



NEW YORK CITY AUDUBON
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NEW YORK CITY AUDUBON'S HARBOR HERONS PROJECT:

2012 INTERIM NESTING SURVEY REPORT

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Prepared for:

New York City Audubon
Glenn Phillips, Executive Director
71 W. 23rd Street, Suite 1523
New York, NY 10010
Tel. 212-691-7483
www.nycaudubon.org

Prepared by:

Elizabeth Craig, Research Associate
New York City Audubon
71 W. 23rd Street, Suite 1523
New York, NY 10010
Tel. 212-691-7483
ecraig@nycaudubon.org

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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 20 May and 1 June 2012. 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 eight 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). Black-crowned Night-Herons continued to be the numerically dominant nesting species in most mixed-species colonies. The Tricolored and Little Blue herons continued to nest at low numbers. Cattle Egret and Green Heron, observed in small numbers in previous years, have not been observed nesting in New York Harbor since 2010. A total of 1,389 Double-crested Cormorant nests were observed, exhibiting very little population growth since 2011. Gull nesting activity was observed on all surveyed islands. As not all islands were comprehensively surveyed in 2012, population level trends for most wader species could not be determined, however island-specific trends are offered below for islands that were comprehensively surveyed in both 2011 and 2012.

Island summaries: The largest species diversity was observed in Jamaica Bay on Subway Island this year (seven wader species) as opposed to Canarsie Pol as in previous years. The greatest total number of nests was observed on Hoffman Island as in recent years, despite the incomplete nature of the survey conducted on this island in 2012. Nesting activity in Jamaica Bay was concentrated on Subway Island and Elder's Point Marsh East, where wader populations experienced moderate increases. Nesting activity declined drastically on Canarsie Pol (by -97%) in Jamaica Bay, and to a lesser extent on South Brother Island (by -9%). 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, continued to exhibit no signs of wader nesting activity in 2012. Mainland nesting of Yellow-crowned Night-Herons has increased after predation pressure reduced the breeding colony at the Redfern Houses in Far Rockaway in 2010. Double-crested Cormorants nested on eight islands throughout the harbor. 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 2012 Harbor Herons nesting survey marks the 27th 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 2012.

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 2012 field season, between 20 May and 1 June. The objectives of the 2012 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 2012 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 20 May and 1 June 2012.

Islands surveyed in 2012 (Table 1, Figure 1) included one in Lower New York Harbor (Swinburne Island); 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 one island in Lower New York Harbor (Hoffman Island) and 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 2012 surveys.

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Results

Overview:

In 2012, 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 Mill Rock. Canarsie Pol, in Jamaica Bay, has historically been the most diverse and one of the largest wader colonies in the New York Harbor in the 14 years that it has been surveyed. In 2012, however, Canarsie Pol exhibited record low numbers of nesting pairs. Several small islands in Jamaica Bay (including Subway Island and the newly-restored Elder's Point Marsh East) exhibited increases in wader nesting activity, likely due to the declines observed on Canarsie Pol. Hoffman Island was not systematically surveyed in 2012 due to poor weather conditions, and therefore the survey numbers reported for this island should be considered underestimates for all wader species. Islands with declining trends in recent years (i.e., Huckleberry Island and North Brother Island) continued to exhibit little to no 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, continues to show no sign of wader nesting activity.

Due to incomplete surveys on major nesting colonies, including Hoffman Island and Canarsie Pol, we cannot offer species-specific trends for the general New York Harbor area this year. The species accounts within this report offer observations and trends specific to islands surveyed comprehensively in both 2011 and 2012 (including South Brother Island and Mill Rock).

Data on wader nesting vegetation and nest contents for South Brother and Hoffman islands are provided in Tables 5-8. Incidental bird observations are provided in the island accounts below.

Island Accounts:

Hutchinson River/Long Island Sound:

Huckleberry Island (10 acres)

23 May 2012, 9:50-11:45 AM.

By the author, Susan Elbin (New York City Audubon), David Künstler (NYCDPR), Alex Summers (NYCDPR), Mary Schroeder (NYCDPR), Krissa Saldana (NYCDPR), Colin Grubel (CUNY Queens), and John Burke (Huckleberry Indians, Inc.).

The Huckleberry Island nesting survey revealed one Black-crowned Night-Heron adults. This 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 2012, despite observations of small numbers of Great Egrets on this island in recent years. Double-crested Cormorants (215 nests) exhibited a 20% decrease from 2011. Eleven Herring Gull and 17 Great Black-backed Gull adults were observed, in addition to three Great Black-backed gull nests. Six adult American Oystercatchers were observed, likely

indicating three nesting pairs on the island. Seven adult Mallards (three pairs) and 21 adult Canada Geese (with at least 17 confirmed nests) were observed. A pair of Killdeer were observed attending a nest with four eggs (Figure 2). Other bird species observed on the island included Song Sparrow, Red-winged Blackbird, Common Grackle, Grey Catbird, Common Eider (one adult male and one adult female), Spotted Sandpiper (six adults), and approximately 40 adult Dowitcher sp.

Wader activity has been concentrated on the northern peninsula of the island in recent years. Apparently appropriate nesting habitat continues to be present on the peninsula and 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, 12:45-2:00 PM.

By the author, Susan Elbin, David Künstler, Alex Summers, Mary Schroeder, Krissa Saldana, and Colin Grubel.

Goose Island supported 111 wader nests, a 12% increase from 2011. Nesting by Black-crowned Night-Heron, Great Egret, Snowy Egret, and Great Blue Heron was confirmed. One adult Glossy Ibis was observed on the island. This adult was assumed to represent one nesting pair. No gull nests were observed on the island this year. Eight Canada Goose nests were observed during the survey. Other bird species observed on the island included Common Grackle (at least 13 nests), and Mallard (one nest). 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 2012.

South Brother Island (12 acres)

24 May from 9:20AM - 12:00PM, and 30 May 2012 from 10:00AM – 12:00PM

By the author, Susan Elbin, Tod Winston (New York City Audubon), John Rowden (New York City Audubon), Andrew Fulmer (CUNY), Michael Feller (NYCDPR), Alex Summers, Mary Schroeder, Krissa Saldana, Colin Grubel, Coby Klein (CUNY), Andrew Turk (New York City Audubon volunteer), and Mitch Waxman (The Newtown Pentacle).

The cormorant survey was conducted on 24 May. Due to rainy conditions on that date, the wader nesting survey was delayed until 30 May when conditions were more favorable. A total of 351 nests of four wader species (Black-crowned Night-Heron, Great Egret, Snowy Egret, and Yellow-crowned Night-Heron; see Table 2) was noted throughout the island. This represents a decrease (-9%) from 2011. No evidence of Glossy Ibis nesting activity was observed this year as in recent years. This colony continued to be the second largest wader colony in the NY Harbor. Double-crested Cormorants (216 nests) exhibited a 10% decrease in nest numbers from 2011, and primarily occupied the center and northeastern areas of the colony. Based on adults present, an estimated 13 Herring Gull pairs and 37 Great Black-backed Gull pairs nested on the Island.

Waders nested in 8 species of trees and shrubs on South Brother, as well as tree/shrub/vine arrangements (Table 5). Black-crowned Night-Herons nested predominantly in Box Elder, Black Cherry, and Mulberry species, 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. 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 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 6).

Other bird species observed included Laughing Gull, American Oystercatcher, Spotted Sandpiper, Semipalmated Sandpiper, Ruddy Turnstone, Common Grackle, Grey Catbird, Song Sparrow, Yellow Warbler, European Starling, Mourning Dove, and Fish Crow. In contrast to recent years, no evidence of Great Horned Owl nesting activity was observed in 2012.

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)

30 May 2012, 1:50 PM - 3:00 PM

By the author, Susan Elbin, Alex Summers, Mary Schroeder, and Krissa Saldana.

Two hundred and three wader nests were observed on Mill Rock Island; a 19% increase from 2011. Four species of waders (Black-crowned Night-Heron, Great Egret, Snowy Egret, and Yellow-crowned Night-Heron) were observed nesting on this Island. Nine Herring Gull and six Great Black-backed Gull nests were confirmed. Double-crested Cormorants (two nests) were observed nesting on Mill Rock Island for the second consecutive year.

Other bird species observed on the island included Mallard, Fish Crow, Spotted Sandpiper, Song Sparrow, and Red-winged Blackbird.

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)

23 May 2012, 7:45 PM

By the author.

U Thant (Figure 3) was surveyed from a boat with binoculars, approximately 10 meters from shore. Thirty-seven 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 18 pairs of Great Black-backed Gulls and one pair of Herring Gulls nested on the island. One Canada Goose was also present on the U Thant Island.

Staten Island – Arthur Kill and Kill Van Kull

Isle of Meadows (101 acres)

29 May 2012, 12:30-1:30 PM

By the author, Alex Summers, and Michael Feller.

No nesting waders, cormorants, or gulls were observed, nor were there any nests that looked recently active at the time of the survey.

White-tailed Deer trails were observed on Isle of Meadows. 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. Raccoon tracks were also observed along the shore of the island. Additional bird species observed included American Robin, House Wren, Tree Swallow, Song Sparrow, Common Yellowthroat, American Redstart, Yellow Warbler, Canada Warbler, Grey Catbird, Eastern Towhee, Willow Flycatcher, Brown-headed Cowbird, American Woodcock, Barn Swallow, Downy Woodpecker, Great Black-backed Gull, Wild Turkey, American Crow, and Red-tailed Hawk.

Based on the forest communities present on the island (gray birch and maple) and its proximity to an area known to support ALBs, the island is at risk for possible ALB infestation. The island should be carefully monitored in future years.

Prall's Island (88 acres)

29 May 2012, 10:45 AM - 12:15 PM

By the author, Alex Summers, and Michael Feller.

Prall's Island, the site of the most recent Black-crowned and Yellow-crowned Night-Heron nesting attempts off western Staten Island, has continued to be inactive since 2005. Efforts to control an ALB infestation on the island in March-April 2007 resulted in the removal of most suitable nesting trees (approximately 3,000 trees in total). A long-term restoration strategy is being formulated in the interest of restoring native plant communities to the island.

Continued use of the island by White-tailed Deer was apparent. Raccoon and fox tracks were also observed on this island. Bird species observed on or flying over the island included Song Sparrow, Yellow Warbler, Caroline Wren, Tree Swallow, Willow Flycatcher, Fish Crow, and American Woodcock.

Shooter's Island (48 acres)

8 May 2012

By Susan Elbin and Nate McVay (NYCDPR)

While this island was not systematically surveyed in 2012, Susan Elbin and Nate McVay visited the island in early May and reported their observations. No waders were observed on, or in the vicinity of, Shooter's Island, which appears to have habitat suitable for waders. One Mallard and two Canada Goose nests were observed on the island. Two adult Herring Gulls were observed off the shore. Other bird species observed included Yellow Warbler and Black and White Warbler.

The Double-crested Cormorant colony situated on dry docks and other wreckage west of Shooter's Island decreased to 17 nests from the 30 active nests observed in 2011.

Hoffman Island (10 acres)

20 May from 1:55 PM - 2:55 PM, and 1 June 2012 from 10:15 AM – 1:30 PM

By the author, Susan Elbin, John Rowden, Emilio Tobon (New York City Audubon), and David Perry (NYU)

Due to time constraints on 20 May, only gulls were surveyed on this date. The waders and cormorants were surveyed on 1 June, however due to stormy weather on this date, waders were not comprehensively surveyed on this island. Despite this, the survey team still observed the largest number of wader nests in the NY Harbor on Hoffman Island as in the previous three years. There were greater than 527 nests of at least five wader species observed, including Black-crowned Night-Heron, Great Egret (Figure 4), Snowy Egret, Glossy Ibis, and Yellow-crowned Night-Heron. Because the waders were not comprehensively surveyed, we cannot offer comparisons of nesting activity to previous years. 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 7). Wader nest content data were collected on Hoffman Island (Table 8).

There were 400 Double-crested Cormorant nests observed on Hoffman Island in 2012; a 16% increase from 2011. 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 in 2012.

Forty Herring and 67 Great Black-backed gull nests were counted during the survey. Two Canada Goose nests were observed. Additional species observed included Mallard, Fish Crow, Northern Cardinal, Red-winged Blackbird, Eastern Towhee, Crey Catbird, Son Sparrow, Cedar Waxwing, Spotted Sandpiper, and Greater Yellowlegs.

Swinburne Island (4 acres)

20 May 2012, 10:20 AM - 1:45 PM

By the author and Susan Elbin.

A total of 426 cormorant nests was observed, a 57% increase from 2012. Nests were located on the remains of buildings, and in several Hackberry, Black Locust, and Mulberry trees (Figure 5). Forty seven Herring Gull nests and 44 Great Black-backed Gull nests were observed. Additional species observed included Fish Crow and Red-winged Blackbird.

Jamaica Bay

Elder's Point Marsh (21 acres)

31 May 2012, 5:30-6:00 PM

By the author, Don Riepe (American Littoral Society), and Susan Elbin.

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). 2012 was the third 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 six wader species, including Black-crowned Night-Herons, Great Egrets, Snowy Egrets, Glossy Ibis, Little Blue Heron, and Tricolored Heron; a 100% increase from 2012 (Figure 6). This increase coincides with a marked decline in nesting activity on Canarsie Pol.

Eighty-nine Double-crested cormorant nests were observed; a 7% decrease 2012. This included cormorants nesting on the ground, which is common elsewhere in the breeding range of the Double-crested Cormorant, but not within the New York Harbor. Two hundred Herring Gull adults and 16 Great Black-backed Gull adults were observed.

Other bird species observed on this island included Red-winged Blackbird and Fish Crow.

Elder's Point Marsh West is in the final stages of marsh restoration through the 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.

Subway Island (40 acres)

31 May 2012, 4:15 – 5:00 PM

By the author, Don Riepe, and Susan Elbin.

2012 was the third 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 160 wader nests were observed, representing seven species of waders including Black-crowned Night-Herons, Great Egrets, Snowy Egrets, Glossy Ibis, Yellow-crowned Night-Heron, Little Blue Heron, and Tricolored Heron. This represents an increase of two species and of 7% nesting activity since 2011. In addition, 350 Herring Gull adults and 16 Great Black-backed Gull adults were observed. Twelve American Oystercatchers were observed on the island as in 2011. Other species present included Mourning Dove, Willet (four adults), Semipalmated Sandpiper, American Crow, Fish Crow, European Starling, Common Grackle, and Red-winged Blackbird.

This influx of birds on Subway Island coincided with unprecedented declines observed on Canarsie Pol.

Canarsie Pol (220 acres)

June 2012,

By Don Riepe.

Due to poor weather during the survey period, Canarsie Pol was not visited as part of the Harbor Herons survey period in 2012. Don Riepe reported observing four cormorant nests, four Black-crowned Night-Heron nests and three Yellow-crowned Night-Heron nests during a visit in mid June. Otherwise, he reported the island was largely deserted this year. This year marks the second consecutive year of massive decline in nesting activity on Canarsie Pol, as well as a record low number of nesting pairs within the 14 years that this island has been monitored. 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. Further investigation is highly recommended, as this island has historically been one of the largest and most diverse heron colonies within the New York Harbor system.

Other Jamaica Bay islands

May-June 2012

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 22 May 2012 10:00 – 10:30 AM) by the author, Mark Hauber (Hunter College), Colin Grubel, and Andrew Fulmer.

A total of 39 nests was observed (Table 2) constituting a marked increase from the 15 nests observed in 2011. This is the 9th year the colony has been confirmed. In 2010, residents of the Redfern Houses observed predation of Yellow-crowned Night-Heron nests by hawks, and low nest numbers in 2011 were attributed to this disturbance. Predation was not observed in 2011 or 2012.

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. There were 10 nesting pairs at Harmon Cove in Secaucus this past season – confirmed by residents. This is a slight decline from 2011. There was a possible nest attempt in the Mill Creek area of Secaucus, but it was not confirmed. Fledglings have been sighted along the river and in the Anderson Creek Marsh.

Aids to Navigation:

Nine nesting pairs of Double-crested Cormorants were observed by the author, Alex Summers and Mike Feller on aids to navigation in the Kill Van Kull and Arthur Kill on 29 May 2012. Cormorants nested on markers near Shooter's Island as well as on the decaying dry docks off the shore of Shooter's Island (discussed in the Shooter's Island survey summary above). Observations were made at a distance of 10-20 meters from channel markers.

Hugh Carola observed 31 nesting pairs of DCCOs on aids to navigation in Newark Bay; an increase from the 4 nests observed last year. 2012 was the first year in Hugh's time along the river that there were no Great Black-backed Gulls nesting on the old Newark Central Railroad bridge ruins.

Species Accounts:

Due to incomplete surveys on major nesting colonies, including Hoffman Island and Canarsie Pol, we cannot offer species-specific trends for the general New York Harbor area this year. The following species accounts offer observations and trends specific to islands surveyed in both 2011 and 2012 (including South Brother Island and Mill Rock).

Black-crowned Night-Heron: Black-crowned Night-Herons were observed on eight colonies in 2012 and were the numerically dominant species in larger, mixed-species colonies such as Hoffman Island, South Brother Island, and Mill Rock. Observed nesting activity increased by approximately 52% on South Brother Island and 21% on Mill Rock.

Yellow-crowned Night-Heron: Numbers of nesting pairs on islands remained relatively unchanged between 2011 and 2012. However, a large increase in mainland nesting activity at the Redfern Houses was observed, likely due to the absence of nest predation by hawks in this area this year.

Great Egret: Great Egrets were observed on six islands in NY/NJ Harbor. This species appears to be moving its centers of nesting activity throughout the harbor, as some colonies (including South Brother Island) exhibited declines while others (including Mill Rock and islands in Jamaica Bay) exhibited increases. Without an accurate count of nesting pairs on Hoffman Island however, harbor-wide trends for this species cannot be determined for this year.

Snowy Egret: Snowy Egrets nested on six islands in NY/NJ Harbor. An overall decrease of approximately 5% was observed harbor-wide. This species, like the Great Egret, appears to be moving its centers of nesting activity throughout the harbor, as some colonies (including South Brother Island) exhibited declines while others (including Mill Rock and islands in Jamaica Bay) exhibited increases. Without an accurate count of nesting pairs on Hoffman Island however, harbor-wide trends for this species cannot be determined for this year.

Little Blue Heron: Little Blue Herons were observed on Elder's Point Marsh and Subway Island in Jamaica Bay in 2012. 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.

Tricolored Heron: Tricolored Herons were observed on Elder's Point Marsh and Subway Island in Jamaica Bay in 2012. 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 observations on 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: Glossy Ibis nests increased by 19% on Subway Island. However, for the first time in survey history, no Glossy Ibis were observed on Canarsie Pol. Without an accurate count of nesting pairs on Hoffman Island, harbor-wide trends for this species cannot be determined for this year.

Double-crested Cormorant: A total of 1,406 Double-crested Cormorant nests was observed on nine islands (Huckleberry, South Brother, U Thant, Hoffman, Swinburne, Mill Rock, and Shooter's islands, Canarsie Pol and Elder's Point Marsh East; Tables 2 & 3). An additional 40 nests were observed on aids to navigation. We observed a 5% increase in cormorant nests harbor-wide. Cormorants colonies must continue to be carefully monitored to determine the potential impact of cormorant nesting activity on wader nesting populations. 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. Moderate increases in nesting pairs were observed Harbor-wide for both species. Canarsie Pol was not surveyed for gulls in 2012 (Table 4).

Common Tern: This year a colony of Common Terns was observed on Governors Island by New York City Audubon's Gabriel Willow. Nests were observed on two fenced, apparently unused piers. Approximately 55 chicks were observed..

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, 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 Waterbirds 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 (1986-2012) 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
<u>Long Island Sound</u>			
Goose Island	23 May	7	NYC DPR
Huckleberry Island	23 May	7	Huckleberry Indians, Inc.
<u>Easter River</u>			
North Brother Island	Not surveyed		NYC DPR
South Brother Island	24 & 30 May	10	NYC DPR
Mill Rock	30 May	5	NYC DPR
U Thant	23 May	1	NYC DPR
<u>Arthur Kill-Kill Van Kull</u>			
Shooter's Island	8 May	2	NYC DPR
Prall's Island	29 May	3	NYC DPR
Isle of Meadows	29 May	3	NYC DPR
<u>Lower New York Harbor</u>			
Swinburne Island	20 May	2	NPS
Hoffman Island	20 May & 1 June	4	NPS
<u>Jamaica Bay</u>			
Elders Point Marsh	31 May	2	NPS
Canarsie Pol	June	1	NPS
Subway Island	31 May	2	NPS
<u>Mainland – Far Rockaway</u>			
Redfern Houses	22 May	4	NYC Housing Authority

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), and Great Black-backed Gull (GBBG).

	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 May & 1 June 2012	24 & 30 May 2012	June 2012	31 May 2012	23 May 2012	23 May 2012	31 May 2012	31 May 2012	20 May 2012	23 May 2012	22 May 2012
Waders											
BCNH	275	279	4	119	51	1	20	32	0	0	0
GREG	94	46	0	40	37	0	32	31	0	0	0
SNEG	56	17	0	42	21	0	18	40	0	0	0
GLIB	100	0	0	0	1	0	3	44	0	0	0
LBHE	0	0	0	0	0	0	5	1	0	0	0
YCNH	2	9	3	0	0	0	0	11	0	0	39
GRHE	0	0	0	0	0	0	0	0	0	0	0
TRHE	0	0	0	0	0	0	2	1	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	0	0	0	2	0	0	0	0	0	0	0
Total Active Wader Nests	527	351	7	203	111	1	80	160	0	0	39
Cormorants											
DCCO	400	216	4	2	0	215	89	0	426	37	0
Gulls											
HERG	40 nests	13 adults		30 adults 9 nests	0 nests	11 adults 0 nests	200 adults	350 adults	47 nests	1 adult	none
GBBG	67 nests	37 adults		34 adults 6 nests	0 nests	17 adults 3 nests	6 adults	16 adults	44 nests	18 adults	none

* - 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 2005-2012 †

<u>Island</u>	<u>Year – Number of Cormorant Nests</u>							
	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>
Shooter’s Island	36 ^a	54	41	23	20	35	30	17
Huckleberry Island	323	334	260	375	306	358	270	215
South Brother Island	281	326	271	297	231	264	241	216
Mill Rock Island	0	0	0	0	0	0	10	2
U Thant	15	21	24	29	30	31	38	37
Hoffman Island	64	166	155	235	225	216	345	400
Swinburne Island	87 ^b	264 ^c	264 ^c	295 ^c	288 ^c	320 ^c	272 ^c	426
Elder’s Point Marsh W	0	0	31	79	83	0	0	0
Elder’s Point Marsh E	0	0	0	0	0	4	96	89
Canarsie Pol	0	0	0	0	0	144	34	4
Aids to Navigation	0 ^a	0 ^a	0 ^a	51 ^a	35 ^a	39 ^a	44 ^{a1}	40 ^{a1}
Island Total	906	1,175	1,046	1,333	1,183	1,372	1,336	1,406
Cumulative Total	906	1,175	1,046	1,384	1,218	1,411	1,380	1,415

† Data sources include New York City Audubon surveys (2005-2012), cormorant studies by Susan Elbin and the author (2006-2012), 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				Great Black-backed Gull			
	# nesting pairs				# nesting pairs			
	2009	2010	2011	2012	2009	2010	2011	2012
Shooter's Island	5	0	N/A	0	0	0	N/A	0
Huckleberry Island	9	39 (2)	0	11 (0)	7	28 (4)	0	17 (3)
Goose island	0	0	0	0 (0)	1	2	1 (1)	0 (0)
S. Brother Island	12	14	6 (1)	13 (2)	49	82 (9)	37 (10)	37 (3)
N. Brother Island	8	25	N/A	N/A	2	6	N/A	N/A
U Thant Island	11	7	2	1	10	22	14	18
Hoffman Island	100	67 (36)	(33)	(40)	60	146 (101)	(40)	(67)
Swinburne Island	133	75 (117)	(47)	(89)	120	62 (33)	(44)	(23)

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

Table 5. Nesting trees, shrubs, and vines for Black-crowned Night-Herons (BCNH), Snowy Egrets (SNEG), and Great Egrets (GREG) at South Brother Island, 24 and 30 May 2012.

South Brother Island - Nesting vegetation

	<u>BCNH</u>	<u>SNEG</u>	<u>GREG</u>
Black Cherry	14		1
Mulberry sp.	12	1	2
Box Elder	25		
Oriental Bittersweet	38	12	11
Multiflora Rose	16		
Sycamore Maple	12		
Black Locust	1		
Ailanthus	2		

Table 6. Nest contents for Black-crowned Night-Herons (BCNH), Snowy Egrets (SNEG), and Great Egrets (GREG) at South Brother Island, 24 and 30 May 2012.

South Brother Island – Nest contents

	<u>BCNH</u>	<u>SNEG</u>	<u>GREG</u>	<u>GLIB</u>
Empty	4	3	0	
1 Egg	1			
2 Eggs	6	3		
3 Eggs	27	1		
4 Eggs	4	4		
5 Eggs	0			
1 Young	1			
2 Young	11			
3 Young	16		1	
4 Young	1			
1 Egg 1 Young	4			
1 Egg 2 Young	4			
1 Egg 3 Young	0			
2 Eggs 1 Young	2			
2 Eggs 2 Young	0			
2 Eggs 3 Young	0			
3 Eggs 1 Young	0			
4 Eggs 1 Young	0			

Table 7. Nesting trees, shrubs, and vines for Black-crowned Night-Herons (BCNH), Snowy Egrets (SNEG), Great Egrets (GREG), and Glossy Ibis (GLIB) at Hoffman Island, 20 May and 1 June 2012.

Hoffman Island - Nesting Vegetation

	<u>BCNH</u>	<u>SNEG</u>	<u>GREG</u>	<u>GLIB</u>
Black Cherry	1			
Mulberry sp	17		6	1
Box Elder	10	1		1
Oriental Bittersweet	7	1	4	
Multiflora Rose	3	1	1	
Privet sp.	24			3
Honeysuckle			2	4

Table 8. Nest contents for Black-crowned Night-Herons (BCNH), Snowy Egrets (SNEG), Great Egrets (GREG), and Glossy Ibis (GLIB) at Hoffman Island, 20 May and 1 June 2012.

<u>Hoffman Island – Nest contents</u>				
	<u>BCNH</u>	<u>SNEG</u>	<u>GREG</u>	<u>GLIB</u>
Empty	3	1		7
1 Egg				
2 Eggs	3			1
3 Eggs	10	2		
4 Eggs			1	
5 Eggs				
1 Young	1		1	
2 Young	1		2	
3 Young	13			
4 Young				1
1 Egg 1 Young				
1 Egg 2 Young	2			
1 Egg 3 Young				1
2 Eggs 1 Young	1			
2 Eggs 2 Young				
2 Eggs 3 Young				
3 Eggs 1 Young				



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



Figure 2: Killdeer nest observed on Hucklberry Island, 23 May 2012. Photo © E. Craig.



Figure 3: U Thant Island during the 2011 breeding season. Photo © E. Craig.



Figure 4: Great Egret adults and young observed during the survey of Hoffman Island on 1 June 2012. Photo © E. Craig.



Figure 5: Double-crested Cormorants breeding on Swinburne Island, 20 May 2012. Photo © E. Craig.



Figure 6: Waders, including Little Blue Herons, Tricolored Herons, and Black-crowned Night-Herons) nesting on Elder's Point Marsh East, 31 May 2012. Photo © Don Riepe.

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

Below is a list of other known projects conducted from 2008 to 2012 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.
- Prall's Island Heron Rookery Restoration and Harbor Herons Studies. Ongoing. Contact: Michael Feller, NYC Department of Parks and Recreation; Susan Elbin, New York City Audubon.