

A Survey of Breeding Birds at the Silver Maple Wind Project Mitigation Parcel in Hancock, Maine

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A SURVEY OF BREEDING BIRDS AT THE SILVER MAPLE WIND PROJECT
MITIGATION PARCEL IN HANCOCK, MAINE



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Biodiversity Research Institute (BRI) is a 501(c)(3) non-profit organization located in Portland, Maine. Founded in 1998, BRI's mission is to assess emerging threats to wildlife and ecosystems through collaborative research, and to use scientific findings to advance environmental awareness and inform decision makers.

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FRONT PHOTO: *Yellow Warbler. Photo credit: Ed Jenkins/BRI*

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EXECUTIVE SUMMARY

This report summarizes the results of a survey for breeding birds at the Silver Maple Wind Farm mitigation parcel in Hancock, Maine. The goal of the survey was to provide information on the value that the property currently provides to breeding birds by collecting baseline data. Two biologists visited the property on July 2-3 to evaluate species diversity and abundance on the property using point counts. Overall, 63 species were detected, 54 of which were detected on point counts. Species richness (number of species detected per point) was 8.7 ± 3.5 (mean \pm SD), while bird density (the number of individual birds detected per point) was 7.1 ± 2.6 . Point counts observing higher number of detections were consistently also those with higher species richness, typically located in, or near to, wetland-associated habitat. Overall, the high bird density and species richness reflect the quality and variety of habitat types available, suggesting the property is valuable to both resident and migratory breeding birds.

INTRODUCTION

The Silver Maple Wind Project (hereafter “Project”) will be a twenty (20) megawatt wind energy project, located in Clifton Maine, directly adjacent to the existing Pisgah Mountain Wind Project. The Project will be developed, owned, and operated by SWEB Development USA, LLC. The Project will consist of five V136 turbines, which will stand on steel towers either 105 meters (344.5 ft) in height, or 117 meters (383.8 ft) in height (see Project application materials for further details¹).

SWEB plans to make a financial contribution to the Frenchman Bay Conservancy (FBC) to mitigate for potential impact to migratory songbirds from the Project. FBC will use this contribution toward the purchase of roughly 1,400 acres of land in Hancock, Maine (named the Frenchman Bay Community Forest), which is adjacent to existing conserved land.

FBC has been coordinating directly with New England Forestry Foundation, expected owner of the 3,100-acre neighboring parcel. The two organizations intend to work together to ensure the long-term conservation objectives for the two properties. Given the current mix of habitat types on the property, and the eventual transition to a mature forest over several decades, a habitat type that is under-represented in the region, FBC anticipates that this large, undeveloped habitat block will provide valuable songbird habitat.

The mitigation parcel is in a region influenced by a wet, cool, climate that supports forests containing a large percentage of spruce and fir (Griffith et al., 2009). This parcel was selected because of the high value of the region to migratory birds and because of the synergies with existing conservation efforts in the area. Boreal features such as black spruce (*Picea mariana*) and other plant species support a suite of boreal bird species whose breeding range stretches from coastal and northern Maine northwards through the almost contiguous boreal zone of Canada. For songbird species such as the Palm Warbler (Yellow, *Setophaga palmarum hypochrysea*), the region represents the southernmost edge of their breeding range (Wilson Jr, 2020).

By monitoring breeding birds through standardized surveys, insight can be gained into species distribution and abundance (Stanton et al., 2019). Long-term monitoring programs such as the North American Breeding Bird Survey (BBS, Sauer et al., 2017) have been assessing demographic trends for decades, using acquired data to prioritize conservation efforts. In the context of Maine, the currently ongoing Maine Bird Atlas (2018-2022, MDIFW) is using a standardized point count methodology to monitor birds in a statewide effort to update breeding

¹<https://www.maine.gov/dep/land/projects/silver-maple/index.html>

bird distribution and abundance data since the first Atlas of Breeding Birds in Maine in 1978-1983 (Adamus, 1987). The survey of breeding birds at the Project's mitigation parcel, while not directly associated with similar efforts, uses the same protocol as the ongoing Maine Bird Atlas (Amundson et al., 2014), with the objective of collecting baseline data to provide valuable information on any breeding birds using the property, with the overall goal of better understanding the value that the property currently provides to birds.

BACKGROUND OF BRI PARTICIPATION

Michael Carey, Development Manager at SWEB Development, contacted the Biodiversity Research Institute (BRI) on June 16, 2020 to discuss the value of the property to songbirds. SWEB and BRI agreed that a simple breeding bird survey would provide important baseline information on the songbirds currently utilizing the property. BRI field biologists were provided access to the property on July 1, by Aaron Dority, Frenchman Bay Conservancy Executive Director, and conducted 120 point counts over the mornings of July 2, and 3.

STUDY SITE

The project area discussed in this report is located in Hancock, ME (approx. N44.554118°, W-4935313°, Fig. 5). The property includes an area of approximately 1,458 acres (5.9 km²). The confluence of the Main and West Branches of the Egypt Stream meet in the northeastern part of the property and form part of the eastern boundary before draining into nearby Egypt Bay. The western section of the Down East Sunrise Trail forms the northern and northeastern boundary of the property, while the remaining boundaries are private property. Vehicular access to the property is from SR 182 on the southern side.

The property supports multiple habitat types, predominantly mixed forest, with areas of deciduous forest (primarily in the northern half) and evergreen forest, including patches of dense black spruce (*Picea mariana*). Forestry has resulted in areas of shrub/scrub successional forest, and multiple patches of low herbaceous habitat along an access track running north-south through the center of the property. The movement of heavy machinery through the site has resulted in many narrow tracks running through the forest (Fig. 1).



Figure 1. An example of one of the many tracks left by heavy forestry equipment. These corridors of successional forest provide habitat for Chestnut-sided Warbler (*Setophaga pensylvanica*), while the surrounding denser forest support Winter Wren (*Troglodytes hiemalis*), Hermit Thrush (*Catharus guttatus*) and White-throated Sparrow (*Zonotrichia albicollis*). Photo by Ed Jenkins.

Woody wetlands are located along the Egypt Stream, with small areas of emergent marsh, open water, and wet meadow in the northeastern and southern portions of the property. A system of beaver dams has created a matrix of small pools on the western boundary (Fig. 2).



Figure 2. Pool created by beaver activity in the foreground and dam in the background. The open areas support Song Sparrow (*Melospiza melodia*), while Common Yellowthroat (*Geothlypis trichas*) use the dense riparian vegetation. Photo by Ed Jenkins.

METHODS

Survey Techniques

Point counts follow methodology proposed by Amundson et al. (2014), which built on efforts by Farnsworth et al. (2005), and is used by technicians collecting breeding bird data for the Maine Bird Atlas 2018-2022 (Kery & Royle, 2015). Forty points were randomly assigned within the boundaries of the project area using a Generalized Random Tessellation Stratified Sampling Framework to ensure spatially balanced random sampling. Each point was ≥ 250 meters from others to guarantee independence among surveys. Those points were then split between the two biologists and all visited once using handheld GPS devices during the 04:30-09:00 survey period (sunrise was at 05:00) on either July 2 or 3. Three, consecutive, four-minute point counts were conducted at each point, and all individual birds detected aurally or visually were recorded. Surveyors spent approximately 8 person-hours scouting points between 14:00-18:00 on July 1-2, and approximately 9 person-hours conducting point counts between 04:30-09:00 on July 2-3. All species detected in the project area during surveys, as well as those detected outside the survey period, are summarized in Table 1.

Weather Conditions

July 2: Cloudy, predominantly SW winds increasing from 3-10 mph and temperature increasing from 60-65°F throughout the survey.

July 3: Cloudy, with some fog in the morning, 5-10 mph NE winds throughout the survey. Temperature increasing from 60-65°F throughout the survey. Conditions were favorable for conducting field observations on both days.

RESULTS

Overall, 63 species were recorded on the property from July 1-3, with 54 detected during point counts, including 15 species of warbler (Table 1). The majority of species detected were migrants that spend the boreal winter in the southern states of the U.S. (e.g., Hermit Thrush and White-throated Sparrow), Central America (e.g., Black-throated Blue Warbler, *Setophaga caerulescens*, and Ovenbird, *Seiurus aurocapilla*), or South America (e.g., Red-eyed Vireo, *Vireo olivaceus*, and Canada Warbler, *Cardellina canadensis*). The five most detected species among the 120 total point counts were Ovenbird (145), Hermit Thrush (94), Black-throated Green Warbler (*Setophaga virens*, 59), Black-and-white Warbler (*Mniotilta varia*, 58), and Common Yellowthroat (48), all typical species breeding in the region. Species richness (number of species detected per point) was 8.7 ± 3.5 (mean \pm SD, Fig. 5), while bird density (the number of individual birds detected per point) was 7.1 ± 2.6 (Fig. 6). Point counts observing higher number of detections were consistently also those with higher species richness, typically located in, or near to, wetland-associated habitat.



Figure 3. Wet, predominantly open patches like this provide suitable habitat for Alder Flycatcher (*Empidonax alnorum*), Palm Warbler (Yellow), Magnolia Warbler (*Setophaga magnolia*), and Nashville Warbler (*Leiothlypis ruficapilla*). Photo by Ed Jenkins.

Detection rates for some resident species, such as Downy Woodpecker (*Dryobates pubescens*), Hairy Woodpecker (*Dryobates villosus*), Pileated Woodpecker (*Dryocopus pileatus*), and Black-capped Chickadee (*Poecile atricapillus*), may be low as they are attending to chicks early July and vocalizing less frequently. Species not detected during point counts—recorded while moving between point count locations, while scouting, or during the night of July 1 and 2—include: nocturnal species (Common Nighthawk, *Chordeiles minor*, Eastern Whip-poor-will, *Antrostomus vociferous*, and Northern Saw-whet Owl, *Aegolius acadicus*); species only detected flying over the property (Osprey, *Pandion haliaetus*, Purple Finch, *Haemorhous purpureus*, and Red Crossbill, *Loxia curvirostra*); and species only observed at a single site on the property (American Kestrel, *Falco sparverius*, Eastern Phoebe, *Sayornis phoebe*, and Ruby-crowned Kinglet, *Regulus calendula*). The only species detected on point counts, which does not breed on the property, is the Common Loon (*Gavia immer*), due to the lack of suitably large bodies of water.

The diversity of plant communities on the property, supported by wetland features and variable topography, have created suitable breeding conditions for many species of birds. The open areas and forest edges created by historic anthropogenic activity provide habitat for American Kestrel, Chipping Sparrow (*Spizella passerina*) and Indigo Bunting (*Passerina cyanea*), and provide adjacent habitat for forest-adapted species such as black-throated green warbler and winter wren. The wetter areas support swamp sparrow (*Melospiza georgiana*), Palm Warbler (Yellow), and

Alder Flycatcher (Fig. 3), while flooded forest on the northeastern side of the property provide suitable habitat for Scarlet Tanager (*Piranga olivacea*) and Veery (*Catharus fuscescens*) to breed.



Figure 4. Areas of dense conifer are used by Golden-crowned Kinglet (*Regulus satrapa*), provide cover for Ruffed Grouse (*Bonasa umbellus*), and support White-tailed Deer (*Odocoileus virginianus*) in winter. Photo by Ed Jenkins.

While no species recorded on the property can be considered unusual in the context of Hancock County, Eastern Whip-poor-wills are not abundant anywhere in Maine, and the nomadic Red Crossbill can be unpredictable, although they are regularly recorded on nearby Mount Desert Island (<https://www.ebird.org>, eBird. 2020).

While birds were the focus of the biologists, mammals observed include White-tailed Deer, Striped Skunk (*Mephitis mephitis*), North American Porcupine (*Erethizon dorsatum*), Snowshoe Hare (*Lepus americanus*), Eastern Gray Squirrel (*Sciurus carolinensis*), American Red Squirrel (*Tamiasciurus hudsonicus*), and Eastern Chipmunk (*Tamias striatus*). In addition, field biologists found fresh sign of American Beaver (*Castor canadensis*) and American Black Bear (*Ursus americanus*) and observed a Luna Moth (*Actias luna*).

CONCLUSION

More than ninety percent of the 2.9 billion individual birds lost in North America since 1970 belong to 12 families (Rosenberg et al., 2019), seven of which were detected on the property, including thrushes (four species), swallows, nightjars and swifts (three species), tyrant flycatchers (three species), finches (three species), blackbirds (one species), wood warblers (15 species), and American sparrows (five species). While no federally or state Threatened or Endangered species were detected, nine Species of Special Concern in Maine were observed (Eastern Whip-poor-will, Veery, American Redstart, *setophaga rutcilla*, Black-and-white Warbler, Canada Warbler, Chestnut-sided Warbler, Yellow Warbler, White-throated Sparrow, and Eastern Towhee, *Pipilo erythrophthalmus*). Additionally, based on a continent-wide analysis (NABCI 2016; Panjabi et al., 2005), 23 species detected during the survey have a Conservation Concern Score of Medium (predominantly consisting of neotropical migrants), while two have a score of High (Eastern whip-poor-will and Canada warbler). Canada warblers are also listed as threatened under the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), as the species has experienced a significant long-term decline, probably due to loss of primary forest on the wintering grounds in South America, and this trend shows no indication of reversal (COSEWIC, 2008). Eastern whip-poor-wills are also listed as threatened under COSEWIC due to showing declines consistent with many aerial insectivores related to habitat loss and degradation, as well as changes to their insect prey base (COSEWIC, 2011).

Overall, the property has high species diversity and richness, which reflects the quality and variety of habitat types available, suggesting the property is valuable to both resident and migratory breeding birds. The property also represents a valuable resource for migrant birds due to its variety of habitats and position relative to the coast. Boreal-breeding species moving through the area to or from northern Maine or Maritime Canada will likely use the area as a stop-over site and therefore the year-round value of the site is significant.

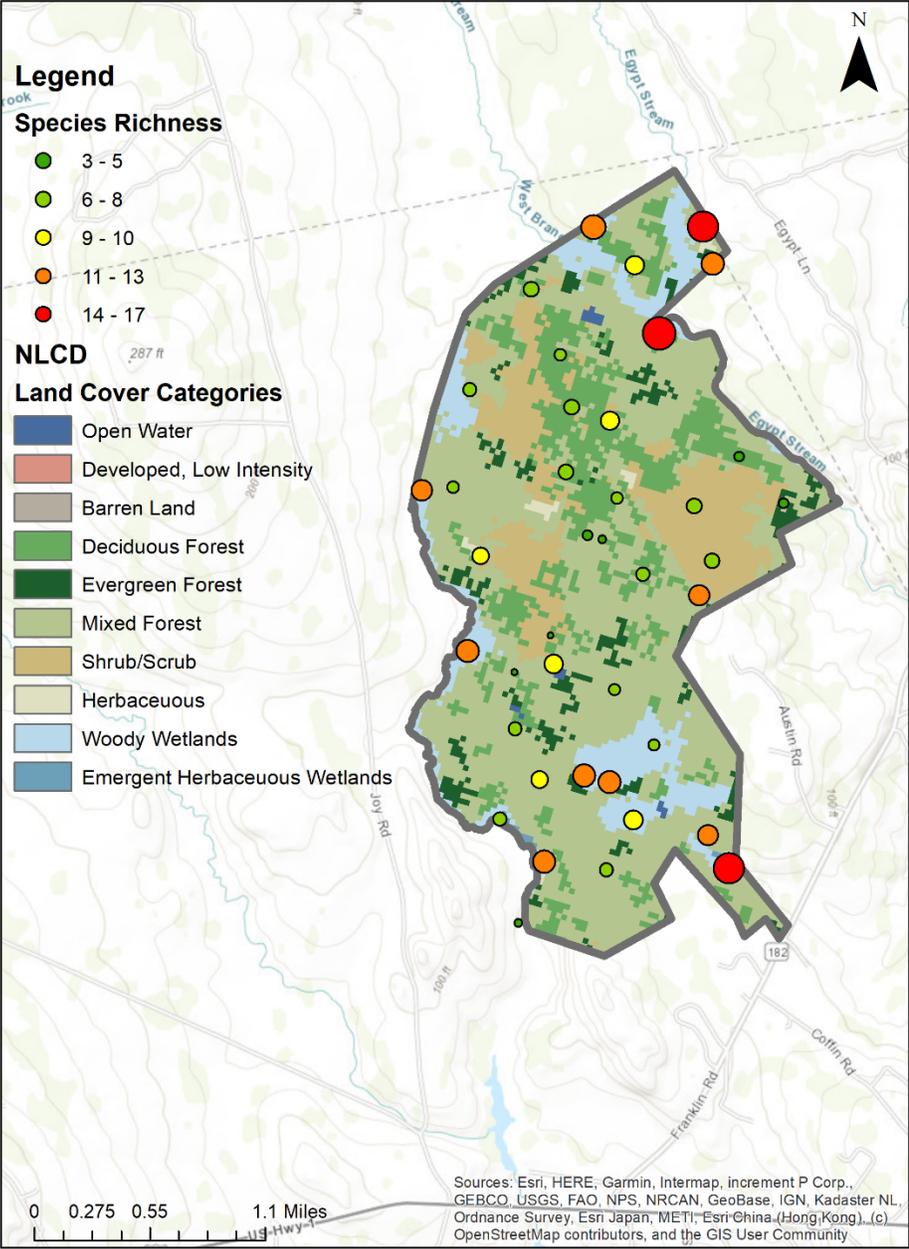


Figure 5. The Silver Maple Wind Farm mitigation parcel in Hancock, Maine, showing point count locations conducted on July 2-3 (dots), color-coded by number of species detected, and land cover categories.

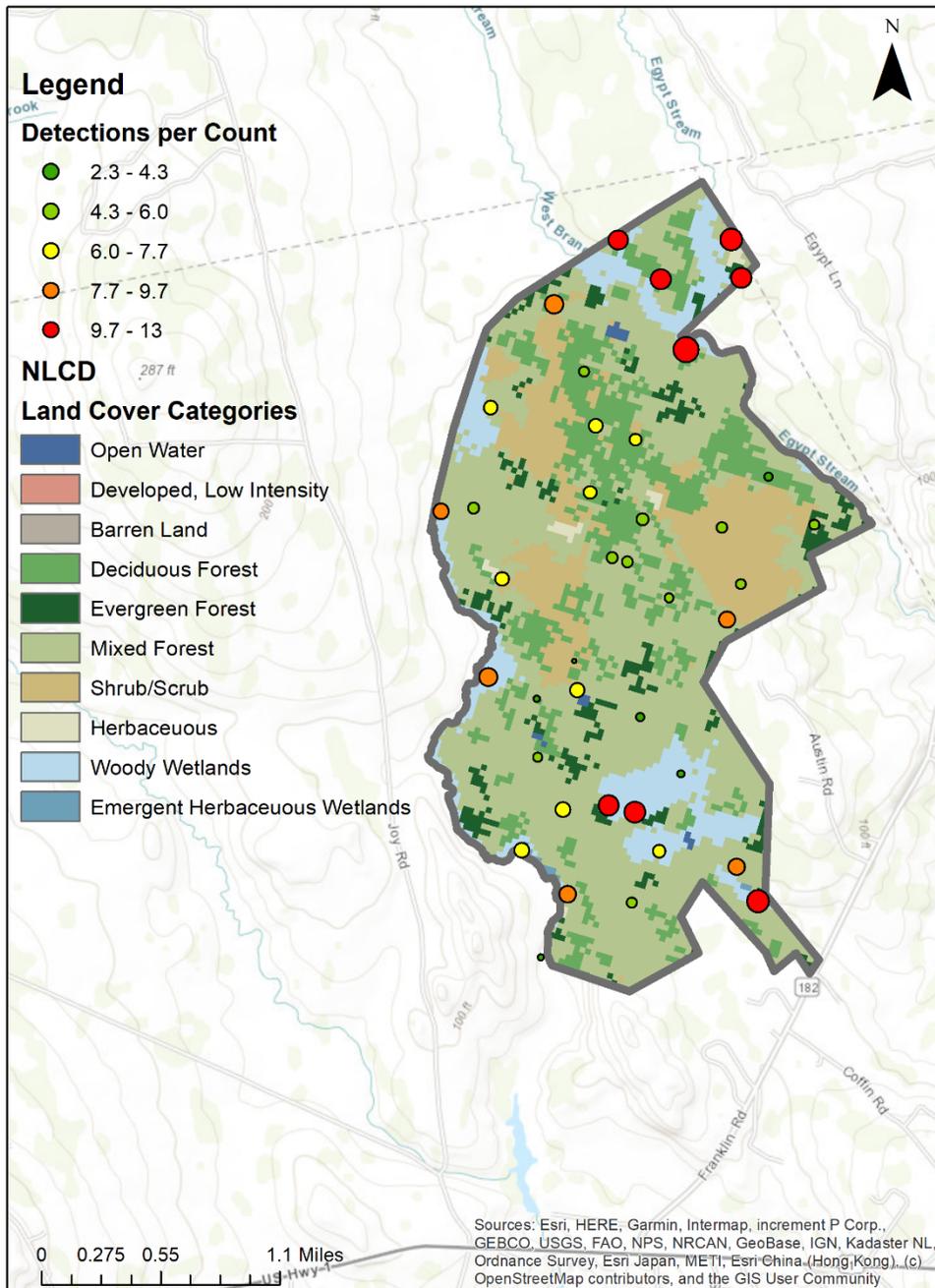


Figure 6. The Silver Maple Wind Farm mitigation parcel in Hancock, Maine, showing point count locations conducted on July 2-3 (dots), size- and color-coded by number of individual birds detected, and land cover categories.

Table 1. Comprehensive list of species detected on the property on July 1-3 (* indicates species detected outside point counts), and number of detections per species (n=120 point counts)

No.	AOU Code	Common Name	Scientific Name	Detections
1	RUGR	Ruffed Grouse	<i>Bonasa umbellus</i>	1
2	WITU	Wild Turkey	<i>Meleagris gallopavo</i>	1
3	MODO	Mourning Dove	<i>Zenaida macroura</i>	18
4	CONI	Common Nighthawk*	<i>Chordeiles minor</i>	*
5	EWPW	Eastern Whip-poor-will*	<i>Antrostomus vociferus</i>	*
6	AMWO	American Woodcock	<i>Scolopax minor</i>	1
7	COLO	Common Loon	<i>Gavia immer</i>	1
8	TUVU	Turkey Vulture	<i>Cathartes aura</i>	1
9	OSPR	Osprey*	<i>Pandion haliaetus</i>	*
10	BWHA	Broad-winged Hawk	<i>Buteo platypterus</i>	2
11	NSWO	Northern Saw-whet Owl*	<i>Aegolius acadicus</i>	*
12	YBSA	Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>	4
13	DOWO	Downy Woodpecker	<i>Dryobates pubescens</i>	2
14	HAWO	Hairy Woodpecker	<i>Dryobates villosus</i>	3
15	PIWO	Pileated Woodpecker	<i>Dryocopus pileatus</i>	6
16	YSFL	Yellow-shafted (Northern) Flicker	<i>Colaptes auratus auratus</i>	5
17	AMKE	American Kestrel*	<i>Falco sparverius</i>	*
18	ALFL	Alder Flycatcher	<i>Empidonax alnorum</i>	4
19	EAPH	Eastern Phoebe*	<i>Sayornis phoebe</i>	*
20	GCFL	Great Crested Flycatcher	<i>Myiarchus crinitus</i>	10
21	BHVI	Blue-headed Vireo	<i>Vireo solitarius</i>	29
22	REVI	Red-eyed Vireo	<i>Vireo olivaceus</i>	44
23	BLJA	Blue Jay	<i>Cyanocitta cristata</i>	25
24	AMCR	American Crow	<i>Corvus brachyrhynchos</i>	11
25	CORA	Common Raven	<i>Corvus corax</i>	2
26	BCCH	Black-capped Chickadee	<i>Poecile atricapillus</i>	6
27	TRES	Tree Swallow	<i>Tachycineta bicolor</i>	1
28	GCKI	Golden-crowned Kinglet	<i>Regulus satrapa</i>	31
29	RCKI	Ruby-crowned Kinglet*	<i>Regulus calendula</i>	*
30	RBNU	Red-breasted Nuthatch	<i>Sitta canadensis</i>	11
31	WBNU	White-breasted Nuthatch	<i>Sitta carolinensis</i>	5
32	WIWR	Winter Wren	<i>Troglodytes hiemalis</i>	24
33	EABL	Eastern Bluebird	<i>Sialia sialis</i>	2
34	VEER	Veery	<i>Catharus fuscescens</i>	4
35	HETH	Hermit Thrush	<i>Catharus guttatus</i>	94
36	AMRO	American Robin	<i>Turdus migratorius</i>	9
37	CEDW	Cedar Waxwing	<i>Bombycilla cedrorum</i>	1
38	PUFI	Purple Finch*	<i>Haemorhous purpureus</i>	*
39	RECR	Red Crossbill*	<i>Loxia curvirostra</i>	*
40	AMGO	American Goldfinch	<i>Spinus tristis</i>	13

41	CHSP	Chipping Sparrow	<i>Spizella passerina</i>	3
42	WTSP	White-throated Sparrow	<i>Zonotrichia albicollis</i>	16
43	SOSP	Song Sparrow	<i>Melospiza melodia</i>	2
44	SWSP	Swamp Sparrow	<i>Melospiza georgiana</i>	5
45	EATO	Eastern Towhee	<i>Pipilo erythrophthalmus</i>	1
46	RWBL	Red-winged Blackbird	<i>Agelaius phoeniceus</i>	5
47	OVEN	Ovenbird	<i>Seiurus aurocapilla</i>	145
48	BAWW	Black-and-white Warbler	<i>Mniotilta varia</i>	58
49	NAWA	Nashville Warbler	<i>Leiothlypis ruficapilla</i>	27
50	COYE	Common Yellowthroat	<i>Geothlypis trichas</i>	48
51	AMRE	American Redstart	<i>Setophaga ruticilla</i>	9
52	NOPA	Northern Parula	<i>Setophaga americana</i>	35
53	MAWA	Magnolia Warbler	<i>Setophaga magnolia</i>	13
54	BLBW	Blackburnian Warbler	<i>Setophaga fusca</i>	1
55	YEWA	Yellow Warbler	<i>Setophaga petechia</i>	1
56	CSWA	Chestnut-sided Warbler	<i>Setophaga pensylvanica</i>	12
57	BTBW	Black-throated Blue Warbler	<i>Setophaga caerulescens</i>	1
58	YPWA	(Yellow) Palm Warbler	<i>Setophaga palmarum hypochrysea</i>	13
59	MYWA	Myrtle (Yellow-rumped) Warbler	<i>Setophaga coronata coronata</i>	4
60	BTNW	Black-throated Green Warbler	<i>Setophaga virens</i>	59
61	CAWA	Canada Warbler	<i>Cardellina canadensis</i>	17
62	SCTA	Scarlet Tanager	<i>Piranga olivacea</i>	2
63	INBU	Indigo Bunting	<i>Passerina cyanea</i>	3

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