

2015 Breeding Bird Study Galloo Island, Hounsfield, NY

Prepared for:

Apex Clean Energy, Inc.
310 4th St. N.E., Suite 200,
Charlottesville, VA 22902

Prepared by:

William R. Evans
Old Bird, Inc.
PO Box 45
Ithaca, NY 14850
admin@oldbird.org

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Summary

This report presents results of a breeding bird study carried out on Galloo Island, Jefferson County, NY in spring/summer 2015. The study was carried out to provide information for the Article 10 review process for the proposed Galloo Island Wind Energy Facility.

The study was developed in coordination with New York Department of Environmental Conservation (NYDEC), the New York Department of Public Service (NYDPS), and the U.S. Fish and Wildlife Service (USFWS) at a meeting on March 26, 2015 (NYDEC), a meeting on May 8, 2015 (NYDEC, NYDPS, USFWS), and through written comments on the wind project's Preconstruction Avian Workplan (Old Bird 2015).

The breeding bird study involved 62 10-minute point counts, two at each of 31 proposed wind turbine sites. In addition to point counts, specific habitats/areas of the island were targeted for surveys. These additional surveys included walking transects of grasslands, searches for swallow roosts, targeted listening for nightjars and owls, and audio playback & listening sessions for secretive wetland birds in the island's northern wetland area.

The surveys for this study were performed by two surveyors over the following dates: May 24-26, June 16-18, and July 16-18. The 62 point counts were carried out during the first two visits resulting in 10.2 hours of systematic sampling of the site. An additional 19.5 hours of grassland surveys and 2.5 hours of wetland surveys were carried out during the first two visits. The July visit focused on grassland, wetland, and tree swallow roost surveys, resulting in 22 hours of additional targeted sampling.

In the two primary breeding bird survey periods (May 24-26 and June 16-18), 89 species of birds were documented by point counts, transects, and incidental observations. Of these, 67 species were documented to be breeders or were exhibiting breeding-like behavior. The other species were late spring migrants, non-breeding visitors to the island, or species nesting on Little Galloo Island that were flying over Galloo Island.

Of the 67 presumed breeding species discovered, 28 were documented by no more than two pairs (or two territorial males) or four or fewer adults.

The breeding birdlife on Galloo Island is dominated by common species such as Yellow Warbler, Song Sparrow, American Robin, and Baltimore Oriole – generally similar to the composition of common breeding species on the mainland.

NYS special status species detected in this study include two Threatened species (Upland Sandpiper & Bald Eagle). Five additional species are designated as Special Concern (Common Loon, American Bittern, and Cooper's Hawk, Red-headed Woodpecker, & Grasshopper Sparrow).

All the NYS special status species were documented in small numbers. Common Loon & Bald Eagle were not documented breeding on Galloo Island.

Introduction

This report presents results from a 2015 breeding bird study on Galloo Island, Town of Hounsfield, Jefferson County NY. The study was carried out to provide information for the Article 10 review process regarding the proposed Galloo Island Wind Energy Facility.

Galloo Island is a 2000-acre (3.1 sq. mile) island 40 km west-southwest of Watertown, NY and 20 km west of Sackets Harbor, NY (Fig.1). The island is roughly 4.5 miles long and 1.5 miles wide with a southwest to northeast orientation. The pre-settlement habitat of the island was likely dominated by mixed forest with some open wetland and perhaps some small grassland areas. The island's bird life was presumably similar to the species composition that frequented such habitat on the mainland. After human settlement in the early 1800s, logging, agriculture, and livestock activities altered the original vegetation structure and likely the avifaunal composition. In the last few decades, invasive plant species (e.g., Black Swallow-wort *Cynanchum louiseae*) have radically changed the ground cover of the island and, in all likelihood, the bird diversity and numbers. Since 2000, cultivation of an unnaturally large deer herd for trophy buck hunting has further impacted the island's vegetation structure.



Fig. 1. Location of Galloo Island in the northeastern Lake Ontario region.

The island has been privately owned for more than 100 years except for two small parcels currently held by the New York State Department of Environmental Conservation (NYDEC). Extensive bird studies were carried out on the island from 2007-2010 for a previously proposed wind project (Hounsfield Wind Energy Project). Before those studies, no records of bird life on the island are known except those documented during several surveys carried out by NYDEC personnel for the New York State Breeding Bird Atlas project (New York State Breeding Bird Atlas 1988, 2008). These surveys apparently only involved the small NYDEC land holdings.

The objective of this 2015 breeding bird study on Galloo Island was to document the species composition and relative abundance of the island's bird life, with particular

attention to the 31 newly proposed wind turbine generator (WTG) sites and grassland habitat. Special attention was given to evaluating potential presence of secretive and rare birds, including those listed as threatened, endangered, or of special concern by the NYDEC (Evans 2015a).

Methods

The protocol for the 2015 breeding bird study on Galloo followed that used in similar surveys conducted for the previously proposed wind project in 2008 and 2009 (Evans 2008, 2009). Survey plans and methods were developed in coordination with New York Department of Environmental Conservation (NYDEC), the New York Department of Public Service (NYDPS), and the U.S. Fish and Wildlife Service (USFWS) at a meeting on March 26, 2015 (NYDEC), a meeting on May 8, 2015 (NYDEC, NYDPS, USFWS), and through written comments on the wind project's Preconstruction Avian Workplan (Evans 2015a).

The studies included two rounds of point counts following USGS Breeding Bird Survey (BBS) guidelines at all proposed wind turbine generator (WTG) sites. It also involved surveys targeting grassland and wetland species, tree swallow roosts, and certain species active at crepuscular/nocturnal hours.

Point count sites were flagged based on tentative WTG lat/long information provided by the project developer using a Garmin "Colorado" 400 series GPS (Fig. 2) with an estimated accuracy of +/- 10 m. All point counts were surveyed once in the period May 24-26 and a second time in the period June 16-18 (referred to hereafter as the first and second survey periods).

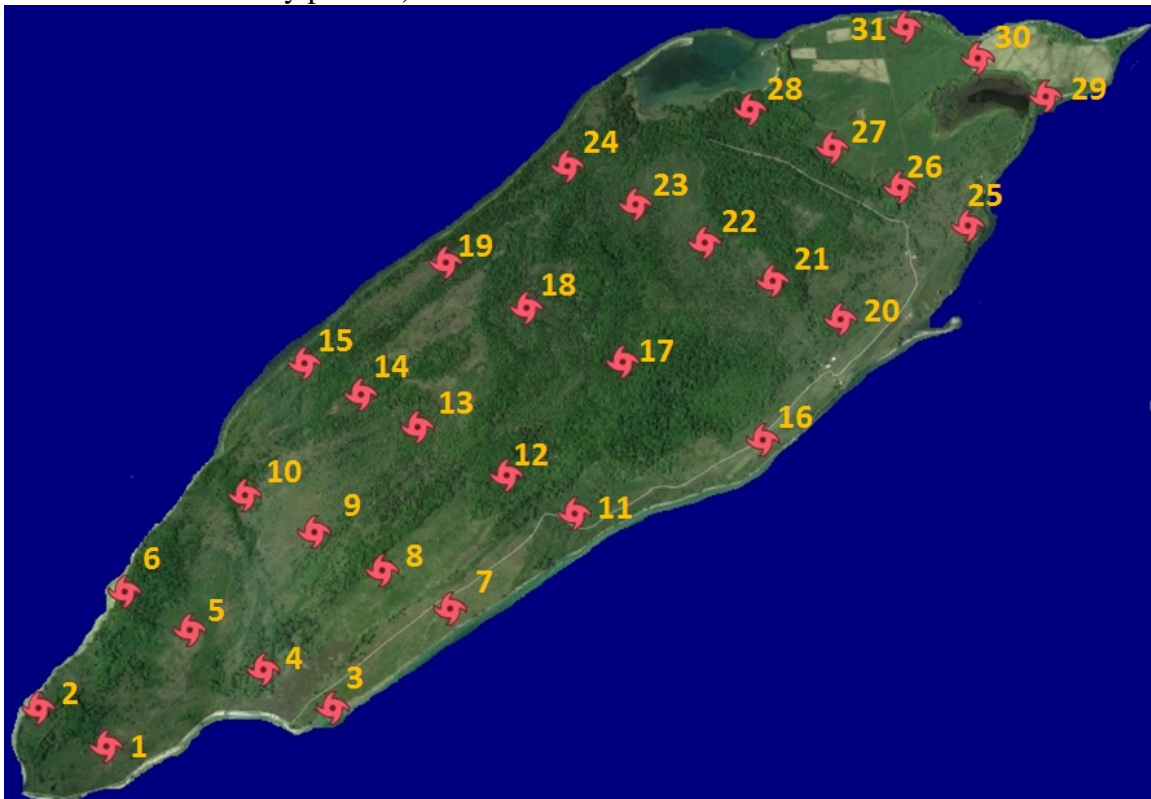


Fig. 2. Proposed WTG locations where breeding bird point counts were carried out. Red marker size is approximately the size of the proposed WTG rotor-diameter (~130 m).

All point count surveys were carried out by a single surveyor for 10 minutes on mornings with light winds, identifying birds by sight or sound. The focus was on birds breeding in vicinity of the point, so distant observations or calls of gulls, ravens, and other loud calling species were not logged. In most cases, flyover waterfowl, gulls, swallows, goldfinches, and waxwings were not considered site breeders and therefore were not incorporated into the breeding bird data for the point. Range of detection varied with species and for most was estimated to be within 150 m. Weather conditions were noted, including wind speed (Beaufort scale) and surf noise, both of which potentially can limit the range of bird sound detection. The point count surveyors were William Evans (director of Old Bird, Inc.) and Dr. Meena Haribal.

In addition to point counts, specific habitats/areas of the island were targeted for bird surveys. These additional surveys included walking transects in the grasslands, search of wetland habitat for large swallow roosts, targeted listening for nightjars and owls during the early to mid-evening hours, and audio playback and listening sessions for secretive wetland birds in the wetland at the northern end of the island. The nightjar and owl listening sessions were made at periodic 5-minute stops (~ 500 m intervals) around the island's perimeter road and along the two roads that bisect the main perimeter road. 30-minute wetland listening sessions were made at southwestern on northeastern locations of the northern wetland in the early evening. Each stop included playback of Virginia Rail, Sora Rail, and Least Bittern calls. The grassland walking transect surveys were conducted at approximately 100-m intervals in the northern and southern hayfields, the southern grassland, and the grassland strip east of the southern hayfield (Fig. 3).



Fig. 3. Map of Galloo Island showing specific locations referred to in this report and proposed WTG locations.

Results

In the first two survey periods (May 24-26; June 16-18), 89 species of birds were documented on Galloo via point counts, transects, and incidental observations. Of these, 67 species were documented to be breeders or were exhibiting behavior indicating an intention to breed on the island (Appendix A); 14 species were presumed to be late spring migrants and were seen only in the first survey period (Appendix B); four species likely did not nest or attempt to nest on Galloo but were just feeding in its vicinity or flying over the island (Appendix C); and four species are established nesters on Little Galloo and were regularly seen flying over Galloo (Appendix D). A third visit to the island in July did not reveal any new species.

Of the 67 species documented to be breeders or found exhibiting breeding behavior, 28 were documented by no more than two breeding pairs (or two territorial males). These species are listed in italics in the list at the beginning of Appendix A.

Point counts

A total of 62 point counts were performed during the late May and mid-June survey periods. Data for 67 breeding or suspected breeding species discovered in these point count surveys are included in Appendix A. An account of the non-breeders & late spring migrants is in Appendices B-D. Table 1 shows the top ten most common species detected at point counts.

Table 1. Species detected at the most point counts in either the first or second survey* (31 total).

Species	# point counts
Yellow Warbler	25
Song Sparrow	23
American Robin	19
Baltimore Oriole	18
House Wren	18*
Eastern Kingbird	17
Red-winged Blackbird	15*
Brown-headed Cowbird	13*
Eastern Wood-Pewee	12
Field Sparrow	11
Common Snipe	10

Survey dates for each point count, their start time and duration, and the number of species identified at each can be found in Appendix E. All point counts were 10 minutes in duration. All occurred over 10 consecutive minutes.

The number of species documented at each point count is indicated in Appendix E. Because of late migrants in the first survey, points with the most species do not indicate points with the most breeding species. In general, points where the most species were tallied were located along the central portion of the northwest side of the island and near the south portion of the northern grassland area - where grassland habitat adjoined moist woodlands.

Transects and targeted grassland surveys

Fig. 4 shows transect routes that were conducted while surveyors were walking between point counts during the first two visits as well as the targeted transects in the three grassland areas that were carried out multiple times during each visit (late May, mid-June, and mid-July). The transect in the ~6 ha southern grassland was surveyed five times during each visit, twice in the morning, once in the afternoon, and twice at dusk. Travel time ranged between 35-50 minutes. The transect in the ~18 ha northern hayfield was surveyed three times each visit, twice in the morning and once at dusk. Travel time ranged from 85-120 minutes. The ~10 ha southern hayfield and vicinity were surveyed three times during the latter two visits, twice in the late morning and once in the afternoon. Travel time ranged from 30-40 minutes.

Besides Bobolink, very few grassland species were found. Two Savannah Sparrow territories (at least one with juveniles) were present in the northwest portion of the northern grassland during the May, June and July survey periods. An additional Savannah Sparrow was noted with juveniles between points three and seven in mid-June. A singing Grasshopper Sparrow was found in the northwest section of the southern grassland each day during the 16-18 June survey period, but not in the May or July survey periods. An Eastern Meadowlark was found during the June transect surveys in the central portion of the northern grassland. And, at least one Upland Sandpiper was found in the central portion of the southern grassland area each day during the mid-June surveys and on one day during the July surveys. Further details on all these observations along with historical information are found in the species accounts in Appendix A.



Fig. 4. 2015 breeding bird survey point count sites (red markers) along with transects that were walked by a surveyor during the point count surveys (yellow lines) and in the grasslands (red lines). Blue lines indicate crepuscular survey routes.

Crepuscular surveys for nightjars, owls and secretive wetland species

Crepuscular surveys for nightjars, owls, and secretive wetland species began at dusk on one calm evening during each of the survey visits. Fig. 4 shows the routes covered for the nightjar and owl survey. A single Great Horned Owl was the only target species documented. The wetland surveys were carried out at dusk on one evening during each survey visit. An American Bittern was quite vocal from the northern wetland during crepuscular surveys in late May. Playback of Least Bittern, Virginia Rail, and Sora song/calls did not elicit a response from northeastern and southwestern vantages of the northern wetland during any of the surveys.

Surveys for tree swallow roosts

The major wetlands of the island were surveyed for tree swallow roosts at dusk during the early evenings of July 16 & 17. None was noted at the northern wetland but a congregation (estimated at about 1000 individuals) was documented at the southern wetland on the evening of the 16th. Birds were flying in high density in the airspace above the wetland and over the woods to the west. They gradually settled into a dense roost about 1.5 m above ground level in brush growing within the wetland. Sign of this aggregation was also apparent during the day on the 17th with more than one hundred birds seen temporarily roosting within the wetland.

NYS special status species detected during breeding bird study

Common Loon *Gavia immer* (NYS: Special Concern)
American Bittern *Botaurus lentiginosus* (NYS: Special Concern)
Upland Sandpiper *Bartramia longicauda* (NYS: Threatened)
Bald Eagle *Haliaeetus leucocephalus* (NYS: Threatened)
Cooper's Hawk *Accipiter cooperii* (NYS: Special Concern)
Red-headed Woodpecker *Melanerpes erythrocephalus* (NYS: Special Concern)
Grasshopper Sparrow *Ammodramus savannarum* (NYS: Special Concern)

Weather conditions during point count surveys

Excellent weather for carrying out point counts occurred during the late May and mid-June surveys. Wind and/or surf noise did not significantly impact the range at which species could be detected except at point 2 and 6 on May 26. The following is a summary of weather for each survey date:

May 25 – 100% cloudy with light drizzle; 64-73 F, wind light S
May 26 – 50% cloudy; 64-75 F, Light SW
Jun 17 – Mostly clear; 56-65 F, Light NE
Jun 18 – Mostly clear; 62-72 F, W at 5-10 mph
Jul 16 – Mostly clear; low 70s F, N at 5-10 mph
Jul 17 – Clear in the AM; light rain early evening; 65-75 F, SE at 5-10 mph
Jul 18 – 100% cloudy; 68-77F, S to W 5-10 mph

Grassland vegetation characteristics and mowing

Since at least 2000, in order to provide hay for the deer herd in the winter, both the northern and southern grassland areas have been seeded with a hay mix in spring and cut at least once in the summer. In 2015, both fields had occasional small clumps of swallow-wort-- it apparently has been kept from forming mats by annual mowing. Due to the cool lake-effected spring and early summer weather, the first hay cut has been later

than the mainland and typically between June 30 and July 15 (R. Hartman, pers. comm.). This is conducive for successful fledging of the island's small grassland birds, notably the Bobolink. In summer 2015, after an especially cool spring, half the northern hayfield was first cut on July 16th. The southern hayfield had not been cut as of July 17. At that time, grass in both these fields was uniformly thick and had reached 2-3 feet in height with a thick litter providing cover for voles and small birds.

The southern grassland has not been used for hay cultivation during the current owner's tenure. The western half of its northeastern portion has very little soil and areas of exposed limestone bedrock. The grass is sparse in this area but gets thicker as one moves southwestward or toward the east approaching the water. A mat of swallow-wort has encroached nearly 100 m in some place from the northeast since the previous survey in 2009 (see Fig. 2 in Evans 2015c). There is also a considerable mat of swallow-wort in the middle of this field proximal to the existing met tower. As one proceeds into the southwestern half of this field the vegetation gets thicker and includes more sedges and non-graminoid broad-leafed species.

Discussion

The Article 10 assessment for the Galloo Island Wind Energy Facility benefits from having a wealth of baseline bird information carried out in 2008 and 2009 for the previous wind project proposal. NYDEC recommended that the breeding bird studies be refreshed to evaluate potential changes in avian activity since the earlier assessment.

With regard to NYS special status species, the following is what was documented to have changed from 2008/2009. No Northern Harriers (NYS Threatened) were found in 2015. This species is not easy to miss on Galloo due to the limited grassland hunting grounds, so it is presumed the species was not present in the 2015 breeding season. A pair of Red-headed Woodpeckers (NYS Special Concern) was found in the old blown down forest area in the north-central part of the island. A Grasshopper Sparrow (NYS Special Concern) was found in the southern Grassland. There was a maximum of five Bald Eagles (NYS Threatened) noted on the island during the spring/summer 2015 surveys. This consisted of two adults and three different subadult birds (one 1st year, two 2-3 year olds). And finally, a small population of the Common Tern (NYS Threatened) has been documented attempting to nest on Little Galloo since 2013--no sightings of this species were documented in the near shore vicinity or flying over Galloo in 2015.

Similar to 2008 & 2009, the 2015 surveys also revealed a large number of species (28) that were only documented by only a few individuals. Sixteen species documented to be breeders or possible breeders in 2008 & 2009 were not found in 2015, and all but three of these had only been documented by a few individuals or a nesting pair or two in 2008 or 2009. Changes in the presence or absence of these species on the island are to be expected, it would seem, simply due to the fact that breeding may not be successful and one or more individuals may perish over the course of a year or two. Only three new potential breeding species were revealed in 2015 (Red-headed Woodpecker, Orchard Oriole, and Grasshopper Sparrow). This disproportion in gains versus losses may be a result of the lower survey coverage in 2015 (i.e., 31 vs 84 point count locations resulting from the smaller number of turbines planned for the 2015 project), the increase in invasive Black Swallow-wort, or variation in precipitation levels. In 2015, the island was bone dry leading up to the late May surveys: the southern wetland and many smaller seeps around the island were dry. The northern wetland was intact but diminished in size. Of note is that 7 of the 16 species from 2008/2009 that were not found in 2015 were wetland species (e.g., Sora, Virginia Rail, Gadwall, Mallard).

A surprising finding of the 2015 breeding bird study was the apparent decline in the population of a number of common species. For example, in 2015 the House Wren was detected at 20% fewer point counts than the 2008/2009 surveys, and it also had a lower average number of individuals detected per point. Looking at the average number of House Wrens among all points where the species was found: in 2008 the first survey averaged 1.5 per point count, the second survey averaged 2.2, and the survey in 2009 averaged 2.4. But in 2015 the averages were only 1.3 and 1.4 in the first and second surveys respectively. In another case, the Mourning Dove was a fairly common breeder on the island in 2008/2009. But in 2015 it was only found at one point in the first survey and one in the second survey. In 2008 it was found on 22/90 point counts in the first survey and 34/86 in the second survey. In 2009 it was found at 16/84 locations. Declines were also evident for Song Sparrow, American Robin, Killdeer, Common Grackle and Eurasian Starling (see species accounts in Appendix A).

One additional variable that may have influenced changes in bird density and species composition could include changes in prey abundance. In 2008 and 2009, a *Mythimna unipuncta* (armyworm) outbreak was documented on Galloo - thousands of these moths per acre were estimated. Additionally, very few voles were noted by surveyors in 2015 compared to 2008/2009, which may have affected the presence of predators like American Kestrel and Northern Harrier.

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Appendix A – Breeding or possible breeding species found during the 2015 breeding bird study on Galloo Island (listed in alphabetical order; italics indicate species documented by only two pairs of birds or less. Species in red text below the gray bar were documented or possible breeders in 2008/2009 that were not found in 2015. Species summaries for all follow the list below.

<i>American Bittern</i>	<i>Grasshopper Sparrow</i>
<i>American Goldfinch</i>	Great Crested Flycatcher
<i>American Redstart</i>	<i>Great Horned Owl</i>
American Robin	Gray Catbird
American Woodcock	<i>Hairy Woodpecker</i>
Baltimore Oriole	House Wren
Barn Swallow	Indigo Bunting
<i>Bank Swallow</i>	<i>Least Flycatcher</i>
<i>Black-capped Chickadee</i>	<i>Mourning Dove</i>
Blue Jay	<i>Northern Cardinal</i>
Bobolink	<i>Northern Flicker</i>
<i>Brown Creeper</i>	<i>Orchard Oriole</i>
Brown Thrasher	<i>Pileated Woodpecker</i>
Brown-headed Cowbird	<i>Purple Finch</i>
<i>Canada Goose</i>	Red-eyed Vireo
Cedar Waxwing	<i>Red-tailed Hawk</i>
Chipping Sparrow	Red-winged Blackbird
<i>Clay-colored Sparrow</i>	Rock Pigeon
Cliff Swallow	Rose-breasted Grosbeak
Common Grackle	Rough-winged Swallow
Common Merganser	Savannah Sparrow
<i>Common Raven</i>	<i>Scarlet Tanager</i>
Common Snipe	Song Sparrow
Common Yellowthroat	Spotted Sandpiper
<i>Cooper's Hawk</i>	Tree Swallow
Downy Woodpecker	<i>Upland Sandpiper</i>
<i>Eastern Bluebird</i>	Warbling Vireo
Eastern Kingbird	Wild Turkey
Eastern Meadowlark	Willow flycatcher
<i>Eastern Phoebe</i>	<i>Winter Wren</i>
Eastern Towhee	<i>Wood Duck</i>
Eastern Wood-Pewee	<i>Wood Thrush</i>
Eurasian Starling	Yellow Warbler
Field Sparrow	
<i>American Kestrel</i>	<i>Northern Mockingbird</i>
<i>Black-crowned Night-Heron</i>	<i>Northern Harrier</i>
<i>Belted Kingfisher</i>	<i>Sora</i>
<i>Black-billed Cuckoo</i>	<i>Turkey Vulture</i>
<i>Gadwall</i>	<i>Virginia Rail</i>
<i>Golden-crowned Kinglet</i>	<i>White-breasted Nuthatch</i>
<i>Mallard</i>	<i>Yellow-rumped Warbler</i>

American Bittern *Botaurus lentiginosus*

Not detected during point count surveys. An individual was calling vociferously from the south end of the northern wetland in the early evening on May 24 & 25.

American Goldfinch *Carduelis tristis*

This species was not reliably on territory in either the first or second survey, with many flyovers noted in both. It was actively nesting during the mid-July survey period.

American Kestrel *Falco sparverious*

The species was not detected during point counts or other surveys in 2015. In the first survey of 2008 it was detected at 5/84 points and in second at 1/84. In 2009 it was found at 2/84 points. While Kestrels have a varied diet, vole numbers were obviously down in 2015 from 2008 & 2009 and the island was very dry in spring 2015 (dragonflies and amphibians were scarce). It's possible that Galloo may only attract nesting Kestrels during years when their food sources are abundant.

American Redstart *Setophaga ruticilla*

Detections during the first survey at three point counts (12, 17, 25) may have been migrants. The species is a late migrant and none were found in these areas during the second survey -- one was found at point 6. The species was found at 4/84 points during the second survey period in 2008 and 3/84 points in the 2009 survey.

American Robin *Turdus migratorious*

Common and widespread breeder. Found at 19/31 point counts in the first survey and 12/31 in second. In the 2008 survey it was found at 73/90 point counts in the first survey and 67/86 in the second. In 2009 it was found at 65/84. Found at a lower percentage of points in 2015 than in 2008/2009 and the average per point was lower. In 2008, an average of 2.1 birds per point was found in the first and second surveys and in 2009 it was 1.9. In 2015 1.6 birds per point were found in the first survey and only 1.3 in the second survey.

Number of American Robins found per point count in 2015.

Point count #	1	3	4	5	6	7	8	9	10	11	12	13	14
Survey 1	2		2	2		2	1	1	1	1	1	2	2
Survey 2		1	3		1			2		1			

Point count #	17	18	19	20	21	22	23	24	25	26	29	30
Survey 1	1	1		2		1	1		2	2		3
Survey 2			1	1	1			1		1	1	2

American Woodcock *Scolopax minor*

Common nester throughout the wooded portions of the island and peent calls were noted from seemingly any location on the island at dusk in the first survey period.

Baltimore Oriole *Icterus galbula*

Common and widespread breeder. Found at 18/31 point counts in the first survey and 14/31 in the second. In 2008 it was found on 53/90 in the first survey and 58/86 in the second. In 2009 it was found at 49/84. Average per point in 2015 was 1.4 in the first

survey and 1.6 in the second. In 2008, the average per point in the first survey was 1.5 and in the second, 1.3. In 2009 it was 1.3.

Number of Baltimore Orioles found per point count in 2015.

Point count #	1	2	5	6	8	9	10	12	13	14	15
Survey 1	1	1	1	1		1	2	3	1	1	2
Survey 2		1	1		1	1	2	2	1	2	

Point count #	17	18	19	20	21	22	23	24
Survey 1	1	2	1	2	2	1	2	1
Survey 2	1	2	1	4			2	1

Bank Swallow *Riparia riparia*

Not documented breeding in 2015 (or in 2008/2009) but flyover individuals were observed occasionally on both point count surveys.

Barn Swallow *Hirundo rustica*

Flyovers were detected regularly across the island in both point count surveys. This species bred in the buildings associated with the main lodge, the old Coast Guard boathouse, and the building at the north end of the north pond. Observations in 2008 suggested breeding also may occur along the island's northwest-facing cliff.

Black-capped Chickadee *Poecile atricapilla*

Uncommon across the wooded portions of the island. Documented at 2/31 points in the first survey (12 & 18) and no points in the second survey. In 2008 it was found on 16/90 point counts in the first survey and 13/86 in second survey. In 2009 it was found at 8/84.

Black-crowned Night-Heron *Nycticorax nycticorax*

Not documented in 2015. This species was seen regularly in small numbers in 2008 and 2009.

Blue Jay *Cyanocitta cristata*

Found on 8/31 point counts in the first survey and 2/31 in the second. In 2008 it was found on 28/90 point counts in first survey and 22/86 in second survey. In 2009 it was found at 24/84. The species was still migrating through during the first survey period.

Number of Blue Jays found per point count in 2015.

Point count #	8	12	13	15	18	19	21	28	31
Survey 1	1	1	1		1	1	1	1	1
Survey 2		2		1					

Bobolink *Dolichonyx oryzivorus*

Found at four point counts in the first survey and six in the second. In 2008 it was found on 6/90 point counts in the first survey and 7/86 in the second survey. Limited to small populations in the fields at the north and south ends of the island. In targeted surveys, the population at the north end was found to have similar numbers as in 2008, with 20+ singing males documented in mid-June. The population in the southern hay field and adjacent field to the east was not present in 2008 & 2009, but had six singing males in

2015. In 2009, 28 territories of singing males were documented in the northern hayfield. Interestingly, all the singing males in the northern grassland have a common and unique quail-like introductory note to their song.

Number of Bobolinks found per point count in 2015.

Point count #	5	7	8	26	27	31
Survey 1			1	2	3	5
Survey 2	1	2	2	1	1	1

Brown Creeper *Certhia americana*

Not detected at point counts in 2015, but one was found about 200 m east of point 12. This is the same vicinity as three points where the species was detected in the first survey in 2008. It was not detected during the second survey in 2008 or the survey in 2009.

Brown Thrasher *Toxostoma rufum*

Fairly common throughout the open wooded areas the island. Found at 8/31 point counts in the first survey and five in the second. In 2008 it was found at 23/90 point counts in the first survey and 15/86 point counts in the second. In 2009 it was found at 9/84.

Number of Brown Thrashers found per point count in 2015.

Point count #	3	5	7	10	14	18	20	22	23	26
Survey 1	1		1	1	1	1		1		1
Survey 2		1		1	2				1	1

Brown-headed Cowbird *Molothrus ater*

Common and widespread. Found at 10/31 point counts in the first survey and 13/31 in the second. In 2008 it was found at 48/90 points in first survey and 33/86 in second survey. In 2009 it was found at 26/84.

Number of Brown-headed Cowbirds found per point count in 2015.

Point count #	4	7	8	10	11	13	16	18	19	20
Survey 1	2	1		1	1	1		1		
Survey 2	1	1	1		2	1	3		1	1

Point count #	21	22	23	27	28	30
Survey 1	1	3	1			1
Survey 2	1	1		1	1	2

Canada Goose *Branta canadensis*

No evidence of breeding was documented in 2015 though small flocks of up to 20 birds were seen in low flight over the island. Breeding was confirmed in the southern and northern wetland, and the large wooded swamp in the island's interior in 2008 & 2009. The island had been extremely dry prior to the first survey in late May and the only suitable location for breeding in 2015 would have been the northern wetland or locations around the perimeter of the island, such as the north pond.

Canada Warbler *Wilsonia canadensis*

Not documented at point counts or in transects in 2015 and none were found in the 2009 survey. A singing bird was found as late as June 5 in 2008 in the large wooded swamp.

Cedar Waxwing *Bombycilla cedrorum*

Not reliably on territory in either the first or second survey, with many flyovers noted in both. It was actively nesting during the mid-July survey period.

Chipping Sparrow *Spizella passerina*

Found fairly commonly throughout the open wooded areas of the island. Found on 7/31 point counts in the first survey and 4/31 in the second. In 2008 it was found at 20/90 point counts in first survey and 28/86 in second survey. In 2009 it was found at 24/84.

Number of Chipping Sparrows found per point count in 2015.

Point count #	8	9	10	14	16	21	22	28
Survey 1		1	1	1	1	1	1	1
Survey 2	1			1		1		1

Clay-colored Sparrow *Spizella pallida*

A singing bird was found at point 25 in the second point count survey. Found singing at two locations in 2008, though this may have been the same individual. It was not found in the 2009 survey.

Cliff Swallow *Petrochelidon pyrrhonota*

A breeding colony was located on the west-shore cliffs north of point 24, and another adjacent to and in the vicinity of points 10 & 15. Observations of breeding also were noted at the main lodge and associated buildings, the old Coast Guard boat house, and the house on the north side of the north pond. Individual foraging birds were noted over other parts of the island during both surveys. This same distribution pattern was found in 2008 & 2009.

Common Grackle *Quiscalus quiscula*

Found at 5/31 point counts in both the first and second surveys. In 2008 it was found at 30/90 point counts in the first survey and 22/86 in the second. In 2009 it was found at 18/84.

Number of Common Grackles found per point count in 2015.

Point count #	2	7	9	16	19	23	24	25	30
Survey 1	1			1	2			1	1
Survey 2		1	1	3		1	1		

Common Merganser *Mergus Merganser*

Individual adult female birds were occasionally seen flying over the island (just above tree tops & often vocalizing) during the first round of point count surveys. At least two females with large broods of young were seen swimming in the water just offshore. This species appears to be the most common species of breeding waterfowl on the island.

Common Raven *Corvus corax*

One family with young (2 adults; 3 juveniles) was noted flying around the island on both the first and second point count surveys, and during the mid-July grassland surveys. Nesting was suspected on the northwest side of the island in 2008 and a family of five was often seen flying around the island that year. A single bird was noted during the 2009 survey.

Common Snipe *Gallinago gallinago*

Found at 7/31 point counts in the first survey and 10/31 in the second survey. In 2008 it was found at 15/90 point counts in the first survey and 11/86 in the second survey. In 2009 it was found at 14/84.

Number of Common Snipe found per point count in 2015.

Point count #	1	4	5	8	9	10	14	16	21	22	27	29	31
Survey 1	1			1	1		1	2				1	1
Survey 2	2	1	2	1	1	1		1	1	1	1		

Common Yellowthroat *Geothlypis trichas*

Found at 9/31 point counts in the first survey and 7/31 points in the second survey. In 2008 it was found at 15/90 in the first survey and 14/86 in the second. In 2009 it was found at 14/84. Likely still migrating through during the first survey.

Number of Common Yellowthroats found per point count in 2015.

Point count #	4	5	8	9	13	14	18	19	20	21	22	23	24
Survey 1	1	1			1	1	2		1		1	2	1
Survey 2			1	1			1	2		1		1	1

Cooper's Hawk *Accipiter cooperi*

Not documented in the point count surveys, but an adult female was seen on four occasions during the second point count survey and the mid-July surveys. An adult male was documented on several occasions during the late June survey in 2008. In 2009, a Cooper's Hawk was seen on June 24 taking a Killdeer.

Downy Woodpecker *Picoides pubescens*

Found at 8/31 point counts in the first survey and 2/31 in the second survey. In 2008 it was found at 7/90 point counts in the first survey and 8/86 in the second survey. In 2009 it was found at 8/84.

Number of Downy Woodpeckers found per point count in 2015.

Point count #	5	7	9	10	16	17	18	19	24
Survey 1	1	1		1	1	1	1	1	1
Survey 2	1		1						

Eastern Bluebird *Sialia sialis*

Found only at point 9 during the first survey. In 2008 it was found at no point counts in the first survey and 5/86 in the second, all in close proximity in the west-central part of the island -- this was thought perhaps to be one family moving around. In 2009 it was found at 2/84 points in the same area as 2008. The 2015 sighting was perhaps 200 m south of the 2008/2009 locations.

Eastern Kingbird *Tyrannus tyrannus*

Common breeder throughout the island except the densely forested interior. Found on 17/31 point counts in the first survey and 13/31 in the second survey. In 2008 it was found on 51/90 point counts in the first survey and 48/86 in the second survey. In 2009 it was found at 48/84.

Number of Eastern Kingbirds found per point count in 2015.

Point count #	1	2	3	5	7	8	9	10	11	13	19
Survey 1	1	3		1	2	1	2	1	2		3
Survey 2		1	1	2		1	2		1	1	

Point count #	21	22	23	24	25	26	27	28	29	30	31
Survey 1	1	1		1	2		1		1	2	2
Survey 2	1	1	1	1		1		1			

Eastern Meadowlark *Sturnella magna*

Not found on any point counts in 2015, but one was seen in the northern grassland during the mid-June and mid-July grassland survey. The species was not found in extensive surveys of the southern grassland and southern hayfield area. In 2008 it was found at 11/90 point counts in the first survey and 11/86 in the second survey. In 2009 it was found at 12/84. This species appeared in 2015 to be substantially less common than in the 2008/2009 surveys.

Eastern Phoebe *Sayornis phoebe*

Not documented at any point counts but was found nesting at the main lodge and the house at the east end of the north pond – the same locations where it was found on the 2008/2009 surveys.

Eastern Towhee *Pipilo erythrophthalmus*

Fairly common in the open wooded areas of the island. Found at 10/31 point counts in the first survey and 6/31 in the second survey. In 2008 it was found at 16/90 point counts in first survey and 19/86 in second survey. In 2009 it was found at 18/84.

Number of Eastern Towhees found per point count in 2015.

Point count #	4	10	12	13	18	19	21	22	23	24	26	27
Survey 1	1	2	1	2		1	2	1	2	1	1	
Survey 2	1	2			2		1	1				1

Eastern Wood-Pewee *Contopus virens*

Fairly common in the woodlands. Found at 12/31 point counts in the first survey and 9/31 in the second survey. In 2008 it was found at 20/90 point counts in the first survey and 28/86 in the second survey. The species is a late migrant and was still in migration in the first survey period of both years. In 2009 it was found at 27/84.

Number of Eastern Wood-Pewees found per point count in 2015.

Point count #	4	6	8	9	10	12	14	15	17	18	19	21	24	26	27
Survey 1	1	1	1	1	1	1		1	1			1	1	1	1
Survey 2	1	1			1	1	1		1	1	1		1		

Eurasian Starling *Sturnus vulgaris*

Common breeder, though numbers seemed substantially lower than in 2008 & 2009. Found at 10/31 point counts in both the first and second survey. In 2008 it was found on 71/90 point counts in the first survey and 30/86 in the second survey (in which flocking was noted). In 2009 it was found at 53/84.

Number of Eurasian Starlings found per point count in 2015.

Point count #	1	2	3	6	7	9	10	14	15	16
Survey 1	2	3		1		1		2	5	1
Survey 2	2	1	3		1	2	1			1

Point count #	19	20	22	23	25	27
Survey 1				3	2	1
Survey 2	2	2	2			

Field Sparrow *Spizella pusilla*

Fairly common in the open wooded regions of the island. Found at 11/31 point counts in the first survey and 7/31 the second. In 2008 it was found at 14/90 point counts in the first survey and 19/86 in the second survey. In 2009 it was found at 17/84.

Number of Field Sparrows found per point count in 2015.

Point count #	4	5	7	9	13	14	18	19	21	22	23	24
Survey 1	1	1	1	1	1		1	1	1	3	2	1
Survey 2	1			1	1	1	1			1	2	

Gadwall *Anas strepera*

Not detected in the 2015 surveys. One pair successfully nested in the northern wetland in 2008. A flock of four was found near shore at one point near the north end of the island in the 2009 survey.

Golden-crowned Kinglet *Regulus satrapa*

Not found on any surveys in 2015. One bird was found in the small northern wooded swamp during the first survey in 2008. None were noted in the 2009 surveys.

Gray Catbird *Dumatella carolinensis*

Uncommon. Found at 3/31 point counts in the first survey and 8/31 in the second survey. In 2008 it was found at 6/90 point counts in the first survey and 14/86 in the second survey. In 2009 it was found at 16/84.

Number of Gray Catbirds found per point count in 2015.

Point count #	4	6	9	10	13	18	22	25	26	28
Survey 1					1	1	1			
Survey 2	1	1	1	1		1		1	1	1

Grasshopper Sparrow *Ammodramus savannarum*

A singing individual was found during a transect survey in the northwest section of the southern grassland. The bird was heard June 16-18 but was not relocated during the mid-July survey.

Great Crested Flycatcher *Myiarchus crinitus*

Uncommon in the wooded areas of the island. Found at 3/31 point counts in the first survey and 4/31 in the second survey. In 2008 it was found at 14/90 point counts in the first survey and 16/86 in the second survey. In 2009 it was found at 11/84.

Number of Great Crested Flycatchers found per point count in 2015.

Point count #	5	10	13	15	18	22	23
Survey 1			1		1	1	
Survey 2	1	1		1			1

Great Horned Owl *Bubo virginianus*

One was detected calling from within the large wooded swamp during the May 25 crepuscular survey. Perhaps the same owl was also seen and heard calling at dusk on May 25 in at the edge of the woods west of the south end of the airport runway.

Hairy Woodpecker *Picoides villosus*

Not found in the point count surveys. A single individual was found while walking between survey points 23 & 18, and another between 16 & 17. This is the same vicinity where the species was documented in 2008. In 2009 it was documented at 5/84.

House Finch *Carpodacus mexicanus*

Not documented in the 2015 surveys. Individual flyovers were documented on two occasions during the second point count survey in 2008. None were found in the 2009 surveys.

House Wren *Troglodytes aedon*

Common breeder across the island. Found on 16/31 point counts in the first survey and 18/31 in the second survey. In 2008 it was found at 59/90 point counts in the first survey and 68/86 in the second survey. In 2009 it was found at 64/84. This species was noticeably less common in 2015 than in the 2008 & 2009 surveys. This was apparent not only in being detected at a lower percentage of points, but also in fewer numbers of individuals per point. Looking at the average number of House Wren among all points where the species was found: in 2008 the first survey averaged 1.5 per point, the second survey in 2008 averaged 2.2, and the survey in 2009 averaged 2.4. But in 2015 the averages were only 1.3 and 1.4 in the first and second surveys respectively.

Number of House Wrens found per point count in 2015.

Point count #	2	3	5	9	10	12	13	14	15	16
Survey 1			1	1	3	1	2	1	1	1
Survey 2	1	1	1	1	2	2	2	1	1	

Point count #	17	18	20	21	22	23	24	26	27	28	29
Survey 1	1	1	1	1		3	1			1	1
Survey 2	1	3	1		2	2	1	1	1	1	

Indigo Bunting *Passerina cyanea*

Detected at only a few sites on the island. In the first survey a singing individual was found while walking between points 17 & 18. In the second survey singing individuals were found at points 21 & 24. These locations in the first and second surveys were in the

vicinity of where Indigo Buntings were found in the 2008 surveys. Only one was found in the 2009 survey. This was in proximity to the southern hayfield, which was a third location this species was also found in 2008. There appears to be a consistent small population on the island.

Killdeer *Charadrius vociferous*

In the 2015 surveys found on 3/31 point counts in each survey. In 2008 this species was found on 23/90 point counts in the first survey and 19/86 in the second. In 2009 it was found at 24/84. Thus, this species had been classified as a common breeder along the main road around the island where it traverses grasslands, also in other grassland areas with exposed limestone flats. The 2015 surveys suggest this is not the case. Perhaps the unusually dry spring on the island was a factor.

Least Flycatcher *Empidonax minimus*

Found at 2/31 point counts (1 & 27) in the first survey and was heard from points 1 & 2 in the woods between them in the second survey. This latter location was the only site on the island where the species was found in the second survey in 2008 and 2009. Other reports from the first survey in 2008 and 2015 may have been late migrants.

Mallard *Anas platyrhynchos*

Not detected nesting on the island in the 2015 surveys and the species may have been overlooked offshore. Two were present in the northern wetland in May 2008. One was documented on the northern wetland in the second survey in 2009.

Mourning Dove *Zenaida macroura*

Only found on one point count in the first survey (point 12) and one in the second survey (point 27). In 2008 it was found on 22/90 point counts in the first survey and 34/86 in the second survey. In 2009 it was found at 16/84. In 2008/2009 the species was a fairly common breeder across the open wooded areas of the island. That was not the case in 2015.

Northern Cardinal *Cardinalis cardinalis*

A singing bird was found at point 12 in the first survey. This species was not found at point counts or other surveys during the breeding season in 2008 and 2009, but a small flock had been found during the winter surveys in those years.

Northern Flicker *Colaptes auratus*

Found at two point counts in the first survey (10 & 12) and at one site between point 14 and 15 in the second survey. In 2008 it was found on 13/90 point counts in the first survey and 14/86 in the second survey. In 2009 it was documented at 23/84. This species had been seen fairly commonly in 2008/2009, but that was not the case in 2015.

Northern Harrier *Circus cyaneus*

None were documented in the 2015 surveys. In 2008, a male and two females were regularly seen hunting in the grassland areas of the island from May 27-July 25, including many point counts in the grassland areas. On two occasions, once in the first survey and once in the second survey, an individual female harrier was seen flying from

Galloo to Stony Island. No evidence of nesting was found and no juvenile birds were seen on the island in three August grassland surveys that targeted this species.

In 2009, one adult and one female Harrier were regularly noted during point counts and transects in the breeding bird survey. In the August 20-21 survey that aimed to find juvenile Harriers, three young Harriers (2 females and one male) were found hunting in close association with an adult female Harrier in the southern grassland. The three juveniles occasionally interacted with one another as if playing. Juvenile Harriers typically make their flight appearance in this region of NY in mid-August. It seems very unlikely that a mother Harrier would lead her three offspring out over the open water to Galloo from the mainland at this early stage in their flight. All evidence and circumstances suggest that the pair of Harriers that were frequently seen in June on Galloo successfully fledged these three juveniles on the island in 2009.

Northern Mockingbird *Mimus polyglottos*

Not documented in the 2015 surveys. In 2008 it was sighted at five point counts and noted in other survey work during both surveys. It was speculated that this may have been a single wandering bird. In 2009 this species was sighted at two point counts near where it was found in 2008, in the eastern portion of the stump forest.

Orchard Oriole *Icterus spurius*

Two individuals, an adult male and a female plumaged bird, were documented in the first and second surveys near point count 7.

Pileated Woodpecker *Dryocopus pileatus*

Documented at one point count in the first survey (point 12) and at two individuals were heard drumming at distant locations simultaneously on several occasions. In 2008 A single bird was documented at one point count in each survey period. An individual bird was also seen during habitat-targeted transect work and fresh chiseling was noted at various locations in the wooded interior of the island. In 2009 it was documented at 1/84.

Purple Finch *Carpodacus purpureus*

One record in 2015 -- an individual was heard singing at point 22 in the first survey. In 2008, an individual bird was detected at two point counts in the first survey and one in the second survey. An individual was also noted on several occasions in transect work. The species was not documented in 2009.

Purple Martin *Progne subis*

Not documented at point counts in 2015. An individual was documented on two occasions while conducting other surveys. In 2008, 20+ individuals were noted during the first survey period, but only one was documented in the second survey period. None were documented in 2009.

Red-eyed Vireo *Vireo olivaceus*

Found at 7/31 point counts in the first survey and 4/31 in the second. In 2008 it was found at 20/90 point counts in the first survey and 14/86 in the second survey. In 2009 it was found at 20/84.

Number of Red-eyed Vireos found per point count in 2015.

Point count #	6	12	13	15	16	18	23	24	25	29
Survey 1		1	1	1	1	1	1		1	
Survey 2	1	1						1		1

Red-tailed Hawk *Buteo jamaicensis*

Documented at point 8 in the first point count survey, and on May 26 four individuals were documented soaring over the island from the lodge. Two individuals were documented in the northern grassland area in the second survey. No juveniles were heard calling during the mid-July surveys. Four individuals and one nest were documented in 2008 and 2009.

Red-winged Blackbird *Agelaius phoeniceus*

Common breeder around the perimeter of the island, in the grasslands not dominated by swallow-wart, and in proximity to inland areas with water. Found at 14/31 point counts in the first survey and 15/31 in the second survey. In 2008 it was found at 47/90 point counts in the first survey and in 2009 it was found at 56/84.

Number of Red-winged Blackbirds found per point count in 2015.

Point count #	1	2	3	7	8	11	15	16	19	20	24
Survey 1		4	3	3	2	2	1	3		2	
Survey 2	4	6	1		1	2	2	2	2		1

Point count #	25	26	27	29	30	31
Survey 1	4	5	3	7	8	4
Survey 2	3	1	4	5	3	12

Rock Pigeon *Columba livia*

Not documented in either point count survey. A few were noted flying around the lodge. No targeted nesting surveys for this species were carried out in 2015. An estimated 40-50 inhabited the island during the 2008 breeding season, with nesting occurring in the garages associated with the lodge and the old Coast Guard station.

Rose-breasted Grosbeak *Pheucticus ludovicianus*

Uncommon in the forested regions of the island. Found at four point counts in both the first and second surveys. Singing birds were also found in the first survey between point 17 & 18 and between point 18 & 23. In 2008 it was found at 8/90 point counts in the first survey and 4/86 in the second survey. In 2009 it was found at 2/84. A small breeding population seems to persist in the forested interior of the island.

Number of Rose-breasted Grosbeaks found per point count in 2015.

Point count #	8	9	12	13	17	18	21	23
Survey 1	1	1	1					2
Survey 2				1	1	1	1	

Rough-winged Swallow *Stelgidopteryx serripennis*

Flyovers were detected regularly around the island at point counts in both surveys. Similar to 2008 and 2009, observations during point counts and targeted surveys suggest breeding occurs throughout the cliffed-perimeter of the island.

Savannah Sparrow *Passerculus sandwichensis*

Found at point 29 in the first survey and at point 7 in the second survey. Transects targeting grassland birds in all three survey periods found two singing birds in the northern grasslands between points 28 & 31. This latter area is adjacent to a strip of plowed field in the northern portion of the northern hayfield where the species was documented in 2008 & 2009. None were found in extensive searches of the southern grassland (vicinity of point count 1) where a single bird was holding territory in 2008.

Scarlet Tanager *Piranga olivacea*

Found during the second survey between point counts 12 & 13. In 2008 it was found on one point count in the south-central region in the first survey period, and one individual was seen in habitat-targeted transects during both surveys. None were documented in 2009.

Song Sparrow *Melospiza melodia*

Common breeder across the island except the densely wooded interior. Found at 23/31 point counts in the first survey and 22/31 in the second survey. In 2008 it was found at 53/90 point counts in the first survey and 68/86 in the second survey. In 2009 it was found at 71/84. Average density per point in 2015 was 1.4 in the first survey and 1.5 in the second. In 2008 it was 1.7 in the first survey and 2.0 in the second. In 2009 it was 2.1.

Number of Song Sparrows found per point count in 2015.

Point count #	1	2	3	4	5	6	8	9	11	13	14	15
Survey 1	1	3		1	3	1	1	1	1	1	1	2
Survey 2	1	1	1	2	3		1	2	2	1		2

Point count #	16	17	18	19	20	22	23	24	25	28	29	30
Survey 1	1	1	1	2	1	1	2	1	2	1	1	1
Survey 2	3	1	1	1	2	1	2	1	1	1	2	1

Sora *Porzana carolina*

Not found on point counts or targeted surveys in 2015. In 2008, one individual was heard calling in the southern wetland from point 18 during the second survey period.

Spotted Sandpiper *Actitis macularia*

Found at 2/31 points in the first survey (3 & 29) and 3/31 in the second survey (2, 3 & 30). In 2008 it was found on 9/90 point counts in both the first and second surveys, primarily along the southern shoreline, but also at the very northern end of the island. In 2009 it was found at 8/84 point counts. It is a common breeder along the non-cliffed shoreline of the island.

Tree Swallow *Tachycineta bicolor*

The most abundant breeding swallow on the island. Flyovers were detected regularly across the island in both point count surveys. In the first survey 6/31 point counts had potential breeding birds and it was observed at 14/31 point counts in the second survey. During the mid-July survey an evening roost of an estimated 1000 birds was present in

the southern wetland. In 2008, 18/90 points had potential breeding birds in the first survey.

Upland Sandpiper *Bartramia longicauda*

Not detected during the first point count survey but a single bird was found during the second survey at point count 1. A single bird was seen all three days of the survey (Jun 16-18). It was not giving wolf-whistle calls, but gave alarm calls when the surveyor walked anywhere near the met tower, point count 1 and its vicinity (including toward the woods to the west), and the old telephone pole directly southwest of the met tower. In the mid-July survey, a single individual was found foraging along the shell beach adjacent to the met tower. When approached, the bird flushed and flew northeasterly well up the beach and landed beyond view. In a minute or two, what seemed like a second individual flew by the surveyor and headed up the beach, apparently landing near where the first one apparently had. Neither was relocated and both were not seen at the same time. This led to speculation that the first one had flown around unnoticed and in fact was the second individual as it flew by again. The area where the one well-observed bird inhabited was about 300 m south of the 2009 location where the individual that year gave alarm calls, which seemed to be in defense of a nest. No evidence of fledged young was found in 2015.

In 2008, one bird was discovered during a habitat-targeted survey in the southern grassland on June 26. Two birds were observed in the vicinity roosting on old telephone poles on June 27 and June 28. One bird was giving “wolf whistle” calls. Single birds were seen during targeted surveys of the area on July 1, 18, and 25. No young birds were observed. Targeted surveys in the southern and northern hayfields, and the airstrip, and the fields east of the southern hayfield did not detect this species in 2015, or in 2008/2009.

In 2009, a single Upland was found in the southern grassland on May 24. Two adults were seen on June 5 & 6. Three adults were seen on June 12 & 13, with one giving wolf-whistle calls. No juvenile birds and only one adult were found in three thorough late June surveys of the southern grassland area that year.

Virginia Rail *Rallus limicola*

Not found in 2015 during targeted surveys of the northern wetland in each of the three survey periods. Each used playback of VIRA calls at several locations around the northern wetland. The southern wetland was dry during the late May survey period. A family was found in 2008 during habitat-targeted surveys at the northern wetland in late May, June, and through July 18. The group was vociferous and easy to find.

Warbling Vireo *Vireo gilvus*

Fairly common in open wooded regions, generally around the perimeter of the island. Found at 7/31 point counts in both the first and second surveys. In 2008 it was found on 15/90 point counts in the first survey and 8/86 in the second. In 2009 it was found at 17/84.

Number of Warbling Vireos found per point count in 2015.

Point count #	1	2	8	9	15	16	20	30	31
Survey 1	1	1	1			1	2	1	1
Survey 2	1	1		1	2	1	1		1

White-breasted Nuthatch *Sitta carolinensis*

Not found in the 2015 surveys and in 2008 only noted on five point counts in both surveys (only one in the first survey). But in 2009 it was found at 9/31.

Wild Turkey *Meleagris gallopavo*

Not a focus of the surveys because the species has been managed on the island. At least 10 adult birds were seen with several groups of poults in the northern half of the island.

Willow Flycatcher *Empidonax traillii*

Found on 3/31 point counts in the first survey and none in the second. One of the detections in the first survey was in the southern wetland and the other two were from the northern wetland. These are the same two locations where this species was present in 2008/2009.

Winter Wren *Troglodytes troglodytes*

A singing bird was found between point 16 & 17 in the first survey. In the second survey a family was found between points 12 & 13.

Wood Duck *Aix sponsa*

A flock of three flew over point count 23 in the first survey. A flock of six was seen in the north wetland during habitat-targeted surveys.

Wood Thrush *Hylocichla mustelina*

A scarce bird on the island. Found at point 12 & 28 in the first survey and one was singing between point 13 & 17 in the second. In 2008 it was found on 5/90 point counts in the first survey and 2/86 in the second. In 2009 it was found at 3/84.

Yellow Warbler *Setophaga petechia*

Common breeder across the island except a portion of the interior. Found at 25/31 point counts in the first survey and 23/25 in the second. In 2008, found on 70/90 point counts in the first survey and 66/86 in the second. In 2009, found at 64/84. Average density per point has remained constant, with 2.0 in the first survey and 2.1 in the second. In 2008 density per point was 2.0 in the first survey and 2.1 in the second. In 2009 it was 2.2.

Number of Yellow Warblers found per point count in 2015.

Point count #	1	2	3	4	5	7	8	9	10	11	12	13	14	16
Survey 1	2	4		2	1	1	3	2	2	2	1	3	1	3
Survey 2	2	1	2	3	3	1	2	2		4		1	1	1

Point count #	18	20	21	22	23	24	25	26	27	28	29	30	31
Survey 1	1	2	2	4	2	2	4	1	2	1		4	1
Survey 2		3	1	4	3	2	2	1	1	3	2		1

Yellow-rumped Warbler *Setophaga coronata*

Not found in the 2015 surveys. In 2008, a single bird was found during the second point count survey.

Appendix B. Late spring migrants detected during first point count survey (May 24-26).

Semipalmated Plover *Charadrius semipalmatus*
Ruddy Turnstone *Arenaria interpres*
Dunlin *Calidris alpina*
Least Sandpiper *Calidris minutilla*
Chimney Swift *Chaetura pelagica*
Blue-gray Gnatcatcher *Polioptila caerulea*
Gray-cheeked Thrush *Catharus minimus*
Northern Parula *Setophaga americana*
Black-throated Blue Warbler *Setophaga caerulescens*
Black-throated Green Warbler *Setophaga virens*
Blackpoll Warbler *Setophaga striata*
Northern Waterthrush *Parkesia noveboracensis*
Mourning Warbler *Geothlypis philadelphia*
Nelson's Sparrow *Ammodramus nelsoni*

Appendix C. Observations of nonbreeding birds (not in active migration).

Common Loon *Gavia immer*

Two individuals were seen in the waters just offshore Galloo in late May. Individuals were heard vocalizing while flying over the island on several occasions in late May, mid-June, and mid-July. No evidence of breeding was found.

Mute Swan *Cygnus olor*

Two individuals were seen roosting and swimming around the shoals off the northeast side of the island (adjacent to northern wetland) in each survey period. No evidence of breeding was noted.

Bald Eagle *Haliaeetus leucocephalus*

A daily maximum of two adults and three different sub-adults were observed on Galloo in the late-May, mid-June and mid-July survey periods. Individuals were typically seen roosting and flying along the southeast shoreline. On occasion up to three eagles were seen soaring in high flight (300+ m agl) over the island. Both adults and juveniles were also occasionally seen flying over the island in the stratum of the rotor-swept zone.

Purple Martin *Progne subis*

Seen twice during the mid-June survey. No evidence of nesting was found and it may be that a few nonbreeders associate with the local swallows and possible roost in the old Coast Guard station. It is also possible that birds nesting on the mainland occasionally wander out to Galloo to feed.

Appendix D. Species nesting on Little Galloo (note: more detail on the movements of these species over Galloo Island is presented in the Diurnal Bird Movement Study report (Evans 2015b)).

Double-crested Cormorant *Phalacrocorax auritus*

In all three surveys this species was occasionally seen flying along the shoreline and across the island. NYDEC estimated 2,264 nests of this species on Little Galloo.

Ring-billed Gull *Larus delawarensis*

From late May through mid-July, this species was seen commonly flying along the shoreline of the island and across the island. NYDEC estimated 43,224 nests of this species on Little Galloo in 2012 (most recent count).

Herring Gull *Larus argentatus*

In all three surveys, this species was seen fairly common flying along the shoreline of the island and occasionally seen flying across the island. There are historical records of this species nesting (2 nests) on the northern shoreline of Galloo (Chip Weseloh, Canadian Wildlife Service, pers. comm.). No Herring Gull nests were noted in the 2008, 2009, and 2015 breeding bird study on Galloo, but no shoreline surveys by boat were carried out. NYDEC estimated 784 nests of this species on Little Galloo in 2015.

Caspian Tern *Sterna caspia*

Seen flying along the shoreline and over island during all three surveys. Birds returning to Little Galloo were often carrying small fish. Seen occasionally feeding in the northern wetland. NYDEC estimated 2084 nests of this species on Little Galloo in 2015.

Common Tern *Sterna hirundo*

Not seen along the shoreline or flying over the island in any 2015 surveys. NYDEC estimated 30 nests on Little Galloo in 2015.

Appendix E. Survey date, start time, and number of species documented on both point counts for all 31 points. Also indicated are wind speed (Beaufort scale), sky cover (tenths of 100%), and surveyor initials.

site #	date	start time	# species	obs
1	May 26	7:33am	10	wre
2	May 26	6:19am	10	wre
3	May 25	7:23am	3	mh
4	May 25	n/a	8	mh
5	May 26	7:06am	8	wre
6	May 26	6:46am	4	wre
7	May 25	6:54am	10	mh
8	May 25	11:51am	13	wre
9	May 25	11:19am	14	wre
10	May 26	8:07am	12	wre
11	May 25	n/a	6	mh
12	May 25	10:15am	17	wre
13	May 25	10:44am	12	wre
14	May 25	9:07am	10	mh
15	May 25	8:34am	9	mh
16	May 25	6:34am	11	mh
17	May 25	8:28am	9	wre
18	May 25	8:02am	15	wre
19	May 25	9:34am	8	mh
20	May 25	6:22am	10	wre
21	May 25	6:48am	12	wre
22	May 25	7:10am	13	wre
23	May 25	7:33am	12	wre
24	May 25	10:17am	11	mh
25	May 26	6:23am	11	mh
26	May 26	8:31am	8	mh
27	May 26	8:07am	8	mh
28	May 26	7:35am	7	mh
29	May 26	6:37am	9	mh
30	May 26	6:55am	10	mh
31	May 26	n/a	7	mh

site #	date	start time	# species	obs
1	Jun 17	6:57am	8	wre
2	Jun 17	7:18am	10	wre
3	Jun 17	6:02am	8	wre
4	Jun 17	6:37am	9	wre
5	Jun 17	n/a	10	wre
6	Jun 17	7:43am	5	wre
7	Jun 17	5:45am	7	wre
8	Jun 17	10:25am	10	wre
9	Jun 17	10:04am	14	wre
10	Jun 17	8:28am	9	wre
11	Jun 17	5:26am	7	wre
12	Jun 17	9:21am	5	wre
13	Jun 17	9:42am	8	wre
14	Jun 17	8:43am	7	wre
15	Jun 17	8:57am	6	wre
16	Jun 18	5:08am	8	wre
17	Jun 17	7:42am	5	wre
18	Jun 18	7:19am	9	wre
19	Jun 17	9:18am	9	wre
20	Jun 18	5:43am	8	wre
21	Jun 18	6:03am	10	wre
22	Jun 18	6:23am	9	wre
23	Jun 18	6:45am	10	wre
24	Jun 17	9:36am	12	wre
25	Jun 17	10:22am	5	wre
26	Jun 17	11:31am	10	wre
27	Jun 17	11:17am	9	wre
28	Jun 18	8:42am	7	wre
29	Jun 17	10:35am	6	wre
30	Jun 17	10:50am	6	wre
31	Jun 17	11:04am	4	wre

Appendix F. Latitude and longitude of breeding bird study point count sites.

Turbine	Latitude			Longitude		
	Deg	Min	Sec	Deg	Min	Sec
1	43	53	24.50186	76	26	23.8553
2	43	53	30.49852	76	26	38.72778
3	43	53	30.42503	76	25	34.65086
4	43	53	36.42672	76	25	49.5225
5	43	53	42.7221	76	26	5.74223
6	43	53	48.63314	76	26	19.74382
7	43	53	45.84369	76	25	8.8913
8	43	53	51.84307	76	25	23.76325
9	43	53	57.84189	76	25	38.63601
10	43	54	3.8434	76	25	53.50967
11	43	54	0.74437	76	24	41.90103
12	43	54	6.74472	76	24	56.77328
13	43	54	14.43654	76	25	16.07091
14	43	54	19.46192	76	25	28.45165
15	43	54	24.48697	76	25	40.82847
16	43	54	12.25945	76	24	0.90801
17	43	54	24.58037	76	24	31.42686
18	43	54	32.96173	76	24	52.19862
19	43	54	40.04963	76	25	9.77141
20	43	54	31.17666	76	23	43.8622
21	43	54	37.17909	76	23	58.73502
22	43	54	43.18096	76	24	13.60866
23	43	54	49.18553	76	24	28.48319
24	43	54	55.1863	76	24	43.35847
25	43	54	45.751	76	23	16.05922
26	43	54	51.78898	76	23	31.02279
27	43	54	57.9096	76	23	45.80977
28	43	55	3.92909	76	24	3.77886
29	43	55	6.02904	76	22	59.16844
30	43	55	12.03629	76	23	14.04256
31	43	55	16.89257	76	23	29.69785