	0	0	0	0	0	0	***0***
Tricolored Heron	0	0	0	0	0	0	***0***
Green Heron	0	0	0	0	0	0	***0***
Cattle Egret	0	0	0	0	~1	0	***~1***
Unknown / Inactive					14	2	***16***
Nest Total by Island	***0***	***0***	***0***	***87***	***485***	***62***	***644***

Table 3. Additional Wader Nesting Data, June to July 2006[†].

2006 Additional Colonies -- Wading Bird Nests					
	Huckleberry Island	Goose Island	Swinburne Island	Main-land	**Nest total**
Black-crowned Night-Heron	12	64	1	0	***77***
Great Egret	8	22	0	0	***30***
Snowy Egret	0	21	0	0	***21***
Glossy Ibis	0	0	0	0	***0***
Yellow-crowned Night-Heron	0	~1	0	30	***31***
Little Blue Heron	0	0	0	0	***0***
Tricolored Heron	0	0	0	0	***0***
Green Heron	0	0	0	0	***0***
Cattle Egret	0	0	0	0	***0***
Nest Total by Island	***20***	***108***	***1***	***30***	***159***

[†] Data for additional islands provided by Dr. Susan Elbin (Wildlife Trust) and David Künstler (NYCDPR, Van Cortlandt & Pelham Bay Parks Administrators' Office). Mainland nesting data provided by various sources.
* Data for Hoffman Island based on 2004 nest numbers (Kerlinger 2004)

Table 4. Summary of Double-crested Cormorant nesting in the New York/New Jersey Harbor, May to June 2002-2006 [†]

	Year – Number of Cormorant Nests				
Island	2002	2003	2004	2005	2006
Shooter's Island	75	48 [a]	45 [a]	36 [a]	54
Huckleberry Island	289	247	324	323	344
South Brother Island	600	625 [b]	350	381	326
U Thant Island	11	11 [b]	16	15	21
Hoffman Island	18	~25	34	64	166
Swinburne Island	210+ [c]	142 [c]	108 [c]	87 [c]	264 [d]
Total	1,203	1,098	877	906	1,175

[†] Data sources include NYC Audubon interim surveys (2005 & 2006), the Wildlife Trust's NY Bioscape Initiative's DCCO study by Dr. Susan Elbin (2006), and nesting surveys by Paul Kerlinger (2002-2004) and David Künstler (2002-2006),

[a] Includes nests on one to three channel markers in the Arthur Kill and Kill Van Kull between the Bayonne Bridge and Outerbridge Crossing.

[b] Estimated based on numbers present in previous years (see Kerlinger 2003, 2004).

[c] Counts at Swinburne Island conducted from a boat ~50-100 meters from shore

[d] Counts at Swinburne Island conducted on island

Figure 1: Location of wading bird and cormorant breeding colonies in NY/NJ Harbor and surrounding waterways, 2006. See text for details of colony status and species composition. Map modified from OasisNYC.

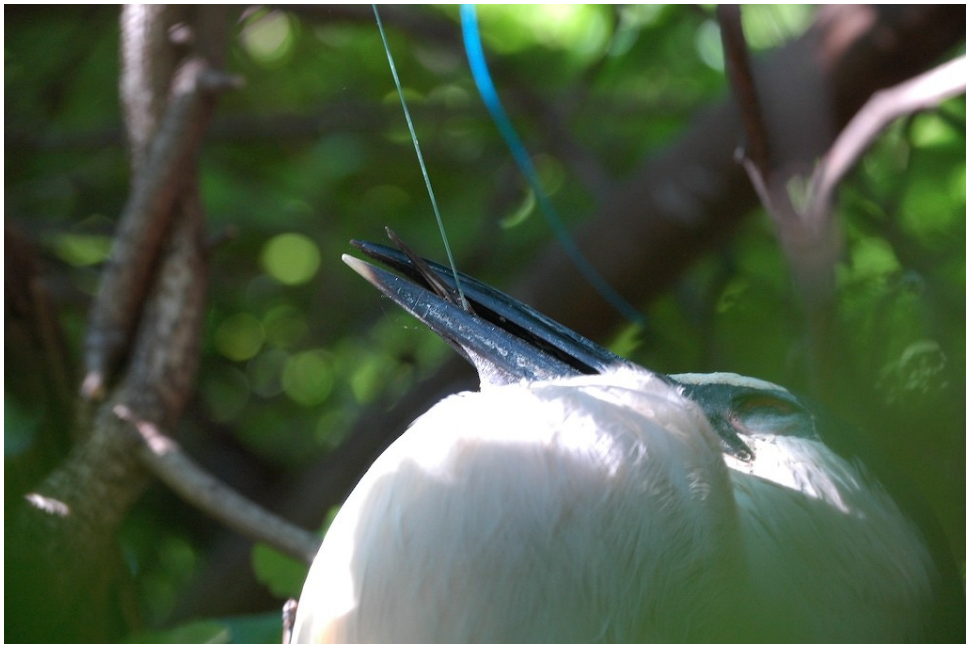

Figure 2: Black-crowned Night-Heron adult mortality at the nest due to entanglement in fishing line, South Brother Island. This is an unfortunately common sight in wading bird colonies and cormorant colonies in the NY/NJ Harbor region. Photo: © Gareth Russell.

Figure 3: White-tailed Deer fawn on Isle of Meadows, June 2006. Fawns were observed on both Isle of Meadows and Prall's Island during NYC Audubon interim surveys there, clear evidence of deer reproduction in the Staten Island area. Photo: © Gareth Russell.

Figure 4: View of habitat on the northeastern part of Shooter's Island, 2 June 2005. The island is heavily colonized by introduced vines; in spite of suitable nesting habitat, no wading bird nesting has been noted on Shooter's Island since 1996. Photo: © Gareth Russell.

Figure 5: Yellow-crowned Night-Heron fledgling at the Redfern Houses in Far Rockaway, July 2006. There were at least 29 nests established at this site in summer 2006. Photo: © Andrew Bernick.

Figure 6: Yellow-crowned Night-Heron nest outside of a 5th floor window at the Redfern Houses in Far Rockaway, July 2006. Humans and YCNHs are often in close proximity to each other at this mainland location. Photo: © Andrew Bernick.

Figure 7: Yellow-crowned Night-Heron feces on a path at the Redfern Houses in Far Rockaway, July 2006. Feces and regurgitated prey, while regularly cleaned by the maintenance staff at Redfern, are deposited on benches and paths in the main courtyard area during the breeding season. Photo: © Andrew Bernick.

Appendix A

Current Research on Wader and Cormorant Nesting Islands, NY/NJ Harbor

Below is a list of other known projects conducted in 2006 either directly or indirectly related to the Harbor Herons or the islands on which they nest. This is likely an incomplete list, though we would like to inform the readers of this report with any research conducted on current or former wading bird colonies in the metropolitan NY/NJ area. Please contact the author (bernick@mail.csi.cuny.edu) to inform him of your recent or ongoing research projects.

Double-crested Cormorant diet study, CUNY-Queens College, April-August 2006. Contact: Colin Grubel and Dr. John Waldman, CUNY-Queens College.

Double-crested Cormorant population dynamics, New York Bioscape Initiative/Wildlife Trust, May-August 2006. Contact: Dr. Susan Elbin, Wildlife Trust.

GPS mapping of wading bird and cormorant nesting trees on South Brother Island and Mill Rock, NYC Department of Parks and Recreation, August 2006. Contact: Alexander Summers, NYC Department of Parks and Recreation.

Habitat Restoration on North Brother Island, NYC Department of Parks and Recreation, February-March 2006. Contact: Tim Wenskus, NYC Department of Parks and Recreation.

Invertebrate and plant surveys on South Brother and Hoffman islands, Columbia University, August 2006. Contact: Elizabeth Craig, Columbia University.

Herbaceous and woody plant list, Hoffman Island, August 2006. Contact: Richard Lynch, Sweetbay Magnolia Conservancy.

Metapopulation modeling of wading bird nesting in the NY/NJ Harbor, NJIT/Rutgers University, Ongoing. Contact: Gareth Russell, NJIT/Rutgers U.

Nuisance mammal surveys in Jamaica Bay (including Canarsie Pol and Ruffle Bar), Hofstra University/National Park Service, Summer 2006. Contact: Dr. Russell Burke, Hofstra University.

Seed collection on NYC Parks-managed islands in the NY/NJ Harbor, NYC Department of Parks and Recreation, Fall 2006. Contact: Tim Chambers, NYC Department of Parks and Recreation.