NEW YORK CITY AUDUBON'S HARBOR HERONS PROJECT:

2008 INTERIM NESTING SURVEY

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Abstract

New York City Audubon's Harbor Herons Project Interim Nesting Survey of New York/New Jersey Harbor and surrounding waterways was conducted between 18 and 30 May 2008, with additional nesting observations in June and July 2008. This report summarizes wading bird, cormorant, and gull nesting activity observed on selected islands, at one mainland colony and on aids to navigation. Wading birds nested on eight islands in NY/NJ Harbor; nine species were confirmed as nesters: Black-crowned Night-Heron, Great Egret, Snowy Egret, Glossy Ibis, Yellow-crowned Night-Heron, Little Blue Heron, Tricolored Heron, Cattle Egret, and Green Heron. The largest species diversity noted on Canarsie Pol (eight species). South Brother Island was the largest wading bird colony observed in 2008 (462 nests). Black-crowned Night-Herons were the numerically dominant nesting species on each island surveyed in 2008; few Cattle Egrets and Tricolored Herons were observed, and nesting for these species was limited to Canarsie Pol. No active wading bird nests were observed on islands in the Arthur Kill and Kill Van Kull. Following an eight-year decline, no Black-crowned Night-Herons were observed on North Brother Island. Wading bird nesting on Huckleberry Island has largely ceased, where only one Black-crowned Night-Heron nest was present. Mainland nesting of Yellow-crowned Night-Herons was observed at the Redfern Houses colony in Far Rockaway; 55 nests were present, a marked increase over the 26 nests observed in 2007. Double-crested Cormorants nested on seven islands (1,333 total nests); nesting activity doubled at Elders Point Marsh West in Jamaica Bay. An additional 51 nesting pairs of Double-crested Cormorants were observed on aids to navigation in the Kill Van Kull, Arthur Kill, and northwestern Raritan Bay. Herring and Great Black-backed gulls continued to nest throughout the harbor, although a total nest count was not conducted in 2008.

Introduction

New York City Audubon's Harbor Herons Project Interim Nesting Survey of New York/New Jersey Harbor and surrounding waterways was conducted between 18 and 30 May 2008, with additional nesting observations in June and July 2008. This report summarizes wading bird, cormorant, and gull nesting activity observed on selected islands, at one mainland colony and on aids to navigation. The primary objectives of the 2008 interim survey were to: (1) monitor the population status of wading birds (i.e., herons, egrets and ibis), cormorants, and gulls on selected islands; (2) document nesting habitat used by nesting wading birds and cormorants; and (3) record the presence of other important nesting or migratory bird species.

Islands surveyed in 2008 included three in the Arthur Kill-Kill Van Kull complex (Shooter's and Prall's Islands, and Isle of Meadows); two in Lower New York Harbor (Hoffman and Swinburne Islands); three in the East River/Western Long Island Sound area (U Thant, North and South Brother Islands); and two in the Hutchinson River/Long Island Sound area (Goose and Huckleberry Islands) (see Table 1 and Figure 1). Partial colonial waterbird estimates were conducted at five islands in Jamaica Bay: Canarsie Pol, Ruffle Bar, Elders Point Marsh West, Little Egg Marsh, and Subway Island. Additionally, presented below are observations of Double-crested Cormorant nests on aids to navigation (i.e., channel markers and beacons) in the Kill Van Kull, Arthur Kill, and northwestern Raritan Bay; and Yellow-crowned Night-Heron nesting at a mainland colony.

These islands were surveyed by a research team consisting of the authors, volunteers from NYC Audubon (NYCA) and other organizations, and staff from New York City Department of Parks and Recreation-Natural Resources Group (NYCDPR-NRG) and the National Park Service (NPS). Double-crested Cormorant counts were primarily conducted by Dr. Susan Elbin, Elizabeth Craig, and numerous volunteers as part of an ongoing study of cormorant population dynamics, habitat use, and foraging ecology in NY/NJ 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 a variety of information on colonial waterbird activity in Jamaica Bay.

In fall 2004, NYCA shifted the Harbor Herons Project Nesting Survey from an annual to a triennial schedule, and this interim report presents island accounts for 2008 activity. As all known colonies in NY/NJ Harbor were not surveyed in 2008, system-wide species totals are not presented. Gull and tern nest estimates were incomplete in 2008, and should not be interpreted as declines. Monitoring wading bird and cormorant nesting populations in NY/NJ Harbor provides both an estimate of the relative stability of local colonial waterbird populations, and serves as a valuable indicator of the overall health of the region's natural resources.

Methodology

The 2008 survey followed field methods designed for previous Harbor Herons Project nesting surveys (Dr. Katherine Parsons [1986-1995], Dr. Paul Kerlinger [1996-2004]) and the standard protocol of the New York State Department of Environmental Conservation's (NYSDEC) Long Island Colonial Waterbird and Piping Plover Survey (LICW). All counts between 6:00 AM and 4:00 PM, and under clear conditions without rainfall, high winds (>8 knots), or temperatures above 80°F. Most counts were conducted once from 18 to 30 May 2008; additional observations were made between early June and early July (see Table 1 for dates).

Wading bird surveys were conducted by one or two teams of researchers led by the authors. 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 'empty,' but not included in the final tally of active nests.

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. These surveys were conducted by Dr. Susan Elbin, Elizabeth Craig, and numerous volunteers. In addition, Dr. Andrew Bernick observed nests on aids to navigation south and west of Staten Island, from distances of 50 to 200 meters.

Adult counts of Great Black-backed and Herring Gulls were estimated at selected colonies. When adults were counted in the vicinity of selected colonies, a nest was assumed present for each adult seen, as one-half of adults are assumed to be foraging away from the nesting colony during daytime (see NYSDEC-LICW protocol; Kerlinger 2004).

Nesting vegetation (i.e., tree, shrub, or vine species) was recorded whenever possible by observers skilled in plant identification.

Transportation and Permits

Boat access to islands was provided by Nathanael McVay and Alexander Summers of the NYCDPR-NRG; Captain Rick Jacks and Debbie Mans of NY/NJ Baykeeper; Don Riepe of the American Littoral Society/Jamaica Bay Guardian; Eli, Lauren and Steven Kornspun; John Burke of the Huckleberry Indians; and Luger Balan and Mitsue Nagase Balan of the Urban Divers Estuary Conservancy. NYCA and the authors express sincere appreciation to these organizations and individuals for their time, fuel, and vessels (see Figure 2).

Permits were issued by the NYCDPR-NRG 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. The authors wish to thank Ellen Pehek and Michael Feller of NYCDPR-NRG, George Frame of NPS, Kim Tripp and Jessica Browning of NPS-Jamaica Bay Institute, and Gerry Padian and Peter Cella of the Huckleberry Indians for assistance during the permitting process.

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The authors wish to acknowledge NYCDPR-NRG for its continuing support and partnership in the Harbor Herons Project, particularly Michael Feller, Alexander Summers, Nathanael McVay, David Künstler, Ellen Pehek and Bill Tai. The NPS provided support and allowed access to islands within Gateway National Recreation Area for the Harbor Herons Project surveys, where information on the status of cormorants in the Lower NY Harbor and Jamaica Bay was acquired. George Frame (NPS) and Kim Tripp (NPS-Jamaica Bay Institute) provided assistance in the permitting process. Don Riepe of the American Littoral Society/Jamaica Bay Guardian continued to provide critical information and assistance on Jamaica Bay populations. Dave Adams, Joseph Pane, Michelle Gibbons, and Chip Hamilton of the NYSDEC provided their expertise and insight, which has aided NYCA in coordinating the NJ/NJ Harbor surveys within NYSDEC's Long Island Colonial Waterbird and Piping Plover Survey timeframe. We also thank Joan Mahoney and Ed Bressel of the NYS Department of Agriculture and Markets for offering Asian Longhorned Beetle (ALB) training in 2008 to Harbor Herons Project volunteers and collaborators.

Results

In 2008, nine species of wading birds (Black-crowned Night-Heron, Great Egret, Snowy Egret, Glossy Ibis, Yellow-crowned Night-Heron, Little Blue Heron, Green Heron, Tricolored Heron, and Cattle Egret) were confirmed as breeders on eight islands (see Table 2). Several islands where wading bird nesting has been recently detected, such as Swinburne Island, Subway Island, and Elders Point Marsh West, continued to support low levels of wading bird nesting. Islands with declining trends in previous years (i.e., Huckleberry Island, North Brother Island) showed an apparent decline in nesting activity in 2007. Two of the largest wading bird colonies, South Brother and Hoffman islands, showed declines in wading bird nests from 2007 levels (-22% and -21%, respectively).

Colonial waterbird nesting on Huckleberry Island has continued to decline over the past decade, and the island mainly supported Double-crested Cormorants and only two wading bird nests (-98% since 2001, when 140 nests were observed). Goose Island continues to support reduced numbers of wading bird nests compared with 2004. Mammalian predators (i.e., Raccoon and Virginia Opossum) may be contributing to the recent reduction in nesting activity on both islands.

In the East River area, Black-crowned Night-Heron nesting activity was absent at North Brother Island, the first time that nesting has not occurred there since annual surveys began in 1991. South Brother Island was the largest wading bird colony (462 nests) and second largest Double-crested Cormorant colony (297 nests) surveyed in 2008. However, the number of nests observed decreased markedly from 2007 levels. Also at South Brother, a Great Horned Owl nest with three fledglings was observed on the northwestern corner of the island.

In the Staten Island area, no wading bird nesting activity was noted on islands in the Arthur Kill/Kill Van Kull complex (Isle of Meadows, Prall's Island, and Shooter's Island), where the core of NY/NJ Harbor area wading bird reproduction occurred from the 1970's through the late 1990's. Prall's Island, the site of the most recent Black-crowned and Yellow-crowned Night-Heron nesting attempts off western Staten Island, was inactive; efforts to control ALB populations on the island in March-April 2007 resulted in the removal of most suitable nesting trees. Several invasive woody plant species, including Glossy Buckthorn (*Frangula alnus*) and Callery Pear (*Pyrus calleryana*), have substantially colonized many of the cleared areas on Prall's Island; a long-term restoration strategy is warranted in the interest of restoring native plant communities to the island. Adult White-tailed Deer were observed on both Isle of Meadows and Prall's Island, were they have reproduced in the past (Bernick 2006). Ospreys established four nests in the Arthur Kill and Kill Van Kull, including one on the ruins of an iron furnace on a wooden structure south of Shooter's Island, and a new nest on a scuttled vessel in the Port Mobil area. A Red-tailed Hawk nest with three young was observed in a large Black Cherry on Isle of Meadows.

In Jamaica Bay, systematic surveys were made only at Elders Point Marsh West. Two Great Egret nests were confirmed and Double-crested Cormorant nesting increased over two-fold to 79 nests. Presently, Elders Point Marsh West is being planned as marsh restoration site by the U.S. Army Corps of Engineers; Canarsie Pol was partially surveyed by both ground- and boat-

based counts (during an annual Barn Owl census conducted by Don Riepe and the New York City Department of Environmental Protection's [NYCDEP] Chris Nadareski), which confirmed nesting for eight species of wading birds (including the only site in NY/NJ Harbor with nesting Cattle Egrets (two nests). Partial counts of Ruffle Bar and Little Egg Marsh showed no evidence of wading bird nesting. Four Black-crowned Night-Heron nests were observed during partial counts of Subway Island, an increase over the two partially constructed Black-crowned Night-Heron nests with attending adults observed in 2008.

For islands where systematic surveys were conducted, nesting appeared to decrease slightly over 2007 levels for Great Egret and Black-crowned Night-Heron, and more markedly for Glossy Ibis and Snowy Egret. In 2007, a five-year low for Glossy Ibis nesting populations was observed in the NY/NJ Harbor; on Hoffman Island, Glossy Ibis nesting decreased from 84 to 56 nests (-34%). Black-crowned Night-Heron remained the numerically dominant nesting species on islands that were systematically surveyed in 2008. Yellow-crowned Night-Heron populations showed a marked increase at a mainland nesting colony over 2007 levels (+47%).

Tricolored Herons, Little Blue Herons and Cattle Egrets continued to nest in low densities in NY/NJ Harbor. Cattle Egrets were confirmed as nesters on Canarsie Pol only. Green Herons were rarely located; the harbor-wide population of Green Herons not well estimated by these surveys.

A total of 1,333 Double-crested Cormorant nests were observed on seven islands (Huckleberry, U Thant, Hoffman, South Brother, Shooter's, and Swinburne and Elders Point Marsh West; see Tables 2 and 3); this represents the highest count since 1999. An additional 51 nests were observed on aids to navigation in Raritan Bay and western Staten Island. Substantial increases over 2007 levels were observed at Hoffman Island (+34%, including the first nesting on the northern portion of the island), Huckleberry Island (+31%) and Elders Point Marsh West (+61%). An analysis of Double-crested Cormorant population trends in NY/NJ Harbor is pending (Elbin and Bernick *in prep*).

Herring and Great Black-backed gull surveys were incomplete in 2008, and the largest gull colonies in the Harbor (i.e., Canarsie Pol, Subway Island and Little Egg Marsh) were not surveyed. Gull nest estimates for selected colonies are presented in Tables 2 and 4. Laughing Gull surveys are conducted annually in Jamaica Bay, although they have not been included in Harbor Herons Project reports. More information on Laughing Gull populations in Jamaica Bay may be obtained from Laura C. Francoeur of the Port Authority of New York and New Jersey and Don Riepe of the American Littoral Society/Jamaica Bay Guardian. Common Terns were found to nest on bare sand upland areas at Little Egg Marsh in 2007; nest numbers were not estimated in 2008. The core nesting area for this species in NY/NJ Harbor is likely Breezy Point Co-op (Steven Sinkevich, U.S. Fish and Wildlife Service [USFWS], pers.comm.), where 1,000's of birds have nested in recent years. No Forster's Terns have been confirmed as breeders by the Harbor Herons Project.

Data on wading bird nesting vegetation and nest contents for Hoffman Island and South Brother Island is provided in Tables 5-8. Incidental bird observations are provided in the island accounts below. Additional incidental data was collected at, and in the vicinity of, the Arthur

Kill/Kill Van Kull colonies during the 23 May 2008 survey, and is presented in Table 9. It is clear that numerous neotropical migrants and breeding birds continue to use islands in the Arthur Kill and Kill Van Kull. Plans for habitat restoration projects should take this into account.

Island Accounts

Long Island Sound - Pelham/New Rochelle, Westchester

Huckleberry Island
30 May 2008, 9:45 AM – 1:30 PM
By Elizabeth Craig, David Künstler (NYCDPR) and Susan Elbin with Janine Harris (NYCDPR-NRG), Kate Ruskin (NJ Audubon), and John Burke (Huckleberry Indians).

Wading bird nest counts revealed approximately two heron and egret nests of two species (see Table 2), a decline from the 6 nests in 2007. Double-crested Cormorant (375 nests) were present throughout the island, and both Herring (nine adults) and Great Black-backed (16 adults) gulls were observed. Five adult American Oystercatchers were observed and one nest was confirmed, constructed on a rocky shore with mussel shells. Adults were observed visiting the nest site as late as 6 June (Emily Yurlina via David Künstler, pers. comm.).

Wading birds nests were located in the center of the island within an area dominated by Norway Maple, Black Cherry, and Multiflora Rose. One Black-crowned Night-Heron nest with two eggs was confirmed. Additional nesting was not observed, although five adults were present on the island during the counts. For Great Egrets, one empty nest with evidence of recent use was observed, although five adults were present during the counts. Appropriate nesting habitat appears to be present within the central and western sections of the island, so observed declines may be caused by the presence of nest predators (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, pers.comm.), while unauthorized visitation remains a source of human disturbance that may escape detection. Double-crested Cormorants have continued to nest on the eastern section of the island, which was formerly populated by herons and egrets. Competition for nesting sites between wading birds and cormorants may be a factor in observed wading bird declines.

Due to an overall decline in wading bird nesting over the past five years on Huckleberry Island, it is imperative to continue monitoring activities. NYCA and NYCDPR-NRG 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 wading birds and cormorants in the New York City area; for a more detailed treatment of the islands' bird populations, see Künstler (2008).

East River, Hutchinson River, and Long Island Sound

Goose Island
19 May 2008, 11:50 AM – 1:40 PM. Additional nestcam repair from 2:55 PM - 4:00 PM
By the authors with David Künstler (NYCDPR) and Michael Feller (NYCDPR-NRG). Webcam repair by Richard Herman and Rebecca Christopher from EarthCam occurred simultaneously with nesting surveys. Christina Aracil and Jeff Kolbrunner provided additional support.

Goose Island supported 106 wading bird nests, a slight increase over 2007 (+19%). Nesting by Black-crowned Night-Herons, Great Egrets, Snowy Egrets, and Yellow-crowned Night-Herons was confirmed. A Little Blue Heron was observed flying from the south side of the island, indicating a nesting attempt. A single Great Black-backed Gull nest was present on the northwest side of the island. Two American Oystercatchers were observed on the east side of the island, and additional observations in early June suggested the presence of a nesting pair on the west side of the island. Yellow-crowned Night-Herons were observed foraging on lawns in the Co-op City housing development (Emily Yurlina, 3 June, pers. comm.) For further information, Künstler (2007) presents a detailed treatment of Goose Island bird populations and vegetation from 1996-2006.

A 'HeronCam' was placed on the island in 2007 in a joint project between NYCA and NYCDPR. Malfunctions were detected during the early nesting season, and repairs were made concurrent with the nesting surveys by EarthCam, Inc. The HeronCam was available for public viewing via NYCA's Harbor Herons website in 2008, although active nests were difficult to locate within the camera viewing area. This might suggest movement from the core nesting area, or a slight shift in nest site location over 2007. Mammals have been noted on Goose Island in past seasons (Raccoon and Virginia Opossum); a lawn chair and beach umbrella was noted on the east side of the island, suggesting unauthorized visitation.

East River

North Brother Island
18 May 2008, 10:00 AM – 11:23 AM
By the authors with Colin Grubel (CUNY - Queens College). Additional support provided by Richard Love (NYCDPR-NRG), Erik Karff (NYCA), Adam Leibowitz and two students (A.C.T.I.O.N. at The Point) and Ludger Balan of the Urban Divers Estuary Conservancy.

No active Black-crowned Night-Heron nests were located on the island during the 18 May 2008 survey. Gull nesting appeared to be reduced from previous years and occurred on the roofs of various hospital buildings on the island. Two American Oystercatcher adults were observed on the northeastern end of the island, and were possibly nesting in the area. Three Mallard nests and five Canada Goose nests were observed. Other species encountered were Black-throated Blue Warbler, American Redstart, Black and White Warbler, Northern Parula, Chestnut-sided Warbler, Eastern Kingbird, Gray Catbird, Northern Cardinal, Common Grackle, Blue Jay, and Fish Crow.

A follow-up survey of North Brother Island was conducted on 25 June 2008 by Elizabeth Craig, Alexander Summers, and Juno Angarita. No active nests or adults were observed. During two New York City Audubon Harbor Herons Eco-cruises, adult and juvenile Great Blue Herons were observed in a tree and along the shoreline of North Brother Island.

A major habitat restoration project was undertaken by NYCDPR-NRG in winter and early spring of 2005 and 2006, which involved the removal of mature stands of Norway Maples, planting of native tree and shrub species favored by nesting wading birds, and the eradication of a kudzu population present on the island (M. Feller, NYCDPR-NRG, pers.comm.). Future plans to manage other introduced vine species prevalent on the island (e.g., Asiatic Bittersweet, Porcelainberry) are being considered by NYCDPR-NRG, with the purpose of establishing native plant communities to the island.

South Brother Island
28 May 2008 from 9:24 AM - 12:00 PM
By the authors with Dr. Susan Elbin; Michael Feller, Nathanael McVay, Alexander Summers, Victoria Ruzicka and Ellen Pehek (NYCDPR-NRG); Juno Angarita (Columbia University) and Tom Veltre (The Really Interesting Picture Company, Ltd.).

A total of 462 nests of five wading bird species (Black-crowned Night-Heron, Great Egret, Snowy Egret, Glossy Ibis, and Yellow-crowned Night-Heron), including 31 unidentified wader nests, were noted throughout the island (see Table 2). This represents a 22% decrease over the previous year, and similar nest levels to 2004. Double-crested Cormorants (297 nests) primarily occupied the center and northeastern areas of the colony. Nests on South Brother had both more eggs and older nestlings than the few nests found on North Brother. Based on adults present, an estimated 131 Herring and 88 Great Black-backed Gulls nested on the island.

Wading birds nested in 10 species of trees and shrubs on South Brother, as well as in tree/shrub/vine arrangements (see Table 5). One Black-crowned Night-Heron was identified in Tall Reed (see Figure 3), though this species nested predominantly in Black Cherry, Mulberry species, and Box Elder, whether or not the trees were encumbered with Asiatic Bittersweet. Snowy Egrets nested more often in tangles of Multiflora Rose and Asiatic Bittersweet than any other tree or shrub. Great Egrets nested mainly in vine-encumbered trees, generally using the vines as a platform on which to construct nests (see Figure 4). Nesting habitat for cormorants on South Brother included a stand of locust trees (in the center of the colony, where the majority of nests are located), as well as Mulberry species, Black Cherry, and other tree species covered with Asiatic Bittersweet also preferred by wading birds.

Nest content data was collected on South Brother Island (see Table 7). Other species observed included a Great Horned Owl nest with three young (see Figure 5), three Common Grackle nests, four Fish Crow nests, one unidentified crow species nest, and two American Oystercatcher adults (possibly the same individuals noted on North Brother Island on 18 May 2008).

The purchase of South Brother Island, which is currently the largest wading bird colony in NY/NJ Harbor, 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. NYCA 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 wading birds, 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 a complete cut 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 US Department of Agriculture's Animal and Plant Health Inspection Service (USDA-APHIS) and other organizations within the ALB Cooperative Eradication Team.

Mill Rock

Not surveyed in 2008.

U Thant Island
6 June 2008, 11:50 AM – 12:00 PM
By Elizabeth Craig and Dr. Susan Elbin

U Thant Island was surveyed from a boat with binoculars, approximately 10 meters from shore. A total of 29 Double-crested Cormorant nests were observed on the island both on the metal arch sculpture and in trees, a slight increase over nests observed the previous year. Based on adults present, an estimated 12 Great Black-backed Gulls nested on the island, with 7 young observed during the survey.

Staten Island – Arthur Kill and Kill Van Kull

Isle of Meadows
23 May 2008, 9:40 AM – 11:33 AM
By the authors with Michael Feller, Nathanael McVay and Alexander Summers of NYCDPR-NRG; Richard Lynch and Catharine Barron (Sweetbay Magnolia Conservancy), Fred Virrazzi (National Biodiversity Parks), Juno Angarita (Columbia University), Kristin Mylecraine (NJ Audubon) and Kate Ruskin (NJ Audubon)

Past colonial waterbird nesting areas were searched by the team, in addition to potential nesting areas on the northern section of the island formerly used by nesting gulls (see Figure 6). No wading birds, cormorants, or gulls were observed, nor were there any nests that looked recently active.

As on Prall's Island, White-tailed Deer evidence was 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. As noted since 2006, a

Red-tailed Hawk nest was discovered near the edge of the formerly active part of the colony, in a mature Black Cherry, with three nestlings present. A Great Horned Owl adult was also observed in the eastern portion of the site. Additional species observed were Gadwall, Indigo Bunting, Baltimore Oriole, Black and White Warbler, American Redstart, House Wren, Scarlet Tanager, White-eyed Vireo, Osprey, foraging Great Egrets, White-throated Sparrow, and American Woodcock. Table 9 presents additional bird observations noted in the Arthur Kill and Kill Van Kull area.

Based on the forest communities present on the island, largely composed of gray birch and maples, 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
23 May 2008, 12:05 PM – 2:25 PM
By the authors with Michael Feller, Nathanael McVay and Alexander Summers of NYCDPR-NRG; Richard Lynch and Catharine Barron (Sweetbay Magnolia Conservancy), Fred Virrazzi (National Biodiversity Parks), Juno Angarita (Columbia University), Kristin Mylecraine (NJ Audubon) and Kate Ruskin (NJ Audubon)

Two teams searched the island for colonial waterbird nests in suitable habitat. There was no sign of wading bird, cormorant, or nesting during this survey, and no empty or inactive nests were located; the island had been cleared of most suitable nesting tree species. Continued use of the island by White-tailed Deer was apparent. An Osprey platform located near the end of River Road on Staten Island was active, with two adults in the vicinity of the nest. A Gadwall nest with 10 eggs was observed on the western edge of the island. A possible Red-tailed Hawk nest was observed at mid-island on the eastern side in a Tree-of-Heaven. Additional species observed included Atlantic Brant (21 foraging), two adult American Woodcocks, Downy Woodpecker, Yellow Warbler, Spotted Sandpiper, Boat-tailed and Common grackle nests, House Wren, Chimney Swift, Barn and Northern Rough-winged Swallow, Brown Thrasher, Swamp Sparrow, and Song Sparrow. Table 9 presents additional bird observations noted in the Arthur Kill and Kill Van Kull area.

Several invasive woody plant species, including Glossy Buckthorn and Callery Pear, have substantially colonized many of the cleared areas on Prall's Island (see Figure 7). A long-term restoration strategy is warranted in the interest of restoring native plant communities to the island.

Shooter's Island
23 May 2008, 3:30 PM – 4:30 PM
By the authors with Michael Feller, Nathanael McVay and Alexander Summers of NYCDPR-NRG; Richard Lynch and Catharine Barron (Sweetbay Magnolia Conservancy), Fred Virrazzi (National Biodiversity Parks), Juno Angarita (Columbia University), Kristin Mylecraine (NJ Audubon) and Kate Ruskin (NJ Audubon)

No wading birds were observed on, or in the vicinity of, Shooter's Island, which appears to have habitat suitable for wading birds. There continues to be no sign of recent human activity at the former encampment near the south side of the island.

The Double-crested Cormorant colony situated on dry docks and other wreckage west of Shooter's Island decreased to 23 nests from the 41 active nests observed in 2007. No nests were observed on the nearby channel marker (Marker 18, Kill Van Kull), and six nests were present on Marker 22. Four Herring Gull nests were observed on the dry docks to the west of the island.

One active Osprey nest was observed, constructed on an old boiler close to the mainland, southwest of Shooter's Island (see Figure 8). The formerly active nest located on a piling east of Shooter's Island collapsed over winter 2007/2008. Table 9 presents additional bird observations noted in the Arthur Kill and Kill Van Kull area.

Hoffman Island
21 May 2008, 10:27 AM – 1:33 PM
By the authors with Dr. Susan Elbin (NYCA), Steven Sinkevich (USFWS), Nathanael McVay (NYCDPR-NRG), Juno Angarita (Columbia University) and Wendi Harrison

Observed on Hoffman Island were 446 nests of seven wading bird species, including Black-crowned Night-Heron, Great Egret, Snowy Egret, Glossy Ibis, Yellow-crowned Night-Heron, Little Blue Heron, and Green Heron. No Cattle Egrets were observed on the island. Vegetation containing wading bird nests included Black Cherry, Mulberry species, Multiflora Rose, Privet, Box Elder, and large masses of Asiatic Bittersweet; wading birds also nested in various tree/bittersweet and tree/rose arrangements (see Table 6). Ten Black-crowned Night-Heron nests were located in Tree-of-Heaven/Asiatic Bittersweet growth; this tree is not typically known to support nesting, although the additional structure provided by vines increases its suitability.

Double-crested Cormorant nests on Hoffman Island were mainly located approximately 10-20 meters up in Black Locust trees, which have not been previously used as nesting trees by wading birds. From 2003 to 2006, Double-crested Cormorant nesting expanded across the southern end of the island, into areas formerly used by wading birds. The first nests on the north side of the island were observed in 2008. Cormorant nests were in close proximity to wading bird nests in some locations, and wading bird nests appeared to be more concentrated in the center of Hoffman Island than in previous years.

Wading bird nest content data was collected on Hoffman Island (see Table 8). Based on observation of adults, an estimated 161 Herring and 148 Great Black-backed Gulls nested on the island. Additional nesting included four Boat-tailed Grackles nests, five Fish Crow nests, and 11 Canada Goose nests. Other species included Brown Thrasher, Gadwall, Gray Catbird, Red-winged Blackbird and Black-throated Blue Warbler.

Swinburne Island
20 May 2008, 10:10 AM – 11:20 AM
By Elizabeth Craig and Dr. Susan Elbin with Kate Ruskin (NJ Audubon), Colin Grubel (CUNY-Queens College), and Alexander Summers (NYCDPR-NRG)

A total of 295 cormorant nests were observed during ground surveys. Nests were located on manmade structures on the island and in Hackberry, Black Locust, and Mulberry trees. One active Black-crowned Night-Heron nest was observed in July during cormorant banding efforts on the island. Based on the adults observed, it was estimated that approximately 60 Herring and 20 Great Black-backed gulls nested on the island. This is likely an underestimate, as weather concerns resulted in an abbreviated survey.

In summer 2008, color banding of Double-crested Cormorant nestlings on Swinburne Island continued under the auspices of New York City Audubon. If any orange leg bands with black lettering are noted in the NY/NJ Harbor, please contact New York City Audubon (bands@nycaudubon.org) with the leg band code, location, date, and name of observer.

Jamaica Bay

Elders Point Marsh West
29 May 2008, 3:00 PM – 3:30 PM
By Elizabeth Craig and Chris Nadareski (NYCDEP)

During the 2008 ground survey of this area, 79 Double-crested Cormorant nests were observed; an increase of 61% over 2007 activity, when nesting was first identified for the island. This is the first island within Jamaica Bay where Double-crested Cormorants have been confirmed as nesters since the Harbor Herons Project began reporting on the area in 1998. The expansion of Double-crested Cormorant nesting activity in Jamaica Bay should be closely monitored in future seasons.

One Great Egret nest was confirmed in a hedge of poison ivy. Based on the attentiveness of the four adult Great Egrets present, there were estimated to be two or more nesting pairs of Great Egrets on the island. In addition, 27 Herring Gull nests, 3 Canada Goose nests, and 4 American Oystercatcher nests were observed. Other species observed on the island and along shore included Black-bellied Plover, Semipalmated Sandpiper, Ruddy Turnstone, Atlantic Brant, Laughing Gull, Great Black-backed Gull, Herring Gull, and Fish Crow.

The future of colonial waterbird nesting activity on the small upland area present at the marsh will depend upon a potential U.S. Army Corps of Engineers (USACE) project scheduled for the island. USACE is presently evaluating plans for a marsh restoration project at Elders Point Marsh West and Yellow Bar Hassock, potentially using dredged material from the NY/NJ Harbor Deepening Project. This project would involve placement of dredged material within the existing or historical marsh island footprint, which would subsequently be graded to elevations suitable for salt marsh plant growth. Current plans would remove the upland area during placement and grading. USACE completed initial construction of a similar marsh island

restoration project at Elders Point Marsh East in 2006-2007, for which dredged material from Rockaway Inlet was used.

Projects aimed at restoring salt marsh acreage within Jamaica Bay are certainly justified by the substantial marsh island losses observed in recent decades. However, implementing a plan that would require the removal of known nesting habitat for colonial waterbirds requires careful evaluation. There are a limited number of island nest sites in NY/NJ Harbor for colonial waterbirds; some of these islands have been proposed as sites for public access, introduced species control, and management for preferred species or habitats. NYCA will remain in contact with the USACE to review the impacts of the proposed project on colonial waterbird populations on the island, including discussing alternative plans that do not require the removal of existing upland habitat, or habitat restoration plans that involve mitigation of colonial waterbird nesting habitat on or off the island.

White Island

Not surveyed in 2008. Habitat restoration activities are currently being conducted on White Island by NYCDPR, with an emphasis on removal of scrub vegetation and *Phragmites* and planting of native grasslands. Due to the presence of machinery and workers on the island in 2008, it is unlikely that gulls or other colonial waterbirds nested on the island this season.

Elders Point Marsh East

Not surveyed in 2008.

Other Jamaica Bay Islands
10 – 11 June 2008, various times
By Elizabeth Craig, Don Riepe (American Littoral Society/Jamaica Bay Guardian), Chris Nadareski (NYCDEP) and Barn Owl banding volunteers

Although 2008 was scheduled as an interim survey year, several Jamaica Bay islands were visited, but not systematically surveyed, in coordination with NYCDEP's Barn Owl nest box survey and banding efforts.

The upland portion of Little Egg Marsh had no apparent colonial waterbird nesting activity. One American Oystercatcher nest was observed; gull and tern activity was not recorded.

On Subway Island there was a minimum of four Black-crowned Night-Heron nests, although no adult herons were observed. Two Fish Crow nests were observed and several adult Fish Crows were present on the island. Gull nesting was not systematically surveyed, although two active Herring Gull nests were observed. An adult Barn Owl was found in a nest box, although no eggs or young were present.

Ruffle Bar had no apparent nesting activity.

The estimates made of adult wading birds on Canarsie Pol were based on observations recorded near Barn Owl nest boxes only; the entire island was not visited during the survey. Adult birds observed at Canarsie Pol during these partial surveys included 118 Glossy Ibis, 60 Black-crowned Night-Herons, 105 Great Egrets, 44 Snowy Egrets, one Tricolored Heron, two Yellow-crowned Night-Herons, and two Cattle Egrets. Additional adults counted from off shore included one Little Blue Heron and one Snowy Egret. It was observed that wading bird nesting activity had increased dramatically in the areas surrounding Barn Owl nest boxes in the northern and central portions of the island; a similar nesting tendency was noted in 2007. Whether this indicates an overall geographic shift from the previously active nesting areas is unclear. Approximately 740 Herring Gulls and 60 Great Black-backed Gulls were observed, although the entire island was not covered during these observations; gulls nest in several large open areas around Canarsie Pol. Additionally, 16 Double-crested Cormorants were observed loafing on shore. There was no evidence of cormorant nesting activity on Canarsie Pol; observed cormorants were likely adults and young from the adjacent Elders Point Marsh West. Twenty-four Fish Crows were observed around the island.

Mainland Accounts

The nesting colony of Yellow-crowned Night-Herons located at the Redfern Houses in Far Rockaway was visited on 9 June 2008 (3:30 PM - 4:15 PM) by Elizabeth Craig and Don Riepe (American Littoral Society/Jamaica Bay Guardian).

A total of 55 nests were observed (see Table 2). This represents a notable increase from last year's count of 26 active nests, although the survey was conducted outside of the NYSDEC-LICW survey period. This is the fifth year the colony has been confirmed, and is the largest aggregation of Yellow-crowned Night-Herons in New York City. NYCA has initiated a dialogue on the persistence of this colony with the residents and management of the Redfern Houses, the NYC Housing Authority, and the NYCDPR-NRG. Several smaller incidences of Yellow-crowned Night-Heron nesting have been reported in Staten Island and s Nassau County in recent years, although no information was available on these for inclusion in this report.

Hugh Corola (Hackensack Riverkeeper) has documented Yellow-crowned Night-Heron nesting sites in the Meadowlands and other areas in northern New Jersey. Known nesting sites for this species include Laurel Hill County Park, Schmidt's Woods Park and Harmon Cove in Secaucus; the vicinity of Waldwick and Allendale in central Bergen County; and a suburban neighborhood in Roselle, NJ. No nest data for 2008 was available for inclusion in this report. Any person with detailed information on wader nesting in northern NJ is encouraged to report to NJ Department of Environmental Protection's Division of Fish and Wildlife-Endangered and Nongame Species Program (Tel. 609-292-9400). The New Jersey Department of Environmental Protection (NJDEP), with the assistance of NJ Audubon and other local stakeholders, is presently planning to conduct volunteer colonial waterbird survey efforts in northern New Jersey in 2009.

Double-crested Cormorants on Aids to Navigation

Approximately 51 nesting pairs of Double-crested Cormorants were observed on aids to navigation in the Kill Van Kull, Arthur Kill and northwestern Raritan Bay. This included nests

on two unidentified markers (one with nine nests and the other with 10), 12 nests on marker 52, five nests on marker 58 at Ward's Point, nine nests on marker 14 at Port Mobil, and six nests on marker 22 in the Kill Van Kull (near Shooter's Island). In previous years, cormorant nests on aids to navigation were restricted to the Shooter's Island area, and added into the nest counts for that island. In 2008, boat access was provided by NY/NJ Baykeeper; this allowed for observations to be made of nesting in Raritan Bay and the Arthur Kill south of Isle of Meadows. In future reports, nests noted on channel markers and other aids to navigation will be noted in a separate column.

Species Accounts

The following species accounts offer general observations on trends observed at selected islands in 2008. As a system-wide survey was not conducted in 2008, total nest numbers and trends are not provided for each species.

Black-crowned Night-Heron: Black-crowned Night-Herons were observed in seven colonies in 2008, and were the numerically dominant species in larger, mixed-species colonies such as those on South Brother Island and Hoffman Island. This species no longer nests on North Brother Island, a wading bird nesting colony active since the mid-1980's.

Yellow-crowned Night-Heron: While the largest island colony for this species (Canarsie Pol) was not surveyed in 2008, a doubling of Yellow-crowned Night-Herons nesting since 2007 was observed at the Redfern Houses in Far Rockaway (55 nests).

Great Egret: Great Egrets were observed on six islands in NY/NJ Harbor, including one confirmed nest at a recent colony in Jamaica Bay (Elders Point Marsh West). Although this species exhibited a slight decline at two large colonies since 2007, longer term increases in Great Egret nesting in NY/NJ Harbor is consistent with regional increases for this species in the northeastern U.S. (K. Parsons, Manomet Center for Conservation Sciences, pers.comm.).

Snowy Egret: Snowy Egrets nested on four islands in NY/NJ Harbor. Apparent decreases over nesting activity in 2007 were observed in the two largest colonies (South Brother Island and Hoffman Island), where a slight increase was noted on Goose Island.

Little Blue Heron: Little Blue Herons were observed on three islands in 2008, including a likely nesting attempt on Goose Island. This species approaches the northern extent of its range in the NY/NJ Harbor area, and these increases may be evidence of a gradual range expansion into the northeastern U.S.

Tricolored Heron: Tricolored Heron adults were noted during a partial survey of Canarsie Pol, suggesting the presence of one or more nests. This is a species more typical of southern colonies, and no increasing trends in NY/NJ 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.

Cattle Egret: Cattle Egrets were observed during partial surveys of Canarsie Pol. No nesting was observed on South Brother Island in 2008, the only other site where nesting has been confirmed in recent years. Overall, the population has declined from a high of 266 pairs on two islands (Prall's and Shooter's islands) in 1985.

Green Heron: This species was noted on Hoffman Island (one nest) in 2008. As this species nests as often or more in mainland areas, it is not well represented by the Harbor Herons Project. It is very likely that, as in other parts of its range, this species is declining due to habitat development. An effort to assess Green Heron populations in NY/NJ Harbor would be a worthwhile endeavor.

Glossy Ibis: Decreases in nesting was noted for Glossy Ibis on Hoffman Island, although the 118+ adults observed during partial surveys of Canarsie Pol suggests that substantial nesting continues on that island. The majority of Glossy Ibis in NY/NJ Harbor have nested on Canarsie Pol and Hoffman Island, with one to two nests noted at South Brother Island and Goose Island in recent years.

Double-crested Cormorant: A total of 1,333 Double-crested Cormorant nests were observed on seven islands (Huckleberry, U Thant, Hoffman, South Brother, Shooter's, and Swinburne and Elders Point Marsh West). See Tables 2 and 4); this represents the highest count since 1999. An additional 51 nests were observed on aids to navigation in Raritan Bay and western Staten Island. Substantial increases over 2007 levels were observed at Hoffman Island (+34%, including the first nesting on the northern portion of the island), Huckleberry Island (+31%) and Elders Point Marsh West (+61%). An analysis of Double-crested Cormorant population trends in NY/NJ Harbor is pending (Elbin and Bernick *in prep*).

Herring and Great Black-backed Gulls: Herring and Great Black-backed Gull surveys were incomplete in 2008, and the largest gull colonies in the Harbor (i.e., Canarsie Pol, Subway Island and Little Egg Marsh) were not surveyed. Gull nest estimates for selected colonies are presented in Tables 2 and 5.

Conclusions and Recommendations

Continued monitoring of wading bird populations through nesting surveys is a necessary step to comprehend species status, population trends, and overall health and persistence of the system. Interim surveys of target islands were completed within the last two weeks of May 2008, as noted by the NYSDEC-LICW survey protocol. Additional partial surveys were also conducted during other island visits (i.e., for Barn Owl banding, cormorant research, etc.).

At least three areas of the Harbor Herons Project survey protocol need further improvement. First, a repeatable method to survey islands with dense vegetation is required. This is a problem faced by many organizations that perform surveys of islands that are heavily colonized by invasive species. Further efforts to design a reasonable survey technique will be explored. Secondly, a method to quantify productivity is necessary. Although some productivity data was collected (i.e., nest counts), the most effective technique would likely be monitoring 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 2009 nesting survey. Lastly, an improved habitat assessment protocol should be developed, including a rapid assessment technique, collaborating with additional botanists during breeding season vegetation surveys, and a conducting a non-breeding season vegetation survey.

Several major conservation challenges were observed in 2008. The discovery of ALBs on Prall's Island in 2007 and the subsequent removal of host trees eliminated valuable nesting habitat for colonial waterbirds. Further, observations this 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 Island 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 reducing 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 wading bird nesting habitat in NY/NJ Harbor. Wading birds 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 wading birds on Prall's Island and other colonies, and their removal greatly reduces the chance that wading birds will nest there in the near future. If ALBs are discovered on other nesting islands, the present management strategy could have serious impacts on wading bird breeding populations in NY/NJ 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 wading birds at island-colonies where ALBs have 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 NPS'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. Such predators can have severe impacts on nesting colonial waterbird populations, and evidence of wading bird and/or gull predation 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.

Human disturbance on island colonies is difficult to manage in a highly urban setting. As mentioned in Bernick (2007), several 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. In 2007, NYSDEC provided 100 signs for posting on city-owned and federally owned islands in NY/NJ Harbor, that clearly state 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/NJ Harbor waters (U.S. Park Police, NYC Police Department's Harbor Unit, U.S. Coast Guard) and inform them of the security and safety threats that this type of activity poses, in addition to the ecological impacts.

When a science article is published about the NY/NJ Harbor islands, the subject(s) of the article should stress that these issues be thoughtfully considered and incorporated. 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 have on bird populations, it also needs to offer programs for the public to learn about, appreciate, and participate in the study of these interesting islands and their birds. NYCA currently runs eco-tours that offer views and narratives on islands and nesting wildlife, and anticipates collaboration with Rocking the Boat and other community organizations to offer the public a chance to participate in observational wading bird studies and other conservation projects. Additionally, direct contact with individuals or organizations that have made unauthorized visits to nesting colonies may often act as an effective deterrent (avoiding the need to resort to regulatory enforcement).

NYCA's Harbor Herons Project has recently included several additional programs (i.e. Harbor Herons Monitoring Program and Eco-tours) that allow for greater public participation and awareness of the Harbor Herons, and have strengthened NYCA's role as an advocate for conserving NY/NJ Harbor's wading bird populations. New and vital collaborations between NYCA and other organizations have formed, and the open forum of NY/NJ Harbor Estuary Program's Harbor Herons Subcommittee has brought together organizations and agencies from New York, New Jersey, and Connecticut to discuss issues of regional importance.

Additional recommendations and goals for 2009 are as follows:

- Analyze data from the NYCA Harbor Heron Surveys (1986-2008) and present findings at the 2009 American Ornithologist's Union Annual Meeting in Philadelphia, PA; a summary report would be produced from this data.

- Complete and distribute the NY/NJ HEP Harbor Herons Subcommittee's Harbor Herons Conservation Plan for external review in 2009.

- A report on Double-crested Cormorant population trends in the NY/NJ Harbor area (1986-2008) is pending from NYCA.

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

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

- Encourage the development of wading bird and cormorant research projects at NY/NJ universities, at high school, undergraduate, and graduate levels. In 2009, a new study conducted by a University of Virginia graduate student will involve collaboration with the Harbor Herons Project team during in-colony work.

- 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, particularly in association with Cal Vornberger, Michael Feller and David Künstler. Guides should be available in PDF format for all volunteers.

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TABLES, FIGURES, AND APPENDICES

Table 1. Survey schedule for wading bird, cormorant, and gull counts, May-June 2008

Location Surveyed	Date(s)	Number of Observers	Owner
Long Island Sound			
Goose Island	19 May	4	NYCDPR
Huckleberry Island	30 May	6	Huckleberry Indians, Inc.
East River			
North Brother Island	18 May	3	NYCDPR
South Brother Island	28 May	9	NYCDPR
U Thant Island	6 June	2	NYCDPR
Arthur Kill-Kill Van Kull			
Shooter's Island	23 May	9	NYCDPR
Prall's Island	23 May	9	NYCDPR
Isle of Meadows	23 May	9	NYCDPR
Lower New York Harbor			
Swinburne Island	20 May	5	NPS
Hoffman Island	21 May	7	NPS
Jamaica Bay			
Elders Point West	30 May	2	NPS
Canarsie Pol	10-11 June	3	NPS
Ruffle Bar	10-11 June	3	NPS
Little Egg Marsh	10-11 June	3	NPS
Subway Island	10-11 June	3	NPS
Mainland – Far Rockaway			
Redfern Houses	9 June	2	NYC Housing Authority
Aids to Navigation			
Raritan Bay/Arthur Kill/Kill Van Kull	23 May	1	US Coast Guard

Table 2. Wading bird, cormorant, and gull nesting activity in NY/NJ Harbor and surrounding waterways, 2008.

	South Brother Island	Hoffman Island	Canarsie Pol	Goose Island	Mill Rock	North Brother Island	Huckleberry Island	Subway Island	Swinburne Island	Elders Point Marsh West	Elders Point Marsh East	U Thant Island	Ruffle Bar	Little Egg Marsh	White Island	Prall' s Island	Shooter's Island	Isle of Meadows	Nests on mainland and aids to navigation	
SURVEY DATE	28 May	21 May	10 -11 June † *	19 May	*Not surveyed*	18 May	30 May	10-11 June †	20 May	29 May	*Not surveyed*	6 June ††	10-11 June †	10-11 June †	*Not surveyed*	23 May	23 May	23 May		
WADING BIRDS																				
Black-crowned Night-Heron	243	187	60+	55	N/A	0	1+	4	1**	0	N/A	0	0	0	N/A	0	0	0		
Great Egret	98	120	105+	21	N/A	0	1?	0	0	2	N/A	0	0	0	N/A	0	0	0		
Snowy Egret	87	59	44+	27	N/A	0	0	0	0	0	N/A	0	0	0	N/A	0	0	0		
Glossy Ibis	1	56	118+	0	N/A	0	0	0	0	0	N/A	0	0	0	N/A	0	0	0		
Yellow-crowned Night-Heron	2	1	2+	2	N/A	0	0	0	0	0	N/A	0	0	0	N/A	0	0	0	55 (9 June†)	
Little Blue Heron	0	3	1+	1	N/A	0	0	0	0	0	N/A	0	0	0	N/A	0	0	0		
Green Heron	0	1	0+	0	N/A	0	0	0	0	0	N/A	0	0	0	N/A	0	0	0		
Tricolored Heron	0	0	1+	0	N/A	0	0	0	0	0	N/A	0	0	0	N/A	0	0	0		
Cattle Egret	0	0	2+	0	N/A	0	0	0	0	0	N/A	0	0	0	N/A	0	0	0		
Unknown	31	19	0	0	N/A	0	0	0	0	0	N/A	0	0	0	N/A	0	0	0		
Total Wading Bird Nests	462	446	333+	106	N/A	0	2	2	1	2	N/A	0	0	0	N/A	0	0	0		
CORMORANTS																				
Double-crested Cormorant	297	235	N/A	0	N/A	0	375	0	295	79	N/A	29	0	0	N/A	0	23	0	51 (23 May)	
GULLS AND TERNS																				
Herring Gull	131	161	740+	0	N/A	48	9	N/A	N/A	27	N/A	N/A	0	N/A	N/A	0	4	0		
Great Black-backed Gull	88	148	60+	1	N/A	5	16	N/A	N/A	0	N/A	12	0	N/A	N/A	0	0	0		
Common Tern	0	0	0*	0	N/A	0	0	N/A	N/A	0	N/A	N/A	0	N/A	N/A	0	0	0		

† - Visit occurred outside of the count period for NYSDEC's Long Island Colonial Waterbird and Piping Plover Survey (LICW). Islands were not systematically surveyed for colonial waterbirds.

†† - Visit occurred outside of the LICW count period, though area was systematically surveyed for colonial waterbirds.

*** - 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.**

**** - Nest observed on Swinburne Island in early July, outside of the LICW count period.**

N/A - Not applicable – either due to partial count or island not visited during the interim survey effort. See text for further information.

Table 3. Summary of Double-crested Cormorant nesting in the New York/New Jersey Harbor, May to July 2004-2008 [†]

	Year – Number of Cormorant Nests				
Island	2004	2005	2006	2007	2008
Shooter's Island	45 [a]	36 [a]	54	41	23
Huckleberry Island	324	323	344	260	375
South Brother Island	350	381	326	271	297
U Thant Island	16	15	21	24	29
Hoffman Island	34	64	166	155	235
Swinburne Island	108 [b]	87 [b]	264 [c]	264 [c]	295 [c]
Elders Point -West	0	0	0	31	79
Total	877	906	1,175	1,046	1,333
Aids To Navigation	0 [a]	0 [a]	0 [a]	0 [a]	51 [a]
Total	877	906	1,175	1,046	1,384

[†] Data sources include NYCA interim surveys (2005-2006), DCCO study by Dr. Susan Elbin (2006-2008), 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, nests on these structures were recorded separately, though only one channel marker with nests (Marker 22, 6 nests) was observed near Shooter's Island.

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

[c] Counts at Swinburne Island conducted on island.

Table 4. Summary of Great Black-backed and Herring Gull nests on selected islands of the New York/New Jersey Harbor in 2004, 2007, and 2008.

	Herring Gull			Great Black-backed Gull		
	2004	2007	2008	2004	2007	2008
Shooter's Island	0	6	4	0	0	0
Huckleberry Island	5	14	9	2	31	16
Goose Island	0	0	0	0	1	1
South Brother Island	40	123	131	40	93	88
North Brother Island	100+	72	48	50+	9	5
U Thant Island	N/A	75	27	N/A	18	N/A
Hoffman Island	47	46	161	112	142	148
Swinburne Island	84	198	N/A	6	112	N/A

N/A = Not surveyed for gulls by NYCA

Table 5. Nesting trees, shrubs, and vines for Black-crowned Night-Herons (BCNH), Snowy Egrets (SNEG), and Great Egrets (GREG) at South Brother Island, 28 May 2008. Glossy Ibis were not observed on or near a nest. Double-crested Cormorants nested predominantly in Black Locust in the center of the colony and Black Cherry/bittersweet in other areas.

South Brother Island - Nesting vegetation

	BCNH	SNEG	GREG
Black Cherry	53	1	11
Mulberry sp.	49	5	
Box Elder	22		1
Asiatic Bittersweet	5	9	6
Multiflora Rose	1	51	1
Sycamore Maple	2		
Hickory sp.	1		
Elderberry	2	5	
Crabapple	1		
Black Locust			
Tall Reed	1		
	137	71	19
Black Cherry/bittersweet	37	14	41
Box Elder/bittersweet	36		4
Mulberry/bittersweet	15	1	30
Tree-of-heaven/bittersweet	11		
Hackberry/bittersweet	2		
Elderberry/bittersweet	1		
Multiflora rose/bittersweet	4	1	4
	106	16	79
Total nests	243	87	98

Table 6. Nesting trees, shrubs, and vines for Black-crowned Night-Herons (BCNH), Snowy Egrets (SNEG), and Great Egrets (GREG), Glossy Ibis (GLIB), Little Blue Herons (LBHE) and Yellow-crowned Night-Herons (YCNH) at Hoffman Island, 21 May 2008. A Double-crested Cormorants nested predominantly in Black Locust in the southern portion of the colony, two nests were noted in the northern portion of the colony for the first time since DCCOs have nested on Hoffman Island

Hoffman Island - Nesting Vegetation

	BCNH	SNEG	GREG	GLIB	LBHE	YCNH
Black Cherry	30	4	8	1		1
Mulberry sp	43	18	10	24	3	
Box Elder	6		2	2		
Asiatic Bittersweet	13		2	2		
Multiflora Rose	8	35		9		
Privet sp.	6			1		
Japanese Honeysuckle	1					
	107	57	22	39	3	1
Black Cherry/Bittersweet		1	43	1		
Box Elder/Bittersweet	5					
Box Elder/Multiflora Rose	1					
Mulberry/Bittersweet	23		33	15		
Tree-of-heaven/Bittersweet	10		22	1		
Hackberry/Bittersweet	1					
Multiflora Rose/Bittersweet	2					
Mulberry/Multiflora Rose	31					
Black Cherry/Multiflora Rose	1					
Black Cherry/Honeysuckle/Rose	6	1				
	80	2	98	17	0	0
Total	187	59	120	56	3	1

Table 7. Nest contents for Black-crowned Night-Herons (BCNH), Snowy Egrets (SNEG), and Great Egrets (GREG) and Yellow-crowned Night-Herons (YCNH) at South Brother Island, 28 May 2008. Glossy Ibis nest contents were not included as only adults were observed. Unknown/empty nests were typically recorded when nest height and density of vegetation created difficulty in examining nest contents with mirror poles or binoculars.

	BCNH	SNEG	GREG	YCNH
Unknown/Empty	28	6	66	
1 Egg	13			
2 Eggs	18	2		
3 Eggs	68	29	16	
4 Eggs	4	6		
5 Eggs				2
1 Young	12			
2 Young	28	2	4	
3 Young	23	19	10	
4 Young		1		
1 Egg 1 Young	14			
1 Egg 2 Young	1	10		
1 Egg 3 Young		3		
2 Eggs 1 Young	11	1	1	
2 Eggs 2 Young	3	8		
2 Eggs 3 Young			1	
3 Eggs 1 Young	20			
4 Eggs 1 Young				
Total nests	243	87	98	2

Table 8. Nest contents for Black-crowned Night-Herons (BCNH), Snowy Egrets (SNEG), and Great Egrets (GREG), Glossy Ibis (GLIB), Little Blue Herons (LBHE) and Yellow-crowned Night-Herons (YCNH) at Hoffman Island, 21 May 2008. Unknown/empty nests were typically recorded when nest height and density of vegetation created difficulty in examining nest contents with mirror poles or binoculars.

	BCNH	SNEG	GREG	GLIB	LBHE	YCNH
Unknown/Empty	24	7	92	4	2	
1 Egg	20	2		9		
2 Eggs	27	2	3	16		
3 Eggs	76	10	8	13		
4 Eggs	9	15				1
5 Eggs		1			1	
1 Young			1	1		
2 Young	5		3	11		
3 Young	11	6	13	1		
4 Young		4				
1 Egg 1 Young						
1 Egg 2 Young	4	2				
1 Egg 3 Young		1				
2 Eggs 1 Young	8					
2 Eggs 2 Young	2					
2 Eggs 3 Young						
3 Eggs 1 Young	1					
4 Eggs 1 Young				1		
Total	187	59	120	56	3	1

Table 9. Incidental bird observations conducted at, and in the vicinity of, the Arthur Kill/Kill Van Kull colonies, 23 May 2008 survey. Observations conducted by the authors, Frank Virrazzi (National Biodiversity Parks, Inc.) and other observers. IM = Isle of Meadows, P = Prall's Island, S = Shooter's Island, All = All three islands.

Glossy Ibis	IM	Chimney Swift	P
Double-crested Cormorant	IM	Warbling Vireo	IM, P
Great Egret	All	Red-eyed Vireo	IM
Snowy Egret	S	American Crow	All
Gadwall	P (nest)	Fish Crow	S
Black Duck	All	House Wren	All
Mallard	All	Marsh Wren	P
Brant	All	Carolina Wren	S
Canada Goose	All	Wood Thrush	IM
Mute Swan	Arthur Kill	American Robin	IM, P
Herring Gull	All	Brown Thrasher	P
Laughing Gull	P	Gray Catbird	All
Cuckoo sp.	IM	European Starling	All
Red-tailed Hawk	IM (nest), P	American Redstart	All
Osprey	P	Northern Parula	IM
Turkey Vulture	All	Magnolia Warbler	IM, S
Great Horned Owl	IM	Yellow Warbler	All
American Woodcock	IM, P	Chestnut-sided Warbler	P
Spotted Sandpiper	P, S	Blackpoll Warbler	IM
Greater Yellowlegs	Goethals Bridge	Black-and-white Warbler	IM
Killdeer	Carteret	Common Yellowthroat	All
Downy Woodpecker	All	Scarlet Tanager	IM
Northern Flicker	P	Eastern Towhee	IM, P
Mourning Dove	S	Song Sparrow	All
Rock Pigeon	S	Swamp Sparrow	IM, P
Eastern Wood Pewee	IM	Northern Cardinal	IM, P
Willow Flycatcher	IM, P	Rose-breasted Grosbeak	IM
Great-crested Flycatcher	IM	Indigo Bunting	IM
Barn Swallow	All	Baltimore Oriole	All
Bank Swallow	P	Red-winged Blackbird	IM, P
Rough-winged Swallow	IM	Boat-tailed Grackle	P
Tree Swallow	All	Common Grackle	All
Purple Martin	S	American Goldfinch	All

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

Figure 2: NYC Audubon's Harbor Herons Project receives generous boat support from numerous organizations and agencies, including NYC Department of Parks and Recreation – Natural Resource Group. From left to right, Nathanael McVay and Alexander Summers from NYCDPR-NRG prepare to transport Elizabeth Craig (NYC Audubon/Cornell University), Colin Grubel (CUNY-Queens College), and Dr. Susan Elbin (Director of Conservation, NYC Audubon) to South Brother Island for survey work, 28 May 2008. Photo: © A. Bernick.

Figure 3: Black-crowned Night-Heron nest in *Phragmites australis* on South Brother Island, 28 May 2008. Photo: © A. Bernick.

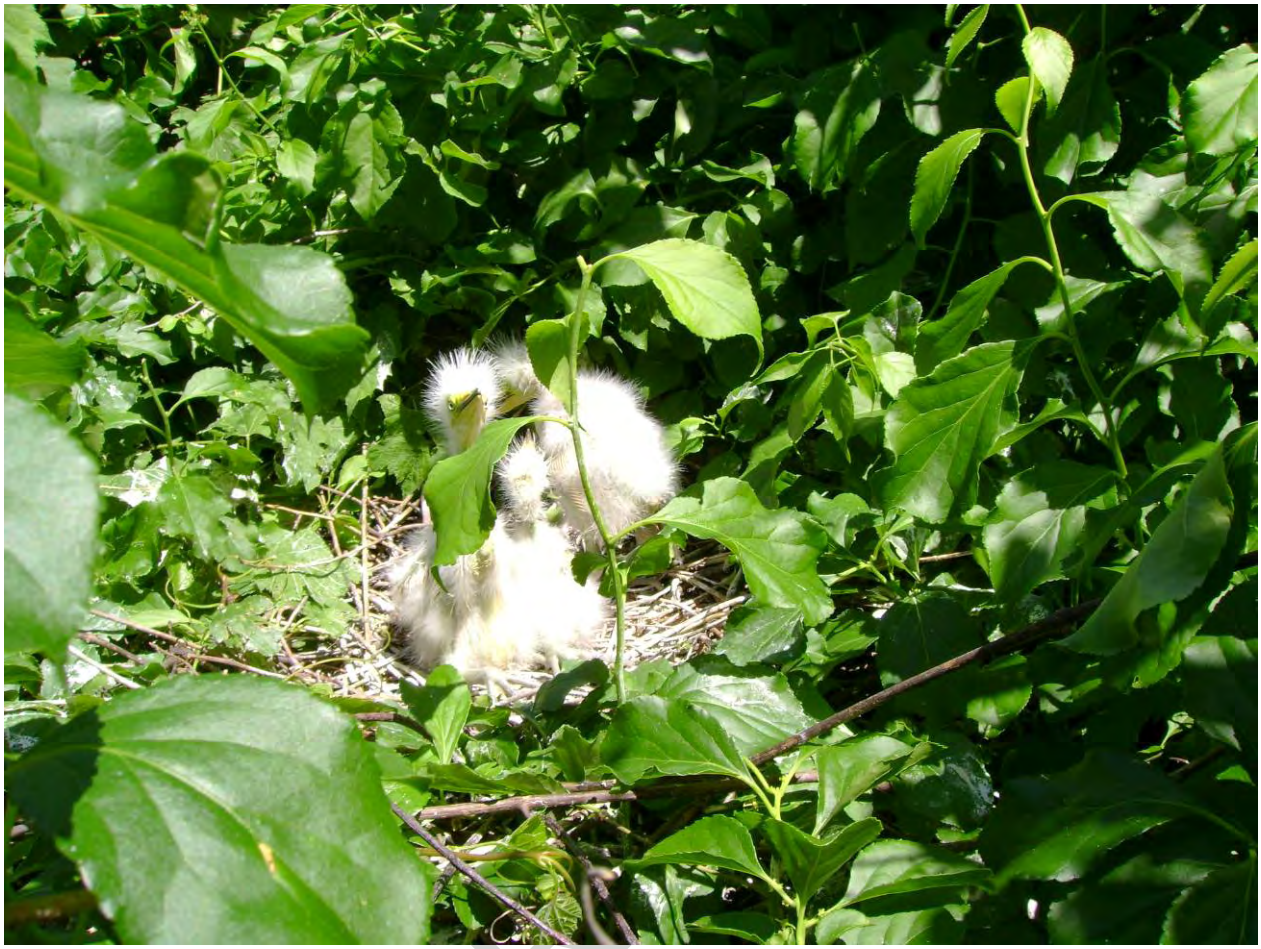

Figure 4: Great Egret nest on South Brother Island, 28 May 2008. In the NY/NJ Harbor colonies, Great Egrets most often construct nests on top of vine-covered woody vegetation. Photo: © A. Bernick.

Figure 5: Two of three Great Horned Owl nestlings on South Brother Island, 28 May 2008. This is the first confirmed nesting of Great Horned Owl on South Brother; adults have been observed on North Brother Island in recent years by NYCDPR-Natural Resources Group staff. Photo: © T.Veltre/The Really Interesting Picture Company, Ltd.

Figure 6: Volunteer observers aiding in a colonial waterbird survey on Isle of Meadows, 23 May 2008. From L to R: Catherine Barron (Sweetbay Magnolia Conservancy), Nathanael McVay (NYCDPR-NRG), Alexander Summers (NYCDPR-NRG), Richard Lynch (Sweetbay Magnolia Conservancy), Fred Virrazzi (National Biodiversity Parks), Elizabeth Craig (NYC Audubon/Cornell University), Michael Feller (NYCDPR-NRG), and Kristin Mylecraine (NJ Audubon). The Harbor Herons Project benefits greatly from the diverse talents of experienced volunteers. Photo: © A. Bernick

Figure 7: Elizabeth Craig (NYC Audubon/Cornell University) and Richard Lynch (Sweetbay Magnolia Conservancy) pose to the right of recent Glossy Buckthorn growth on the northern end of Prall's Island, 23 May 2008. Since the Asian Longhorned Beetle-related clearing of Prall's Island in April 2007, several non-native, invasive species have established an obvious foothold on the island. Photo: © A. Bernick.

Figure 8: Osprey nest along the Kill Van Kull, southwest of Shooter's Island, on 23 May 2008. This nest site has been in use since 2007. A former Osprey nest located on a piling east of Shooter's Island collapsed prior to the 2008 breeding season. Photo: © A. Bernick.

Appendix A

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

Below is a list of other known projects conducted in 2008 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 (ALB) identification training for NYC-area researchers, Fort Wadsworth, Staten Island, NY. March 2008. Contact: Joan Mahoney, New York State Department of Agriculture and Markets.

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

Double-crested Cormorant diet study, CUNY-Queens College, April-August 2008. Contact: Colin Grubel and Dr. John Waldman, CUNY-Queens College.

Double-crested Cormorant population dynamics, May-August 2008. Contact: Dr. Susan Elbin, NYC Audubon.

Elders Point Marsh West Marsh Restoration Project, U.S. Army Corps of Engineers. Tentative Schedule 2009/2010. Contact: Melissa D.A. Alvarez, U.S. Army Corps of Engineers

Great Egret radiotelemetry study, NYC Audubon/NJ Audubon. June-August 2008. Contact: Dr. Susan Elbin, NYC Audubon.

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/New York City Department of Sanitation. Contact: Michael Feller, NYC Department of Parks and Recreation – Natural Resources Group.

Photosynthetic stress experiment, Columbia University. June-August 2008. Contact: Elizabeth Craig, NYC Audubon/Cornell University

Webcam project on Goose Island, NYC Audubon and NYC Department of Parks and Recreation. Ongoing. Contact: Glenn Phillips, NYC 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.