NEW YORK CITY AUDUBON'S HARBOR HERONS PROJECT:

2011 INTERIM NESTING SURVEY REPORT

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Abstract

New York City Audubon's Harbor Herons Project Nesting Survey of the New York Harbor and surrounding waterways was conducted between 19 and 27 May 2011, with additional observations in June and July. This report summarizes long-legged wading bird, cormorant, and gull nesting activity observed on selected islands, aids to navigation and at one mainland colony.

Species summaries: Eight species of long-legged wading birds nested on nine islands in New York Harbor. These species, hereafter collectively referred to as waders, included Black-crowned Night-Heron, Great Egret, Snowy Egret, Glossy Ibis, Yellow-crowned Night-Heron, Little Blue Heron, Tricolored Heron and Great Blue Heron (observed nesting in the New York Harbor for the first time in 2011). Cattle Egret and Green Heron, observed in small numbers in previous years, were not observed in 2011. Population increases were observed for the Great Egret and Little Blue Heron. Population declines were observed in Black-crowned Night-Herons, Snowy Egrets, and Glossy Ibis. The Tricolored Herons continued to nest at low numbers. Black-crowned Night-Herons continue to be the numerically dominant nesting species in most mixed-species colonies. A total of 1,336 Double-crested Cormorant nests were observed, representing a slight decrease from 2010. Gull nesting activity was observed on all surveyed islands.

Island summaries: The largest species diversity was observed on Canarsie Pol (seven species) as in previous years. The greatest total number of nests was observed on Hoffman Island (824 nests); a marked increase over the 624 wading bird nests observed in 2010. Nesting activity declined on both Canarsie Pol (by nearly -60%) and South Brother Island (by -16%). Wader nesting activity on Huckleberry Island continued to persist at low levels. Recently inactive islands, including the three islands in the Arthur Kill and Kill Van Kull (Shooters Island, Pralls Island, and Isle of Meadows) and North Brother Island, were not surveyed in 2011. Mainland nesting of Yellow-crowned Night-Herons has continued at the Redfern Houses colony in Far Rockaway, where 15 nests were observed. Double-crested Cormorants nested on nine islands, including Canarsie Pol (for the second year since their establishment in 2010) and Mill Rock Island (for the first time in the history of these surveys). Additional cormorant nests were observed near Shooters Island and on aids to navigation in the Kill Van Kull, Arthur Kill and northwestern Raritan Bay.

Introduction

New York City Audubon's 2011 Harbor Herons nesting survey marks the 26th consecutive year of this project. The primary objective of the surveys is to monitor the population status of wading birds (i.e. herons, egrets, ibis) and cormorants on select islands in New York/New Jersey (NY/NJ) Harbor and surrounding waterways, while also noting the presence of other nesting bird species and current nesting habitat.

In Fall 2004, New York City Audubon made a decision to shift the Harbor Herons Nesting Survey from an annual to a triennial schedule, and in intervening years to conduct interim surveys on islands where nesting occurred in the prior year. An interim nesting survey was conducted in May 2011.

The US Army Corps of Engineers and The Port Authority of New York & New Jersey "Comprehensive Restoration Plan for the Hudson-Raritan Estuary" and the Harbor Herons Subcommittee of the Harbor Estuary Program's "Harbor Herons Conservation Plan" provide historical perspective of Harbor Herons and their breeding and foraging habitat, identify threats to the persistence of these species in the harbor, and lay out a plan of action for protecting these birds in the future.

This report summarizes nesting activity of long-legged wading birds, cormorants, and gulls observed on selected islands, aids to navigation and at one mainland colony documented during the 2011 field season, between 19 and 27 May, with additional nesting observations later in June and July. The objectives of the 2011 survey were to: (1) monitor the population status of long-legged wading birds (i.e. herons, egrets and ibis) cormorants, and gulls on selected islands; (2) document nesting habitat used by long-legged wading birds and cormorants; and (3) record the presence of other important nesting or migratory bird species.

Monitoring long-term trends and short-term conditions in long-legged wading bird and cormorant nesting populations in NY/NJ Harbor provides both an estimate of the relative health and stability of local colonial waterbird populations, and a valuable indicator of the overall health of the region's natural resources.

Methods

The 2011 survey followed field methods designed for previous Harbor Herons Project nesting surveys [Katherine Parsons (1986-1995), Paul Kerlinger (1996-2004)] and the standard protocol of the New York State Department of Environmental Conservation's Long Island Colonial Waterbird and Piping Plover Survey (Litwin et al. 1993). All counts were conducted between 6:00AM and 4:00PM, and under clear conditions without rainfall, high winds (>8 knots), or temperatures above 80°F. Counts were conducted once from 18-30 May; additional observations were made between early June and July (see Table 1 for dates).

Islands surveyed in 2011 (Table 1, Figure 1) included two in Lower New York Harbor (Hoffman and Swinburne islands); three in the East River/Western Long Island Sound area (U Thant, Mill

Rock, and South Brother islands); and two in the Hutchinson River/Long Island Sound area (Goose and Huckleberry islands). Partial colonial waterbird estimates were conducted at three islands in Jamaica Bay: Canarsie Pol, Elders Point Marsh East, and Subway Island. Additionally, observations of (1) Double-crested Cormorant nests near Shooters Island and on aids to navigation (i.e., channel markers and beacons) in the Kill Van Kull, Arthur Kill and northwestern Raritan Bay and (2) Yellow-crowned Night-Heron nesting at a mainland colony are also presented in this report.

Each island was surveyed by a research team consisting of the author, volunteers from New York City Audubon and other organizations, and staff from New York City Department of Parks and Recreation (NYCDPR). Double-crested Cormorant counts were conducted by the author with Susan Elbin and numerous volunteers (see island accounts for details) as part of an ongoing study of cormorant population dynamics, habitat use, and foraging ecology in NY Harbor. Surveys at Goose and Huckleberry islands were conducted jointly with David Künstler (NYCDPR, Van Cortlandt & Pelham Bay Parks Administrators' Office). Don Riepe of the American Littoral Society/Jamaica Bay Guardian provided additional information on colonial waterbird activity in Jamaica Bay.

Surveys were conducted by one or two teams of researchers, lead by the author and trained volunteers. Groups quickly and systematically searched for nests on each island, initially focusing effort on areas occupied by nesting birds in previous years. Depending on the colony size, each team was composed of two counters (i.e. one person using a telescopic mirror pole 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 deemed 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 with the above characteristics. Whenever possible, nests were identified to species by the presence of young, eggs and clearly discernable 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), nesting species was noted as 'unknown'. Old or unused nests were noted in the count as 'inactive, but not included in the final tally of active nests. Nesting vegetation (i.e., tree, shrub, or vine species) was recorded for all species whenever possible by observers skilled in plant identification.

Double-crested Cormorant surveys were conducted by direct observation within colonies (as detailed above), with the exception of Shooter's and U Thant islands, where nests were counted with binoculars from a boat no more than 20 meters away from the colony. In addition, observations of nesting activity on aids to navigation were made from distances of up to 20 meters.

Adult counts of Great Black-backed Gulls and Herring Gulls were conducted at all surveyed colonies, in addition to nest counts whenever possible. Both adult counts and nest counts are presented in this report. When adults were counted in the vicinity of selected colonies, a nest

was assumed present for each adult observed, as one-half of adults are assumed to be foraging away from the nesting colony during daytime (see Litwin et al. 1993; Kerlinger 2004).

Transportation and Permits

Boat access to islands was provided by Don Riepe of the American Littoral Society/Jamaica Bay Guardian, and New York City Audubon.

Permits were issued by the NYCDPR and the NPS to conduct surveys on protected islands under city and federal jurisdiction, and permission to access the privately-owned Huckleberry Island was offered by the Huckleberry Indians, Inc.

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We sincerely thank all volunteers (noted by name in the island profiles), organizations and agencies who participated in the 2011 surveys.

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Results

Overview:

In 2011, eight species of long-legged wading birds were observed nesting on nine islands (Table 2). These eight species, hereafter collectively referred to as waders, included Black-crowned Night-Heron, Great Egret, Snowy Egret, Glossy Ibis, Yellow-crowned Night-Heron, Little Blue Heron, Tricolored Heron, and Great Blue Heron. The three most active nesting colonies, with the greatest number of nests and diversity of nesting species, were Hoffman Island, South Brother Island, and Canarsie Pol. Hoffman Island had a record number of nesting pairs in 2011 (824) while both South Brother Island and Canarsie Pol exhibited declines (-16% and -60% respectively). Islands with declining trends in recent years (i.e., Huckleberry Island and North Brother Island) continued to exhibit little to no nesting activity. Several small islands in Jamaica Bay (including Subway Island and the newly restored Elder's Point Marsh East) exhibited increases in wader nesting activity. The Arthur Kill/Kill van Kull complex (Isle of Meadows, Prall's Island, and Shooter's Island), which was the core of NY/NJ Harbor's breeding wader community from the 1970s until the late 1990s, was not comprehensively surveyed in 2011, but informal observations continue to show no sign of wader nesting activity.

In comparison to 2010, population increases were observed for the Great Egret (+14%) and Little Blue Heron (+46%). 2011 numbers of Black-crowned Nigh-Heron, Snowy Egret, and Tricolored Heron nests did not vary greatly from 2010. Glossy Ibis exhibited a moderate decline from 2010 (-35%), and two species (Cattle Egret and Green Heron) were not observed nesting on surveyed islands this year. Green Herons have been observed in very small numbers in the past, and because this species often nests in mainland habitats, the harbor-wide population of Green Herons is not well estimated by these surveys. One additional species, the Great Blue Heron, was observed nesting for the first time on a New York Harbor Island (Goose Island) in 2011. Black-crowned Night-Herons remain the numerically dominant nesting species on nearly all islands colonies.

Data on wader nesting vegetation and nest contents for South Brother and Hoffman islands are provided in Tables 6-9. Incidental bird observations are provided in the island accounts below.

Island Accounts:

Hutchinson River/Long Island Sound:

Huckleberry Island (10 acres)
24 May 2011, 9:00-10:30 AM.
By the author, David Künstler (NYCDPR), Rachel Elbin (New York City Audubon), Tod Winston (New York City Audubon), Coby Klein (CUNY), and John Burke (Huckleberry Indians, Inc.).

The Huckleberry Island nesting survey revealed three Black-crowned Night-Heron adults and one juvenile. Each adult bird was assumed to represent one nesting pair (Table 2). This year marks a continued decline in the numbers of nesting waders on Huckleberry Island. No other

wader adults or active nests were observed in 2011, despite observations of small numbers of Great Egrets on this island in recent years. Double-crested Cormorants (270 nests) exhibited a 25% decrease from 2010. 8 Herring Gull and 2 Great Black-backed Gull adults were observed, but there was no indication of gull nesting activity on the island. Seven adult American Oystercatchers were observed, likely indicating three nesting pairs on the island. Six adult Mallards (three pairs) and 42 adult Canada Geese (with at least four confirmed nests) were observed. Other bird species observed on the island included Common Grackle, Yellow Warbler, Red-winged Blackbird, Red-eyed Vireo, Northern Waterthrush, Magnolia Warbler, Song Sparrow, Black-capped Chickadee, Spotted Sandpiper (two adults), and Killdeer (two adults). Butterflies observed on the island included Eastern Tiger Swallowtail and Eastern Comma.

Wader activity was concentrated on the northern peninsula of the island. Appropriate nesting habitat appears to be present within the central and western sections of the island as well, so observed declines may be caused by the presence of nest predators (i.e., raccoon tracks were observed on the island) and/or human activity during the breeding season. Authorized use of the island by the property owners appears to be limited (J. Burke, Huckleberry Indians, personal communication), while unauthorized visitation remains a source of human disturbance that may escape detection. Double-crested Cormorants have expanded their nesting activity into the eastern section of the island, which was formerly populated by herons and egrets. Competition for nesting sites between waders and cormorants may be a factor in the observed wader declines.

Wader nesting activity on Huckleberry Island has continued to decline over the past decade and continued monitoring of this colony is imperative. New York City Audubon and NYCDPR will work closely with the Huckleberry Indians to insure necessary researcher access to this island, and to understand and address any potential factors contributing to the continued decline. Huckleberry Island has been a critical nesting site for both waders and cormorants in the New York City area. Nearby David's Island may also provide suitable nesting habitat for waders, and this island should be monitored for future nesting activity.

Goose Island (1 acre)
24 May 2011, 12:00-1:10 PM.
By the author, Dave Künstler, Rachel Elbin, Tod Winston, and Coby Klein.

Goose Island supported 99 wader nests, an 11% decrease from 2010. Nesting by Black-crowned Night-Heron, Great Egret, Snowy Egret, and Great Blue Heron was confirmed. One Great Black-backed Gull nest was observed as in pervious years. Ten Canada Goose nests were observed during the survey. Other bird species observed on the island included Common Grackle. Künstler (2007) presented a detailed treatment of Goose Island bird populations and vegetation from 1996-2006.

Mammals have been noted on Goose Island in past seasons (Raccoon and Virginia Opossum), and unauthorized, human disturbance may continue to pose a threat.

East River:

North Brother Island (19 acres): Not surveyed in 2011.

South Brother Island (12 acres)
25 May 2011 from 9:30AM - 1:30PM
By the author, Michael Feller (NYCDPR), Alex Summers (NYCDPR), Colin Grubel (CUNY Queens), Michael Parkes (Great Ecology and Environments), and Vicky Ruzicka (Randall's Island Sports Foundation).

A total of 387 nests of five wader species (Black-crowned Night-Heron, Great Egret, Snowy Egret, Glossy Ibis, and Yellow-crowned Night-Heron; see Table 2) was noted throughout the island. This represents a decrease (-15%) from 2010. This colony was the second largest wader colony in the NY Harbor in the 2011 breeding season. Double-crested Cormorants (241 nests) exhibited a 10% decrease in nest numbers from 2010, and primarily occupied the center and northeastern areas of the colony. Based on adults present, an estimated 8 Herring Gull pairs and 37 Great Black-backed Gull pairs nested on the Island.

Waders nested in 15 species of trees and shrubs on South Brother, as well as tree/shrub/vine arrangements (Table 6). Black-crowned Night-Herons nested predominantly in Box Elder, Black Cherry, Mulberry species, and Ailanthus, often in the presence of Oriental Bittersweet vines. Multiflora Rose was also a common nesting substrate. Snowy Egrets nested most often in tangles of Oriental Bittersweet and Multiflora Rose than any other tree or shrub, although nests were found in species including Box Elder, Black Cherry, and Ailanthus. Great Egrets nested mainly in vine-encumbered trees (most often Oriental Bittersweet and Wild Grape) generally using the vines as a platform on which to construct nests. Tree species included Box Elder, Mulberry species, and Black Cherry. Nesting habitat for cormorants on South Brother Island included a stand of locust trees in the center of the colony, where the majority of nests were located, as well as Box Elder, Mulberry Species, Ailanthus, and Black Cherry. Cormorants therefore exhibit nest-site preferences in common with wader species, and may compete with waders for these nest-sites in some instances. Nest content data were collected on South Brother Island (Table 7).

Other bird species observed included Common Grackle, Gray Catbird, Eastern Kingbird, Gadwall (one pair), Brant (three adults), Mallard (one nest; Figure 2), Mute Swan (one nest), and American Oystercatcher (2 adults). Additional species were observed on a separate visit in June, including Common Merganser (one pair), Gadwall (one pair), American Black Duck, Brant (three adults), Canada Goose (13 adults) and Spotted Sandpiper. Evidence of Great Horned Owl nesting activity was observed again in 2011.

The purchase of South Brother Island was coordinated in 2007 by Trust for Public Land, Wildlife Conservation Society, The Point Community Development Corporation, and Congressman Serrano (16th Congressional District, Bronx. NY). The island was officially transferred to NYCDPR in November 2007. New York City Audubon will continue to advocate for maintaining the island as a refuge for nesting colonial waterbirds.

A potential concern is that one of the prevalent tree species used by nesting waders, Box Elder, is also a host tree preferred by Asian Longhorned Beetles (ALBs). If ALBs were detected on South Brother, the current management plan calls for the complete removal of all potential ALB host trees within the area. This could have a devastating effect on the persistence of the colony; it is important to establish preventative measures to reduce the chance of this occurring (i.e., early detection surveys, training of Harbor Herons volunteer teams, chemical treatment) with USDA-APHIS and other organizations within the ALB Cooperative Eradication Team.

Mill Rock (3 acres)
25 May 2011, 1:50PM - 3:30PM
By the author, Michael Feller, and Alex Summers.

One hundred and sixty-nine wader nests were observed on Mill Rock Island; a 51% increase from 2010. Four species of waders (Black-crowned Night-Heron, Great Egret, Snowy Egret, and Yellow-crowned Night-Heron; Figure 3) were observed nesting on this Island. 5 Herring Gull and 7 Great Black-backed Gull nests were confirmed. Double-crested Cormorants (10 nests) were observed nesting on Mill Rock Island for the first time in 2011.

Other bird species observed on the island included Mallard and European Starling.

Human disturbance has become increasingly evident on Mill Rock Island. Man-made structures including benches and tables have persisted over the last few years. There is evidence of visitation from kayaking clubs, which should be discouraged from disturbing this growing nesting colony. Future efforts to discourage human disturbance should include increased signage on the island, particularly at the north harbor and west dock. If possible, kayaking clubs known to visit Mill Rock Island and other Harbor Herons nesting islands should be contacted and educated about the importance of maintaining zero human disturbance during the critical nesting period.

U Thant (1/4 acre)
25 May 2011, 3:50-3:55 PM
By the author, Michael Feller and Alex Summers

U Thant (Figure 4) was surveyed from a boat with binoculars, approximately 10 meters from shore. Thirty-eight Double-crested Cormorant nests were observed on the island both on the collapsed metal arch sculpture and in trees. Approximately the same number of nests have been observed annually on this island since the colony established in 2008. Based on adults present, an estimated 14 pairs of Great Black-backed Gulls and 2 pairs of Herring Gulls nested on the island. Two Canada Geese were also present on the U Thant Island.

Staten Island – Arthur Kill and Kill Van Kull

The three islands in this complex (Pralls Island, Shooters Island, and Isle of Meadows) were not formally surveyed in 2011. Anecdotal reports indicate that no colonial waterbird nesting activity occurred this year. 30 cormorant nests were observed on the dry dock structure off the shore of Shooters Island (14 July 2011). NYCDPR has observed a diversity of other birds using Pralls Island as breeding, foraging, and migratory stopover habitat.

Hoffman Island (10 acres)
20 May 2011, 10:00AM - 12:15PM and 26 May 2011, 9:30AM – 1:30PM
By the author, Susan Elbin (New York City Audubon), Colin Grubel, Tod Winston, Alex Summers, Kathryn Carse (Staten Island Advance).

Due to poor weather conditions on 20 May, only gulls and cormorants were surveyed on this date. The waders were surveyed on 26 May. Hoffman Island had the largest number of wader nests in the NY Harbor in 2011 as in the previous two years. There were 824 nests of six wader species observed, including Black-crowned Night-Heron, Great Egret, Snowy Egret, Glossy Ibis, Yellow-crowned Night-Heron, and Little Blue Heron; a 32% increase from 2010. Vegetation containing wader nests included Black Cherry, Mulberry species, Multiflora Rose, Privet, Box Elder, Hackberry, and large masses of Oriental Bittersweet; waders also nested in various tree/bittersweet and tree/rose arrangements (Table 8). Wader nest content data were collected on Hoffman Island (Table 9).

There were 345 Double-crested Cormorant nests observed on Hoffman Island in 2011; a 60% increase from 2010. Cormorant nests on Hoffman Island were located approximately 10 to 20 meters up in Black Locust trees, locations that, for the most part, have not been used previously as nesting trees by waders. From 2003 to 2006, Double-crested Cormorant nesting expanded across the southern end of the island, into areas formerly used by waders. In 2008, the first nests were noted on the north side of the island. Cormorant nests were in close proximity to wader nests in some locations, and wader nests appeared to be more concentrated in the center of Hoffman Island than in previous years. Cormorants maintained the same general nesting locations with a slight eastward expansion in the central part of the island in 2011.

Thirty-three Herring and 40 Great Black-backed gull nests were counted during the survey. Six Canada Goose nests were observed. Additional species observed included Red-winged Blackbird, Song Sparrow, Yellow warbler, Northern Parula, Magnolia Warbler, Common Yellowthroat, Gray Catbird, Boat-tailed Grackle, Northern Cardinal, Spotted Sandpiper, Fish Crow, and Red-breasted Merganser.

Swinburne Island (4 acres)
27 May 2011, 10:15-11:45AM
By the author, Colin Grubel, and Mary Cool.

A total of 272 cormorant nests was observed, a 15% decrease from 2010. Nests were located on the remains of buildings, and in several Hackberry, Black Locust, and Mulberry trees. One pair of Black-crowned Night-Herons and one pair of Yellow-crowned Night-Herons (Figure 5) were observed on the island in June and July.

Forty seven Herring Gull nests and 44 Great Black-backed Gull nests were observed. Additional species observed included Fish Crow and Red-winged Blackbird. A Harbor Seal was also observed on Swinburne Island in June (Figure 6).

Jamaica Bay

Elder's Point Marsh (21 acres)
19 May 2011, 10:30-10:55 AM

By the author, Don Riepe (American Littoral Society), Emilio Tobon (New York City Audubon), Mark Hauber (Hunter College), and Kate Boicourt (HEP).

Elder's Point Marsh East was recently restored as part of a marsh restoration project undertaken in Jamaica Bay by the U.S. Army Corps of Engineers (USACE). 2011 was the second year since the commencement of restoration activities in which colonial waterbirds had the opportunity to nest on Elder's Point Marsh East. A total of 40 wader nests were observed on this island from four wader species (Figure 7), including Black-crowned Night-Herons, Great Egrets, Snowy Egrets, and Glossy Ibis; a 122% increase from 2010. In addition, 96 Double-crested cormorant nests were observed; a large increase from the 4 nests observed in 2010. This included cormorants nesting on the ground (Figure 8), which is common elsewhere in the breeding range of the Double-crested Cormorant, but not within the New York Harbor. 147 Herring Gull adults and 5 Great Black-backed Gull adults were observed. This increase coincides with a marked decline in nesting activity on Canarsie Pol.

Other bird species observed on this island included one pair of American Oystercatchers.

Elder's Point Marsh West is currently under construction for a marsh restoration program through USACE. In December 2009 all of the vegetation and trees were removed from the island, and sand was deposited on the island as substrate for the future marsh. Colonial waterbird nesting activity was therefore discontinued on this island while. Waders are unlikely to re-colonize this island due to the removal of potential nesting habitat. The restored marsh will hopefully provide productive foraging habitat for waders in the future. This island should be monitored for other colonial waterbird activity once restoration activities have been completed. Restoration is scheduled for completion in February or March 2010. USACE completed initial construction of a similar marsh island restoration project at Elders Point East in 2006-2007, which used dredged material from Rockaway Inlet. Projects aimed at restoring salt marsh acreage within the Bay are certainly justified by the substantial marsh island losses observed in recent decades. As anticipated, we believe the removal of nesting habitat for cormorants and waders on Elder's Point Marsh West has encouraged these birds to move to nearby nesting colony on Elder's Point Marsh East, Subway Island, and Canarsie Pol. Colonization of Canarsie Pol by cormorants (as occurred in 2010) was an undesirable outcome of USACE activities, as nesting cormorants have the potential to threaten the valuable and diverse wader colony currently thriving on Canarsie Pol. New York City Audubon will continue to carefully monitor cormorant nesting activity in Jamaica Bay.

Subway Island (40 acres)
27 May 2009, 11:30AM - 12:15PM
By the author, Don Riepe, Emilio Tobon, Mark Hauber, and Kate Boicourt.

2011 was the second consecutive year in the history of these nesting surveys in which a large group of waders was found nesting on Subway Island. A total of 149 wader nests were observed, representing five species of waders including Black-crowned Night-Herons, Great Egrets, Snowy Egrets, Glossy Ibis, and Yellow-crowned Night-Heron. In addition, 184 Herring Gull adults and 20 Great Black-backed Gull adults were observed. Twelve American Oystercatchers were observed on the island. Other species present included Barn Swallow, Song Sparrow, Red-winged Blackbird, Common Yellowthroat, Northern Cardinal, European Starling, Boat-tailed Grackle, Fish Crow, American Crow, Willet, Gadwall (one nest) and Clapper Rail (four individuals).

This unprecedented influx of birds on Subway Island coincided with USACE restoration activities and the colonization of adjacent Canarsie Pol by cormorants.

Canarsie Pol (220 acres)
27 May 2010, 8:30-10:45 AM
By the author, Don Riepe, Emilio Tobon, Mark Hauber, and Kate Boicourt.

Due to the impenetrable vegetation in which the majority of waders nest on Canarsie Pol, the nesting population on this island was estimated again this year by a combination of ground counts taken at centers of nesting activity across the island. Despite the success of this method in past years, low numbers of adults were observed using this method in 2011. It is possible that low numbers were due to population declines on Canarsie Pol, however it is also possible that populations have moved to more impenetrable parts of the island. Based on adult waders encountered during this ground survey, there were an estimated 202 total wader nesting pairs on Canarsie Pol this year, consisting of seven species including Black-crowned Night-Heron, Great Egret, Snowy Egret, Glossy Ibis, Little Blue Heron, Yellow-crowned Night-Heron, and Tricolored Heron. This constitutes a 59% decrease from the number of nesting pairs of waders observed in 2010. Thirty-four Double-crested Cormorant nests were observed; a 76% decrease from 2010. It is unclear why these declines have occurred, but presence of mammals on the island, including raccoons, may be causing declines on Canarsie Pol as they have done on other nesting islands in Jamaica Bay.

Five hundred and nine adult Herring Gulls and 26 adult Great Black-backed Gulls were observed. Gulls nested in several large open areas throughout Canarsie Pol. Twenty-eight American Oystercatcher were observed on the island.

Other bird species observed included Red-winged Blackbird, Boat-tailed Grackle, Song Sparrow, Eastern Towhee, Common Yellowthroat, Yellow Warbler, Tree Swallow, Barn Swallow, Northern Cardinal, Gray Catbird, European Starling, House wren, Fish Crow, Peregrine Falcon, Osprey, and Common Tern.

Other Jamaica Bay islands
May-June 2011
By Don Riepe.

No heron nesting activity was observed on other Jamaica Bay islands.

Mainland Accounts:

The New York City Audubon's Harbor Herons Project has traditionally reported nesting activity on island colonies only. Two species of waders are known to nest in mainland areas: Yellow-crowned Night-Heron and Green Heron.

The nesting colony of Yellow-crowned Night-Herons located at the Redfern Houses in Far Rockaway was visited on 19 May 2011 1:55-2:20PM) by the author, Susan Elbin, Don Riepe,

Emilio Tobon, Mark Hauber, and Kate Boicourt.

A total of 15 nests was observed (Table 2) constituting a marked decline from the 65 nests observed in 2010. This is the eighth year the colony has been confirmed. In 2010, residents of the Redfern Houses observed predation of Yellow-crowned Night-Heron nests by hawks. This likely explains the decline observed in 2011.

Several smaller incidences of Yellow-crowned Night-Heron nesting have been reported on Staten Island and several sites in Nassau County in recent years.

Hugh Carola (program director, Hackensack Riverkeeper) has presented information on Yellow-crowned Night-Heron nesting activity in the Meadowlands and northern New Jersey at Harbor Estuary Program Harbor Herons Subcommittee meetings. Known nesting sites for this species include: Laurel Hill County Park, Schmidt's Woods Park and Harmon Cove in Secaucus, nests in the vicinity of Waldwick and Allendale in central Bergen County, and in a suburban neighborhood in Roselle, NJ. In 2011 the Schmidt's Woods Park site had four Yellow-crowned Night-Heron nests. The Harmon Cove site had ten Yellow-crowned Night-Heron nests.

Aids to Navigation:

Sixteen nesting pairs of Double-crested Cormorants were observed by the author and Judy Craig on aids to navigation in the Kill Van Kull, Arthur Kill and northwestern Raritan Bay on 14 July 2011 (Figure 9). Cormorants nested on two markers: 11 nest on marker 14, 5 nests on marker 22. Observations were made at a distance of 10-20 meters from channel markers. An additional 28 cormorant nests was observed by Hugh Carola on aids to navigation in Newark Bay.

Species Accounts:

The following species accounts offer general observations and trends summarized in Table 2. Trends discussed in the text refer to 2010/2011 population comparisons based on observations at colonies surveyed during these two survey years.

Black-crowned Night-Heron: Black-crowned Night-Herons were observed on nine colonies in 2011 and were the numerically dominant species in larger, mixed-species colonies such as Hoffman Island, South Brother Island, Canarsie Pol and Mill Rock. This species no longer nests on North Brother Island, a wader nesting colony active since the mid-1980s; the reason for this decline is unclear. Observed nesting activity decreased by approximately 7% harbor-wide.

Yellow-crowned Night-Heron: Numbers of nesting pairs on islands remained relatively unchanged between 2010 and 2011. However, a large decrease in mainland nesting activity at the Redfern Houses was observed, likely due to nest predation by hawks in this area.

Great Egret: Great Egrets were observed on seven islands in NY/NJ Harbor. This species exhibited growth at all colonies within the city except for Canarsie Pol and Goose Island. Observed nesting activity increased by 14% harbor-wide.

Snowy Egret: Snowy Egrets nested on seven islands in NY/NJ Harbor. An overall decrease of approximately 5% was observed harbor-wide. This decline was limited to South Brother Island, Goose Island, and Canarsie Pol colonies. All other colony sites exhibited local increases in nesting activity.

Little Blue Heron: Little Blue Herons were observed on three islands in 2011; an increase from the two nesting islands used by this species in 2010. This species approaches the northern extent of its range in the NY/NJ Harbor area, and it maintains a consistent, low-level presence in the NY/NJ Harbor breeding community. However, the observed nesting activity for this species has increased from 13 breeding pairs in 2010 to 19 breeding pairs in 2011.

Tricolored Heron: Tricolored Heron adults were observed only on Canarsie Pol. This is a species more typical of southern colonies, and no increasing trends in NY Harbor have been observed. The first record of Tricolored Herons nesting in NY/NJ Harbor occurred in 1955 on Ruler's Bar Hassock in Jamaica Bay, and nesting for this species has also been observed in colonies in Long Island's Great South Bay (McGowan and Corwin 2008).

Cattle Egret: Cattle Egrets were not observed during this year's survey of Canarsie Pol. No nesting was observed on South Brother Island, the only other site where nesting had been confirmed in recent years. The population has declined to zero from a high of 266 nests on two islands (Prall's and Shooter's islands) in 1985.

Green Heron: No Green Heron nests were observed this year. This species often nests in mainland habitats, and it is therefore not well represented by the Harbor Herons Project. It is likely that, as in other parts of its range, this species may be declining due to habitat development. An effort to assess the population in NY/NJ Harbor would be a worthwhile endeavor.

Glossy Ibis: A drastic decline in Glossy Ibis nesting activity was noted in Jamaica Bay (particularly on Canarsie Pol), accounting for much of the 35% decrease in population size observed harbor-wide. Local population increase was observed on Hoffman Island.

Double-crested Cormorant: A total of 1,336 Double-crested Cormorant nests was observed on nine islands (Huckleberry, South Brother, U Thant, Hoffman, Swinburne, Mill Rock, and Shooter's islands, Elder's Point Marsh East, and Canarsie Pol; Tables 2 & 3). An additional 44 nests were observed on aids to navigation. Despite the increased number of islands colonized by this species in 2011, slight decreases from 2010 population numbers were observed at all colony sites except for Hoffman Island, U Thant, and Elder's Point Marsh East. We observed a 1% decrease in cormorant nests harbor-wide. Cormorants colonized one new island habitat in 2011 (Mill Rock), and this colony must continue to be carefully monitored to determine the potential impact of cormorant nesting activity on growing wader nesting populations on this island. An analysis of Double-crested Cormorant population trends in NY/NJ Harbor is pending.

Herring and Great Black-backed gulls: This year, gulls were monitored using adult counts, nest counts, or both whenever possible. Harbor-wide decreases in the numbers of these gulls were

observed, but this may correspond to a decreased survey effort from the comprehensive survey conducted in 2010. Laughing Gull surveys are conducted annually in Jamaica Bay, though they have are not included in the Harbor Herons Project report. More information on these surveys may be obtained from Laura Francoeur of the Port Authority of New York and New Jersey and Don Riepe of the American Littoral Society/Jamaica Bay Guardian.

Conclusions and Recommendations

Continued monitoring of wader populations through nesting surveys and banding is a necessary step to comprehend species status, population trends, and overall health and persistence of the system.

At least three areas of the Harbor Herons Project survey protocol need further improvement.

1. A repeatable method to survey islands with dense vegetation is required. This somewhat intractable problem is faced by many researchers that survey islands heavily colonized by invasive species, and further efforts to design a reasonable survey technique will be explored. Implementing a grid system on larger islands with dense undergrowth would improve the quality of systematic surveys. This could be accomplished by blazing or tagging select trees along gridlines throughout the island. This system would improve the qualitative and quantitative data collected in these surveys by allowing surveyors to more accurately describe changes in the nesting community and vegetation of a specific colony segment from one year to the next. This would add a valuable spatial component to the dataset.
2. A method of quantifying productivity is necessary and should be implemented. Although some productivity data were collected (i.e., nest counts and contents), the most effective technique would likely be to mark and monitor a subset of nests within selected colonies over the breeding season; both the method and funding necessary to carry out productivity studies will be explored for the 2010 nesting survey.
3. An improved habitat assessment protocol should be developed, including a rapid assessment technique, collaborating with additional botanists during breeding season vegetation surveys and conducting a non-breeding season vegetation survey.

Several major conservation challenges have been observed in recent years. The discovery of ALBs on Prall's Island in 2007 and subsequent tree removal eliminated valuable nesting habitat for colonial waterbirds. Further, observations in the 2008 season confirmed that Prall's Island is being heavily colonized by invasive woody plant species (i.e., Glossy Buckthorn, Callery Pear). Future habitat restoration at Prall's will need to take the vigorous growth of invasive species into account. Further, management of ALBs detected on island colonies may cause a similar degradation in native plant communities, which could have detrimental effects on biodiversity, as well as suitable habitat for birds and other wildlife. Tree removal and treatment is the standard ALB management approach, where all potential ALB host trees are cut within a 0.5 mile area surrounding infested trees. A clear conservation concern of this management protocol is the potential for loss of colonial waterbird nesting habitat in NY Harbor. Waders require trees for nest-building and nest material; unfortunately, the list of preferred nesting trees overlaps widely with preferred ALB host trees (USDA-APHIS 2005). For instance, gray birch has been an important tree species for nesting waders on Prall's Island and other colonies, and their removal

greatly reduces the chance that waders will nest there in the near future. If ALBs are discovered on other nesting islands, the present management strategy could have serious impacts on wader breeding populations in NY Harbor.

Various organizations, including the NY/NJ Harbor Estuary Program's Harbor Herons Subcommittee, are working closely with the management team to develop workable plans for habitat restoration and preventative management strategies to reduce impacts on nesting waders at island-colonies where ALB has not been identified. In February 2008, Joan Mahoney and Ed Bressel of the NYS Department of Agriculture and Markets provided training on recognizing ALB presence (i.e., oviposition sites, exit holes) at the National Park Service's Fort Wadsworth. Several Harbor Herons Project volunteers and field workers from several governmental agencies were in attendance.

Another conservation issue is the presence of mammalian predators, particularly raccoons, on current and former nesting islands. Mammalian predators can have severe impacts on nesting colonial waterbird populations, and evidence of predation on waders and gulls has been observed on Ruffle Bar, Goose Island, South Brother Island and others. Efforts to quantify mammalian presence throughout the year should be conducted on all nesting islands, and methods to control the impacts on colonial waterbirds should be considered for island colonies found to support mammalian predators. For instance, raccoons present on active and potential nesting islands could be live-trapped and released in appropriate mainland habitats early in the spring before nesting activity commences.

Human disturbance on island colonies is difficult to manage in a highly urban setting. As mentioned in Bernick (2007), articles and websites that document unauthorized visitation of colonial waterbird nesting island have appeared in recent years. While an increase in waterfront activities by the public is a positive sign of a growing interest in the urban environment, any unauthorized visitation of nesting colonies requires attention and thoughtful solutions.

The first step to addressing unauthorized visitation of islands is through clear signage. Additional signs must be posted on city-owned and federally-owned islands, clearly stating the restricted status of the islands and the protected status of colonial waterbirds. In addition to signage, managing agencies and stakeholders should establish a dialogue with law enforcement entities that patrol NY Harbor waters (US Park Police, New York City Police Department's Harbor Unit, and the US Coast Guard) and inform them of the security and safety threats that this type of activity poses, in addition to the ecological impacts.

Any communication concerning press coverage of NY/NJ Harbor islands should stress that these issues be thoughtfully considered and incorporated in the press coverage. This would reinforce to the public that these islands are unique, lively places that often support large bird populations, and that these birds are sensitive to human disturbance.

Not only does the conservation community need to effectively, publicly express the conservation issues that unauthorized visitation to nesting islands can create for bird populations; we also need to offer programs for the public to learn about, appreciate and participate in the study of these interesting islands and their birds. New York City Audubon currently runs eco-tours that offer

views and narratives on islands and nesting wildlife. Additional collaborations with ACTION, Rocking the Boat and other community organizations will create opportunities for community and educational outreach through participate in observational wader studies and other conservation projects. Additionally, direct contact with individuals or organizations that have made unauthorized visits to nesting colonies may often be productive and easily remedied, without resorting to regulatory enforcement.

The Harbor Herons Conservation Plan was published in 2010 (Elbin and Tsipoura, Eds. 2010). Efforts need to be made to prioritize and implement recommended actions outlined in this plan. In particular, emphasis needs to be placed on the protection of important foraging areas in addition to nesting habitats.

The New York City Audubon Harbor Herons Project Nesting Surveys are complemented by a suite of research programs (outlined in Appendix A), many of which include banding initiatives of multiple species at nesting islands throughout the NY Harbor. In recent years, color bands have been affixed to young of the year Double-crested Cormorants, Herring Gulls, Great Black-backed Gulls, Great Egrets (Figure 10), Glossy Ibis, and Black-crowned Night-Herons. Color band sightings of any of these species should be communicated to the author or to New York City Audubon (bands@nycaudubon.org) giving leg band code, color, location, date, and name of observed. All band sightings should be reported to the Bird Banding Laboratory.

Additional recommendations and goals for 2011-2012 are as follows:

- Analyze and summarize data from the New York City Audubon Harbor Heron Surveys (1986-present) as presented by Andrew Bernick at the 2009 American Ornithologist's Union Annual Meeting in Philadelphia, PA and by the author at the 2009 Colonial Waterbird's Meeting in Cape May, NJ; a summary report will be produced from these data.

- 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 wader and cormorant populations. Coordinating standardized methods to allow for regional comparisons and data analysis will be critical to the success of this effort.

- A report on Double-crested Cormorant population trends in the NY/NJ Harbor area (1986-2011) is pending from New York City Audubon.

- For privately-owned Huckleberry Island, continued communication and collaboration with the current owners should be pursued by parties interested in the persistence of wader and cormorant populations.

- Encourage the development of wader 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).

- 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.

- 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. Guides should be available in PDF format for all volunteers.

New York City Audubon's Harbor Herons Project has included several additional programs in recent years (i.e. Harbor Herons Monitoring Program and Eco-tours) that allow for greater public participation and awareness of the 'Harbor Herons', and have strengthened New York City Audubon's role as an advocate for conserving NY/NJ Harbor's wader populations. New and vital collaborations between New York City Audubon and other organizations (i.e. NJ Audubon) 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.

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TABLES, FIGURES, AND APPENDICES

Table 1. Survey schedule for wader, cormorant and gull counts, May-July 2011

Location Surveyed	Date(s)	# of Observers	Ownership
Long Island Sound			
Goose Island	24 May	5	NYC DPR
Huckleberry Island	24 May	5	Huckleberry Indians, Inc.
Easter River			
North Brother Island	Not surveyed		NYC DPR
South Brother Island	25 May	6	NYC DPR
Mill Rock	25 May	3	NYC DPR
U Thant	25 May	3	NYC DPR
Arthur Kill-Kill Van Kull			
Shooter's Island	Not surveyed		NYC DPR
Prall's Island	Not surveyed		NYC DPR
Isle of Meadows	Not surveyed		NYC DPR
Lower New York Harbor			
Swinburne Island	27 May	3	NPS
Hoffman Island	20 & 26 May	6	NPS
Jamaica Bay			
Elders Point Marsh	19 May	5	NPS
Canarsie Pol	19 May	5	NPS
Subway Island	19 May	5	NPS
Mainland – Far Rockaway			
Redfern Houses	19 May	6	NYC Housing Authority
Aids to Navigation			
Raritan Bay / Arthur Kill / Kill Van Kull	14 July	2	US Coast Guard

Table 2. Wader, cormorant, and gull nesting activity on selected islands in NY/NJ Harbor and surrounding waterways, 2010 Species include Black-crowned Night-Heron (BCNH), Great Egret (GREG), Snowy Egret (SNEG), Glossy Ibis (GLIB), Little Blue Heron (LBHE), Yellow-crowned Night-Heron (YCNH), Green Heron (GRHE), Tricolored Heron (TRHE), Cattle Egret (CAEG), Great Blue Heron (GBHE), Double-crested Cormorant (DCCO), Herring Gull (HERG), Great Black-backed Gull (GBBG), Canada Goose (CANG), Mallard (MALL), American Black Duck (ABDU), Gadwall (GADW), and Mute Swan (MUSW).

	Hoffman Island	**South Brother Island**	**Canarsie Pol***	**Mill Rock**	**Goose Island**	**Huckleberry Island**	**Elders Point Marsh East**	**Subway Island**	**Swinburne Island**	**U Thant Island**	**Red Fern**
Survey Date	20- and 26-May	25-May	19-May	25-May	24-May	24-May	19-May	19-May	27-May	25-May	19-May
Waders											
BCNH	322	184	115	98	28	3	5	61	1	0	0
GREG	278	150	28	31	47	0	8	25	0	0	0
SNEG	95	38	25	39	22	0	23	21	0	0	0
GLIB	115	3	19	0	0	0	4	37	0	0	0
LBHE	10	1	8	0	0	0	0	0	0	0	0
YCNH	1	7	4	1	0	0	0	5	1	0	15
GRHE	0	0	0	0	0	0	0	0	0	0	0
TRHE	0	0	3	0	0	0	0	0	0	0	0
CAEG	0	0	0	0	0	0	0	0	0	0	0
GBHE	0	0	0	0	1	0	0	0	0	0	0
Unidentified	3	4	0	0	1	0	0	0	0	0	0
Total Active Wader Nests	824	387	202	169	99	3	40	149	2	0	15
Cormorants											
DCCO	345	241	34	10	0	270	96	0	272	38	0
Gulls											
HERG	33 nests	6 adults 1 nest	509 adults	5 nests	0 nests	0 nests 8 adults	147 adults	184 adults	47 nests	2 adults	0 nests 0 adults
GBBG	40 nests	37 adults 10 nests	26 adults	7 nests	1 adult 1 nest	2 adults	5 adults	20 adults	44 nests	14 adults	0 nests 0 adults
Waterfowl											
CANG	6	1	10	0	10	42	1	10	0	2	0
MALL	0	1	4	1	0	3	2	0	0	0	0
ABDU	0	0	0	0	0	0	0	0	0	0	0
GADW	0	0	0	0	0	0	0	1	0	0	0
MUSW	0	1	0	0	0	0	0	0	0	0	0

* - Nest estimates for Canarsie Pol based on a combination of ground counts and adult observations in a limited section of the island – see text for details.

Table 3. Summary of Double-crested Cormorant nesting in the New York/New Jersey Harbor, May to July 2005-2011 [†]

	Year – Number of Cormorant Nests						
Island	2005	2006	2007	2008	2009	2010	2011
Shooter's Island	36[a]	54	41	23	20	35	30
Huckleberry Island	323	334	260	375	306	358	270
South Brother Island	281	326	271	297	231	264	241
Mill Rock Island	0	0	0	0	0	0	10
U Thant	15	21	24	29	30	31	38
Hoffman Island	64	166	155	235	225	216	345
Swinburne Island	87[b]	264[c]	264[c]	295[c]	288[c]	320[c]	272[c]
Elder's Point Marsh W	0	0	31	79	83	0	0
Elder's Point Marsh E	0	0	0	0	0	4	96
Canarsie Pol	0	0	0	0	0	144	34
Aids to Navigation	0[a]	0[a]	0[a]	51[a]	35[a]	39[a]	44[a1]
Island Total	**906**	**1,175**	**1,046**	**1,333**	**1,183**	**1,372**	**1,346**
Cumulative Total	**906**	**1,175**	**1,046**	**1,384**	**1,218**	**1,411**	**1,390**

[†] Data sources include New York City Audubon surveys (2005-2011), cormorant studies by Susan Elbin and the author (2006-2011), and nesting surveys by Paul Kerlinger (2004) and David Künstler (2004-2006).

[a] Nests observed on aids to navigation in the Arthur Kill and Kill Van Kull between the Bayonne Bridge and Goethals Bridge were included in Shooter's Island numbers in 2004-2005. No nesting on these structures was observed in 2006-2007. In 2008 through 2011, nests on these structures were recorded separately.

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

[c] Counts at Swinburne Island conducted on island.

Table 4. Summary of Herring Gull and Great Black-backed Gull nesting activity on selected islands of the New York Harbor from 2008 to 2011. Numbers presented are total adults observed on each island. Numbers in parentheses are total nests observed on each island, when available.

	Herring Gull # nesting pairs				**Great Black-backed Gull** # nesting pairs			
	2008	2009	2010	2011	2008	2009	2010	2011
Shooter's Island	4	5	0	N/A	0	0	0	N/A
Huckleberry Island	9	9	39 (2)	0	16	7	28 (4)	0
Goose island	0	0	0	0	1	1	2	1 (1)
S. Brother Island	131	12	14	6 (1)	88	49	82 (9)	37 (10)
N. Brother Island	48	8	25	N/A	5	2	6	N/A
U Thant Island	27	11	7	2	N/A	10	22	14
Hoffman Island	161	100	67 (36)	(33)	148	60	146 (101)	(40)
Swinburne Island	N/A	133	75 (117)	(47)	N/A	120	62 (33)	(44)

N/A = Not surveyed for gulls by New York City Audubon

Table 6. Nesting trees, shrubs, and vines for Black-crowned Night-Herons (BCNH), Snowy Egrets (SNEG), Great Egrets (GREG), Glossy Ibis (GLIB), and Yellow-crowned Night-Herons (YCNH) at South Brother Island, 25 May 2011.

South Brother Island - Nesting vegetation

	BCNH	SNEG	GREG	GLIB	YCNH
Black Cherry	13	1	4		
Mulberry sp.	9		8	1	
Box Elder	33	5	4		1
Oriental Bittersweet	59	18	35	2	
Multiflora Rose	8	6			
Sycamore Maple	3				
Black Locust					
Ailanthus	5	2			

Table 7. Nest contents for Black-crowned Night-Herons (BCNH), Snowy Egrets (SNEG), Great Egrets (GREG), and Glossy Ibis (GLIB) at South Brother Island, 25 May 2011.

South Brother Island – Nest contents

	BCNH	SNEG	GREG	GLIB
Empty	4	4	1	
1 Egg	2	2		1
2 Eggs	13		1	
3 Eggs	36	11	2	
4 Eggs	2	7	1	
5 Eggs				
1 Young		1		
2 Young	9			1
3 Young	14	1		
4 Young				
1 Egg 1 Young	5			
1 Egg 2 Young	7		1	
1 Egg 3 Young				
2 Eggs 1 Young				
2 Eggs 2 Young				
2 Eggs 3 Young				
3 Eggs 1 Young				1
4 Eggs 1 Young				

Table 8. Nesting trees, shrubs, and vines for Black-crowned Night-Herons (BCNH), Snowy Egrets (SNEG), Great Egrets (GREG), and Glossy Ibis (GLIB) at Hoffman Island, 26 May 2011.

Hoffman Island - Nesting Vegetation

	BCNH	SNEG	GREG	GLIB
Black Cherry	9	1	6	7
Mulberry sp	89	9	64	11
Box Elder	26	2	5	1
Oriental Bittersweet	55	16	55	24
Multiflora Rose	21	30	13	9
Privet sp.	35	5	9	7
Hackberry	4		1	

Table 9. Nest contents for Black-crowned Night-Herons (BCNH), Snowy Egrets (SNEG), Great Egrets (GREG), and Glossy Ibis (GLIB) at Hoffman Island, 26 May 2011.

Hoffman Island – Nest contents

	BCNH	SNEG	GREG	GLIB
Empty	18		1	13
1 Egg	6	2		1
2 Eggs	17	8	2	8
3 Eggs	65	17	18	12
4 Eggs	8	7	5	4
5 Eggs		3		
1 Young	6	1	1	1
2 Young	37	2	11	8
3 Young	58	8	14	15
4 Young	1	1		4
1 Egg 1 Young	3			4
1 Egg 2 Young	18	4	3	3
1 Egg 3 Young		3		
2 Eggs 1 Young	2			
2 Eggs 2 Young		3		
2 Eggs 3 Young		1		
3 Eggs 1 Young	1	1	2	

Figure 1: Current and former nest sites in NY/NJ Harbor for waders, cormorants, and gulls. Map modified by authors from OasisNYC.

Figure 2: Mallard nest observed in base of tree on South Brother Island, May 15, 2011. Photo: © E. Craig.

Figure 3: Great Egret nest with six eggs on Mill Rock Island, May 25, 2011. Photo: © E. Craig.

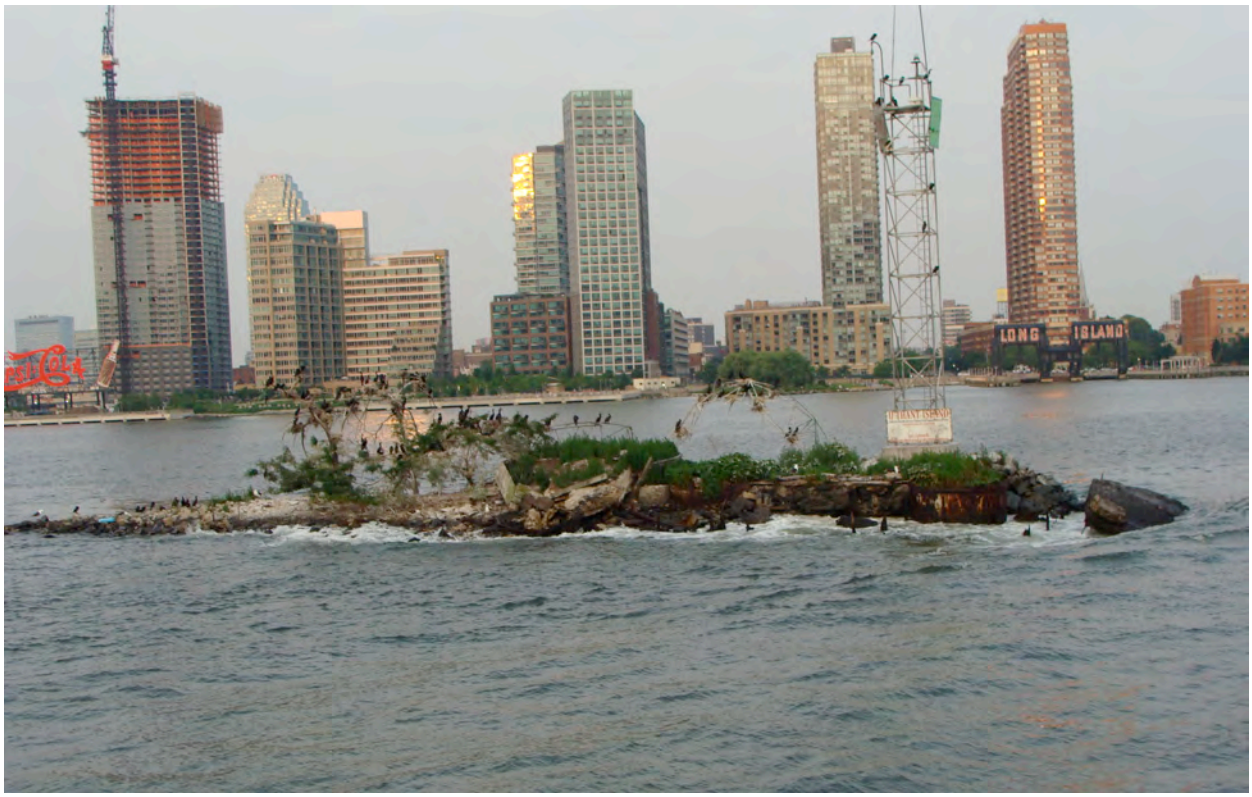

Figure 4: U Thant Island during the 2011 breeding season. Photo © E. Craig.

Figure 5: Yellow-crowned Night-Herons observed on Swinburne Island during the 2011 breeding season. Photo © E. Craig.

Figure 6: Harbor Seal observed in the harbor of Swinburne Island, June 14 2011. Photo: © E. Craig.

Figure 7: An active, mixed species colony (top) and Snowy Egret nest (bottom) on Elder's Point Marsh East in Jamaica Bay, May 19, 2011. Photo: © E. Craig.

Figure 8: Ground-nesting Double-crested Cormorants on Elder's Point Marsh East in Jamaica Bay, May 19, 2011. Photo © E. Craig.

Figure 9: Cormorants nesting on aids to navigation in the Arthur Kill, Kill van Kull, and northwestern Raritan Bay, 30 July 2010. Photo: © E. Craig

Figure 10: Great Egret banded on June 30, 2011 on Hoffman Island and re-sighted in Ulster County, NY. Photo © Jim Yates.

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

Below is a list of other known projects conducted from 2008 to 2010 either directly or indirectly related to the Harbor Herons or the islands on which they nest. Please contact ecraig@nycaudubon.org to report additional research projects.

Asian Longhorned Beetle identification training for NYC-area researchers, Fort Wadsworth, Staten Island, NY. 2008. Contact: Joan Mahoney, NYS Department of Ag. and Markets.

Arthur Kill Wildlife Refuge Concept, Sweetbay Magnolia Conservancy. Ongoing. Contact: Richard Lynch, Sweetbay Magnolia Conservancy.

Citizen science monitoring program of long-legged waders of NY and NJ, NYC/NJ Audubons. Ongoing. Contact: Susan Elbin, New York City Audubon and Nellie Tsipoura, NJ Audubon.

Colonial waterbird foraging ecology study: stable isotope analyses of wading bird and seabird feathers from NY Harbor and Westchester County, NY. Ongoing. Contact: Elizabeth Craig, New York City Audubon/ Cornell University.

Double-crested Cormorant diet study, CUNY-Queens College. Ongoing. Contact: Colin Grubel and John Waldman, CUNY-Queens College.

Double-crested Cormorant population dynamics. Ongoing. Contact: Susan Elbin, New York City Audubon.

Elders Point Marsh West Marsh Restoration Project, U.S. Army Corps of Engineers. Ongoing Contact: Melissa D.A. Alvarez, U.S. Army Corps of Engineers

Great Egret radiotelemetry study, New York City Audubon/NJ Audubon. June-August 2008-2010. Contact: Susan Elbin, New York City Audubon.

Habitat Health, Ptilochronology and Waterbirds: A Tale of Two Estuaries. Ongoing. Contact: Charles Clarkson, University of Virginia.

Habitat restoration on North Brother Island, NYC Department of Parks and Recreation, Ongoing. Contact: Tim Wenskus, NYC Department of Parks and Recreation.

Habitat restoration and final capping activity for the proposed Fresh Kills Park (in the vicinity of Isle of Meadows), NYC Department of Parks and Recreation/NYC Department of Sanitation. Contact: Michael Feller, NYC Department of Parks and Recreation – Natural Resources Group.

HeronCam project on Goose Island, New York City Audubon and NYC Department of Parks and Recreation. Ongoing. Contact: Glenn Phillips, New York City Audubon.

White Island Habitat Restoration Project, NYC Department of Parks and Recreation. Ongoing. Contact: Michael Feller, NYC Department of Parks and Recreation – Natural Resources Group.