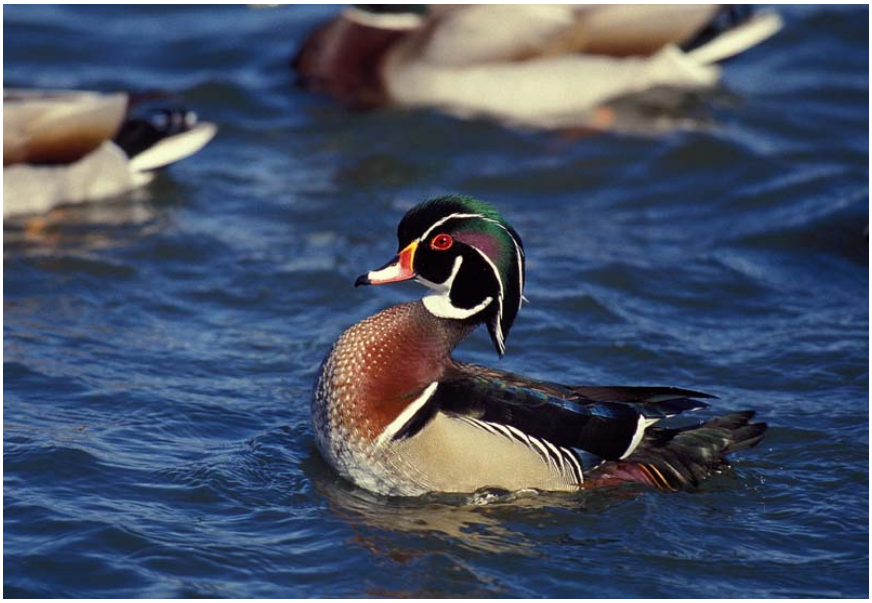
NEW YORK CITY AUDUBON

Breeding and Migrating Bird Census Project in Van Cortlandt Park – a study of an Important Bird Area



Wood Duck. Photo by Steve Nanz

Final Report

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Part I: Introduction

Van Cortlandt Park is the third-largest park in New York City and is located in the northwest part of the Bronx. It's a 1,146 acre public park that holds many natural beauties as well as a rich social history. New York City bought the property in 1888 from the Van Cortlandt family. The city developed numerous recreational facilities, such as two municipal golf courses and a 66 acre section of open land known as the "Parade Ground." The park is intersected by several large roadways that divide the park into sectors. Despite this, Van Cortlandt Park contains some of the largest areas of natural land in New York City and has been identified as an Important Bird Area (IBA) by Audubon New York. This status was given to Van Cortlandt Park because it supports an exceptional diversity of migrant songbirds and is thought to be an important migratory stopover for landbirds.

Given its dense and varied habitat, this park is a prime location to see migrating songbirds during both spring and fall migration. The importance of Van Cortlandt Park to birds stems most importantly from its large size and its role as an oasis of habitat in the urban environment.

Van Cortlandt Park also hosts dozens of species of songbirds and other birds choose Van Cortlandt Park as their breeding territory and nest within the boundaries of this urban expanse of forests, lawns, running tracks, and paths.

Despite the long and extensive history of birding interest in the area, the most recent information regarding which species have territories or nest in Van Cortlandt Park dates back to 1993. Also lacking is information on their abundance and specifically where they are found within the Park. Census research (using spot-mapping methodology) was done on a 25 acre plot in the Northwest Forest in 1992 and 1993, with results published in the Journal of Field Ornithology. A breeding bird census of the Van Cortlandt Park swamp was also conducted in 1971 and 1972 and results were published in The Linnaean News-Letter. While these censuses are very detailed and thorough, they don't afford an overall vision of the avian population in the park.

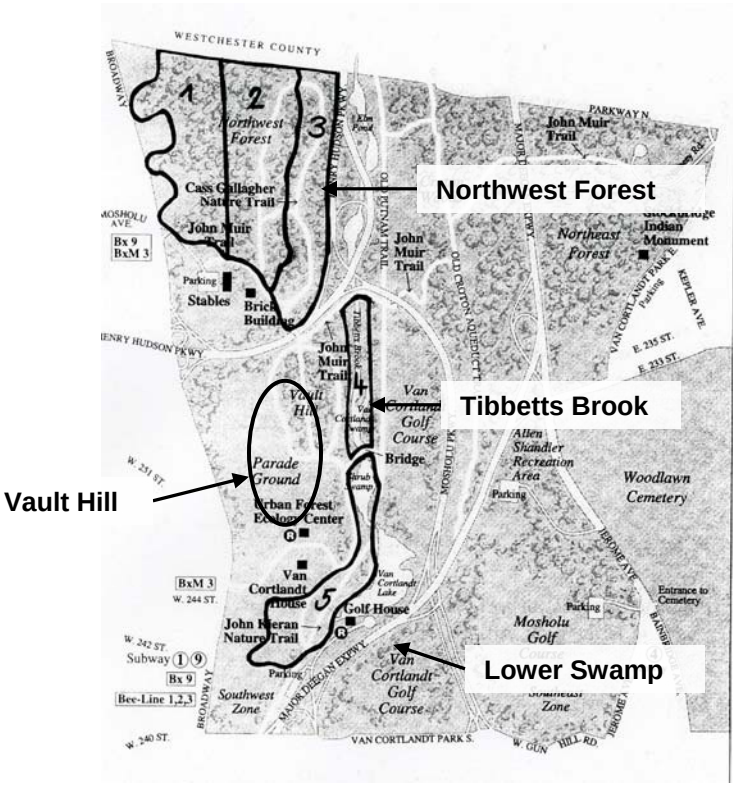
To fill this gap and to better understand the value of this Important Bird Area, New York City Audubon conducted a special bird census in Van Cortlandt Park in the summer of 2006. Special attention was given to the Northwest Forest because it contains the park's older-growth forest. This census wasn't limited to identifying the breeding species but also aimed to take into account all migrating species that choose the park as stopover habitat. Thus this breeding and migrating bird census aimed to gather overall information about the birds' presence, abundance, and distribution in various sectors of the park. This census was also an opportunity to create a network of stewards who will continue to advocate for the protection and enhancement of the park in the future. The results described in this report summarize the data gathered by volunteers over a

course of two months. This information will provide baseline data to assist future management in enhancing bird habitat and directing future restoration and conservation efforts and will also be an important asset for bird watchers and environmental organizations such as NYC Audubon. This report contains recommendations for maintaining and encouraging the species that currently nest in the park and species that could nest in the park in the future.

Part II: Methods

The NYC Audubon census focused on the Northwest Forest, a plot of 170 acres. Given the size of this area, it was divided into three sections (1, 2, 3), choosing the pathways as borders between each section. This area holds a great variety of vegetation and significant changes in elevation. Its center is remote from major human activity and seems like an ideal territory for some forest birds. Other areas with natural habitat were also included in the census. These were Tibbetts Brook (4), a barely accessible thick swampy habitat, and the Lower Swamp (5), upstream of Van Cortlandt Lake. They are both part of the same wetland complex and share many similar characteristics. In total, the census covered five different sections of Van Corltandt Park (VCP), totaling over 200 acres.

Map of Van Cortlandt Park with the sections studied



The overall methods used in the present study followed the New York State Breeding Bird Atlas 2000 protocols for conducting breeding bird censuses.

The field component of this project was launched during the first week of May and ran until the end of July 2006, totaling 12 weeks of study. During this period, volunteers walked their section at least 8 times and were asked to note every bird they saw or heard in their assigned section as well as the nests they found. Bird behavior was also documented such as a bird carrying food or nesting materials, or a bird defending its territory[1]. All breeding behavior was written on a data sheet and reported on a map for accurate location of the various territories (pairs) within a site. The various behaviors correspond to protocols used for atlasing birds in New York State. The following table indicates how to determine the status of a bird.

Possible Breeding	**Probable Breeding**	**Confirmed breeding**
- Species observed in possible breeding habitat, but no other indication of breeding noted; singing male(s) present (or breeding calls heard) in breeding season.	- Singing male present - Pair observed in suitable habitat in breeding season - Bird (or pair) apparently holding territory. In addition to territorial singing, chasing of other individuals of same species often marks a territory - Courtship and display, including copulation - Carrying nesting material	- Carrying food or fecal sac - Presence of nest, nestlings, fledglings, or young

For each section, the total nests and territories for each confirmed species were mapped and then tallied. For these purposes, a nest was defined as follows: the actual viewing of an active nest. In cases were an actual active nest was not visible, we defined this as a territory. A territory was identified as follows: the presence of fledglings or repeated singing and breeding behavior in a same location. A probable territory was identified when singing occurred repeatedly outside a confirmed territory, or when density suggested that some territories may overlap.

The census was not limited to observing breeding birds only: during a period of two months all birds were recorded, thus extending the list to a great variety of species. Birds could then also fall in the following categories:

Category	**Definition**
Migrant	All birds that pass though and use VCP as stopover habitat. They were usually spotted only once or twice and mostly at the beginning of the survey, during migration season.
Forager	All birds suspected to nest in the city but not in VCP and who come and forage in the park during the day. These species were seen throughout the census.

[1] See appendix 1 for the full protocol.

Part III: Results

A total of 28 species were confirmed to nest within the five areas studied, including the Willow Flycatcher, Wood Thrush, Rose-breasted Grosbeak, Eastern Wood Peewee and Wood Duck. Furthermore, another 16 species were identified as probable breeders and nine were identified as possible breeders as shown in the tables 1 and 2 and figure 1. The presence of an additional 31 species was recorded in the five sections; this includes all the migrating species that chose Van Cortland Park as stopover habitat as well as the species who feed in the park while breeding in some other areas of New York City as listed in table 3.

Table 1[*]: Confirmed breeding species, by section, and corresponding breeding activity in VCP, 2006

Confirmed breeders	Section 1	Section 2	Section 3	Section 4	Section 5
Wood Duck	-	-	-	-	3
Mallard	-	-	-	-	2
Red-bellied Woodpecker	5	3	-	-	2
Downy Woodpecker	-	1	-	-	1
Hairy Woodpecker	-	1	1	-	-
Northern Flicker	1	-	-	-	2
Eastern Wood-Peewee	1	-	-	-	-
Willow Flycatcher	-	-	-	-	1
Eastern Kingbird	-	-	-	1	1
Blue Jay	-	1	1	-	1
Warbling Vireo	-	-	-	1	5
Tree Swallow	-	-	-	1	1
Northern Rough-winged Swallow	-	-	-	-	1
Barn Swallow	-	-	-	-	1
Wood Thrush	6	7	2	-	-
American Robin	7	9	3	8	22
Gray Catbird	10	4	1	6	6
Cedar Waxwing	-	-	-	-	1
Yellow Warbler	-	-	-	13	2
Eastern Towhee	2	2	-	-	-
Song Sparrow	-	-	-	-	8
Northern Cardinal	-	-	-	-	2
Rose-breasted Grosbeak	-	-	1	-	-
Red-winged Blackbird	-	-	-	10	9
Common Grackle	-	2	-	-	3
Brown-headed cowbird	-	-	-	1	5
Baltimore Oriole	2	4	2	5	5
American Goldfinch	-	-	-	1	-

[*] Counts include nests and territories

Table 2: Probable and possible breeding species, VCP, 2006

Probable breeders
Canada Goose
Mute Swan
Ring-necked Pheasant
Belted Kingfisher
Great Crested Flycatcher
Red-eyed Vireo
Black-capped Chickadee
Tufted Titmouse
White-breasted Nuthatch
Carolina Wren
House Wren
Northern Mockingbird
Common Yellowthroat
Scarlet Tanager
Orchard Oriole

Possible breeders
Green Heron
Rock Pigeon
Mourning Dove
Chimney Swift
American Crow
Marsh Wren
Blue-gray Gnatcatcher
Brown Thrasher
House Sparrow

Between May 4th and July 23rd 2006, a total of 25 species were identified as migrants in the five sections studied. Furthermore, another four species were identified as foragers as shown in table 3 and figure 1. These species nest outside of Van Cortlandt Park but forage there during the day.

Table 3: Migratory species, and foraging species, VCP, 2006

Migratory Species	
Turkey Vulture	Blackburnian Warbler
Gadwall	Bay-breasted Warbler
Solitary Sandpiper	Blackpoll Warbler
Spotted Sandpiper	Black-and-white Warbler
Least Sandpiper	American Redstart
Ruby-crowned Kinglet	Ovenbird
Veery	Northern Waterthrush
Hermit Thrush	Wilson's Warbler
Northern Parula	Summer Tanager
Magnolia Warbler	American Tree Sparrow
Black-throated Blue Warbler	Swamp Sparrow
Yellow-rumped Warbler	White-throated Sparrow
Black-throated Green Warbler	

Foraging Species
Double-crested Cormorant
Great Blue Heron
Great Egret
Black-crowned Night Heron

House Sparrows and European Starlings – two species alien to North America – were present, but absolute numbers of breeding territories for these species were not determined because of the vastness of the task.

The American Robin was the most numerous and widespread of native species with 49 breeding territories confirmed. The species was recorded in all five sections. The Gray Catbird was second most numerous with 27 confirmed territories. The Red-winged Blackbird, although only present in two sections, consisted of 19 breeding territories. The Baltimore Oriole, present in all five sections, had 18 breeding territories recorded.

As shown in table 4, the number of species varied greatly among the five sections. The number of confirmed breeding species ranged from seven to 22 species for the five sections studied. For instance, the section with the greatest number of species was the Lower Swamp region (section 5) around Van Cortlandt lake with a total of 22 confirmed breeders, an additional 15 probable breeders and seven possible breeders and an overall total of 61 species spotted during the two-month study. The section with the fewest species spotted was situated on the east side of the Northwest Forest (3).

Table 4: Number of species found in each section, by status, VCP, 2006

Section	# Confirmed Breeding species	# Probable Breeding species	# Possible Breeding species	# Migratory and Foraging species	Total # of species recorded
1. East Northwest Forest	8	7	10	16	41
2. Middle Northwest Forest	10	11	9	16	46
3. West Northwest Forest	7	4	2	13	26
4. Tibbetts Brook	10	15	6	9	40
5. Lower Swamp, VC Lake	22	15	7	17	61
Overall	**28**	**16**	**9**	**29**	**82**

Table 5 indicates all the species that were sighted in the five study sections of Van Cortlandt Park between May 4th and July 23rd 2006 as well as an indication of their status and numbers.[2]

[2] See appendix 2 for a full description of the breeding species found in each of the five section

Table 5: All species recorded with status and description, VCP, 2006

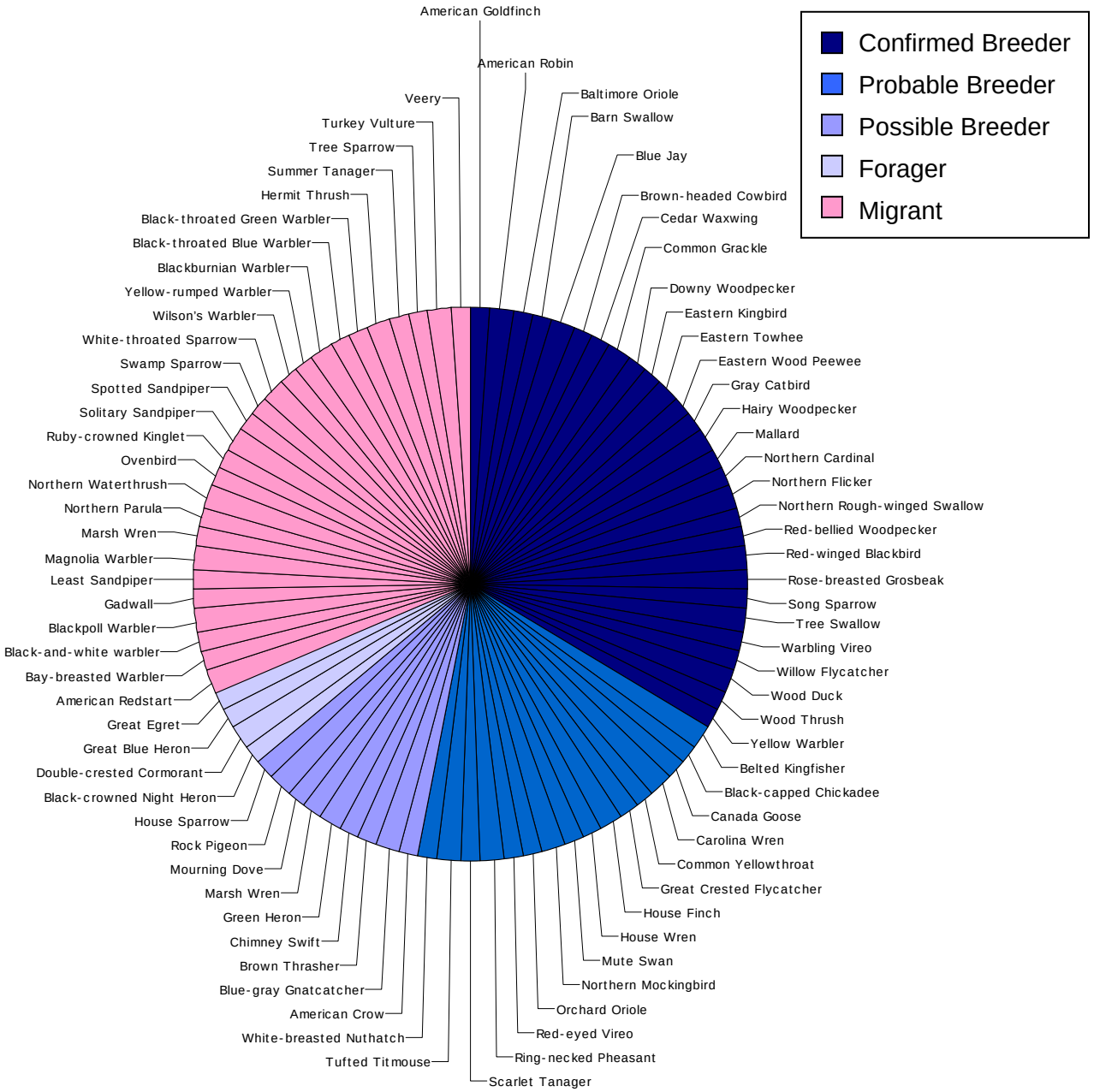
Species	Status	Description
Double-crested Cormorant	Forager	Sighted section 5. This species may nest on South Brother Island, located in the East River, where a large colony is established.
Great Blue Heron	Forager	Sighted section 5.
Great Egret	Forager	Sighted section 5.
Green Heron	Possible	This heron was spotted three times in Tibbetts Brook and three times in the Lower Swamp, indicating a fair chance of breeding territory.
Black-crowned Night Heron	Forager	Sighted in section 5.
Turkey Vulture	Migrant	Sighted in flight from section 5.
Canada Goose	Probable	Two nests were found in the Lower Swamp but they were not successful.
Mute Swan	Probable	A nest was identified in the Lower Swamp but it wasn't successful this year.
Wood Duck	Confirmed	Three batches of ducklings were identified in the Lower Swamp which suffered removal by snapping turtles.
Gadwall	Migrant	Sighted once in section 5.
Mallard	Confirmed	At least three pairs with fledglings were sighted in the Lower Swamp. (5)
Ring-necked Pheasant	Probable	Sighting and calls for this bird were identified in sections 4 and 5, suggesting that the bird moves around. Its presence was constant but there were no indications of successful breeding. This species is a non-native and resident to VCP.
Solitary Sandpiper	Migrant	Sighted once in section 5.
Spotted Sandpiper	Migrant	This regional breeder was sighted once in section 5.
Least Sandpiper	Migrant	Sighted once in the Lower Swamp. (5)
Rock Pigeon	Possible	This non-native species was only sighted in the Lower Swamp region.
Mourning Dove	Possible	This resident species was sighted abundantly in sections 1, 2, 4, and 5 but never showing breeding behavior. It most likely breeds in the park.
Chimney Swift	Possible	This bird was sighted five times in the Lower Swamp and also in the Upper Swamp. But breeding may take place outside the park boundaries, probably across Broadway.
Belted Kingfisher	Probable	In the Lower Swamp the bird was heard "singing" two times and was sighted as well.
Red-bellied Woodpecker	Confirmed	Eight nests were found in the Northwest Forest (1 and 2), fledglings were sighted in the Lower Swamp (5), and numerous calls were heard in Tibbetts Brook (4).
Downy Woodpecker	Confirmed	No nests of this species were found but the calls and fledglings confirm breeding in sections 2, 4, and 5 but probable breeds in all sections of the park.
Hairy Woodpecker	Confirmed	A nest was found in section 3 and fledglings were spotted in section 2, confirming the breeding for this species in the Northwest Forest.
Northern Flicker	Confirmed	Juveniles were found in section 5 and breeding behavior indicates breeding in sections 1 and 4. It possibly also nests in section 2.
Eastern Wood Peewee	Confirmed	A nest was found in the western portion of the Northwest Forest (1) and singing was heard on three occasions in section 2.
Willow Flycatcher	Confirmed	One successful breed is confirmed in section 5 with another possible territory.

Great Crested Flycatcher	Probable	This bird was heard singing two times and seen an additional three times in section 2 in the Northwest Forest. Successful breeding was also recorded on Vault Hill, which is adjacent to the study areas.
Eastern Kingbird	Confirmed	Presence of fledglings with adults and repeated singing indicate breeding in the Lower Swamp (5).
Warbling Vireo	Confirmed	A nest was found in section 4 with an additional three possible territories and in the Lower Swamp, at least five breeding territories were identified.
Red-eyed Vireo	Probable	Multiple instances of singing were heard on four occasions in section 2, indicating probable breeding. No obvious signs of successful breeding were recorded.
Blue Jay	Confirmed	This bird is confirmed in sections 2, 3, and 5 and multiple sightings indicate that it probably also breeds in section 1. The sole nest found was in section 3.
American Crow	Possible	Sighted in sections 1, 2, and 5.The annual Christmas Bird Counts reveal that its population had dropped in the park, but it might still breed some year.
Tree Swallow	Confirmed	A pair successfully bred in a nest box in section 4 and one nest was found in the Lower Swamp, with an additional two probable territories.
Northern Rough-winged Swallow	Confirmed	Fledgling with parents was seen in the Lower Swamp.
Barn Swallow	Confirmed	Only the Lower Swamp recorded this bird with 1 nest and an additional probable breeding territory.
Black-capped Chickadee	Probable	In section 2, a pair was sighted as well as two other sightings. In section 5 it was recorded singing once and seen three times.
Tufted Titmouse	Probable	This resident species was heard often in the Northwest Forest confirming its breeding territory in section 1 and 2. It may also breed in the Lower Swamp where it was heard and seen a few times, but no obvious sign of successful breeding was observed
White-breasted Nuthatch	Probable	Presence of a pair and calls in sections 1, 2 and 5 indicate probable breeding territories.
Carolina Wren	Probable	Sighted and heard singing in sections 1, 2, and 5. No signs of breeding.
House Wren	Probable	Sighted and heard in sections 4 and 5.
Marsh Wren	Possible	Heard once in section 5. This species is known to nest in the Bronx.
Ruby-crowned Kinglet	Migrant	Sighted once each in sections 1 and 3.
Blue-gray Gnatcatcher	Possible	This species was seen three times in the Lower Swamp and once in Tibbetts Brook. It was also seen at the base of Vault Hill slightly before the beginning of the survey.
Veery	Migrant	Heard once in section 2.
Hermit Thrush	Migrant	Sighted once in section 3.
Wood Thrush	Confirmed	One nest was found in section 1 and an additional 20 territories were identified in the Northwest Forest.
American Robin	Confirmed	A total of 49 territories were identified among the five sections. The Lower Swamp alone (5) accounted for 16 nests and six additional territories.
Gray Catbird	Confirmed	This species is very abundant with 27 breeding territories in total and section 1 alone accounting for 10 territories. Its presence was recorded in all five sections.
Brown Thrasher	Possible	Was heard singing once in section 2. Past records indicated breeding in the Northwest Forest.
Northern Mockingbird	Probable	Abundant singing and presence in sections 1 and 5 indicate probable breeding.

European starling	Possible	This species was present in all sections and not tallied.
Cedar Waxwing	Confirmed	A nest was found in the Lower Swamp. Territorial defense was also recorded further north in that section. Some nests may have been missed due to this species' later breeding cycle.
Northern Parula	Migrant	Sighted once each in sections 1, 2, 3, and 4.
Yellow Warbler	Confirmed	Abundant singing and presence of fledglings revealed about 13 territories in sections 3 and 4 in the Lower Swamp, where juveniles were observed.
Magnolia Warbler	Migrant	Sighted once in section 1.
Black-throated Blue Warbler	Migrant	Sighted in section 2.
Yellow-rumped Warbler	Migrant	Sighted in sections 1, 2, and 3.
Black-throated Green Warbler	Migrant	Sighted in sections 1 and 2.
Blackburnian Warbler	Migrant	Sighted in section 3.
Bay-breasted Warbler	Migrant	Sighted in the Lower Swamp (5).
Blackpoll Warbler	Migrant	Sighted in sections 1, 2, 4, and 5.
Black-and-White Warbler	Migrant	Sighted in sections 2, 3, and 4.
American Redstart	Migrant	Sighted in section 2 and 5 but not beyond May 21st.
Ovenbird	Migrant	Sighted and heard abundantly in sections 2 and 3.
Northern Waterthrush	Migrant	Sighted in sections 1, 2, and 5.
Common Yellowthroat	Probable	This bird was seen in sections 1, 2, 4, and 5. The singing patterns indicate about 3 territories although no nests or juveniles were found.
Wilson's Warbler	Migrant	Heard once in section 5.
Summer Tanager	Migrant	Sighted once in section 3.
Scarlet Tanager	Probable	This species was heard singing at various locations of section 2.
Eastern Towhee	Confirmed	Breeding is confirmed in two portions of the Northwest Forest through repeated singing, territorial defense, and presence of fledglings.
Tree Sparrow	Migrant	Sighted once in section 5.
Song Sparrow	Confirmed	This species is abundant in the Lower Swamp with at least eight breeding territories identified and four in Tibbetts Brook.
Swamp Sparrow	Migrant	Sighted in section 4.
White-throated Sparrow	Migrant	Sighted once each in sections 1, 3, and 4.
Northern Cardinal	Confirmed	No nests were found but the presence of fledglings and repeated singing indicate breeding in sections 1, 4 and 5. It possibly also breeds in section 2 of the Northwest Forest.
Rose-breasted Grosbeak	Confirmed	Multiple sightings and signs of breeding (carrying food) indicate that one or two pairs nested in the Northwest Forest, somewhere between sections 2 and 3.
Red-winged Blackbird	Confirmed	This species is very abundant in the marshy and swampy areas. In Tibbetts Brook, 10 territories were identified and in the Lower Swamp, two nests were found and another seven territories were identified.

Common Grackle	Confirmed	A nest was found in section 5 and fledglings were observed in section 2. The birds probably breed in sections 1 and 4 as well.
Brown-headed Cowbird	Confirmed	In section 2, its presence on four occasions indicate possible and typical nest parasitism. In section 4, a juvenile BHCB was found in a BAOR nest and in section 5, two juveniles were spotted in an YWAR nest and one in a SOSP nest.
Orchard Oriole	Probable	Repeated singing was heard on three occasions, making this species a possible breeder in the Lower Swamp.
Baltimore Oriole	Confirmed	This bird was confirmed in all five sections. Researchers in Plots 4 and 5 both found five nests and two probable additional territories.
House Finch	Probable	This bird was spotted four times in section 1, especially in July, making it a probable breeder. It was also heard singing in the Lower Swamp. This species has suffered a lot from eye disease.
American Goldfinch	Confirmed	One nest was found in section 4 and in section 5, intensive singing was heard. Some nest may have been missed due to late breeding.
House Sparrow	Possible	This species was present in all sections and not tallied.

Figure 1: All Species recorded in the VCP 2006 census and their status



Part IV: Discussion

The results of the NYC Audubon breeding and migrating bird census in the urban IBA of Van Cortlandt Park highlight the importance of these areas for both breeding and migratory birds.

a. Breeding birds

Van Cortlandt hosts a diverse array of breeding birds including waterfowl, woodpeckers, songbirds and at least three raptor species. In addition to the 28 confirmed breeding species, there were 25 additional species identified as probable and possible breeders. A more comprehensive census is necessary to determine the final status of these species.

Species representation was not equally distributed among the five sections monitored. Some species were present in all sections such as the American Robin, but many species were only found in specific sections. The census clearly reveals a connection between habitat type and corresponding bird species. Sections 1, 2 and 3 covered the Northwest Forest, which contains the park's older-growth forest, featuring red, white and black oak, hickory, beech, cherry birch, sweetgum, red maple and tulip trees. This type of habitat attracted mostly forest dependant species such as the Wood Thrush, Eastern Wood Peewee, Eastern Towhee, Red-eyed Vireo, Rose-breasted Grosbeak and Tufted Titmouse. These areas are also important to species such as the Northern Flicker, Red-bellied Woodpecker and White-breasted Nuthatch.

Sections 4 and 5 were both part of a wetland habitat, including a large thick marsh. This was ideal habitat for species such as the Willow Flycatcher, Song Sparrow, Yellow Warbler and Common Yellowthroat. Additionally section 5 was adjacent to Van Cortlandt Lake, thus attracting all the waterfowl such as the Wood Duck, Canada Goose, Mallard and species such as the Northern Rough-winged Swallow that feed on the insects around the lake.

The sections with the fewest species were situated on the east and west sides of the Northwest Forest, where high traffic areas were found to exist. On the west side runs Broadway Avenue and the Henry Hudson Parkway crosses the park on the east. These two sections are also more accessible for species such as European Starlings and House Sparrow, thus creating more competition for breeding territories and food resources. To avoid this situation larger buffer zones between the edges of the park and the forested areas could be created to isolate better this prime breeding habitat.

Breeding species in Van Corltlandt Park can be separated into three groups – short to middle distance migrants, Neotropical migrants and residents. In the spring, the short to middle distance migrants travel from the south of the continental U.S. to the north of Canada. They include the American Robin, Blue

Jay, American Goldfinch, and Eastern Towhee. The Neotropical migrants nest in temperate regions and migrate to the Neotropical faunal region, which includes the West Indies, Mexico, and Central America. The Yellow Warbler, the Willow Flycatcher, the Northern Rough-winged Swallow, the Wood Thrush and the Eastern Wood Peewee are examples of Neotropical migrants which breed in Van Cortlandt Park. The residents species that breed in the par are the Northern Cardinal, Downy Woodpecker and White-breasted Nuthatch.

The census revealed that different bird species are also subject to different rhythms in their breeding cycles. Some species were found to breed earlier in the season, like the American Robin. This species' capacity to reproduce is astonishing. Volunteers who conducted this census suspected some pairs had more than one batch of fledglings. Other species, like the American Goldfinch, are known to be later breeders and usually don't have chicks until mid-July, whereas most species have their chicks in June.

Forested areas of Van Cortlandt Park are most likely populated with resident Eastern Screech-Owls. While this census did not identify this bird species, one Screech-owl, a rufous morph, was spotted at the southwest corner of section 4 a few weeks before the beginning of the survey. And an active nest was recorded in the central portion of the Northwest Forest. These elements confirm the presence and breeding of the Eastern Screech-Owl in Van Cortlandt Park but more monitoring needs to be carried out to assess the population status of this species in the park.

According to David Kunstler, Wildlife Manager for Van Cortlandt Park, another great raptor nests in the park: The Great Horned Owl. But its nest was not within the areas studied, although this census covered part of its territory. Mr. Kunstler also confirmed the presence of the Wild Turkey in the park, but it wasn't detected during the census. It most likely resides on the east side of the park. Two other species were sought after but not seen. They were the Eastern Bluebird and American Kestrel which both have boxes installed for nesting, but they weren't seen this year.

b. Migratory and foraging birds

Migrating birds used Van Cortland Park as stopover habitat during their long journey north. A total of 25 migrating species were spotted in the five sections studied in the month of May, corresponding to the migration season. Since migration doesn't always take place at the same time for every bird species, this number underestimates the true migratory activity within the park as our census started late in the spring season. The census revealed that all the migrating warblers had left by May 14th. These migrants included the Northern Parula, Blackpoll Warbler, Black-throated Green Warbler, and Black-and-white Warbler among others. After May 14th the only migratory species found was a Veery, belonging to the Thrush family. To better understand the diversity of species that

rely on Van Cortlandt Park as stopover habitat, a specific migrating census should be conducted following the migrations seasons over the course of a year. A more comprehensive census would have also allowed us to quantify the quantity of migratory birds passing through the park through the use of spot counts or similar methods.

Other birds that nest elsewhere in the city came to Van Cortlandt Park to forage. These included the Great Egret, the Black-crowned Night Heron, the Great Blue Heron and the Double-crested Cormorant.

c. Conservation

The variety of birds observed in Van Cortlandt Park underscores the importance of an IBA's rich habitat in an urban setting like New York City. Van Cortlandt Park's habitats provide shelter and food to species that nest in the park, near the park, and also to all the species that refuel and stop over during migration season. For this reason, special attention needs to be given to habitat quality and maintenance to ensure the reproductive success of all the birds that nest in the park and that can potentially nest there. Special care needs to be given to the habitats of species whose population is under pressure such as the Wood Thrush, which is found on both The Audubon Watch List and the U.S. Fish and Wildlife's Birds of Conservation Concern list. This species has seen its woodland breeding habitat shrink over the last decades thus retarding its reproduction rate.

The Willow Flycatcher, another Van Cortlandt Park breeding bird, is also on the Audubon Watch List, and its presence in the park is positive. Another migrating bird that is on the Audubon Watch list stopped in Van Cortlandt Park to refuel on its journey north: the Bay-breasted Warbler, a Neotropical migrants. Since these species of special concern use the park during migration, this offers an opportunity for park managers and environmental organizations to take the necessary steps toward a long-term conservation commitment by offering the best habitat possible for these species.

d. Recommendations

Vault Hill, a sandy, rocky upland adjacent to the Northwest Forest and Tibbetts Brook was regularly monitored although not officially studied. The regular monitoring revealed confirmed breeding for the following species: American Robin, Red-tailed Hawk (with three chicks), Northern Cardinal, Blue Jay, Baltimore Oriole, Great Crested Flycatcher, Downy Woodpecker, and Red-bellied Woodpecker. Other species such as the Eastern Towhee, Red-eyed Vireo, Gray Catbird, Tufted Titmouse, and Yellow Warbler very likely nest in that section of the park. As mentioned, this section of the park should be incorporated in all future Van Cortlandt park censuses.

It is important to ensure the continuity of monitoring efforts in order to be able to measure population trends. Censuses should be carried out every year so that data can be compared from year to year. Censuses should also be extended to other areas of the park which are just as rich in habitat as the sections studied, such as Vault Hill and the Croton Woods. More funding for this project would have allowed NYC Audubon to map all species' territories using GIS mapping software. This would increase the accuracy of data and the ability to compare data from year to year.

As mentioned earlier, additional funding would have allowed us to survey the areas more thoroughly in order to determine the breeding status of unconfirmed species. It would also allow us to determine the quantity of migrating birds that pass through the park.

e. Volunteers

This project owes its success to many committed NYC Audubon volunteers who went out regularly to collect data throughout the study period. It is these people who also form the basis for the next generation of ecological stewards who could advocate on the IBA's behalf.

Without doubt, Van Cortlandt Park is an Important Bird Area and its urban setting makes it even more unique. New Yorkers have the opportunity to discover amazing wildlife right at their doorstep and projects such as this one allow NYC Audubon to offer outreach and encourage people to care about this hidden urban gem.

Part V: Acknowledgments

NYC Audubon would like to thank Audubon for supporting this project through a grant from the Hudson River Estuary Program.

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David Kunstler, New York City Parks Department provided valuable help on various aspects of the project, such as providing maps helping define the territories studied and contributing to this report.

***

Yigal Gelb, Amelia Linn, Glenn Phillips, and Ann Seligman for proof reading this report and making it come to life a little more.

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Finally and most importantly, thanks to all the participants who provided their time and field expertise in collecting the data that made this report possible. The participants were: Angel Cardenas, Yolanda Garcia, Joe Giunta, Brendan Keogh, David Kunstler, Christopher Lyons, Peter Mott, and John Young.

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NYC Audubon thanks all of the above and appreciates their assistance.

Part VI: Appendices

a. Appendix 1

Instructions and Protocols for Conducting the Breeding and Migrating Bird Census in Van Cortlandt Park

Conducting a Migrating and Breeding Bird Census is an easy and fun way to monitor the health of bird populations and the health of Van Cortlandt Park. Although I will not tell you how to enjoy yourself when doing a Bird Census, I am insisting on adherence to standardized protocols. These protocols are easy and they will also help you learn more about the behavior and ecology of the birds you see. By performing all Breeding and Migrating Bird Censuses in the same way, we ensure that the data set is credible and accurate.

The first step in doing a census is to familiarize yourself with your census area. Since the first part of the census involves migrating birds, the protocol – which is less strict – will allow you to get acquainted with the boundaries of the area and the route that you will follow when the more methodical part of the census begins with breeding birds. In sections 1,2,3 and 5, there are trails that can be used. This means that unless you choose to survey section 4, you will rarely have to leave the trails.

DATES FOR CENSUSING: May 4th to July 23rd. This period was selected to cover both migration and breeding seasons. You will see migrating birds during the months of May and early June; later in June and July the resident nesters will be showcased.

NUMBER OF VISITS NEEDED: A minimum of eight visits (and maximum of 12) to the census area is needed for the study to be complete. Any fewer and the data cannot be included in the larger data set. If you cannot commit to eight visits within the study period, please notify me. The attached calendar will give you an idea of the time frame. The length of the study period is 12 weeks and within those weeks, a four-day time frame has been highlighted each week. The visits can be done during any of these four days, but a maximum of once a week.

TIME OF DAY AND DURATION OF A VISIT: Censuses for the migrating birds should take place when birds are most active, mainly before noon. Censuses for the breeding birds should commence within 30 minutes after sunrise or 30 minutes before sunset and continue for about two to three hours. This timing should allow identification by ear as well as sight. But breeding behavior can be seen throughout the day as well (nest building, food carrying). It should take an observer between two and four minutes per acre to do a census depending on how thick the habitat is. Pace yourself so that you can finish your entire area within two to three hours.

CENSUSING ROUTE: Vary the route you use through your census area from visit to visit. Do not use the same route every time. Instead, you may wish to do the route backward on the second visit, start in the middle on the third, and cycle through these or other

options throughout the study period. This will ensure that you do not bias your data set by censusing the same area at the same time on every visit.

SAFETY: You personal safety is important to us, so we ask you to be careful. Starting near dawn or dusk may mean that the park is rather empty and you will be somewhat alone. If you haven't been paired up with someone, ask a friend to come with you, even if he or she isn't a birder.

WHAT TO BRING ON A CENSUS: You will need to bring binoculars, pencil with eraser, a clipboard or other surface (i.e. a field guide) to write on, the map, data sheets, the list of species with abbreviations, and a field guide if you need one.

HOW TO CONDUCT AN ACTUAL CENSUS: When you arrive at your starting point, circle the site number on the data sheet, write your name and all other participants' names, the date, starting time, weather (temperature, precipitation and wind speed following the Beaufort Wind Scale) and place a star on the map at the starting point for that date.

Beaufort Wind Scale:

0 =	< 1 mph	smoke rises vertically
1 =	1-3 mph	wind direction shown by smoke
2 =	4-7 mph	wind felt on face, leaves rustle
3 =	8-12 mph	leaves, small twigs in constant motion
4 =	13-18 mph	raises dust and loose paper

If the wind is constantly blowing at #4 speeds, you should consider getting a cup of coffee and shift your visit to another day.

Indicate precipitation as follows:

0 = no precipitation
1 = light intermittent showers
2 = steady, light shower
3 = steady rain
4 = deluge

If you record precipitation of #3 or greater, you should consider getting a cup of coffee and shift your visit to another day.

Once preliminary data are recorded, walk slowly through your area using all available trails, looking and listening for birds. When you hear a song or see a bird, watch to see what it is and what it is doing. After you identify the bird, you have two options:

1) if the bird is simply feeding, flying or calling, note the species using abbreviations on the data sheet provided. No special code will be added. Record that species showing that type of behavior only once per day (even if you see 20).

2) If the bird is showing signs of the following behaviors, record the bird on the data sheet and the appropriate code from those below. Also, note the position on the map, using the corresponding line number for that sighting. If you see multiple birds of one species doing these behaviors, record all instances.

   SO = Singing

TD = Territorial defense (chasing other birds away in an aggressive fashion)
CO = Copulating
CF = Carrying food or fecal sac
CN = Carrying nesting material
NE = Nest
YO = Nestling or fledgling without parents – down feathers or flight feathers not fully grown)
PA = Nestling or fledgling with parents – down feathers or flight feathers not fully grown.

For each bird plotted on the map (meaning with distinct behavioral attitude), add the number to which it corresponds on the data sheet (1 to 46). Please see attached sample sheet for an example of this numbering procedure.

Wind scale, precipitation and behavior codes are also listed on the data sheet.

WHAT ABOUT HOUSE SPARROWS, EUROPEAN STARLINGS AND ROCK DOVES: These species will not be tallied. Just note their presence for each section and whether there is evidence of breeding (without numbers).

USE A NEW MAP FOR EVERY VISIT AND NOTE EVRYTHING YOU SEE FOR EACH VISIT (DON'T JUST RECORD BIRDS THAT YOU HADN'T SEEN ON PREVIOUS VISITS).

WHAT TO DO WITH YOUR DATA SHEETS AND MAPS: When you have finished doing an individual census or, perhaps 3 or 4, please mail them to me. It is also possible to do it by email. But I will eventually need to recover all the hard copies. By sending them in a few at a time, we will be able to keep up with data input.

Nicole Delacrétaz
Van Cortlandt Bird Census
71 West 23rd Street, Suite 1523
New York, NY, 10010

If you have any questions, please call me at NYC Audubon (212-691-7483) or on my cell phone (646-243-5894).

On behalf of New York City Audubon and the birds and habitat we seek to protect, thank you.

Nicole Delacrétaz
Project Manager
646-243-5894

b. Appendix 2

Van Cortlandt Migrating and Breeding Bird Census

Section 1 – Northwest Forest, Westside

Confirmed breeder (8):

American Robin	4 nests + 3 territories
Baltimore Oriole	1 nest + 1 territory + 1 probable territory
Eastern Towhee	2 territories
Eastern Wood Peewee	1 nest
Gray Catbird	10 territories
Northern Flicker	1 Adult with Parent
Red-bellied Woodpecker	5 nests + 2 probable territories
Wood Thrush	6 territories

Probable breeder (7):

Blue Jay
Carolina Wren
Northern Cardinal
Northern Mockingbird
Tufted Titmouse
White-breasted Nuthatch
Yellow Warbler

Possible breeder (10):

American Crow
Black-capped Chickadee
Common Grackle
Common Yellowthroat
Downy Woodpecker
House Finch
Mourning Dove
Red-eyed Vireo
Rose-breasted Grosbeak
Song Sparrow

Other species observed (16):

American Crow
Blackpoll Warbler
Black-throated Green Warbler
Brown-headed cowbird
Chimney Swift
European Starling
House Sparrow
Magnolia Warbler
Mallard
Mourning Dove
Northern Parula
Northern Waterthrush
Red-eyed Vireo
Ruby-crowned Kinglet
Scarlet Tanager
Turkey Vulture

Total number of species recorded: 41

Section 2 – Northwest Forest, Middle section

Confirmed breeder (10):

American Robin	5 nests + 4 territories + 2 more probable
Baltimore Oriole	1 nest + 1 nest by the stables + 3 territories
Blue Jay	Presence of fledglings
Common Grackle	Presence of fledglings at 2 locations
Downy Woodpecker	Presence of fledglings + 1 probable other territory
Eastern Towhee	2 territories + 1 probable other
Gray Catbird	4 territories + 2 probable others
Hairy Woodpecker	Presence of fledglings + 2 other sightings
Red-bellied Woodpecker	3 nests + 2 probable territories
Wood Thrush	at least 7 territories + 9 probable other ones

Probable breeder (11):

Black capped Chickadee
Eastern Wood Peewee
Great Crested Flycatcher
Northern Cardinal
Northern Flicker
Rose-breasted Grosbeak
Red-eyed Vireo
Scarlet Tanager
Tufted Titmouse
Warbling Vireo
White-breasted Nuthatch

Possible breeder (9):

American Crow
Brown-headed Cowbird
Brown Thrasher
Carolina Wren
Cedar Waxwing
Common Yellowthroat'
Mourning Dove
Song Sparrow
Yellow Warbler

Other species observed (16):

American Crow
American Redstart
Black-and-white Warbler
Blackpoll Warbler
Black-throated Blue Warbler
Black-throated Green Warbler
Eastern kingbird
European Starling
House Sparrow
Northern Mockingbird
Northern Parula
Northern Waterthrush
Ovenbird
Red-winged Blackbird
Veery
Yellow-rumped Warbler

Total number of species recorded: **46**

Section 3 – Northwest Forest, Eastside

Confirmed breeder (7):

American Robin	3 nests + 3 probable territories
Baltimore Oriole	2 nests + 3 probable territories
Blue Jay	1 nest
Gray Catbird	1 nest + various sightings
Hairy Woodpecker	1 nest
Rose-breasted Grosbeak	1 individual carrying food
Wood Thrush	1 nest + 1 territory + 1 probable territory

Probable breeder (4):

Eastern Towhee
Great Crested Flycatcher
Red-eyed Vireo
Tufted Titmouse

Possible breeder (2):

Northern Cardinal
Northern Flicker

Other species observed (13):

Black-and-white Warbler
Blackburnian Warbler
Chimney Swift
European Starling
Hermit Thrush
House Sparrow
European Starling
Northern Parula
Ovenbird
Ruby-crowned Kinglet
Summer Tanager
White-throated Sparrow
Yellow-rumped Warbler

Total number of species recorded: 26

Section 4 – Tibbetts Brook

Confirmed breeder (10):

American Goldfinch	1 nest found
American Robin	8 nests found + 3 probable territories
Baltimore Oriole	5 nests found + 2 probable territories
Brown-headed Cowbird	Juvenile founding Baltimore Oriole Nest
Eastern Kingbird	Individual seen carrying food
Gray Catbird	6 territories
Red-winged Blackbird	10 territories
Tree Swallow	1 successful breed in nest box
Warbling Vireo	1 nest + 3 probable territories
Yellow Warbler	13 territories

Probable breeder (15):

Black-capped Chickadee
Blue Jay
Cedar Waxwing
Common Yellowthroat
Downy Woodpecker
House Wren
Mallard
Northern Cardinal
Northern Flicker
Mourning Dove
Red-bellied Woodpecker
Ring-necked Pheasant
Song Sparrow
Willow Flycatcher
White-breasted Nuthatch

Possible breeder (6):

Blue-gray Gnatcatcher
Common Grackle
Green Heron
Mourning Dove
Red-eyed Vireo
Wood Duck

Other species observed (9):

Black-and-White Warbler
Blackpoll Warbler
Canada Goose
Chimney Swift
European Starling
House Sparrow
Northern Parula
Swamp Sparrow
White-throated Sparrow

Total number of species recorded: 40

Section 5 – Lower Swamp, Van Cortlandt Lake

Confirmed breeder (22):

American Robin	16 nests + 6 territories
Baltimore Oriole	5 nests + 2 probable territories
Barn Swallow	1 nest + 1 probable other territory
Blue Jay	One territory
Brown-headed Cowbird	2 young in YEWA nest, 1 in SOSP nest + 2 YO
Cedar Waxwing	1 nest found + 1 probable territory further north
Common Grackle	1 nest + 2 territories
Downy Woodpecker	Juvenile and sightings. One territory
Eastern Kingbird	One territory at least
Gray Catbird	About 6 territories. Juv. + breeding behavior
Mallard	2 or 3 pairs breeding
Northern Cardinal	2 batch of fledgling + 2 probable territories
Northern Flicker	Juveniles with parents at 2 locations
Northern Rough-winged Swallow	Juv. With parents at one location
Red-bellied Woodpecker	Juveniles sighted at 2 locations
Red-winged Blackbird	2 nests + 7 territories + 3 probable territories
Song Sparrow	8 territories minimum. No juveniles observed
Tree Swallow	1 nest + 2 possible territories
Warbling Vireo	Sighting of adult carrying food. 5 territories
Willow Flycatcher	One territory + one possible other
Wood Duck	3 batches of fledglings. Snapping turtle removal
Yellow Warbler	2 territories + 2 possible territories

Probable breeder (15):

American Goldfinch
Belted Kingfisher
Canada Goose
Carolina Wren
Common Yellowthroat
House Finch
House Wren
Mute Swan
Northern Mockingbird
Orchard Oriole
Red-eyed Vireo
Ring-necked Pheasant
Tufted Titmouse
White-breasted Nuthatch
Black capped Chickadee

Possible breeder (7):

Blue Grey Gnatcatcher
Chimney Swift
Great Crested Flycatcher
Green Heron
Marsh Wren
Mourning Dove
Rock Dove

Other species observed (17):

American Redstart
Bay-breasted Warbler
Black Crowned Night Heron
Black-throated Green Warbler
Double-crested Cormorant

European Starling
Gadwall
Great Blue Heron
Great Egret
House Sparrow
Least Sandpiper
Marsh Wren
Northern Waterthrush
Spotted Sandpiper
Tree Sparrow
Turkey Vulture
Wilson's Warbler

Total number of species recorded: **61**