

EXHIBIT L. Raptor Nest Survey



May 2011

**RAPTOR NEST SURVEY
REPUBLIC WIND FARM
SENECA COUNTY, OHIO**

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Table 1. Raptor nest and great blue heron breeding colony locations, tree species, nest height, and tree diameter at breast height (DBH) at the Republic Wind, LLC, Republic Wind Farm Project Area and 2-mile buffer surrounding the Project Area boundaries, Seneca County, Ohio.

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Figure 1. Locations of raptor nests and great blue heron breeding colony at the Republic Wind, LLC, Republic Wind Farm Project Area and 2-mile buffer surrounding the Project Area boundaries, Seneca County, Ohio.

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Appendix A. Photographs of representative raptor nests and great blue heron breeding colony at the Republic Wind, LLC, Republic Wind Farm Project Area and 2-mile buffer surrounding the Project Area boundaries, Seneca County, Ohio.

EXECUTIVE SUMMARY

BHE Environmental, Inc. (BHE) was contracted to complete a three-day raptor nest survey following methods described in the *On-Shore Bird and Bat Pre- and Post-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio* ("Ohio Protocol") issued by the Ohio Department of Natural Resources (ODNR), Division of Wildlife in May, 2009. This report provides data and analysis of results of the Raptor Nest Survey conducted March 17-25, 2011 by BHE at the Republic Wind, LLC, (Republic) Republic Wind Farm ("Project Area") in Seneca County, Ohio and the 2-mile surrounding area.

A total of eleven raptor nests and one great blue heron (*Ardea herodias*) breeding colony were identified within the survey area. Two nests had red-tailed hawks (*Buteo jamaicensis*) perched nearby and may have been in the early stages of nesting (i.e., nest construction, egg laying); the same may have been true for a third nest seen with a red-tailed hawk circling above. The remaining eight nests (species unknown) appeared to be inactive.

BHE found no nests of listed or sensitive species within the Project Area or the 2-mile buffer surrounding the Project Area boundaries; therefore, according to the Ohio Protocol, no additional raptor nest monitoring should be required. Monitoring will take place of Bald Eagles at two nest locations just beyond two miles from the site boundary, which will be the subject of a further report. There are no requirements in the Ohio Protocol that specifically address heron breeding colonies. The Diurnal Bird/Raptor Migration Survey currently being conducted by BHE may also provide information regarding great blue heron use of the Project Area, if any. If they are found to be using the Project Area (e.g., as a travel corridor) we recommend further coordination with the ODNR to determine the appropriate next steps. We also recommend that Republic notify ODNR of the presence of the colony, and based upon initial study results, perhaps consider establishing a protective buffer around the colony, at a distance that is consistent with what has been approved at other wind farms in Ohio.

1.0 INTRODUCTION

Republic Wind, LLC (Republic) proposes to install wind turbines on the approximately 12,141 hectare (ha; 30,000 acres [ac]) Republic Wind Farm ("Project Area") in Seneca County, Ohio (Figure 1). The actual area occupied by the turbines and access roads that will comprise the facility will be a very small percentage of the Project Area.

Interactions between wind turbines and raptors have been cause for concern since an unexpectedly large number of raptors were documented as fatalities at one of the first wind turbine facilities in Altamont, California (Hoover and Morrison 2005; Orloff and Flannery 1992; Smallwood and Thelander 2005). Although subsequent Raptor collision rates at modern wind farms have declined significantly, raptors may be affected by wind power development in several ways, including: a) collisions with operating turbine rotors; b) habitat disturbance resulting from construction or new infrastructure on site; and, c) disturbance from increased human activity in the vicinity of the turbines. Collision mortalities associated with wind turbines could have potentially substantial effects on raptor populations because raptors are not numerous and typically reproduce and mature slowly; thus, in contrast to passerine species, raptors cannot absorb mortalities and recover from losses on an annual basis easily (Kuvlesky et al. 2007).

BHE was contracted by Republic to conduct a three-day raptor nest survey of the proposed Project Area according to specifications outlined in the Ohio Department of Natural Resources (ODNR) *On-Shore Bird and Bat Pre- and Post-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio, An Addendum to the Ohio Department of Natural Resource's Voluntary Cooperative Agreement* (Ohio Protocol). The purpose of this report is to document locations of nesting raptors found during the survey in relation to the Project Area.

2.0 METHODS

In accordance with specifications of the Ohio Protocol, a survey for raptor nests was conducted March 17 - 25, 2011. Observed species and locations of nests were marked on U.S. Geological Survey (USGS) 1:24,000 topographic quadrangles. The survey focused on the location of stick nests. The Ohio Protocol specifies raptor nest surveys should occur between February 1 and March 31 because the majority of deciduous trees are without leaves and nests can be most easily seen at this time. The survey included the proposed Project Area and a 2-mile buffer surrounding the Project Area boundaries. In addition to marking the locations of nest sites on USGS 1:24,000 topographic quadrangles, the BHE biologist recorded the nest location on a global positioning system (GPS) device (if access to the nest location was available) for mapping and potential future nest visits. If access to the nest was not available, the BHE biologist used a GPS to record the location from the nearest publically accessible area and then estimated the distance and bearing to the nest for mapping. The nests were photographed (Appendix A). At the time of the survey, access had been secured for three woodlots in the southern portion of the Project Area, which were searched on foot. The remainder of the survey was conducted by automobile from public roads.

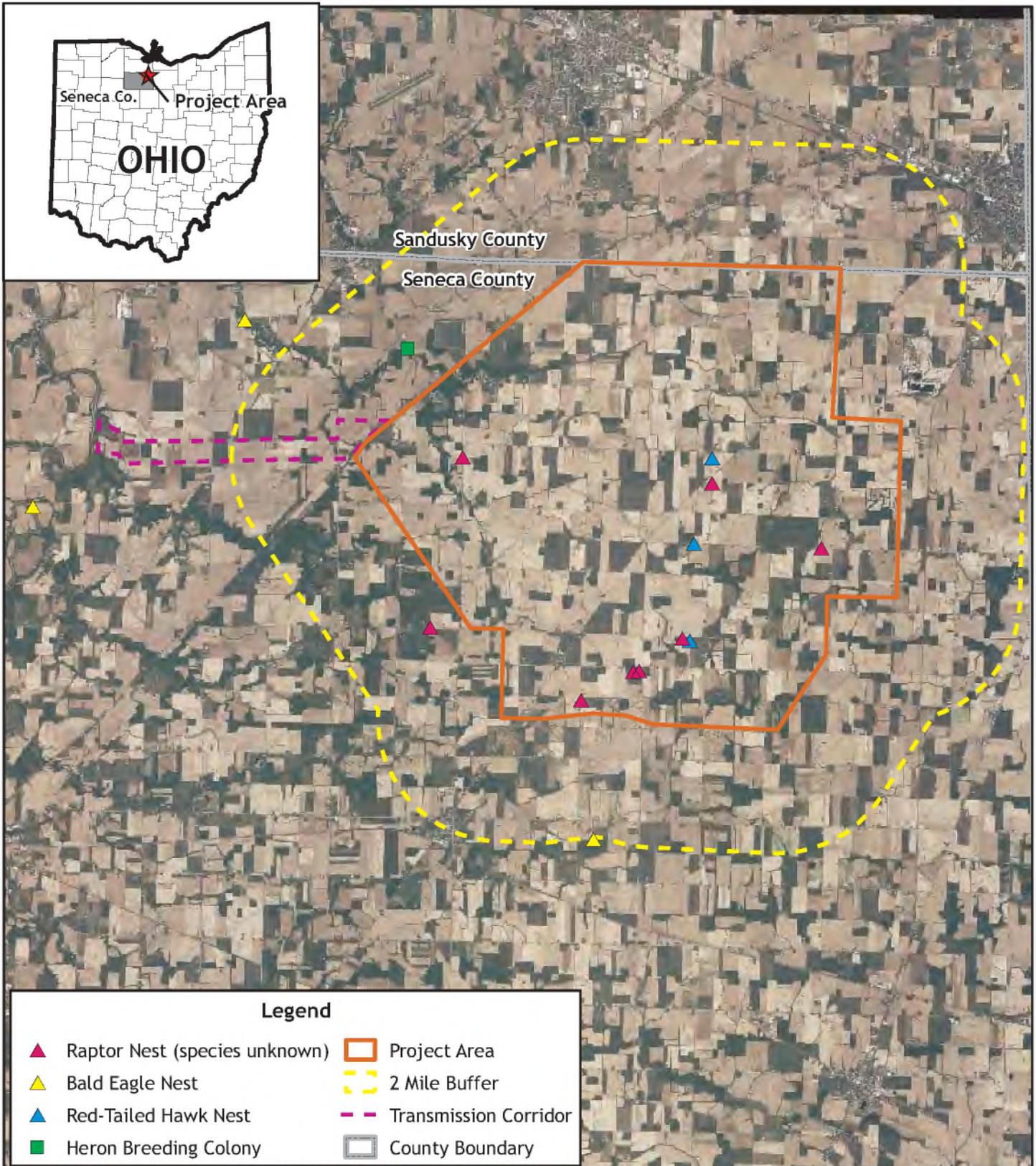


Figure 1. Raptor Nest Locations and Heron Breeding Colony within the Republic Wind, LLC, Republic Wind Farm Project Area and Surrounding 2-Mile Buffer, Seneca County, Ohio.

		April 2011	
	Project No. 1953.001	Basemap: NAIP Imagery - Seneca County, OH (2010)	

3.0 RESULTS

Eleven raptor nests and one great blue heron breeding colony were identified during the Survey (Figure 1, Table 1). Two nests had red-tailed hawks (*Buteo jamaicensis*) perched nearby and may have been in the early stages of nesting (i.e., nest construction, egg laying); the same may have been true for a third nest seen with a red-tailed hawk circling above. The remaining eight nests appeared to be inactive and the species associated with these nests are unknown.

A great blue heron breeding colony was located outside the Project Area but within the 2-mile buffer (approximately 0.75 mile west of the northwestern portion of the Project Area), and included 12 to 15 nests; each with an adult great blue heron perched nearby.

4.0 DISCUSSION

The red-tailed hawk is one of the most widespread and commonly observed birds of prey in North America (Preston and Beane 2009). The species occupies a large range in North and Central America and exhibits increasing or stable populations in most areas of the U.S. and Canada (NatureServe 2010, Suaer et al. 2011). In an early assessment of the impact that wind turbines were having on local raptor populations at the Altamont Pass Wind Resource Area (APWRA) in Alameda, California, red-tailed hawks were found to be the raptor species most commonly killed by collisions with wind turbines (Orloff and Flannery 1992). While they were the most commonly observed raptor species at the APWRA, immature red-tailed hawks were killed by colliding with turbines more frequently than would have been predicted by their relative abundance in the population (Orloff and Flannery 1992), suggesting a disproportionately high risk of impact to young of this species.

Mortality studies at operational wind farms outside of California, however, have shown relatively low raptor fatality rates (NRC 2007, NWCC 2010). Of the studies reviewed by the NRC (2007), 14 were conducted using a survey protocol for all seasons of occupancy for a one-year period and incorporated scavenging and searcher-efficiency biases into estimates. The combined average raptor mortality for the 14 studies was 0.03 birds/turbine/year and 0.04 birds/megawatt/year. In a review of bird collisions documented in 31 studies at wind-energy facilities outside California, Erickson et al. (2001) reported that diurnal raptors comprised 2.7 percent of avian fatalities, while 78 percent of birds killed were protected songbirds. In a 3-year study conducted at a 354-turbine facility in Buffalo Ridge, Minnesota, Johnson et al. (2002) found that of 55 documented fatalities only one was a raptor (red-tailed hawk; 1.8 percent of fatalities; .0009/turbine/year). When examined by region (East, Midwest, Pacific Northwest, and Rocky Mountain), raptor fatalities resulting from collision with wind turbines were found to be lowest in the Midwest (NRC 2007).

This reduction in raptor mortality rates may be due to advances in wind turbine technology which have made turbines less likely to impact birds. Specifically, modern wind turbines of the type proposed for the Project Area are on monopole tower structures which, unlike the lattice towers formerly used in California, and do not provide roosting opportunities for avifauna. Further, modern wind turbine blades have a much slower rotational speed which may aid birds in avoiding a collision.

Great blue herons (*Ardea herodias*) will sometimes breed in lone pairs but more often they may be found breeding in colonies ranging in size from several to hundreds of pairs (Butler 1992). The great blue heron is one of the most widespread and adaptable wading birds in North America (NatureServe 2010). Populations generally are stable or increasing in most areas (NatureServe 2010, Suaer et al. 2011). Great blue herons will often fly more than 20

miles from their nest to reach favored feeding areas, typically located in slow moving or calm freshwater. The Sandusky River is located approximately 5.5 miles to the west of the Project Area and many small tributaries are located in the immediate vicinity of the colony, north and west of the Project Area. In addition, the southwestern shores of Lake Erie are located approximately 13.7 miles north-northeast of the Project Area. Great blue herons from the breeding colony would not have to cross the Project Area to access these potential feeding areas.

Table 1. Raptor nest and great blue heron breeding colony locations, tree species, nest height, and tree diameter at breast height (DBH) at the Republic Wind Farm Project Area and 2-mile buffer surrounding the Project Area boundaries, Seneca County, Ohio.

Date	Nest Identification	Latitude	Longitude	Species	Height	Width	Additional Notes
3/17/2011	RAP-1-Ped ^a	41.15299	-82.97667	Quercus rubra	30 - 40 ft	24 - 36"	Red-tailed hawk attending nest
3/23/2011	RAP-2-Ped	41.16756	-82.94311	Q. rubra	60 - 80 ft	20 - 24"	Red-tailed hawk seen nearby
3/23/2011	RAP-3 -Ped	41.16808	-82.94546	Carya Cordiformes	60 - 80 ft	20 - 30"	
3/23/2011	RAP-4 -Ped	41.16007	-82.96008	C. ovata	80 - 100 ft	20 - 24"	Approximately 200 ft east of RAP #5
3/23/2011	RAP-5 -Ped	41.15997	-82.96055	C. ovata	80 - 100 ft	20 - 30"	Approximately 200 ft west of RAP #4
3/25/2011	RAP-6-Auto ^b	41.19009	-82.90284	Unknown	80 - 100 ft	Unknown	
3/25/2011	RAP-7-Auto	41.21069	-82.93734	Unknown	70 - 90 ft	Unknown	Red-tailed hawk attending nest
3/25/2011	RAP-8 -Auto	41.20956	-83.01514	Unknown	Unknown	Unknown	
3/25/2011	RAP-9 -Auto	41.1693	-83.02404	Unknown	Unknown	Unknown	
3/25/2011	RAP-10 -Auto	41.1904	-82.9425	Unknown	Unknown	Unknown	
3/25/2011	RAP-11 -Auto	41.2048	-82.93726	Unknown	Unknown	Unknown	
3/25/2011	NDX-GBH -Auto	41.23491	-83.03299	Unknown	Unknown	Unknown	Approximately 12 to 15 adults observed perched on and nearby nests

^a Ped suffix indicates pedestrian survey.

^b Auto suffix indicates survey conducted from automobile via public roads.

5.0 CONCLUSIONS AND RECOMMENDATIONS

BHE found no nests of listed or sensitive species of raptors within the Project Area or a 2-mile buffer surrounding the Project Area boundaries; therefore, according to the Ohio Protocol, no additional raptor nest monitoring will be required.

There are no requirements stated in the Ohio Protocol regarding heron breeding colonies. ODNR's Division of Natural Areas and Preserves maintains the Ohio Biodiversity Database, a source of information regarding rare and endangered plants and animals, outstanding natural communities and special geological features in the state. Though the great blue heron is a common and widespread species, heron breeding colonies are less common and, thus, are included in the Ohio Biodiversity Database as a breeding concentration area. However, there are no monitoring requirements specifically stated in the Ohio Protocol regarding these breeding colonies. We recommend that Republic notify ODNR of the presence of the colony to identify any potential agency considerations for this resource. A possible approach to address the presence of the great blue heron breeding colony could include establishing a protective buffer around the colony, at a distance that is consistent with what has been approved at other wind farms in Ohio.

The Diurnal Bird/Raptor Migration Survey currently being conducted by BHE may also provide information regarding great blue heron use of the Project Area, if any. If they are found to be using the Project Area (e.g., as a travel corridor) we recommend further coordination with the ODNR to determine appropriate next steps.

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APPENDIX A

Photographs of raptor nests and great blue heron breeding colony at the Republic Wind Farm Project Area and 2-mile buffer surrounding the Project Area boundaries, Seneca County, Ohio



Red-tailed hawk nest (adults away from nest at the time photo was taken) approximately 30-40 feet above ground in a red oak (*Quercus rubra*). Nest found during pedestrian survey of woodlot in southern portion of the Project Area.



Red-tailed hawk nest (note adult in nest) found during survey conducted from an automobile on public roads. Nest was located 70-90 feet above ground in a woodlot approximately 200 feet from Township Road 79 (tree species unidentified).



Raptor nest (species unknown) found during survey conducted from an automobile on public roads. Nest was located 80-100 feet above ground in a woodlot approximately 400 feet from County Road 46 (tree species unidentified).



Great blue heron breeding colony located nearest to Township Road 180, approximately 0.75 mile northwest of the Project Area boundary but within the surveyed 2-mile buffer.



Closer view of great blue heron breeding colony in which adults may be seen attending nests.



Adult great blue herons in full breeding plumage attending nests in breeding colony.

Exhibit M. Bald Eagle Survey



November 2012

**FINAL RESULTS FOR THE
BALD EAGLE SURVEY EFFORT
REPUBLIC WIND FARM,
SENECA AND SANDUSKY COUNTIES, OHIO**

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- Appendix A. Bald Eagle Point Count Data.

1.0 INTRODUCTION

Republic Wind Farm, LLC, a subsidiary of Nordex USA, Inc. (Nordex), proposes construction of the Republic Wind Farm (RWF or Project Area) wind energy generation facility in Seneca and Sandusky counties, Ohio. The Project Area spans approximately 39,627 acres (ac; 16,036 hectares [ha]) northeast of the town of Republic, Ohio (Figure 1). The Project Area represents the maximum area considered for placement of turbines and facility infrastructure. Nordex anticipates the nameplate capacity of the RWF will be 200 megawatts (MW) with an anticipated 83 turbines allocated throughout the Project Area. At this time, the layout and final number of turbines has not yet been selected; however, Nordex anticipates that the actual area disturbed by the turbines and access roads will comprise less than 1 percent of the Project Area (less than 1 percent).

BHE Environmental, Inc. (BHE) was contracted by Nordex to conduct Bald Eagle point count monitoring at the proposed RWF according to specifications outlined in the US Fish and Wildlife Service (USFWS) Draft Eagle Conservation Plan Guidance (ECP) point count methodology, with some modifications discussed and approved by USFWS on August 23, 2011. Additionally, BHE conducted raptor/diurnal bird monitoring and raptor nest searches in accordance with the Ohio Department of Natural Resources (ODNR) *On-Shore Bird and Bat Pre- and Post-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio, An Addendum to the Ohio Department of Natural Resource's Voluntary Cooperative Agreement* (Ohio Protocol) during the 2011 and 2012 survey seasons. The purpose of this interim report is to document the results of the Bald Eagle survey effort to date and provide supplemental information from the raptor/diurnal bird and raptor nest search surveys. This information has been provided to USFWS in order to assist in the preliminary assessment of the potential risk to Bald Eagles posed by the proposed RWF wind energy facility.

Regional Context

The Project Area is heavily influenced by agricultural practices; BHE has calculated utilizing ArcGIS resources that 84.7 percent of the Project Area is devoted to intensive row crop (i.e., corn, soybean, wheat) agricultural production with fragmented woodlots that comprise only 7.6 percent of the Project Area (Table 1). The Project Area lies along the eastern edge of the Mississippi flyway which also includes, although to a lesser extent, the Ohio River Valley and tributaries. The Project Area is approximately 18 miles south of Lake Erie.

2.0 BALD EAGLE AND RAPTOR NEST SURVEY

In accordance with specifications of the Ohio Protocol, a survey for raptor nests was conducted March 17 - 25, 2011. Observed species and locations of nests were marked on US Geological Survey (USGS) 1:24,000 topographic quadrangles. The survey focused on the location of stick nests. The Ohio Protocol specifies raptor nest surveys should occur between February 1 and March 31 because the majority of deciduous trees are without leaves and nests can be most easily seen at this time. The survey included the proposed Project Area and a 2-mile buffer surrounding the Project Area boundaries. In addition to marking the locations of nest sites on USGS 1:24,000 topographic quadrangles, the BHE biologist recorded the nest location on a global positioning system (GPS) device (if access to the nest location

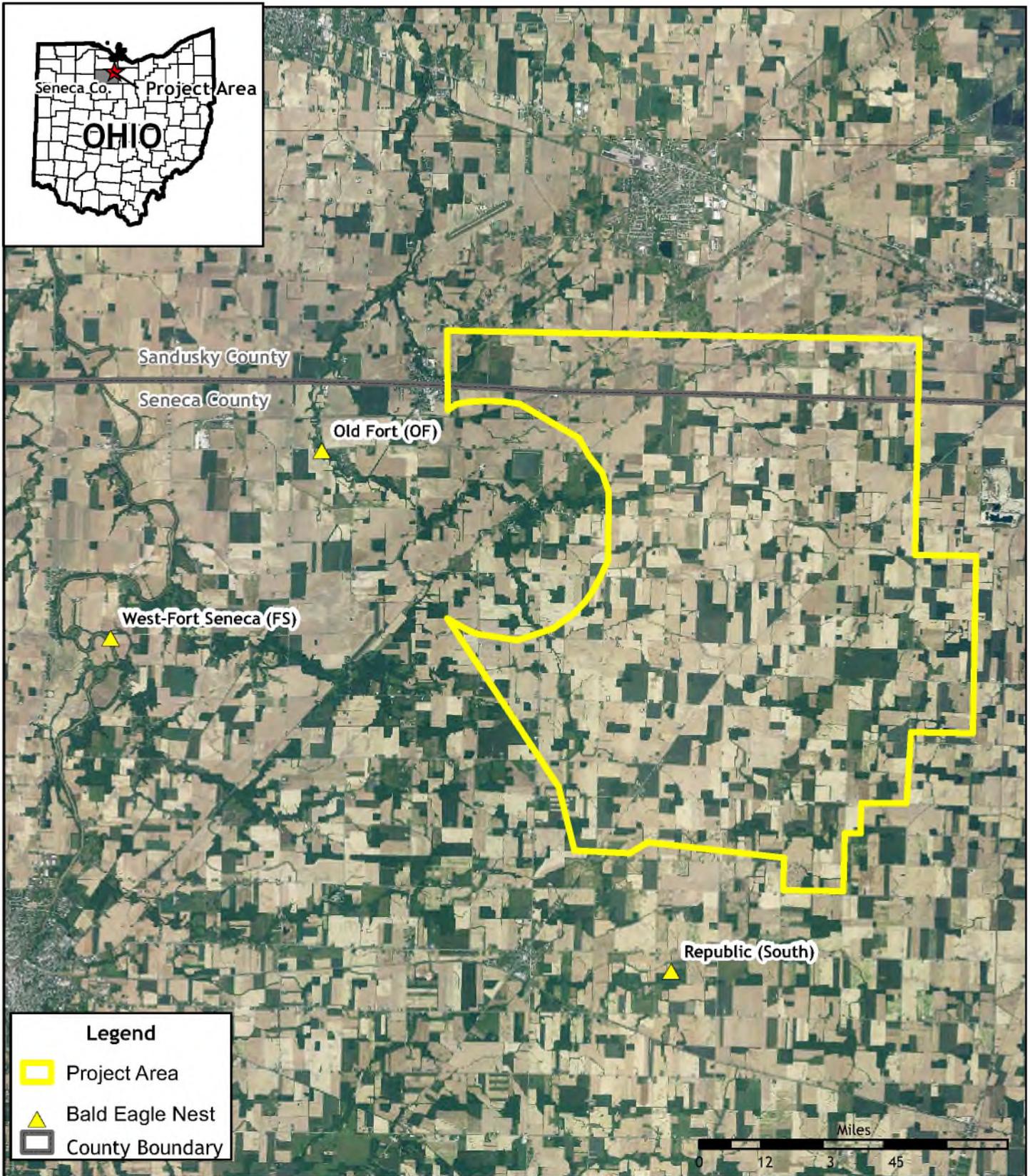


Figure 1. Site location and Bald Eagle Nest locations.

	Republic Wind, LLC Project Area, Seneca and Sandusky Counties, Ohio.	
	Basemap: NAIP Imagery - Seneca and Sandusky Counties, OH (2010)	

Table 1. National land use/land cover acreages in the Republic Wind, LLC Project Area, Seneca and Sandusky counties, Ohio.

Land Use	Acres	Percent
Cultivated Crops	33,571.5	84.7%
Deciduous Forest	3,012.7	7.6%
Developed, Open Space	2,101.0	5.3%
Hay/Pasture	425.0	1.1%
Herbaceous	209.96	0.5%
Developed, Low Intensity	136.6	0.3%
Open Water	116.1	0.3%
Woody Wetlands	32.0	0.1%
Emergent Herbaceous Wetlands	10.5	<0.1%
Developed, Medium Intensity	8.3	<0.1%
Evergreen Forest	3.2	<0.1%
Total	39,626.6	100.0%

Source: National Land Cover Database – 2006 (<http://www.mrlc.gov/nlcd2006.php>)

was available) for mapping and potential future nest visits. If access to the nest was not available, the BHE biologist used a GPS to record the location from the nearest publically accessible area and then estimated the distance and bearing to the nest for mapping. At the time of the survey, access had been secured for three woodlots in the southern portion of the Project Area, which were searched on foot. The remainder of the survey was conducted by automobile from public roads.

3.0 BALD EAGLE NEST MONITORING AND RESULTS

During the nest survey, BHE identified three Bald Eagle nests within close proximity (approximately 6 miles) to the Project Area (Figure 1). BHE identified each of the Bald Eagle nests by their given ODNR/USFWS nest location name: Old Fort (OF), Fort Seneca (FS), and Republic (known as South). Figure 1 depicts their location with proximity to the Project Area and their general habitat matrices. BHE biologists monitored each of identified nests during the incubation and rearing stages to assess the daily movement patterns of each breeding pair of adults and in order to attempt to identify the productivity success of each nest location during the 2011 and 2012 breeding/nesting seasons (Table 2).

Each Bald Eagle nest was monitored from a vehicle (serving as a blind) positioned at best point for observation. All eagle movements to and from the nest were recorded and a diagram was produced depicting estimated heights, direction of travel, and flight paths used. The location and behavior of the adult Bald Eagles within the near nest territory were documented for at least four hours, twice per week, during the 2011 and 2012 breeding and nesting seasons. The data collected for each of the nest monitoring events will be provided as an appendix to the final report.

The FS nest produced two eaglets that fledged in 2011. Observations showed the birds used the Sandusky River and its environs almost exclusively. Few observations documented

Table 2. Bald Eagle Nest Monitoring Dates during the 2011/2012 breeding/nesting seasons.

Bald Eagle Nest	2011 Breeding/Nesting Season Observation Dates*	2012 Breeding/Nesting Season Observation Dates **
Old Fort	Inactive/Abandoned	January 18, February 16, March 15, April 15, May 18, June 17, and July TBD
Fort Seneca	March 23 through July 19 (2 times weekly)	January 18, February 16, March 15, April 15, May 18, June 17, and July TBD
Republic	Inactive/Abandoned	January 19, February 15, March 14, April 16, May 16, June 15, and July TBD

*Bald Eagle nest monitoring in accordance with Ohio Protocol.

**Bald Eagle nest monitoring in accordance with modified study plan to incorporate the USFWS Draft ECP guidance.

the birds flying to or from the east where the Project Area lies. The birds using the nest did not appear to be using the Project Area based on these observations.

Due to limited visibility from the observation points and site access constraints at each of the nest locations, BHE biologists were unable to determine the productivity status of any of the observed Bald Eagle nests in the 2012 survey period. One more observation period of the nests is scheduled for July, and should BHE be able to identify the productivity status of the nests, BHE will report the results. Should USFWS and/or ODNR know the productivity status of these nests in 2012, BHE and Nordex request they be provided the productivity status and number of fledglings documented in order to incorporate those items in to the overall risk assessment for the Republic Wind Farm.

4.0 EAGLE POINT COUNT SURVEY AND RESULTS

Using GIS, a random or random-systematic approach was used to distribute twenty points (Figure 2) across the Project Area (approximately one plot per 3.0 square miles) such that suitable habitat was represented in proportion to their extent within the Project Area. Points in the field were marked using a GPS. Points were separated by at least 1,600 meters (m) to avoid overlap among the 800-m radius plots that are centered on the points. When the plots were established, existing natural or man-made landmarks at the perimeter of the 800-m plot were noted to assist observers with distance estimates, where available.

Using best professional judgment, the BHE biologist moved plots from the GIS random-generated point locations up to 800 m to maximize visibility within the plots, to align with access to sites, and to assure all habitats are appropriately represented. After establishment of the plots in the field, Republic sent the map to the USFWS and the ODNR for concurrence of the final plot locations. Points were moved at the request of the USFWS to be more representative of all habitats and compass directions within the RWF project boundary.

Surveys were completed under all weather conditions unless visibility approached 0 (blinding snow or fog) or where visibility was less than 800 m horizontally and 200 m vertically. Surveys

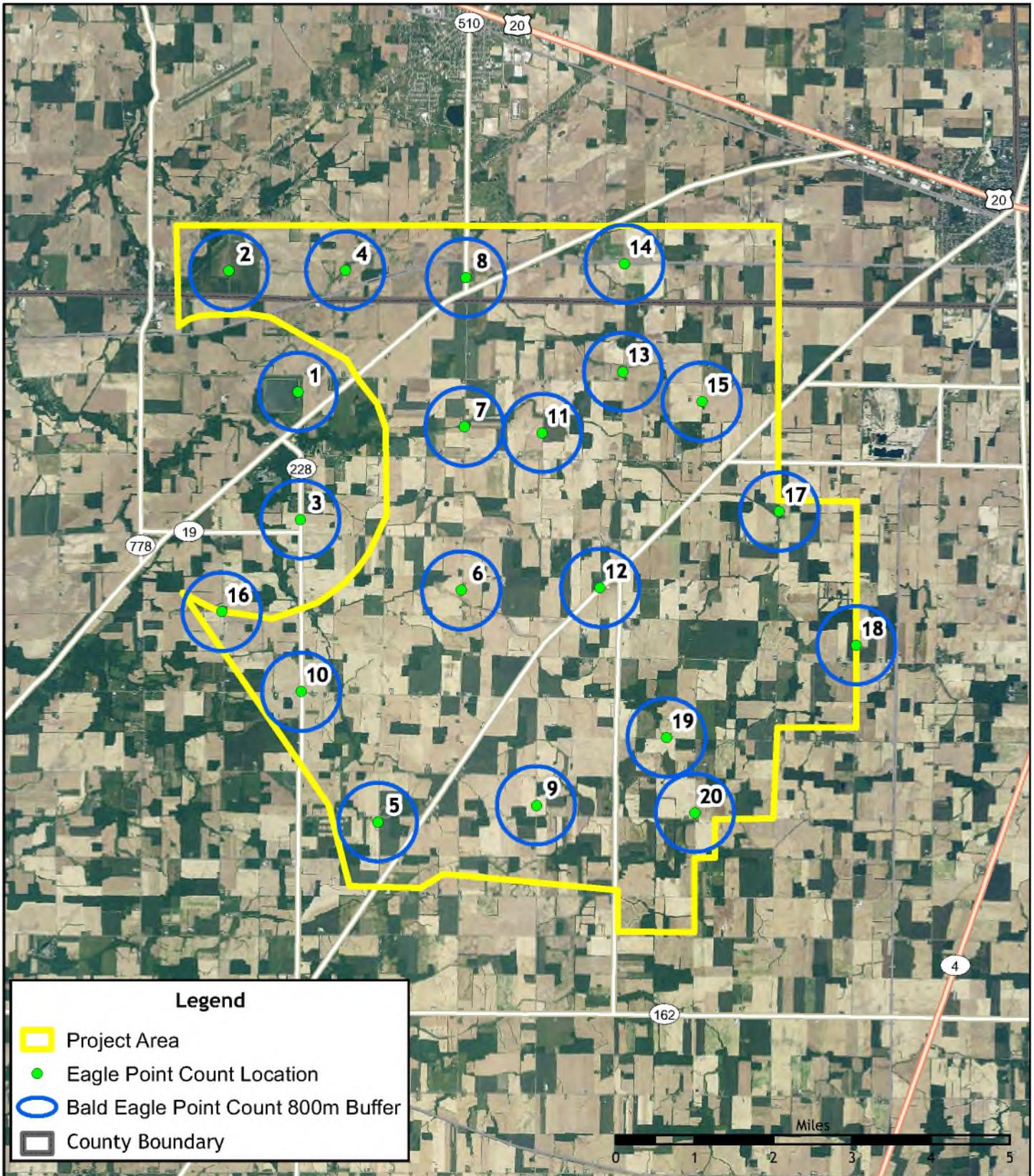


Figure 2. Random Bald Eagle Point Count Locations and 800m buffer

	Republic Wind, LLC Project Area, Seneca and Sandusky Counties, Ohio.	Project No. 1953.001.002	
	Basemap: NAIP Imagery - Seneca and Sandusky Counties, OH (2010)	July 2012	

were conducted during daylight hours and employed a temporally stratified sampling approach. Survey start times varied throughout the course of the study, such that each point was surveyed during a range of daylight hours.

During each survey visit, an observer remained at each point for 20 minutes. The observer recorded the total number of minutes, if any, of eagle flight activity within 800 m. The total 20-minute sample interval was divided into 1-minute intervals during which the observer noted the number of birds in flight within the plot in each interval (such that one eagle in flight in the observation area in a given minute = 1 exposure minute; two eagles in flight in the observation area in a given minute [or the same eagle in flight continuing into a second minute interval] = 2 exposure minutes). One exposure minute was assigned to an eagle perched within a plot during the entire 20-minute survey, but perched birds will be noted as such so perching can be taken into account in the analyses. Incidental observations of eagles outside of survey plots were also recorded, but not included in statistical analysis.

Field data forms included a large circle representing the point count observation area on which the observer can record approximate flight paths and heights of eagles plus ancillary notes on general behavior and activity. Behavior prevalent during each 1-minute interval was recorded as soaring flight (circling broadly with wings outstretched), flapping-gliding, kiting-hovering, stooping or diving at prey, stooping or diving, being mobbed, undulating/territorial flight, or perched.

The age of each eagle was categorized as juvenile (recently fledged or fledged the previous year), subadult, adult, or unknown. An eagle's above-ground height was estimated in 50 m increments for each 1-minute interval record, using broad categories relevant to the height of the rotor-swept zone and other risk-specific considerations. Standard weather data was recorded at each point, i.e., temperature, wind speed, wind direction, precipitation, and cloud cover. In addition, incidental observations of other large birds of conservation interest (raptors, sandhill cranes, and waterfowl) were recorded during the course of this study, however, they are not included in this report.

The point count surveys were conducted from August 2011 through July 2012, with each established point surveyed two times per month.

Results

BHE biologists observed Bald Eagle activity on two occasions within the study area on November 9, 2011 and March 13, 2012 at point count location 19. A total of seven minutes of Bald Eagle exposure was documented with 1 minute on November 9, 2011 and six minutes on March 13, 2012 at heights ranging from 1 to 50 m above ground surface. During each observation period, an adult Bald Eagle was observed in direct flight either flapping or gliding through the point count location and 800-m buffer area (Appendix A).

A total of 9,220 minutes of observation were conducted by BHE biologists. Of the 9,220 minutes, a total of 7 minutes contained Bald Eagle observations. Based on these results, the overall mean Bald Eagle exposure rate (ER) as defined in the USFWS ECP, can be calculated as the number of Bald Eagle observations per minute (7) divided by the total number survey minutes (9,220) across all of the point count locations over the entire survey period. Therefore, the mean Bald Eagle ER for the RWF Project Area was found to be 0.00076. This means that on average, one Bald Eagle was observed during every 1,317 minutes (21 hours and 54 minutes) of survey time across the entire Project Area.

Of the observed 20 point count locations, only one (Point Count Location 19) had any eagle observations documented during the entire survey period. Therefore, 19 of the 20 point count locations exhibited an eagle exposure rate of zero (0). The eagle exposure for point count location 19 can be calculated by dividing the number of Bald Eagle Observation minutes (7) by the total number of survey minutes at Point Count Location 19, which was 460 minutes. Therefore, the eagle exposure rate at Point Count Location 19 can be determined as 0.01521 (approximately 0.015) over the entire survey period. Of the seven eagle minutes observed, none of them were within the assumed rotor swept zone (40 to 120 m) of the proposed wind turbines for the RWF Project Area.

BHE and Nordex's intent is to provide this eagle exposure rate for the entire survey period and Point Count Location 19, in order to assist the USFWS in determining the preliminary collision probability (risk) and annual fatality rate of the proposed Republic Wind Farm based on the results of this survey effort.

5.0 BALD EAGLE OBSERVATIONS DURING DIURNAL BIRD/RAPTOR MIGRATION

During the course of the spring and fall diurnal bird/raptor migration surveys, results were detailed and reported to Nordex in the BHE report, *Results of the Diurnal Bird/Raptor Migration Survey, Republic Wind Farm, Seneca and Sandusky Counties, Ohio*, dated December 2011.

Results

A total of four Bald Eagles were observed during the point counts for a total of 7 minutes of eagle exposure, all during the spring migration period (Table 3).

Three of the observations occurred in the northwestern portion of the Project Area and each of these observations were of a juvenile bird flying between 40 and 180 m above the ground. A single observation of an adult bird occurred in the southern portion of the Project Area flying between 40 and 180 m above the ground.

A total of 17,640 minutes of observation were conducted by BHE biologists during the diurnal bird/raptor migration. Of the 17,640 minutes of observation, a total of 7 minutes contained Bald Eagle observations.

Based on these results, the overall mean Bald Eagle ER as defined in the USFWS ECP, can be calculated as the number of Bald Eagle observations per minute (7) divided by the total number survey minutes (17,640) across all of the diurnal bird/raptor observation points over the entire survey period. Therefore, the mean Bald Eagle ER for the RWF Project Area during the diurnal bird/raptor migration period was found to be 0.00039. This means that on average, one Bald Eagle was observed during every 2,520 minutes (42 hours) of survey time during the diurnal bird/raptor migration survey.

Table 3. Bald Eagles Observed During the Diurnal Bird/Raptor Migration.

Date	Species	#	Time	Age	Observation Height	Estimated time within rooster area
3/22/2011	Bald Eagle	1	2:46 PM	3 yrs	40 - 180 m	2 min
4/15/2011	Bald Eagle	1	12:01 PM	Adult	2	2 min
4/20/2011	Bald Eagle	1	2:21 PM	3 yrs	40 - 180 m	1 min
4/21/2011	Bald Eagle	1	12:47 PM	3 yrs	40 - 180 m	2 min

APPENDIX A

Bald Eagle Point Count Data

BAEA Point Count Data

Point Count Location	Survey Date	Time Duration	Minutes of Exposure	Age	Height	Behavior	Temp (Celsius)	Precipitation	Wind		Cloud Cover (%)
									Speed (mph)	Direction	
1	8/28/2011	0:20	0	-	-	-	30	N/A	0	N/A	0
2	8/28/2011	0:20	0	-	-	-	22	N/A	0	N/A	0
3	8/28/2011	0:20	0	-	-	-	30	N/A	0	N/A	0
4	8/28/2011	0:20	0	-	-	-	22	N/A	0	N/A	0
5	8/28/2011	0:20	0	-	-	-	29	N/A	0	N/A	0
6	8/28/2011	0:20	0	-	-	-	30	N/A	0	N/A	0
7	8/28/2011	0:20	0	-	-	-	23	N/A	0	N/A	0
8	8/28/2011	0:20	0	-	-	-	23	N/A	0	N/A	0
9	8/28/2011	0:20	0	-	-	-	28	N/A	0	N/A	0
10	8/28/2011	0:20	0	-	-	-	30	N/A	0	N/A	0
11	8/28/2011	0:20	0	-	-	-	24	N/A	0	N/A	0
12	8/28/2011	0:20	0	-	-	-	29	N/A	0	N/A	0
13	8/28/2011	0:20	0	-	-	-	25	N/A	0	N/A	0
14	8/28/2011	0:20	0	-	-	-	26	N/A	0	N/A	0
15	8/28/2011	0:20	0	-	-	-	25	N/A	0	N/A	0
16	8/28/2011	0:20	0	-	-	-	26	N/A	0	N/A	0
17	8/28/2011	0:20	0	-	-	-	26	N/A	0	N/A	0
18	8/28/2011	0:20	0	-	-	-	27	N/A	0	N/A	0
19	8/28/2011	0:20	0	-	-	-	27	N/A	0	N/A	0
20	8/28/2011	0:20	0	-	-	-	28	N/A	0	N/A	0
1	8/31/2011	0:20	0	-	-	-	19	N/A	0	N/A	0
2	8/31/2011	0:20	0	-	-	-	18	N/A	0	N/A	0
3	8/31/2011	0:20	0	-	-	-	19	N/A	0	N/A	0
4	8/31/2011	0:20	0	-	-	-	18	N/A	0	N/A	0
5	8/31/2011	0:20	0	-	-	-	22	N/A	0	N/A	0
6	8/31/2011	0:20	0	-	-	-	26	N/A	0	N/A	0
7	8/31/2011	0:20	0	-	-	-	27	N/A	0	N/A	0
8	8/31/2011	0:20	0	-	-	-	17	N/A	0	N/A	0
9	8/31/2011	0:20	0	-	-	-	23	N/A	0	N/A	0
10	8/31/2011	0:20	0	-	-	-	21	N/A	0	N/A	0
11	8/31/2011	0:20	0	-	-	-	27	N/A	0	N/A	0
12	8/31/2011	0:20	0	-	-	-	26	N/A	0	N/A	0
13	8/31/2011	0:20	0	-	-	-	28	N/A	0	N/A	0
14	8/31/2011	0:20	0	-	-	-	17	N/A	0	N/A	0
15	8/31/2011	0:20	0	-	-	-	28	N/A	0	N/A	0
16	8/31/2011	0:20	0	-	-	-	21	N/A	0	N/A	0
17	8/31/2011	0:20	0	-	-	-	25	N/A	0	N/A	0
18	8/31/2011	0:20	0	-	-	-	25	N/A	0	N/A	0
19	8/31/2011	0:20	0	-	-	-	25	N/A	0	N/A	0
20	8/31/2011	0:20	0	-	-	-	23	N/A	0	N/A	0
1	9/15/2011	0:20	0	-	-	-	12	N/A	7	north	40
2	9/15/2011	0:20	0	-	-	-	14	N/A	2	north	40

BAEA Point Count Data

Point Count Location	Survey Date	Time Duration	Minutes of Exposure	Age	Height	Behavior	Temp (Celsius)	Precipitation	Wind		Cloud Cover (%)
									Speed (mph)	Direction	
3	9/15/2011	0:20	0	-	-	-	12	N/A	7	north	45
4	9/15/2011	0:20	0	-	-	-	14	N/A	7	north	30
5	9/15/2011	0:20	0	-	-	-	11	N/A	5	N/A	10
6	9/15/2011	0:20	0	-	-	-	24	N/A	0	N/A	10
7	9/15/2011	0:20	0	-	-	-	23	0	2	Northwest	10
8	9/15/2011	0:20	0	-	-	-	18	0	2	West/Northwest	35
9	9/15/2011	0:20	0	-	-	-	11	0	2	North/Northwest	10
10	9/15/2011	0:20	0	-	-	-	12	0	2	Northwest	15
11	9/15/2011	0:20	0	-	-	-	24	0	0	N/A	10
12	9/15/2011	0:20	0	-	-	-	23	0	7	Northwest	10
13	9/15/2011	0:20	0	-	-	-	19	0	7	North/Northwest	30
14	9/15/2011	0:20	0	-	-	-	19	0	2	North/Northwest	40
15	9/15/2011	0:20	0	-	-	-	21	0	7	Northwest	20
16	9/15/2011	0:20	0	-	-	-	12	0	2	Northwest	45
17	9/15/2011	0:20	0	-	-	-	22	0	2	Northwest	15
18	9/15/2011	0:20	0	-	-	-	23	0	2	Northwest	10
19	9/15/2011	0:20	0	-	-	-	10	0	2	North	10
20	9/15/2011	0:20	0	-	-	-	10	0	2	North	10
1	9/22/2011	0:20	0	-	-	-	19	0	0	N/A	70
2	9/22/2011	0:20	0	-	-	-	19	0	0	N/A	95
3	9/22/2011	0:20	0	-	-	-	17	0	0	N/A	70
4	9/22/2011	0:20	0	-	-	-	19	0	0	N/A	100
5	9/22/2011	0:20	0	-	-	-	14	0	0	N/A	30
6	9/22/2011	0:20	0	-	-	-	23	0	0	N/A	50
7	9/22/2011	0:20	0	-	-	-	22	0	0	N/A	70
8	9/22/2011	0:20	0	-	-	-	20	0	0	N/A	95
9	9/22/2011	0:20	0	-	-	-	14	0	0	N/A	50
10	9/22/2011	0:20	0	-	-	-	15	0	0	N/A	70

BAEA Point Count Data

Point Count Location	Survey Date	Time Duration	Minutes of Exposure	Age	Height	Behavior	Temp (Celsius)	Precipitation	Wind		Cloud Cover (%)
									Speed (mph)	Direction	
11	9/22/2011	0:20	0	-	-	-	22	0	0	N/A	95
12	9/22/2011	0:20	0	-	-	-	22	0	0	N/A	90
13	9/22/2011	0:20	0	-	-	-	21	0	0	N/A	85
14	9/22/2011	0:20	0	-	-	-	21	0	0	N/A	95
15	9/22/2011	0:20	0	-	-	-	21	0	0	N/A	75
16	9/22/2011	0:20	0	-	-	-	16	0	0	N/A	60
17	9/22/2011	0:20	0	-	-	-	22	0	0	N/A	90
18	9/22/2011	0:20	0	-	-	-	12	0	0	N/A	5
19	9/22/2011	0:20	0	-	-	-	13	0	0	N/A	40
20	9/22/2011	0:20	0	-	-	-	13	0	0	N/A	30
<hr/>											
1	10/13/2011	0:20	0	-	-	-	11	0	1 to 3	East	99
2	10/13/2011	0:20	0	-	-	-	10	0	0	N/A	85
3	10/13/2011	0:20	0	-	-	-	17	0	1 to 3	Southeast	75
4	10/13/2011	0:20	0	-	-	-	7	0	0	N/A	90
5	10/13/2011	0:20	0	-	-	-	18	0	1 to 3	South/Southeast	85
6	10/13/2011	0:20	0	-	-	-	17	0	1 to 3	Southeast	70
7	10/13/2011	0:20	0	-	-	-	12	0	0	N/A	90
8	10/13/2011	0:20	0	-	-	-	9	0	0	N/A	85
9	10/13/2011	0:20	0	-	-	-	17	0	0	N/A	80
10	10/13/2011	0:20	0	-	-	-	18	0	0	N/A	85
11	10/13/2011	0:20	0	-	-	-	12	0	1 to 3	Southeast	75
12	10/13/2011	0:20	0	-	-	-	13	0	0	N/A	80
13	10/13/2011	0:20	0	-	-	-	9	0	0	N/A	90
14	10/13/2011	0:20	0	-	-	-	9	0	0	N/A	90
15	10/13/2011	0:20	0	-	-	-	9	0	1 to 3	East	95
16	10/13/2011	0:20	0	-	-	-	17	0	0	N/A	80
17	10/13/2011	0:20	0	-	-	-	12	0	1 to 3	Southeast	80
18	10/13/2011	0:20	0	-	-	-	14	0	0	N/A	80
19	10/13/2011	0:20	0	-	-	-	14	0	1 to 3	South/Southeast	80
20	10/13/2011	0:20	0	-	-	-	15	0	0	N/A	80
<hr/>											
1	10/26/2011	0:20	0	-	-	-	17	0	7	Southwest	90
2	10/26/2011	0:20	0	-	-	-	18	0	5	Southwest	80
3	10/26/2011	0:20	0	-	-	-	11	0	2	North	100
4	10/26/2011	0:20	0	-	-	-	21	0	5	Southwest	100
5	10/26/2011	0:20	0	-	-	-	12	0	5	East/Northeast	100
6	10/26/2011	0:20	0	-	-	-	11	0	5	East	100
7	10/26/2011	0:20	0	-	-	-	17	0	2	South/Southwest	95
8	10/26/2011	0:20	0	-	-	-	21	0	5	Southwest	100
9	10/26/2011	0:20	0	-	-	-	11	0	2	Northeast	100
10	10/26/2011	0:20	0	-	-	-	11	0	5	East	100
11	10/26/2011	0:20	0	-	-	-	16	0	0	N/A	90
12	10/26/2011	0:20	0	-	-	-	12	0	2	Southeast	100

BAEA Point Count Data

Point Count Location	Survey Date	Time Duration	Minutes of Exposure	Age	Height	Behavior	Temp (Celsius)	Precipitation	Wind		Cloud Cover (%)
									Speed (mph)	Direction	
13	10/26/2011	0:20	0	-	-	-	12	0	5	East	55
14	10/26/2011	0:20	0	-	-	-	14	0	5	Southwest	45
15	10/26/2011	0:20	0	-	-	-	13	0	5	South	100
16	10/26/2011	0:20	0	-	-	-	11	0	7	North	100
17	10/26/2011	0:20	0	-	-	-	10	0	0	N/A	100
18	10/26/2011	0:20	0	-	-	-	10	0	2	Northeast	100
19	10/26/2011	0:20	0	-	-	-	11	0	5	North	100
20	10/26/2011	0:20	0	-	-	-	10	0	5	Northeast	100
1	11/9/2011	0:20	0	-	-	-	5	0	2	Southeast	55
2	11/9/2011	0:20	0	-	-	-	5	0	2	Southeast	60
3	11/9/2011	0:20	0	-	-	-	6	0	0	N/A	70
4	11/9/2011	0:20	0	-	-	-	5	0	0	N/A	65
5	11/9/2011	0:20	0	-	-	-	6	0	5	South	70
6	11/9/2011	0:20	0	-	-	-	8	0	2	South/Southwest	80
7	11/9/2011	0:20	0	-	-	-	8	0	2	Southwest	85
8	11/9/2011	0:20	0	-	-	-	9	0	2	South/Southwest	90
9	11/9/2011	0:20	0	-	-	-	6	0	0	N/A	60
10	11/9/2011	0:20	0	-	-	-	6	2	0	South	85
11	11/9/2011	0:20	0	-	-	-	9	0	2	Southwest	95
12	11/9/2011	0:20	0	-	-	-	7	0	2	South	75
13	11/9/2011	0:20	0	-	-	-	9	0	2	South/Southwest	95
14	11/9/2011	0:20	0	-	-	-	11	0	5	Southwest	80
15	11/9/2011	0:20	0	-	-	-	10	0	2	Southwest	85
16	11/9/2011	0:20	0	-	-	-	5	0	0	N/A	80
17	11/9/2011	0:20	0	-	-	-	7	0	2	South/Southwest	75
18	11/9/2011	0:20	0	-	-	-	6	0	2	South/Southwest	60
19	11/9/2011	0:20	1	Adult	1 - 25 m	Flapping/Gliding; north out of woodlot and across the field	7	0	2	South/Southwest	45
20	11/9/2011	0:20	0	-	-	-	7	0	0	N/A	50
1	11/27/2011	0:20	0	-	-	-	12	0	0	N/A	0
2	11/27/2011	0:20	0	-	-	-	12	0	1 to 3	South/Southwest	0
3	11/27/2011	0:20	-	-	-	-	12	0	0	N/A	0
4	11/27/2011	0:20	0	-	-	-	13	0	4 to 7	Southwest	0
5	11/27/2011	0:20	0	-	-	-	6	0	3	South	5
6	11/27/2011	0:20	0	-	-	-	12	0	0	N/A	0
7	11/27/2011	0:20	0	-	-	-	13	0	1 to 3	Southwest	0
8	11/27/2011	0:20	0	-	-	-	14	0	0	N/A	0
9	11/27/2011	0:20	0	-	-	-	7	0	0	N/A	5
10	11/27/2011	0:20	0	-	-	-	6	0	1 to 3	South	5
11	11/27/2011	0:20	0	-	-	-	15	0	0	N/A	0
12	11/27/2011	0:20	0	-	-	-	11	0	4 to 7	South/Southeast	0
13	11/27/2011	0:20	0	-	-	-	11	0	4 to 7	South	0

BAEA Point Count Data

Point Count Location	Survey Date	Time Duration	Minutes of Exposure	Age	Height	Behavior	Temp (Celsius)	Precipitation	Wind Speed (mph)	Wind Direction	Cloud Cover (%)
14	11/27/2011	0:20	0	-	-	-	14	0	1 to 3	Southwest	0
15	11/27/2011	0:20	0	-	-	-	10	0	0	N/A	0
16	11/27/2011	0:20	0	-	-	-	12	0	0	N/A	0
17	11/27/2011	0:20	0	-	-	-	9	0	1 to 3	South	0
18	11/27/2011	0:20	0	-	-	-	9	0	0	N/A	0
19	11/27/2011	0:20	0	-	-	-	8	0	0	N/A	0
20	11/27/2011	0:20	0	-	-	-	7	0	0	N/A	0
1	12/15/2011	0:20	0	-	-	-	9	0	5	West/Northwest	25
2	12/15/2011	0:20	0	-	-	-	9	0	0	N/A	25
3	12/15/2011	0:20	0	-	-	-	10	0	0	N/A	20
4	12/15/2011	0:20	0	-	-	-	8	0	0	N/A	30
5	12/15/2011	0:20	0	-	-	-	10	0	0	N/A	10
6	12/15/2011	0:20	0	-	-	-	15	0	0	N/A	0
7	12/15/2011	0:20	0	-	-	-	15	0	0	N/A	0
8	12/15/2011	0:20	0	-	-	-	8	0	<1	West	30
9	12/15/2011	0:20	0	-	-	-	11	0	0	N/A	10
10	12/15/2011	0:20	0	-	-	-	9	0	0	N/A	25
11	12/15/2011	0:20	0	-	-	-	14	0	0	N/A	0
12	12/15/2011	0:20	0	-	-	-	16	0	0	N/A	0
13	12/15/2011	0:20	0	-	-	-	14	0	0	N/A	0
14	12/15/2011	0:20	0	-	-	-	14	0	0	N/A	0
15	12/15/2011	0:20	0	-	-	-	13	0	0	N/A	0
16	12/15/2011	0:20	0	-	-	-	10	0	0	N/A	20
17	12/15/2011	0:20	0	-	-	-	12	0	0	N/A	0
18	12/15/2011	0:20	0	-	-	-	12	0	0	N/A	0
19	12/15/2011	0:20	0	-	-	-	11	0	2	N/A	10
20	12/15/2011	0:20	0	-	-	-	11	0	0	N/A	10
1	1/6/2012	0:20	0	-	-	-	7	0	0	N/A	0
2	1/6/2012	0:20	0	-	-	-	9	0	1 to 3	Southwest	0
3	1/6/2012	0:20	0	-	-	-	9	0	1 to 3	Southwest	0
4	1/6/2012	0:20	0	-	-	-	10	0	1 to 3	South	0
5	1/6/2012	0:20	0	-	-	-	6	0	4 to 7	Southwest	5
6	1/6/2012	0:20	0	-	-	-	9	0	0	N/A	0
7	1/6/2012	0:20	0	-	-	-	8	0	0	N/A	0
8	1/6/2012	0:20	0	-	-	-	10	0	1 to 3	Southwest	0
9	1/6/2012	0:20	0	-	-	-	5	0	0	N/A	5
10	1/6/2012	0:20	0	-	-	-	6	0	4 to 7	Southwest	0
11	1/6/2012	0:20	0	-	-	-	9	0	0	N/A	0
12	1/6/2012	0:20	0	-	-	-	9	0	1 to 3	South	0
13	1/6/2012	0:20	0	-	-	-	9	0	4 to 7	South	0
14	1/6/2012	0:20	0	-	-	-	9	0	1 to 3	Southwest	0
15	1/6/2012	0:20	0	-	-	-	8	0	1 to 3	South	0

BAEA Point Count Data

Point Count Location	Survey Date	Time Duration	Minutes of Exposure	Age	Height	Behavior	Temp (Celsius)	Precipitation	Wind		Cloud Cover (%)
									Speed (mph)	Direction	
16	1/6/2012	0:20	0	-	-	-	7	0	1 to 3	Southeast	0
17	1/6/2012	0:20	0	-	-	-	8	0	1 to 3	Southeast	0
18	1/6/2012	0:20	0	-	-	-	8	0	4 to 7	South/Southeast	0
19	1/6/2012	0:20	0	-	-	-	5	0	1 to 3	South/Southeast	10
20	1/6/2012	0:20	0	-	-	-	4	0	4 to 7	South/Southeast	5
1	1/18/2012	0:20	0	-	-	-	-4	0	4 to 7	North	95
2	1/18/2012	0:20	0	-	-	-	-7	0	8 to 12	North	95
3	1/18/2012	0:20	0	-	-	-	-3	0	1 to 3	North	95
4	1/18/2012	0:20	0	-	-	-	-6	0	8 to 12	North	95
5	1/18/2012	0:20	0	-	-	-	-3	0	1 to 3	North	95
6	1/18/2012	0:20	0	-	-	-	-2	0	1 to 3	North/Northeast	95
7	1/18/2012	0:20	0	-	-	-	-4	0	1 to 3	North	95
8	1/18/2012	0:20	0	-	-	-	-5	0	4 to 7	North	95
9	1/18/2012	0:20	0	-	-	-	-2	0	1 to 3	North	95
10	1/18/2012	0:20	0	-	-	-	-3	0	4 to 7	North	95

BAAE Point Count Data

Point Count Location	Survey Date	Time Duration	Minutes of Exposure	Age	Height	Behavior	Temp (Celsius)	Precipitation	Wind		Cloud Cover (%)
									Speed (mph)	Direction	
11	1/18/2012	0:20	0	-	-	-	-4	0	4 to 7	North	95
12	1/18/2012	0:20	0	-	-	-	-2	0	4 to 7	North	95
13	1/18/2012	0:20	0	-	-	-	1	0	8 to 12	North/Northeast	95
14	1/18/2012	0:20	0	-	-	-	-4	0	8 to 12	North	95
15	1/18/2012	0:20	0	-	-	-	1	0	8 to 12	North/Northeast	95
16	1/18/2012	0:20	0	-	-	-	-3	0	4 to 7	North	95
17	1/18/2012	0:20	0	-	-	-	0	0	4 to 7	North	95
18	1/18/2012	0:20	0	-	-	-	-1	0	4 to 7	North/Northeast	95
19	1/18/2012	0:20	0	-	-	-	-2	0	4 to 7	North	95
20	1/18/2012	0:20	0	-	-	-	-1	0	4 to 7	North/Northeast	95
1	2/1/2012	0:20	0	-	-	-	4	0	0	N/A	35
2	2/1/2012	0:20	0	-	-	-	5	0	0	N/A	30
3	2/1/2012	0:20	0	-	-	-	4	0	0	N/A	40
4	2/1/2012	0:20	0	-	-	-	4	0	0	N/A	30
5	2/1/2012	0:20	0	-	-	-	3	0	0	N/A	85
6	2/1/2012	0:20	0	-	-	-	3	0	0	N/A	45
7	2/1/2012	0:20	0	-	-	-	5	0	0	N/A	35
8	2/1/2012	0:20	0	-	-	-	4	0	0	N/A	25
9	2/1/2012	0:20	0	-	-	-	3	0	0	N/A	95
10	2/1/2012	0:20	0	-	-	-	4	0	0	N/A	50
11	2/1/2012	0:20	0	-	-	-	4	0	0	N/A	40
12	2/1/2012	0:20	0	-	-	-	3	0	0	N/A	50
13	2/1/2012	0:20	0	-	-	-	1	0	4 to 7	West	95
14	2/1/2012	0:20	0	-	-	-	2	0	4 to 7	West	90
15	2/1/2012	0:20	0	-	-	-	2	0	0	N/A	90
16	2/1/2012	0:20	0	-	-	-	3	0	0	N/A	45
17	2/1/2012	0:20	0	-	-	-	3	0	0	N/A	95
18	2/1/2012	0:20	0	-	-	-	3	0	5	West	85
19	2/1/2012	0:20	0	-	-	-	3	0	0	N/A	90
20	2/1/2012	0:20	0	-	-	-	3	0	0	N/A	95
1	2/15/2012	0:20	0	-	-	-	4	0	0	N/A	100
2	2/15/2012	0:20	0	-	-	-	4	0	0	N/A	100
3	2/15/2012	0:20	0	-	-	-	4	0	0	N/A	100
4	2/15/2012	0:20	0	-	-	-	4	0	1 to 3	West	100
5	2/15/2012	0:20	0	-	-	-	5	0	0	N/A	50
6	2/15/2012	0:20	0	-	-	-	5	0	0	N/A	40
7	2/15/2012	0:20	0	-	-	-	4	0	0	N/A	100
8	2/15/2012	0:20	0	-	-	-	3	0	0	N/A	100
9	2/15/2012	0:20	0	-	-	-	6	0	0	N/A	50
10	2/15/2012	0:20	0	-	-	-	5	0	0	N/A	60
11	2/15/2012	0:20	0	-	-	-	3	0	0	N/A	100
12	2/15/2012	0:20	0	-	-	-	6	0	0	N/A	45

BAEA Point Count Data

Point Count Location	Survey Date	Time Duration	Minutes of Exposure	Age	Height	Behavior	Temp (Celsius)	Precipitation	Wind		Cloud Cover (%)
									Speed (mph)	Direction	
13	2/15/2012	0:20	0	-	-	-	2	0	0	N/A	100
14	2/15/2012	0:20	0	-	-	-	3	0	0	N/A	100
15	2/15/2012	0:20	0	-	-	-	2	0	0	N/A	100
16	2/15/2012	0:20	0	-	-	-	4	0	0	N/A	100
17	2/15/2012	0:20	0	-	-	-	2	0	0	N/A	100
18	2/15/2012	0:20	0	-	-	-	4	Light Mist	0	N/A	100
19	2/15/2012	0:20	0	-	-	-	3	Light Mist	0	N/A	100
20	2/15/2012	0:20	0	-	-	-	4	Light Mist	0	N/A	100
1	3/2/2012	0:20	0	-	-	-	5	0	0	N/A	85
2	3/2/2012	0:20	0	-	-	-	6	0	0	N/A	70
3	3/2/2012	0:20	0	-	-	-	4	Light Drizzle	1 to 3	West	100
4	3/2/2012	0:20	0	-	-	-	6	0	0	N/A	50
5	3/2/2012	0:20	0	-	-	-	3	0	0	N/A	100
6	3/2/2012	0:20	0	-	-	-	6	0	1 to 3	West	100
7	3/2/2012	0:20	0	-	-	-	5	Light Rain	1 to 3	West/Northwest	100
8	3/2/2012	0:20	0	-	-	-	4	0	0	N/A	90
9	3/2/2012	0:20	0	-	-	-	2	0	0	N/A	100
10	3/2/2012	0:20	0	-	-	-	3	0	0	N/A	100
11	3/2/2012	0:20	0	-	-	-	5	Light Rain	4 to 7	West/Northwest	100
12	3/2/2012	0:20	0	-	-	-	1	0	0	N/A	100
13	3/2/2012	0:20	0	-	-	-	5	0	0	N/A	0
14	3/2/2012	0:20	0	-	-	-	6	0	0	N/a	20
15	3/2/2012	0:20	0	-	-	-	5	0	0	N/A	0
16	3/2/2012	0:20	0	-	-	-	4	Light Drizzle	0	N/A	100
17	3/2/2012	0:20	0	-	-	-	1	0	1 to 3	Northwest	95
18	3/2/2012	0:20	0	-	-	-	1	0	1 to 3	Northwest	100
19	3/2/2012	0:20	0	-	-	-	1	0	2	Northwest	95
20	3/2/2012	0:20	0	-	-	-	0	0	2	Northwest	95

BAEA Point Count Data

Point Count Location	Survey Date	Time Duration	Minutes of Exposure	Age	Height	Behavior	Temp (Celsius)	Precipitation	Wind Speed (mph)	Wind Direction	Cloud Cover (%)
1	3/13/2012	0:20	0	-	-	-	13	0	<1	South/Southwest	0
2	3/13/2012	0:20	0	-	-	-	13	0	1 to 3	South/Southwest	0
3	3/13/2012	0:20	0	-	-	-	13	0	4 to 7	South/Southwest	0
4	3/13/2012	0:20	0	-	-	-	13	0	1 to 3	South/Southwest	0
5	3/13/2012	0:20	0	-	-	-	11	0	0	N/A	0
6	3/13/2012	0:20	0	-	-	-	7	0	1 to 3	South/Southwest	0
7	3/13/2012	0:20	0	-	-	-	6	0	4 to 7	South/Southwest	0
8	3/13/2012	0:20	0	-	-	-	14	0	0	N/A	0
9	3/13/2012	0:20	0	-	-	-	10	0	0	N/A	0
10	3/13/2012	0:20	0	-	-	-	13	0	1 to 3	South	0
11	3/13/2012	0:20	0	-	-	-	5	0	1 to 3	Southwest	0
12	3/13/2012	0:20	0	-	-	-	7	0	0	N/A	0
13	3/13/2012	0:20	0	-	-	-	6	0	4 to 7	South/Southwest	0
14	3/13/2012	0:20	0	-	-	-	13	0	1 to 3	South/Southwest	0
15	3/13/2012	0:20	0	-	-	-	6	0	4 to 7	South/Southwest	0
16	3/13/2012	0:20	0	-	-	-	12	0	1 to 3	South/Southwest	0
17	3/13/2012	0:20	0	-	-	-	8	0	0	N/A	0
18	3/13/2012	0:20	0	-	-	-	8	0	0	N/A	0
19	3/13/2012	0:20	6	Adult	1 - 50 m	Flapping/Gliding	8	0	0	N/A	0
20	3/13/2012	0:20	0	-	-	-	9	0	0	N/A	0
1	4/3/2012	0:20	0	-	-	-	7	Rain	0	N/A	100
2	4/3/2012	0:20	0	-	-	-	7	Light Drizzle	1 to 3	Northwest	100
3	4/3/2012	0:20	0	-	-	-	8	0	0	N/A	80
4	4/3/2012	0:20	0	-	-	-	6	Light Drizzle	1 to 3	North	100
5	4/3/2012	0:20	0	-	-	-	10	0	1 to 3	Northwest	60
6	4/3/2012	0:20	0	-	-	-	7	0	1 to 3	Northeast	80
7	4/3/2012	0:20	0	-	-	-	7	0	1 to 3	Northeast	85
8	4/3/2012	0:20	0	-	-	-	7	izzle/Thunder	1 to 3	North	100
9	4/3/2012	0:20	0	-	-	-	10	0	0	N/A	50
10	4/3/2012	0:20	0	-	-	-	9	0	1 to 3	Northwest	50
11	4/3/2012	0:20	0	-	-	-	7	0	1 to 3	Northeast	90
12	4/3/2012	0:20	0	-	-	-	7	0	1 to 3	Northeast	80
13	4/3/2012	0:20	0	-	-	-	7	0	1 to 3	Northeast	90
14	4/3/2012	0:20	0	-	-	-	7	0	1 to 3	Northeast	100
15	4/3/2012	0:20	0	-	-	-	7	0	0	N/A	100
16	4/3/2012	0:20	0	-	-	-	8	0	1 to 3	Northwest	75
17	4/3/2012	0:20	0	-	-	-	11	0	0	N/A	40
18	4/3/2012	0:20	0	-	-	-	11	0	0	N/A	45
19	4/3/2012	0:20	0	-	-	-	11	0	0	N/A	50
20	4/3/2012	0:20	0	-	-	-	10	0	1 to 3	Northwest	50
TR80Pond	4/3/2012	0:20	0	-	-	-	7	0	1 to 3	Northeast	100
1	4/18/2012	0:20	0	-	-	-	14	0	1 to 3	Southwest	0

BAEA Point Count Data

Point Count Location	Survey Date	Time Duration	Minutes of Exposure	Age	Height	Behavior	Temp (Celsius)	Precipitation	Wind		Cloud Cover (%)
									Speed (mph)	Direction	
2	4/18/2012	0:20	0	-	-	-	14	0	0	N/A	0
3	4/18/2012	0:20	0	-	-	-	13	0	1 to 3	Southwest	0
4	4/18/2012	0:20	0	-	-	-	15	0	0	N/A	0
5	4/18/2012	0:20	0	-	-	-	12	0	4 to 7	Southwest	0
6	4/18/2012	0:20	0	-	-	-	4	0	4 to 7	Southwest	0
7	4/18/2012	0:20	0	-	-	-	4	0	4 to 7	Southwest	0
8	4/18/2012	0:20	0	-	-	-	16	0	0	N/A	0
9	4/18/2012	0:20	0	-	-	-	12	0	4 to 7	Southwest	0
10	4/18/2012	0:20	0	-	-	-	12	0	0	N/A	0
11	4/18/2012	0:20	0	-	-	-	5	0	4 to 7	Southwest	0
12	4/18/2012	0:20	0	-	-	-	12	0	4 to 7	Southwest	0
13	4/18/2012	0:20	0	-	-	-	6	0	4 to 7	Southwest	0
14	4/18/2012	0:20	0	-	-	-	7	0	4 to 7	Southwest	0
15	4/18/2012	0:20	0	-	-	-	8	0	1 to 3	Southwest	0
16	4/18/2012	0:20	0	-	-	-	13	0	1 to 3	Southwest	0
17	4/18/2012	0:20	0	-	-	-	8	0	1 to 3	Southwest	0
18	4/18/2012	0:20	0	-	-	-	9	0	4 to 7	Southwest	0
19	4/18/2012	0:20	0	-	-	-	11	0	0	N/A	0
20	4/18/2012	0:20	0	-	-	-	11	0	1 to 3	Southwest	0
1	5/3/2012	0:20	0	-	-	-	21	0	8 to 12	West/Southwest	20
2	5/3/2012	0:20	0	-	-	-	20	0	1 to 3	South/Southwest	15
3	5/3/2012	0:20	0	-	-	-	22	0	1 to 3	South/Southwest	20
4	5/3/2012	0:20	0	-	-	-	19	0	1 to 3	South/Southwest	10
5	5/3/2012	0:20	0	-	-	-	25	0	4 to 7	South/Southwest	40
6	5/3/2012	0:20	0	-	-	-	25	0	4 to 7	West/Southwest	45
7	5/3/2012	0:20	0	-	-	-	28	0	1 to 3	South/Southwest	50
8	5/3/2012	0:20	0	-	-	-	19	0	4 to 7	South	10
9	5/3/2012	0:20	0	-	-	-	26	0	1 to 3	South/Southwest	45
10	5/3/2012	0:20	0	-	-	-	24	0	1 to 3	Southwest	40

BAEA Point Count Data

Point Count Location	Survey Date	Time Duration	Minutes of Exposure	Age	Height	Behavior	Temp (Celsius)	Precipitation	Wind Speed (mph)	Wind Direction	Cloud Cover (%)
11	5/3/2012	0:20	0	-	-	-	28	0	1 to 3	South/Southwest	0
12	5/3/2012	0:20	0	-	-	-	29	0	1 to 3	Southwest	45
13	5/3/2012	0:20	0	-	-	-	18	0	1 to 3	South/Southwest	5
14	5/3/2012	0:20	0	-	-	-	18	0	4 to 7	South/Southwest	5
15	5/3/2012	0:20	0	-	-	-	17	0	1 to 3	South/Southwest	5
16	5/3/2012	0:20	0	-	-	-	24	0	1 to 3	Southwest	40
17	5/3/2012	0:20	0	-	-	-	29	0	1 to 3	South/Southwest	40
18	5/3/2012	0:20	0	-	-	-	28	0	4 to 7	South/Southwest	50
19	5/3/2012	0:20	0	-	-	-	26	0	1 to 3	Southwest	50
20	5/3/2012	0:20	0	-	-	-	26	0	1 to 3	Southwest	45
1	5/17/2012	0:20	0	-	-	-	18	0	0	N/A	0
2	5/17/2012	0:20	0	-	-	-	20	0	0	N/A	0
3	5/17/2012	0:20	0	-	-	-	16	0	1 to 3	East	0
4	5/17/2012	0:20	0	-	-	-	21	0	1 to 3	East/Southeast	0
5	5/17/2012	0:20	0	-	-	-	11	0	1 to 3	East	0
6	5/17/2012	0:20	0	-	-	-	23	0	0	N/A	0
7	5/17/2012	0:20	0	-	-	-	23	0	1 to 3	East	0
8	5/17/2012	0:20	0	-	-	-	22	0	0	N/A	0
9	5/17/2012	0:20	0	-	-	-	11	0	1 to 3	East	0
10	5/17/2012	0:20	0	-	-	-	12	0	0	N/A	0
11	5/17/2012	0:20	0	-	-	-	24	0	1 to 3	East/Southeast	0
12	5/17/2012	0:20	0	-	-	-	24	0	0	N/A	0
13	5/17/2012	0:20	0	-	-	-	24	0	1 to 3	East/Southeast	0
14	5/17/2012	0:20	0	-	-	-	22	0	0	N/A	0
15	5/17/2012	0:20	0	-	-	-	22	0	0	N/A	0
16	5/17/2012	0:20	0	-	-	-	14	0	0	N/A	0
17	5/17/2012	0:20	0	-	-	-	7	0	1 to 3	East/Northeast	0
18	5/17/2012	0:20	0	-	-	-	7	0	1 to 3	East/Northeast	0
19	5/17/2012	0:20	0	-	-	-	9	0	0	N/A	0
20	5/17/2012	0:20	0	-	-	-	8	0	0	N/A	0
1	6/10/2012	0:20	0	-	-	-	28	0	<1	South	0
2	6/10/2012	0:20	0	-	-	-	28	0	<1	South	0
3	6/10/2012	0:20	0	-	-	-	29	0	<1	South	0
4	6/10/2012	0:20	0	-	-	-	27	0	<1	South	0
5	6/10/2012	0:20	0	-	-	-	30	0	0	N/A	0
6	6/10/2012	0:20	0	-	-	-	33	0	<1	South	0
7	6/10/2012	0:20	0	-	-	-	22	0	<1	South	0
8	6/10/2012	0:20	0	-	-	-	26	0	<1	South	0
9	6/10/2012	0:20	0	-	-	-	31	0	0	N/A	0
10	6/10/2012	0:20	0	-	-	-	30	0	0	N/A	0
11	6/10/2012	0:20	0	-	-	-	22	0	<1	South	0
12	6/10/2012	0:20	0	-	-	-	33	0	<1	South	0

BAEA Point Count Data

Point Count Location	Survey Date	Time Duration	Minutes of Exposure	Age	Height	Behavior	Temp (Celsius)	Precipitation	Wind Speed (mph)	Wind Direction	Cloud Cover (%)
13	6/10/2012	0:20	0	-	-	-	23	0	< 1	South	0
14	6/10/2012	0:20	0	-	-	-	26	0	< 1	South	0
15	6/10/2012	0:20	0	-	-	-	24	0	< 1	South	0
16	6/10/2012	0:20	0	-	-	-	30	0	< 1	South	0
17	6/10/2012	0:20	0	-	-	-	33	0	< 1	South	10
18	6/10/2012	0:20	0	-	-	-	32	0	< 1	South	0
19	6/10/2012	0:20	0	-	-	-	31	0	< 1	South	0
20	6/10/2012	0:20	0	-	-	-	31	0	0	N/A	0
1	6/25/2012	0:20	0	-	-	-	21	0	0	N/A	0
2	6/25/2012	0:20	0	-	-	-	22	0	< 1	Northwest	5
3	6/25/2012	0:20	0	-	-	-	17	0	4 to 7	Northwest	0
4	6/25/2012	0:20	0	-	-	-	23	0	< 1	West/Northwest	5
5	6/25/2012	0:20	0	-	-	-	15	0	1 to 3	Northwest	0
6	6/25/2012	0:20	0	-	-	-	18	0	4 to 7	Northwest	5
7	6/25/2012	0:20	0	-	-	-	20	0	0	N/A	0
8	6/25/2012	0:20	0	-	-	-	23	0	1 to 3	Northwest	0
9	6/25/2012	0:20	0	-	-	-	14	0	1 to 3	Northwest	0
10	6/25/2012	0:20	0	-	-	-	15	0	< 1	North/Northwest	0
11	6/25/2012	0:20	0	-	-	-	19	0	0	N/A	0
12	6/25/2012	0:20	0	-	-	-	18	0	1 to 3	Northwest	10
13	6/25/2012	0:20	0	-	-	-	20	0	< 1	West/Northwest	15
14	6/25/2012	0:20	0	-	-	-	24	0	1 to 3	North/Northwest	0
15	6/25/2012	0:20	0	-	-	-	19	0	< 1	West/Northwest	15
16	6/25/2012	0:20	0	-	-	-	16	0	1 to 3	Northwest	0
17	6/25/2012	0:20	0	-	-	-	19	0	1 to 3	Northwest	5
18	6/25/2012	0:20	0	-	-	-	19	0	1 to 3	North/Northwest	10
19	6/25/2012	0:20	0	-	-	-	12	0	1 to 3	North/Northwest	0
20	6/25/2012	0:20	0	-	-	-	11	0	< 1	West/Northwest	0

BAEA Point Count Data

Point Count Location	Survey Date	Time Duration	Minutes of Exposure	Age	Height	Behavior	Temp (Celsius)	Precipitation	Wind Speed (mph)	Wind Direction	Cloud Cover (%)	
1	7/6/2012	0:20	0	-	-	-	33	0	<1	West	0	
2	7/6/2012	0:20	0	-	-	-	31	0	0	N/A	0	
3	7/6/2012	0:20	0	-	-	-	24	0	0	N/A	0	
4	7/6/2012	0:20	0	-	-	-	30	0	0	N/A	0	
5	7/6/2012	0:20	0	-	-	-	25	0	0	N/A	0	
6	7/6/2012	0:20	0	-	-	-	22	0	0	N/A	0	
7	7/6/2012	0:20	0	-	-	-	33	0	0	N/A	0	
8	7/6/2012	0:20	0	-	-	-	29	0	0	N/A	0	
9	7/6/2012	0:20	0	-	-	-	25	0	<1	West	0	
10	7/6/2012	0:20	0	-	-	-	24	0	0	N/A	0	
11	7/6/2012	0:20	0	-	-	-	34	0	0	N/A	0	
12	7/6/2012	0:20	0	-	-	-	21	0	<1	West	0	
13	7/6/2012	0:20	0	-	-	-	28	0	0	N/A	0	
14	7/6/2012	0:20	0	-	-	-						
15	7/6/2012	0:20	0	-	-	-	27	0	0	N/A	0	
16	7/6/2012	0:20	0	-	-	-	24	0	0	N/A	0	
17	7/6/2012	0:20	0	-	-	-	27	0	<1	West	0	
18	7/6/2012	0:20	0	-	-	-	26	0	0	N/A	0	
19	7/6/2012	0:20	0	-	-	-	25	0	0	N/A	0	
20	7/6/2012	0:20	0	-	-	-	26	0	0	N/A	0	
<hr/>												
1	7/27/2012	0:20	0	-	-	-	28	0	3 to 5	West	20	
2	7/27/2012	0:20	0	-	-	-	25	0	1 to 3	West/Northwest	0	
3	7/27/2012	0:20	0	-	-	-	28	0	<1	N/A	20	
4	7/27/2012	0:20	0	-	-	-	25	0	1 to 3	West/Northwest	0	
5	7/27/2012	0:20	0	-	-	-	31	0	1 to 3	West/Northwest	60	
6	7/27/2012	0:20	0	-	-	-	30	0	<1	N/A	30	
7	7/27/2012	0:20	0	-	-	-	28	0	1 to 3	West	20	
8	7/27/2012	0:20	0	-	-	-	25	0	<1	N/A	0	
9	7/27/2012	0:20	0	-	-	-	31	0	1 to 3	West	60	
10	7/27/2012	0:20	0	-	-	-	31	0	1 to 3	West/Northwest	60	
11	7/27/2012	0:20	0	-	-	-	28	0	<1	N/A	15	
12	7/27/2012	0:20	0	-	-	-	30	0	<1	N/A	30	
13	7/27/2012	0:20	0	-	-	-	27	0	<1	N/A	15	
14	7/27/2012	0:20	0	-	-	-	27	0	<1	N/A	0	
15	7/27/2012	0:20	0	-	-	-	27	0	1 to 3	West	0	
16	7/27/2012	0:20	0	-	-	-	29	0	1 to 3	West	20	
17	7/27/2012	0:20	0	-	-	-	30	0	1 to 3	West	30	
18	7/27/2012	0:20	0	-	-	-	30	0	1 to 3	West	40	
19	7/27/2012	0:20	0	-	-	-	31	0	<1	N/A	60	
20	7/27/2012	0:20	0	-	-	-	31	0	<1	N/A	60	
<hr/>												
Total:										6:09:40	days/hours/minutes	

BAEA Point Count Data

Point Count Location	Survey Date	Time Duration	Minutes of Exposure	Age	Height	Behavior	Temp (Celsius)	Precipitation	Wind		Cloud Cover (%)
									Speed (mph)	Direction	
		9220	minutes								
	Total:										

Exhibit N. Passerine Migration Survey



December 2011

**RESULTS OF THE
PASSERINE MIGRATION SURVEY
REPUBLIC WIND FARM
SENECA AND SANDUSKY COUNTIES, OHIO**

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- Figure 1. Passerine Migration Survey Locations for the Republic Wind Farm Project Area, Seneca and Sandusky counties, Ohio.

APPENDICES

- Appendix A. Passerine Migration Survey Observations.
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EXECUTIVE SUMMARY

BHE Environmental, Inc. (BHE) was contracted to complete diurnal passerine migration surveys following methods described in the *On-Shore Bird and Bat Pre- and Post-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio* issued by the Ohio Department of Natural Resources, Division of Wildlife. This report provides data and analysis of results of the passerine migration surveys conducted by BHE in spring (April 4 through May 30) and fall (August 18 through November 18) 2011. Surveys were conducted by BHE at the proposed Republic Wind Farm project in Seneca and Sandusky counties, Ohio.

A total of 98 species were identified during the migration surveys including the following state-listed species: state endangered northern harrier (*Circus cyaneus*) and yellow-bellied sapsucker (*Sphyrapicus varius*); state threatened dark-eyed junco (*Junco hyemalis*), hermit thrush (*Catharus guttatus*), and least flycatcher (*Empidonax minimus*); state species of special interest green-winged teal (*Anas crecca*), golden crowned kinglet (*Regulus satrapa*), red-breasted nuthatch (*Sitta Canadensis*), and winter wren (*Troglodytes troglodytes*); and state species of concern bobolink (*Dolichonyx oryzivorus*). No federally listed species were observed during passerine migration surveys.

The passerine use survey of the Project Area did not reveal use by an unusual number or assemblage of species; use by sensitive bird species was limited. Due to the limited size of woodlots, wetlands, open water, and potential stopover sites, and due to an availability of similar habitat in northwestern Ohio, the Project Area does not represent a unique resource for large numbers of passerines during migration. The data did not demonstrate a relationship between the passerine use of the Project Area and the passerine migration through Magee Marsh or the western basin of Lake Erie. The survey results did not demonstrate avian use patterns that would indicate it is an essential contributor to passerine migration in the region.

1.0 INTRODUCTION

Republic Wind Farm, LLC, a subsidiary of Nordex USA, Inc. (Nordex), proposes construction of the Republic Wind Farm (RWF or Project Area) wind energy generation facility in Seneca and Sandusky counties, Ohio. The Project Area spans approximately 39,627 acres (ac; 16,036 hectares [ha]) of leased agricultural land northeast of the town of Republic, Ohio (Figure 1). This area represents the maximum area considered for placement of turbines and facility infrastructure; the actual area occupied by the turbines and access roads that will comprise the facility will be less than 1 percent of the Project Area discussed in this document.

BHE Environmental, Inc. (BHE) was contracted by Nordex to conduct passerine migration surveys at the proposed RWF according to specifications outlined in the Ohio Department of Natural Resources (ODNR) *On-Shore Bird and Bat Pre- and Post-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio, An Addendum to the Ohio Department of Natural Resource's Voluntary Cooperative Agreement* ("Ohio Protocol"). The purpose of this report is to document the results of the survey.

Passerines appear to be especially vulnerable to collision with wind turbines, and in one synthesis, were found to represent 74 percent of all fatalities recorded in existing data sets (Strickland 2008). The same synthesis observed a variety of displacement effects, most of them small-scale: some facilities appeared to have little effect on passerine distribution, while others showed species-specific impacts (Strickland 2008). While passerines are the most susceptible group of bird species, the numbers of bird casualties are low (NWCC 2010). Passerines are known to congregate in large numbers along the southern shore of Lake Erie (ODNR DOW no date); ODNR often recommends passerine migration surveys to evaluate whether a particular wind energy project area is part of that known migration concentration, as was the case in this instance.

2.0 METHODS

2.1 PASSERINE MIGRATION SURVEY

In order to gauge the rate at which nocturnal migrating passerines could potentially come into conflict with wind turbines at RWF, BHE conducted weekly migration surveys during seasonally favorable weather for migration (northerly winds in fall, southerly winds in spring). The surveys were conducted at 11 points within the project area during spring and fall migration (Figure 1). Points were established near wooded areas that are utilized by migrating passerines to forage and replenish fat reserves. Surveys began at dawn and were completed by no later than 10:00 am EST (Eastern Standard Time), per the Protocol. Every bird seen or heard during a 10 minute period at each established survey point was identified to species. Distance from the observer, direction of travel, number of individuals present, and behavior was recorded if possible. Weather conditions, including ambient temperature, wind speed, and cloud cover were recorded. Bird migration surveys were completed in spring (April 4 through May 30) and fall (August 18 through November 18) 2011. The surveys were completed from 11 points chosen near potential suitable stopover habitat (forested and grassed areas) for migrating songbirds (Figure 1).

3.0 RESULTS

3.1 BIRD MIGRATION

The Project Area is heavily influenced by agricultural practices; 84.7 percent of the Project Area is devoted to intensive row crop agriculture production with occasional woodlots that comprise 7.6 percent of the Project Area (Table 1). The Project Area itself likely does not represent an important stopover resource for migrating birds as it is largely in agricultural (row crop) land use. A total of 15,525 birds were observed from 98 species during migration surveys (Table 2). Twenty-two percent of birds were observed during spring surveys (3,225 individuals from 84 species) and 78 percent were observed during fall surveys (12,300 individuals from 69 species; Table 2).

Table 1. National land use/land cover acreages in the Republic Wind, LLC Project Area, Seneca and Sandusky Counties Ohio.

Land Use	Acres	Percent
Cultivated Crops	33,571.5	84.7%
Deciduous Forest	3,012.7	7.6%
Developed, Open Space	2,101.0	5.3%
Hay/Pasture	425.0	1.1%
Herbaceous	209.96	0.5%
Developed, Low Intensity	136.6	0.3%
Open Water	116.1	0.3%
Woody Wetlands	32.0	0.1%
Emergent Herbaceous Wetlands	10.5	<0.1%
Developed, Medium Intensity	8.3	<0.1%
Evergreen Forest	3.2	<0.1%
Total	39,626.6	100.0%

Red-winged blackbirds (*Agelaius phoeniceus*) comprised over half (62 percent) of the birds observed. Red-winged blackbirds were observed at an average of 310.1 birds per day for a total of 9,612 birds. European starling (*Sturnus vulgaris*) was the second most common species encountered. Starlings were observed at an average of 34.3 birds per day for a total of 1,062 birds. Other large numbers of birds encountered were from common species including: American crow (*Corvus brachyrhynchos*; 514 birds, 16.6 birds/day), common grackle (*Quisacalus quiscula*; 510 birds, 16.5 birds/day), American robin (*Turdus migratorius*; 484 birds, 15.6 birds/day), tree swallow (*Tachycineta bicolor*; 450 birds, 14.5 birds/day), and blue jay (*Cyanocitta cristata*; 346 birds, 11.2 birds/day) (Table 1). Large flocks (>100) of birds were limited to red-winged blackbirds, European starlings, and tree swallows. Data collected during the spring and fall migration surveys can be found in Appendix A.

Table 2. Bird species observed during the Republic Wind Farm Passerine Migration Survey.

Common Name	Scientific Name	Observations			
		Spring	Autumn	Birds/Day [^]	Total
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	501	9,111	310.1	9,612
European Starling	<i>Sturnus vulgaris</i>	119	943	34.3	1,062
American Crow	<i>Corvus brachyrhynchos</i>	321	193	16.6	514
Common Grackle	<i>Quiscalus quiscula</i>	179	331	16.5	510
American Robin	<i>Turdus migratorius</i>	320	164	15.6	484
Tree Swallow	<i>Tachycineta bicolor</i>	0	450	14.5	450
Blue Jay	<i>Cyanocitta cristata</i>	117	229	11.2	346
Mourning Dove	<i>Zenaida macroura</i>	108	106	6.9	214
American Goldfinch	<i>Spinus tristis</i>	109	77	6.0	186
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>	115	69	5.9	184
House Sparrow	<i>Passer domesticus</i>	118	59	5.7	177
Tufted Titmouse	<i>Baeolophus bicolor</i>	111	38	4.8	149
Brown-headed Cowbird	<i>Molothrus ater</i>	86	32	3.8	118
Song Sparrow	<i>Melospiza melodia</i>	85	20	3.4	105
Northern Cardinal	<i>Cardinalis cardinalis</i>	67	34	3.3	101
Canada Goose	<i>Branta canadensis</i>	47	38	2.7	85
White-breasted Nuthatch	<i>Sitta carolinensis</i>	31	45	2.5	76
Chipping Sparrow	<i>Spizella passerina</i>	73	2	2.4	75
Northern Flicker	<i>Colaptes auratus</i>	48	19	2.2	67
Eastern Bluebird	<i>Sialia sialis</i>	17	48	2.1	65
Wood Thrush	<i>Hylocichla mustelina</i>	59	0	1.9	59
Baltimore Oriole	<i>Icterus galbula</i>	53	2	1.8	55
Black-capped Chickadee	<i>Poecile atricapillus</i>	33	17	1.6	50
Killdeer	<i>Charadrius vociferus</i>	35	13	1.5	48
Turkey Vulture	<i>Cathartes aura</i>	34	11	1.5	45
Downy Woodpecker	<i>Picoides pubescens</i>	26	18	1.4	44
Field Sparrow	<i>Spizella pusilla</i>	36	7	1.4	43
House Wren	<i>Troglodytes aedon</i>	36	6	1.4	42
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>	42	1	1.4	43
Cedar Waxwing	<i>Bombycilla cedrorum</i>	0	41	1.3	41
Horned Lark	<i>Eremophila alpestris</i>	28	12	1.3	40
Yellow-rumped Warbler	<i>Dendroica coronata</i>	26	14	1.3	40
Eastern Wood-Pewee	<i>Contopus virens</i>	23	14	1.2	37
Indigo Bunting	<i>Passerina cyanea</i>	27	10	1.2	37
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	15	18	1.1	33
Gray Catbird	<i>Dumetella carolinensis</i>	17	6	0.7	23

Table 2. Bird species observed during the Republic Wind Farm Passerine Migration Survey.

Common Name	Scientific Name	Observations			
		Spring	Autumn	Birds/Day [^]	Total
House Finch	<i>Carpodacus mexicanus</i>	3	19	0.7	22
Red-eyed Vireo	<i>Vireo olivaceus</i>	16	5	0.7	21
Dark-eyed Junco*	<i>Junco hyemalis</i>	9	7	0.5	16
Red-tailed Hawk	<i>Buteo jamaicensis</i>	4	10	0.5	14
Eastern Towhee	<i>Pipilo erythrophthalmus</i>	11	2	0.4	13
Great Crested Flycatcher	<i>Myiarchus crinitus</i>	13	0	0.4	13
Barn Swallow	<i>Hirundo rustica</i>	2	7	0.3	9
Chimney Swift	<i>Chaetura pelagica</i>	3	5	0.3	8
Rusty Blackbird	<i>Euphagus carolinus</i>	8	0	0.3	8
Tennessee Warbler	<i>Vermivora peregrina</i>	8	0	0.3	8
Warbling Vireo	<i>Vireo gilvus</i>	5	3	0.3	8
White-throated Sparrow	<i>Zonotrichia albicollis</i>	4	5	0.3	9
Brown Thrasher	<i>Toxostoma rufum</i>	7	0	0.2	7
Carolina Wren	<i>Thryothorus ludovicianus</i>	2	4	0.2	6
Hairy Woodpecker	<i>Picoides villosus</i>	5	2	0.2	7
Mallard	<i>Anas platyrhynchos</i>	5	2	0.2	7
Pileated Woodpecker	<i>Dryocopus pileatus</i>	3	2	0.2	5
Acadian Flycatcher	<i>Empidonax virescens</i>	2	0	0.1	2
American Coot	<i>Fulica americana</i>	3	0	0.1	3
American Redstart	<i>Setophaga ruticilla</i>	3	0	0.1	3
Bobolink*	<i>Dolichonyx oryzivorus</i>	1	2	0.1	3
Common Yellowthroat	<i>Geothlypis trichas</i>	0	2	0.1	2
Eastern Kingbird	<i>Tyrannus tyrannus</i>	2	0	0.1	2
Eastern Meadowlark	<i>Sturnella magna</i>	2	1	0.1	3
Eastern Phoebe	<i>Sayornis phoebe</i>	1	2	0.1	3
Golden-crowned Kinglet*	<i>Regulus satrapa</i>	0	2	0.1	2
Great Blue Heron	<i>Ardea herodias</i>	3	1	0.1	4
Green-winged Teal*	<i>Anas crecca</i>	3	0	0.1	3
Nashville Warbler	<i>Vermivora ruficapilla</i>	3	1	0.1	4
Northern Harrier*	<i>Circus cyaneus</i>	1	1	0.1	2
Ovenbird	<i>Seiurus aurocapilla</i>	2	0	0.1	2
Red-breasted Nuthatch*	<i>Sitta canadensis</i>	2	0	0.1	2
Red-shouldered Hawk	<i>Buteo lineatus</i>	2	0	0.1	2
Savannah Sparrow	<i>Passerculus sandwichensis</i>	3	1	0.1	4
Scarlet Tanager	<i>Piranga olivacea</i>	4	0	0.1	4
Short-billed Dowitcher	<i>Limnodromus griseus</i>	0	2	0.1	2

Table 2. Bird species observed during the Republic Wind Farm Passerine Migration Survey.

Common Name	Scientific Name	Observations			
		Spring	Autumn	Birds/Day [^]	Total
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	0	2	0.1	2
Wild Turkey	<i>Meleagris gallopavo</i>	0	2	0.1	2
Willow Flycatcher	<i>Empidonax traillii</i>	2	0	0.1	2
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	0	2	0.1	2
Yellow-throated Warbler	<i>Dendroica dominica</i>	3	0	0.1	3
American Kestrel	<i>Falco sparverius</i>	0	1	0.0	1
Blue-headed Vireo	<i>Vireo solitarius</i>	1	0	0.0	1
Brown Creeper	<i>Certhia americana</i>	1	0	0.0	1
Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>	1	0	0.0	1
Cooper's Hawk	<i>Accipiter cooperii</i>	1	0	0.0	1
Gray-cheeked Thrush	<i>Catharus minimus</i>	0	1	0.0	1
Green Heron	<i>Butorides virescens</i>	1	0	0.0	1
Hermit Thrush*	<i>Catharus guttatus</i>	0	1	0.0	1
Least Flycatcher*	<i>Empidonax minimus</i>	1	0	0.0	1
Northern Bobwhite	<i>Colinus virginianus</i>	1	0	0.0	1
Orchard Oriole	<i>Icterus spurius</i>	1	0	0.0	1
Pine Warbler	<i>Dendroica pinus</i>	1	0	0.0	1
Ring-necked Pheasant	<i>Phasianus colchicus</i>	1	0	0.0	1
Rock Pigeon	<i>Columba livia</i>	0	1	0.0	1
Ruby-crowned Kinglet	<i>Regulus calendula</i>	0	1	0.0	1
Swainson's Thrush	<i>Catharus ustulatus</i>	0	1	0.0	1
White-eyed Vireo	<i>Vireo griseus</i>	1	0	0.0	1
Winter Wren*	<i>Troglodytes troglodytes</i>	0	1	0.0	1
Worm-eating Warbler	<i>Helmitheros vermivorum</i>	1	0	0.0	1
Yellow-bellied Sapsucker*	<i>Sphyrapicus varius</i>	0	1	0.0	1
Yellow-throated Vireo	<i>Vireo flavifrons</i>	1	0	0.0	1
Total		3,225	12,300	n/a	15,525

[^] 31 observation days

* Listed by the State of Ohio, see Table 3.

Table 3. Bird species listed by the State of Ohio and recorded during the Republic Wind Farm Passerine Migration Survey.

Common Name	Ohio Listed Species Classification	Total Number of Birds Observed
Northern Harrier	Endangered	2
Yellow-bellied Sapsucker	Endangered	1
Dark-eyed Junco	Threatened	16
Least Flycatcher	Threatened	1
Hermit Thrush	Threatened	1
Bobolink	Species of Concern	3
Green-winged Teal	Species of Special Interest	3
Red-breasted Nuthatch	Species of Special Interest	2
Golden-crowned Kinglet	Species of Special Interest	2
Winter Wren	Species of Special Interest	1

3.2 SENSITIVE SPECIES

Results of the passerine migration surveys showed limited use of the Project Area by listed avian species. No federally listed bird species were observed. Thirty-two individuals representing 10 state-listed species were observed during the surveys representing only 0.19% of the observed individuals (Table 3). Of these, half (n=16) were dark-eyed juncos (*Junco hyemalis*), nine were observed during spring surveys and seven in autumn. Two northern harriers (*Circus cyaneus*) were observed during spring and autumn surveys. A single yellow-bellied sapsucker (*Sphyrapicus varius*) was observed feeding during autumn surveys. One least flycatcher (*Empidonax minimus*) was observed during spring surveys and a single hermit thrush was observed during the autumn surveys. A total of three bobolinks (*Dolichonyx oryzivorus*) were observed, one during spring surveys and two during autumn surveys. A small flock of three green-winged teal (*Anas crecca*) was observed during spring surveys. Two red-breasted nuthatches (*Sitta canadensis*) were recorded during spring surveys and two golden-crowned kinglets (*Regulus satrapa*) were observed during autumn surveys. A single winter wren (*Troglodytes troglodytes*) was recorded during the autumn surveys.

4.0 DISCUSSION

Bird migration is commonly perceived as involving north-south movements of populations on a large scale, typically associated with seasons. However, there are many types of migratory behavior; some are simple, others more complex. Most seasonal movement between northern and southern climes follows a system of flyways and these flyways are loosely defined by geographical features. These physical features include coasts, river valleys, and mountain ranges, and together form the four major North American migratory corridors: the Atlantic, Mississippi, Central, and Pacific flyways. The Project Area lies along the eastern edge of the Mississippi flyway which also includes, although to a lesser extent, the Ohio River Valley and tributaries. Magee Marsh Wildlife Area is a 2,202 acre wetland complex and part of the Lake Erie Western Basin Important Bird area that is located approximately 25 miles northwest of the Project Area. The marsh is a critical feeding and resting habitat for more than 150 species of migrating songbirds in both spring and fall; more than 300 species of birds have been recorded on the area including more than 150 species of migrating songbirds (ODNR DOW).

The Project Area is largely covered with row crops and does not contain features known to attract large concentrations of migrating birds, i.e., lakes, rivers, large streams, large wetlands, topographic ridges, large forests, or large grasslands (see Appendix B for site photos). Passerine use results were consistent with a landscape dominated by row crop monoculture. Based upon observations of migrating passerines, the Project Area does not appear to be an important part of a passerine migratory pathway. One species (red-winged blackbirds) comprised over half of the total birds observed. Large flocks observed using the area consisted of common species (red-winged blackbirds, European starlings, and tree swallows) and listed species were not recorded in large numbers.

Nocturnally migrating passerines are the most abundant species at most wind energy facilities and are the most commonly reported fatalities (NAS 2007). In a review of bird collisions documented in 31 studies at wind-energy facilities outside California, Erickson et al. (2001) reported that songbirds comprised 78 percent of avian fatalities. Bird mortality at wind farms is generally only a few birds per turbine distributed among many species and is influenced by factors that are largely lacking at the Project Area, e.g., rivers, lakes, large wetlands, large forest tracts, large grasslands. In 2007, the NAS reported an average of 2.22 bird fatalities per turbine per year from wind energy facilities in the upper Midwest, the region most comparable to the Project Area. When spread among the many species, the effect of this small mortality level would be reduced even more on any one species.

5.0 CONCLUSIONS

The passerine use survey of the Project Area did not reveal use by an unusual number or assemblage of species; use by sensitive bird species was limited. Due to the limited size of woodlots, wetlands, open water, and potential stopover sites, and due to an availability of similar habitat in northwestern Ohio, the Project Area does not represent a unique resource for large numbers of passerines during migration. The data did not demonstrate a relationship between the passerine use of the Project Area and the unique passerine migration through Magee Marsh or the western basin of Lake Erie. The survey results did not demonstrate avian use patterns that would indicate it is an essential contributor to passerine migration in the region.

6.0 LITERATURE CITED

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FIGURE

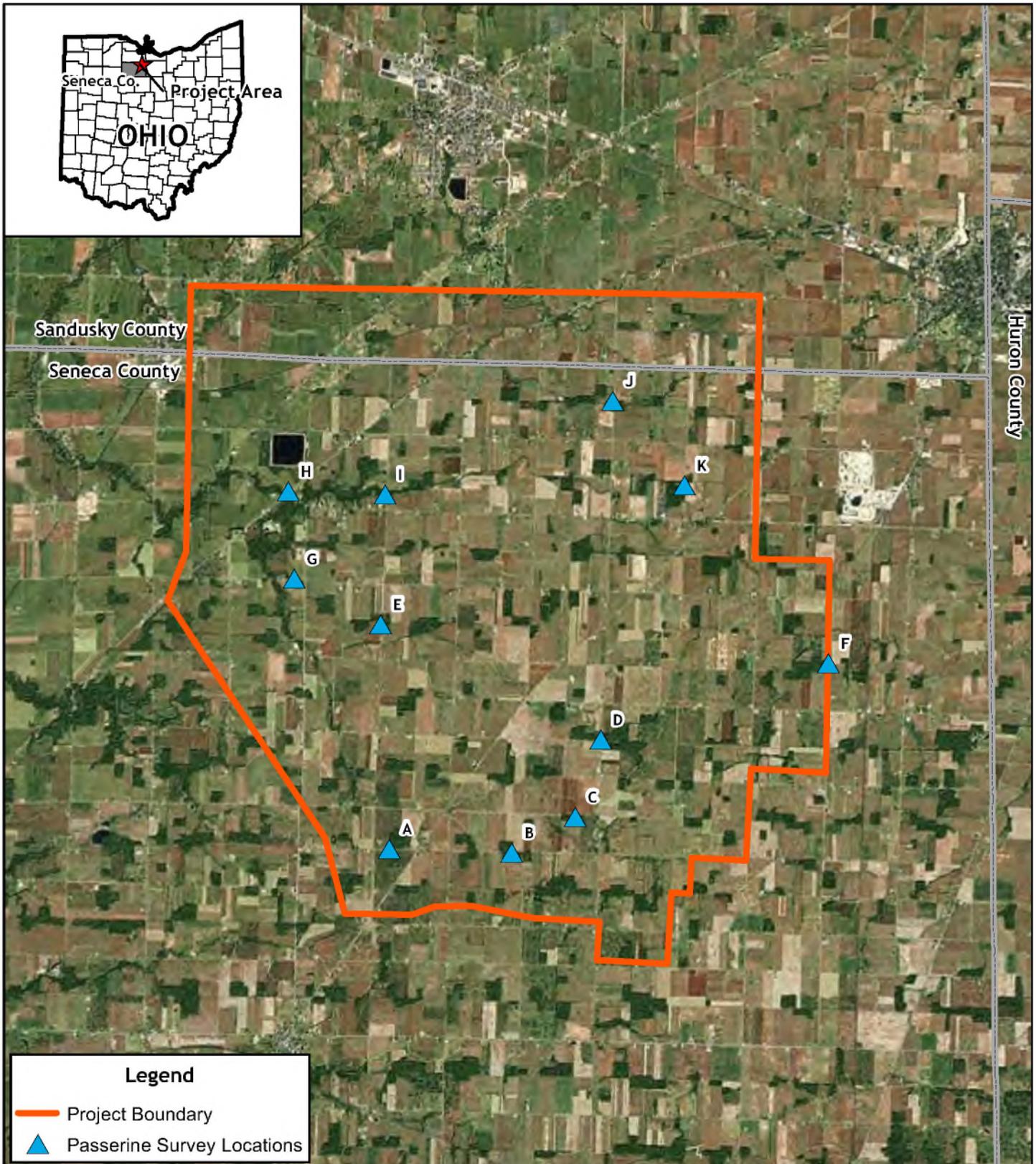


Figure 1. Passerine Migration Survey Locations for the Republic Wind Farm Project Area, Seneca and Sandusky counties, Ohio.

		December 2011	
	Project No. 1953.001	Basemap: NAIP Imagery - Seneca County, OH (2010)	

APPENDIX A

Passerine Migration Survey Observations

Passerine Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flyover # in Flock	Behavior/notes	Survey Start	Survey Stop	Survey Temp (C)	Survey Weather	Conditions	
4-Apr-11	A	Spring	AMRO	American Robin	6	NE	1							
		Spring	AMRO	American Robin	4	N	1							
		Spring	AMRO	American Robin	6	NE	1							
		Spring	AMRO	American Robin	3	NE	1							
		Spring	SOSP	Song Sparrow	2	NW	1							
		Spring	SOSP	Song Sparrow	3	NW	1							
		Spring	AMRO	American Robin	1	E	1			6:50	6:55	16	5	100%
		Spring	GBHE	Great Blue Heron	6	SE	1							
		Spring	AMCR	American Crow	100	NW	24							
		Spring	RBWO	Red-bellied Woodpecker	10	S	1							
4-Apr-11	B	Spring	NOCA	Northern Cardinal	10	N	1							
		Spring	AMRO	American Robin	100	NE	1							
		Spring	WBNU	White-breasted Nuthatch	100	S	1							
		Spring	AMRO	American Robin	100	E	1							
		Spring	AMCR	American Crow	100	SE	1							
		Spring	AMCR	American Crow	150	E	1							
		Spring	RBWO	Red-bellied Woodpecker	110	W	1							
		Spring	AMCR	American Crow	120	SW	3							
		Spring	AMRO	American Robin	150	E	1			7:05	7:10	16	7	100%
		Spring	ETTL	Tufted Titmouse	80	W	1							
4-Apr-11	C	Spring	CAGO	Canada Goose	300	NE	2							
		Spring	AMRO	American Robin	60	NE	1							
		Spring	AMCR	American Crow	50	E	1							
		Spring	EUST	European Starling	40	NW	1							
		Spring	TUVU	Turkey Vulture	30	E	1							
		Spring	NOCA	Northern Cardinal	60	NE	1							
		Spring	AMCR	American Crow	30	E	1							
		Spring	ETTL	Tufted Titmouse	50	NW	1							
		Spring	AMCR	American Crow	40	N	3							
		Spring	AMCR	American Crow	40	NE	1							
5-Apr-11	D	Spring	AMRO	American Robin	50	NE	1							
		Spring	SOSP	Song Sparrow	60	SE	1							
		Spring	ETTL	Tufted Titmouse	100	E	1							
		Spring	AMRO	American Robin	100	SW	1							
		Spring	SOSP	Song Sparrow	50	S	1							
		Spring	RBWO	Red-bellied Woodpecker	20	E	1							
		Spring	AMCR	American Crow	10	E	3							
		Spring	ETTL	Tufted Titmouse	80	NE	1							
		Spring	COGR	Common Grackle	40	E	1							
		Spring	RBWO	Red-bellied Woodpecker	120	E	1							
5-Apr-11	E	Spring	NOFL	Northern Flicker	50	SW	1							
		Spring	AMRO	American Robin	60	E	1							
		Spring	BLJA	Blue Jay	80	-	2							
		Spring	RWBL	Red-winged Blackbird	100	-	20							
		Spring	MODO	Mourning Dove	30	N	2							
		Spring	RBWO	Red-bellied Woodpecker	100	SE	1							
		Spring	RBWO	Red-bellied Woodpecker	50	SW	1							
		Spring	MODO	Mourning Dove	40	S	1							
		Spring	DEJU	Dark-eyed Junco	20	SW	1							
		Spring	AMRO	American Robin	60	SW	1							
5-Apr-11		Spring	AMCR	American Crow	20	W	1							
		Spring	SOSP	Song Sparrow	50	N	1							
		Spring	NOCA	Northern Cardinal	30	N	1							
		Spring	ETTL	Tufted Titmouse	100	S	1							
		Spring	AMRO	American Robin	60	S	1							
		Spring	GWTE	Green-winged Teal	20	SW	3							
		Spring	CARW	Carolina Wren	60	SW	1							
		Spring	AMRO	American Robin	20	SW	3							
		Spring	AMRO	American Robin	20	SW	3							
		Spring	AMRO	American Robin	20	SW	3							

Passerine Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flyover # in Flock	Behaviors/notes	Survey Time Start	Survey Time Stop	Survey Temp (C)	Wind	Cloud	
5-Apr-11	F	Spring	AMCR	American Crow	100	W	1							
		Spring	AMRO	American Robin	60	W	1							
		Spring	BLJA	Blue Jay	40	W	1							
		Spring	AMRO	American Robin	30	N	1			7:51	7:56	4	10	
		Spring	COGR	Common Grackle	20									
		Spring	NOFL	Northern Flicker	60	NW	1							
		Spring	BHCO	Brown-headed Cowbird	15									
		Spring	FISSP	Field Sparrow	70	NW	1							
		Spring	WBNU	White-breasted Nuthatch	50	W	1							
		Spring	RWB	Red-winged Blackbird	30			30						
5-Apr-11	G	Spring	AMRO	American Robin	10	SW	1							
		Spring	SOSP	Song Sparrow	30	SW	1							
		Spring	COGR	Common Grackle	30	S	1							
		Spring	AMRO	American Robin	40	E	1							
		Spring	BCCH	Black-capped Chickadee	20	S	1			8:10	8:15	4	0	100%
		Spring	NOCA	Northern Cardinal	40	S	1							
		Spring	SOSP	Song Sparrow	40	N	1							
		Spring	SOSP	Song Sparrow	60	SW	1							
		Spring	SOSP	Song Sparrow	100	N	1							
		Spring	AMRO	American Robin	20	S	1							
5-Apr-11	H	Spring	AMRO	American Robin	10	N	1							
		Spring	COGR	Common Grackle	10									
		Spring	RBWO	Red-bellied Woodpecker	50	W	1							
		Spring	WBNU	White-breasted Nuthatch	30	E	1							
		Spring	SOSP	Song Sparrow	10	S	1			8:21	8:21	4	0	100%
		Spring	RWB	Red-winged Blackbird	40	N	1							
		Spring	RBWO	Red-bellied Woodpecker	30	SE	1							
		Spring	NOCA	Northern Cardinal	20	NW	1							
		Spring	EUST	European Starling	30	S	1							
		Spring	CAGO	Canada Goose	10	NW	2							
5-Apr-11	I	Spring	ETI	Tufted Titmouse	20	W	1							
		Spring	AMRO	American Robin	30	E	1							
		Spring	AMRO	American Robin	30	N	1							
		Spring	WBNU	White-breasted Nuthatch	20	W	1							
		Spring	NOCA	Northern Cardinal	50	W	1							
		Spring	AMRO	American Robin	50	N	1							
		Spring	AMCR	American Crow	30	W	2			8:24	8:32	4	0	100%
		Spring	COGR	Common Grackle	20	W	1							
		Spring	MOOD	Mourning Dove	100	N	1							
		Spring	SOSP	Song Sparrow	20	N	1							
5-Apr-11	J	Spring	HOFI	House Finch	10	S	1							
		Spring	BHCO	Brown-headed Cowbird	30	SW	1							
		Spring	SOSP	Song Sparrow	30	NW	1							
		Spring	RBWO	Red-bellied Woodpecker	40	SW	1							
		Spring	NOCA	Northern Cardinal	20	W	1							
		Spring	SOSP	Song Sparrow	40	SW	1							
		Spring	COGR	Common Grackle	20	SW	2							
		Spring	KILL	Killdeer	60	N	2							
		Spring	SOSP	Song Sparrow	30	SW	1			8:51	8:56	4	0	95%
		Spring	AMRO	American Robin	20	SE	1							
5-Apr-11	K	Spring	AMRO	American Robin	40	E	1							
		Spring	DOWO	Downy Woodpecker	10	S	1							
		Spring	ETI	Tufted Titmouse	20	NW	1							
		Spring	AMRO	American Robin	40	W	1							
		Spring	NOCA	Northern Cardinal	10	W	1							
		Spring	RWB	Red-winged Blackbird	10	S	150							
		Spring	AMRO	American Robin	20	S	1							
		Spring	AMRO	American Robin	10	E	4							
		Spring	AMRO	American Robin	5	NE	9			9:03	9:08	4	0	100%
		Spring	BLJA	Blue Jay	40	NW	1							

Passerine Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flyover # in Flock	Behavior/notes	Start	Stop	Temp (C)	Wind	Cloud	
11-Apr-11	A	Spring	CAGO	Canada Goose	20	N	1	Walking in middle of woodlot						
		Spring	AMCR	American Crow	20	W	1		808	818	19	2	100%	
		Spring	NOFL	Northern Flicker	60	NW	1							
		Spring	AMRO	American Robin	40	W	1							
11-Apr-11	B	Spring	NOCA	Northern Cardinal	80	SE	1							
		Spring	RWBL	Red-winged Blackbird	10	W	8							
		Spring	COGR	Common Grackle	10	W	3							
		Spring	CHSP	Chipping Sparrow	20	W	1							
		Spring	RUBL	Rusty Blackbird	10	W	4			753	803	19	5	100%
		Spring	AMRO	American Robin	40	E	1							
		Spring	NOFL	Northern Flicker	70	W	1							
		Spring	AMCR	American Crow	80	S	2							
		Spring	NOFL	Northern Flicker	40	SW	1							
		Spring	RBWO	Red-bellied Woodpecker	80	S	1							
11-Apr-11	C	Spring	RHWJ	Red-headed Woodpecker	50	SW	1							
		Spring	DEJU	Dark-eyed Junco	30	SW	1							
		Spring	NOFL	Northern Flicker	30	SE	1							
		Spring	EAME	Eastern Meadowlark	100	NW	1			735	745	19	2	100%
		Spring	AMCR	American Crow	60	NW	1							
		Spring	AMRO	American Robin	60	S	1							
		Spring	AMRO	American Robin	25	W	1							
		Spring	EATO	Eastern Towhee	70	W	1							
		Spring	EABL	Eastern Bluebird	10	SW	1							
		Spring	AMRO	American Robin	20	S	2							
11-Apr-11	D	Spring	MALL	Mallard	20	W	1							
		Spring	AMRO	American Robin	40	SW	2							
		Spring	RBWO	Red-bellied Woodpecker	40	W	1			720	730	19	2	100%
		Spring	NOCA	Northern Cardinal	60	E	1							
		Spring	BLJA	Blue Jay	80	E	1							
		Spring	COGR	Common Grackle	10	NE	1							
		Spring	COGR	Common Grackle	10	N	3							
		Spring	NOCA	Northern Cardinal	20	W	1							
		Spring	CHSP	Chipping Sparrow	5	E	1							
		Spring	RBWO	Red-bellied Woodpecker	60	E	1							
11-Apr-11	E	Spring	RWBL	Red-winged Blackbird	40	N	18							
		Spring	ETTF	Tufted Titmouse	60	NW	2							
		Spring	DOWO	Downy Woodpecker	30	E	1							
		Spring	RBWO	Red-bellied Woodpecker	50	E	1			823	833	19	2	100%
		Spring	AMRO	American Robin	20	SE	1							
		Spring	EUST	European Starling	20	W	1							
		Spring	EUST	European Starling	20	NW	4							
		Spring	COGR	Common Grackle	10	W	1							
		Spring	KILL	Killdeer	30	SW	1							
		Spring	NOCA	Northern Cardinal	60	W	1							
11-Apr-11	F	Spring	SAVS	Savannah Sparrow	40	SE	1							
		Spring	AMRO	American Robin	20	W	1							
		Spring	COGR	Common Grackle	40	S	1							
		Spring	AMRO	American Robin	50	NW	1							
		Spring	BHCO	Brown-headed Cowbird	20	N	3			702	712	19	7	100%
		Spring	NOFL	Northern Flicker	100	SE	1							
		Spring	COGR	Common Grackle	10	W	6							
		Spring	RWBL	Red-winged Blackbird	10	E	14							
		Spring	RWBL	Red-winged Blackbird	10	E	26							
		Spring	AMRO	American Robin	50	NW	1							
10-Apr-11	G	Spring	AMRO	American Robin	30	E	1							
		Spring	RBWO	Red-bellied Woodpecker	20	E	1			804	814	15	7	60%
		Spring	AMCR	American Crow	100	SW	3							
		Spring	KILL	Killdeer	60	NE	2							
		Spring	NOFL	Northern Flicker	60	NW	1							
		Spring	BCGH	Black-capped Chickadee	30	W	1							
10-Apr-11	H	Spring	AMRO	American Robin	70	E	1							
		Spring	RWBL	Red-winged Blackbird	40	W	1							
		Spring	AMRO	American Robin	50	S	1							
		Spring	COGR	Common Grackle	50	N	1			750	800	15	2	100%
		Spring	DOWO	Downy Woodpecker	40	N	1							
		Spring	RBWO	Red-bellied Woodpecker	40	SW	1							
		Spring	RBWO	Red-bellied Woodpecker	50	E	1							
		Spring	BLJA	Blue Jay	30	N	3							

Passerine Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flyover # in Flock	Behavior/notes	Survey Time Start	Survey Time Stop	Survey Temp (C)	Wind	Cloud	
10-Apr-11	J	Spring	ETTI	Tufted Titmouse	40	SW	1							
		Spring	FJSP	Field Sparrow	60	S	1							
		Spring	CAGO	Canada Goose	100	SW	6							
		Spring	AMRO	American Robin	50	W	1			7:36	7:46	15	11	50%
		Spring	ETTI	Tufted Titmouse	50	NW	1							
		Spring	NOCA	Northern Cardinal	40	S	1							
		Spring	DOWO	Dowry Woodpecker	35	SW	1							
		Spring	BLJA	Blue Jay	60	W	1							
		Spring	DEJU	Dark-eyed Junco	30	E	5							
		Spring	AMCR	American Crow	100	SE	3							
10-Apr-11	J	Spring	ETTI	Tufted Titmouse	20	SW	1							
		Spring	AMRO	American Robin	20	NW	2							
		Spring	NOFL	Northern Flicker	40	E	1			7:21	7:31	14	9	100%
		Spring	MODO	Mourning Dove	10	E	1							
		Spring	RBWO	Red-bellied Woodpecker	30	SW	1							
		Spring	HOLA	Horned Lark	50	NE	1							
		Spring	EUST	European Starling	10	NE	5							
		Spring	DOWO	Dowry Woodpecker	30	E	1							
		Spring	NOFL	Northern Flicker	50	E	1							
		Spring	KILL	Killdeer	40	NW	1							
10-Apr-11	K	Spring	AMRO	American Robin	10	NE	1							
		Spring	RWBL	Red-winged Blackbird	60	E	32							
		Spring	COGR	Common Grackle	20	W	1							
		Spring	EUST	European Starling	10	W	6			7:05	7:15	14	2	100%
		Spring	BLJA	Blue Jay	40	W	1							
		Spring	RBWO	Red-bellied Woodpecker	50	NW	1							
		Spring	COGR	Common Grackle	10	W	1							
		Spring	BLJA	Blue Jay	40	W	1							
		Spring	RBWO	Red-bellied Woodpecker	50	NW	1							
		Spring	COGR	Common Grackle	10	W	1							
20-Apr-11	A	Spring	EATO	Eastern Towhee	20	N	1							
		Spring	AMCR	American Crow	5	S	1							
		Spring	AMCR	American Crow	30	E	5							
		Spring	AMRO	American Robin	10	NW	1							
		Spring	BCGH	Black-capped Chickadee	20	NE	1							
		Spring	ETTI	Tufted Titmouse	10	N	1							
		Spring	ETTI	Tufted Titmouse	30	SW	1							
		Spring	EATO	Eastern Towhee	1	N	1							
		Spring	COGR	Common Grackle	6	SW	1			7:30	7:40	13	5	100%
		Spring	AMCR	American Crow	40	SE	1							
20-Apr-11	B	Spring	MYWA	Yellow-rumped Warbler	1	N	3							
		Spring	NOFL	Northern Flicker	20	W	1							
		Spring	AMRO	American Robin	50	S	1							
		Spring	AMRO	American Robin	20	SE	1							
		Spring	COGR	Common Grackle	10	W	1							
		Spring	AMCR	American Crow	30	E	1							
		Spring	COGR	Common Grackle	-	W	3							
		Spring	NOFL	Northern Flicker	100	E	1							
		Spring	RBWO	Red-bellied Woodpecker	10	N	1							
		Spring	RBWO	Red-bellied Woodpecker	100	W	1							
20-Apr-11	B	Spring	ETTI	Tufted Titmouse	5	N	1							
		Spring	ETTI	Tufted Titmouse	25	SW	1							
		Spring	AMRO	American Robin	30	NE	1							
		Spring	AMRO	American Robin	10	SE	1							
		Spring	MYWA	Yellow-rumped Warbler	2	W	4			7:45	7:55	13	7	100%
		Spring	DOWO	Dowry Woodpecker	40	NW	1							
		Spring	EATO	Eastern Towhee	50	E	1							
		Spring	EATO	Eastern Towhee	100	SW	1							
		Spring	AMRO	American Robin	10	W	1							
		Spring	BCGH	Black-capped Chickadee	20	N	5							
Spring	TUVU	Turkey Vulture	150	NW	12									
Spring	AMCR	American Crow	25	N	1									
Spring	AMCR	American Crow	30	SSW	4									

Passerine Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flyover # in Flock	Behavior/notes	Survey Time Start	Survey Time Stop	Temp (C)	Wind	Cloud	
21-Apr-11	F	Spring	AMRO	American Robin	30	NE	1							
		Spring	AMRO	American Robin	50	N	1							
		Spring	AMCR	American Crow	100	SW	1							
		Spring	AMCR	American Crow	30	W	1							
		Spring	AMCR	American Crow	100	S	1							
		Spring	NOCA	Northern Cardinal	100	NW	1							
		Spring	FISP	Field Sparrow	20	NW	1							
		Spring	FBWO	Red-bellied Woodpecker	30	W	1							
		Spring	NOFL	Northern Flicker	40	SW	1							
		Spring	BCCH	Black-capped Chickadee	10	W	1			6:45	6:55	4	3	0%
		Spring	AMRO	American Robin	5	N	1							
		Spring	RTHA	Red-tailed Hawk	30	W	1							
		Spring	BLJA	Blue Jay	40	N	1							
		Spring	NOFL	Northern Flicker	20	NW	1							
		Spring	BHCO	Brown-headed Cowbird	-	S	10							
		Spring	EUST	European Starling	-	S	10							
		Spring	ETTL	Tufted Titmouse	40	WSW	1							
Spring	AMRO	American Robin	30	WSW	1									
Spring	ETTL	Tufted Titmouse	100	NW	1									
Spring	CHSP	Chipping Sparrow	2	E	1									
Spring	CHSP	Chipping Sparrow	40	NW	1									
Spring	AMRO	American Robin	30	E	1									
Spring	AMRO	American Robin	100	NE	1									
Spring	FBWO	Red-bellied Woodpecker	40	S	1									
Spring	MODO	Mourning Dove	10	SW	1									
Spring	AMRO	American Robin	5	S	1									
Spring	BLJA	Blue Jay	50	S	1									
Spring	COGR	Common Grackle	-	S	1									
Spring	AMCR	American Crow	100	SE	1									
Spring	FISP	Field Sparrow	150	SE	1									
Spring	KILL	Killdeer	20	SW	1									
Spring	COGR	Common Grackle	-	NW	4									
Spring	SOSP	Song Sparrow	1	S	1									
Spring	FBWO	Red-bellied Woodpecker	10	N	1									
Spring	AMCR	American Crow	2	N	1									
Spring	AMRO	American Robin	10	E	1									
Spring	FBWO	Red-bellied Woodpecker	5	NW	1									
Spring	HAWO	Hairy Woodpecker	20	SE	1									
Spring	SOSP	Song Sparrow	10	N	1									
Spring	CHSP	Chipping Sparrow	5	W	1									
Spring	NOEL	Northern Flicker	30	SW	1									
Spring	AMRO	American Robin	40	NE	1									
Spring	ETTL	Tufted Titmouse	10	E	1									
Spring	BCCH	Black-capped Chickadee	15	NW	1									
Spring	SOSP	Song Sparrow	5	W	1									
Spring	AMCR	American Crow	10	SE	1									
Spring	RTHA	Red-tailed Hawk	-	NE	1									
Spring	TUVU	Turkey Vulture	-	N	3									
Spring	ETTL	Tufted Titmouse	30	SW	1									
21-Apr-11	G	Spring	AMRO	American Robin	30	NE	1							
		Spring	AMRO	American Robin	50	N	1							
		Spring	AMCR	American Crow	100	SW	1							
		Spring	AMCR	American Crow	30	W	1							
		Spring	AMCR	American Crow	100	S	1							
		Spring	NOCA	Northern Cardinal	100	NW	1							
		Spring	FISP	Field Sparrow	20	NW	1							
		Spring	FBWO	Red-bellied Woodpecker	30	W	1							
		Spring	NOFL	Northern Flicker	40	SW	1							
		Spring	BCCH	Black-capped Chickadee	10	W	1							
		Spring	AMRO	American Robin	5	N	1							
		Spring	RTHA	Red-tailed Hawk	30	W	1							
		Spring	BLJA	Blue Jay	40	N	1							
		Spring	NOFL	Northern Flicker	20	NW	1							
		Spring	BHCO	Brown-headed Cowbird	-	S	10							
		Spring	EUST	European Starling	-	S	10							
		Spring	ETTL	Tufted Titmouse	40	WSW	1							
Spring	AMRO	American Robin	30	WSW	1									
Spring	ETTL	Tufted Titmouse	100	NW	1									
Spring	CHSP	Chipping Sparrow	2	E	1									
Spring	CHSP	Chipping Sparrow	40	NW	1									
Spring	AMRO	American Robin	30	E	1									
Spring	AMRO	American Robin	100	NE	1									
Spring	FBWO	Red-bellied Woodpecker	40	S	1									
Spring	MODO	Mourning Dove	10	SW	1									
Spring	AMRO	American Robin	5	S	1									
Spring	BLJA	Blue Jay	50	S	1									
Spring	COGR	Common Grackle	-	S	1									
Spring	AMCR	American Crow	100	SE	1									
Spring	FISP	Field Sparrow	150	SE	1									
Spring	KILL	Killdeer	20	SW	1									
Spring	COGR	Common Grackle	-	NW	4									
Spring	SOSP	Song Sparrow	1	S	1									
Spring	FBWO	Red-bellied Woodpecker	10	N	1									
Spring	AMCR	American Crow	2	N	1									
Spring	AMRO	American Robin	10	E	1									
Spring	FBWO	Red-bellied Woodpecker	5	NW	1									
Spring	HAWO	Hairy Woodpecker	20	SE	1									
Spring	SOSP	Song Sparrow	10	N	1									
Spring	CHSP	Chipping Sparrow	5	W	1									
Spring	NOEL	Northern Flicker	30	SW	1									
Spring	AMRO	American Robin	40	NE	1									
Spring	ETTL	Tufted Titmouse	10	E	1									
Spring	BCCH	Black-capped Chickadee	15	NW	1									
Spring	SOSP	Song Sparrow	5	W	1									
Spring	AMCR	American Crow	10	SE	1									
Spring	RTHA	Red-tailed Hawk	-	NE	1									
Spring	TUVU	Turkey Vulture	-	N	3									
Spring	ETTL	Tufted Titmouse	30	SW	1									
21-Apr-11	H	Spring	AMRO	American Robin	30	NE	1							
		Spring	AMRO	American Robin	50	N	1							
		Spring	AMCR	American Crow	100	SW	1							
		Spring	AMCR	American Crow	30	W	1							
		Spring	AMCR	American Crow	100	S	1							
		Spring	NOCA	Northern Cardinal	100	NW	1							
		Spring	FISP	Field Sparrow	20	NW	1							
		Spring	FBWO	Red-bellied Woodpecker	30	W	1							
		Spring	NOFL	Northern Flicker	40	SW	1							
		Spring	BCCH	Black-capped Chickadee	10	W	1							
		Spring	AMRO	American Robin	5	N	1							
		Spring	RTHA	Red-tailed Hawk	30	W	1							
		Spring	BLJA	Blue Jay	40	N	1							
		Spring	NOFL	Northern Flicker	20	NW	1							
		Spring	BHCO	Brown-headed Cowbird	-	S	10							
		Spring	EUST	European Starling	-	S	10							
		Spring	ETTL	Tufted Titmouse	40	WSW	1							
Spring	AMRO	American Robin	30	WSW	1									
Spring	ETTL	Tufted Titmouse	100	NW	1									
Spring	CHSP	Chipping Sparrow	2	E	1									
Spring	CHSP	Chipping Sparrow	40	NW	1									
Spring	AMRO	American Robin	30	E	1									
Spring	AMRO	American Robin	100	NE	1									
Spring	FBWO	Red-bellied Woodpecker	40	S	1									
Spring	MODO	Mourning Dove	10	SW	1									
Spring	AMRO	American Robin	5	S	1									
Spring	BLJA	Blue Jay	50	S	1									
Spring	COGR	Common Grackle	-	S	1									
Spring	AMCR	American Crow	100	SE	1									
Spring	FISP	Field Sparrow	150	SE	1									
Spring	KILL	Killdeer	20	SW	1									
Spring	COGR	Common Grackle	-	NW	4									
Spring	SOSP	Song Sparrow	1	S	1									
Spring	FBWO	Red-bellied Woodpecker	10	N	1									
Spring	AMCR	American Crow	2	N	1									
Spring	AMRO	American Robin	10	E	1									
Spring	FBWO	Red-bellied Woodpecker	5	NW	1									
Spring	HAWO	Hairy Woodpecker	20	SE	1									
Spring	SOSP	Song Sparrow	10	N	1									
Spring	CHSP	Chipping Sparrow	5	W	1									
Spring	NOEL	Northern Flicker	30	SW	1									
Spring	AMRO	American Robin	40	NE	1									
Spring	ETTL	Tufted Titmouse	10	E	1									
Spring	BCCH	Black-capped Chickadee	15	NW	1									
Spring	SOSP	Song Sparrow	5	W	1									
Spring	AMCR	American Crow	10	SE	1									

Passerine Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flyover # in Flock	Behavior/notes	Survey Time Start	Survey Time Stop	Temp (C)	Wind	Cloud	
21-Apr-11	I	Spring	NOCA	Northern Cardinal	40	E	1							
		Spring	AMRO	American Robin	10	NW	1							
		Spring	RBWO	Red-bellied Woodpecker	30	NE	1							
		Spring	ETTI	Tufted Titmouse	10	W	1							
		Spring	AMRO	American Robin	40	NW	1							
		Spring	TUVU	Turkey Vulture	-	N	2							
		Spring	DOWO	Downy Woodpecker	20	W	1							
		Spring	SOSP	Song Sparrow	30	E	1			7:35	7:45	4	3	0%
		Spring	BLJA	Blue Jay	50	SE	1							
		Spring	COGR	Common Grackle		SW	4							
		Spring	AMRO	American Robin	100	NW	1							
		Spring	EAPH	Eastern Phoebe	4	S	1							
		Spring	ETTI	Tufted Titmouse	20	W	1							
		Spring	NOCA	Northern Cardinal	10	NW	1							
Spring	AMRO	American Robin	50	SE	1									
Spring	BHCO	Brown-headed Cowbird		SE	2									
21-Apr-11	J	Spring	SOSP	Song Sparrow	10	NW	1							
		Spring	FISP	Field Sparrow	5	E	1							
		Spring	CARW	Carolina Wren	30	S	1							
		Spring	AMRO	American Robin	50	SE	1							
		Spring	AMCR	American Crow	10	NE	1							
		Spring	DOWO	Downy Woodpecker	10	W	1							
		Spring	AMRO	American Robin	5	W	1							
		Spring	RBWO	Red-bellied Woodpecker	30	NW	1			8:10	8:20	4	5	10%
		Spring	EUST	European Starling	5	S	10							
		Spring	RWBL	Red-winged Blackbird	15	S	1							
		Spring	COGR	Common Grackle	10	E	1							
		Spring	SOSP	Song Sparrow	20	SE	1							
		Spring	ETTI	Tufted Titmouse	5	N	1							
		Spring	AMCR	American Crow	5	W	1							
Spring	ETTI	Tufted Titmouse	20	W	1									
Spring	AMRO	American Robin	10	NE	1									
21-Apr-11	K	Spring	AMRO	American Robin	5 to 10	NNE	15	Foraging						
		Spring	MYWA	Yellow-rumped Warbler	3	NW	5	Foraging						
		Spring	SOSP	Song Sparrow	20	NE	1							
		Spring	AMRO	American Robin	15	SW	1							
		Spring	RWBL	Red-winged Blackbird	50	SW	10							
		Spring	CHSP	Chipping Sparrow	10	S	1							
		Spring	RBWO	Red-bellied Woodpecker	30	W	1							
		Spring	BLJA	Blue Jay	40	W	1							
		Spring	BCGH	Black-capped Chickadee	15	W	1							
		Spring	ETTI	Tufted Titmouse	5	NW	1			8:25	8:35	4	5	10%
		Spring	AMRO	American Robin	30	W	1							
		Spring	RBWO	Red-bellied Woodpecker	5	W	1							
		Spring	TUVU	Turkey Vulture	-	NE	3		Flyover					
		Spring	COGR	Common Grackle	10	W	6							
24-Apr-11	A	Spring	AMCR	American Crow	50	NW	3							
		Spring	AMRO	American Robin	40	W	1							
		Spring	NOCA	Northern Cardinal	60	S	1							
		Spring	RBWO	Red-bellied Woodpecker	30	N	1			7:15	7:24	10	0	75%
		Spring	ETTI	Tufted Titmouse	40	SE	1							
		Spring	ETTI	Tufted Titmouse	70	7W	1							
		Spring	COGR	Common Grackle	10	W	3							
		Spring	CHSP	Chipping Sparrow	20	W	1							
		Spring	RWBL	Rusty Blackbird	10	W	4							
		Spring	AMRO	American Robin	40	E	1							
		Spring	NOCA	Northern Cardinal	20	NW	1							
		Spring	AMRO	American Robin	35	SE	1							
		Spring	BHCO	Brown-headed Cowbird	40	E	1							
		Spring	ETTI	Tufted Titmouse	30	SW	1							
24-Apr-11	B	Spring	AMRO	American Robin	20	WNW	3							
		Spring	AMRO	American Robin	20	WNW	3							
		Spring	AMRO	American Robin	20	WNW	3							
		Spring	AMRO	American Robin	20	WNW	3							
		Spring	AMRO	American Robin	20	WNW	3							
		Spring	AMRO	American Robin	20	WNW	3							
		Spring	AMRO	American Robin	20	WNW	3							
		Spring	AMRO	American Robin	20	WNW	3							
		Spring	AMRO	American Robin	20	WNW	3							
		Spring	AMRO	American Robin	20	WNW	3							
		Spring	AMRO	American Robin	20	WNW	3							
		Spring	AMRO	American Robin	20	WNW	3							
		Spring	AMRO	American Robin	20	WNW	3							
		Spring	AMRO	American Robin	20	WNW	3							

Passerine Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flock # in Flock	Behavior/notes	Survey Time Start	Survey Time Stop	Temp (C)	Wind	Cloud	
24-Apr-11	C	Spring	AMRO	American Robin	60	SW	1							
		Spring	RBGR	Rose-breasted Grosbeak	50	W	1							
		Spring	FISP	Field Sparrow	50	NW	1							
		Spring	BLJA	Blue Jay	25	SW	2			6:45	6:54	11	0	80%
		Spring	SOSP	Song Sparrow	30	NW	1							
		Spring	RWBL	Red-winged Blackbird	15	W	6							
		Spring	AMRO	American Robin	25	SE	1							
		Spring	ETTI	Tufted Titmouse	40	E	1							
		Spring	AMRO	American Robin	50	NE	1							
		Spring	EWBL	Eastern Bluebird	30	SW	2							
24-Apr-11	D	Spring	REWO	Red-bellied Woodpecker	20	NW	1							
		Spring	FISP	Field Sparrow	50	N	1			6:41	6:50	11	0	85%
		Spring	AMGO	American Goldfinch	40	N	4							
		Spring	REWO	Red-bellied Woodpecker	40	NW	1							
		Spring	ELST	European Starling	40	SW	6							
		Spring	BLJA	Blue Jay	10	W	1							
		Spring	RWBL	Red-winged Blackbird	50	NW	2							
		Spring	ETTI	Tufted Titmouse	20	NE	1							
		Spring	REWO	Red-bellied Woodpecker	15	S	1							
		Spring	MOJO	Mourning Dove	15	S	2			7:30	7:39	11	0	85%
24-Apr-11	E	Spring	WBNU	White-breasted Nuthatch	40	NE	1							
		Spring	BLJA	Blue Jay	30	E	1							
		Spring	REWO	Red-bellied Woodpecker	45	NW	1							
		Spring	NOCA	Northern Cardinal	60	W	1							
		Spring	SAVS	Savannah Sparrow	40	SE	1							
		Spring	AMRO	American Robin	20	W	1							
		Spring	COGR	Common Grackle	40	S	1							
		Spring	AMRO	American Robin	50	NW	1							
		Spring	BHCO	Brown-headed Cowbird	20	N	3			6:27	6:36	9	0	75%
		Spring	NOFL	Northern Flicker	100	SE	1							
24-Apr-11	F	Spring	COGR	Common Grackle	10	W	6							
		Spring	AMRO	American Robin	50	NW	1							
		Spring	RWBL	Red-winged Blackbird	45	SW	1							
		Spring	COGR	Common Grackle	40	N	1							
		Spring	AMCR	American Crow	100	SW	3							
		Spring	KILL	Killdeer	60	NE	2							
		Spring	CHSP	Chipping Sparrow	20	W	1							
		Spring	RBGR	Rose-breasted Grosbeak	40	NW	1			7:44	7:52	11	0	90%
		Spring	FISP	Field Sparrow	60	NW	1							
		Spring	RWBL	Red-winged Blackbird	30	NW	1							
24-Apr-11	G	Spring	ETTI	Tufted Titmouse	50	S	1							
		Spring	BCCH	Black-capped Chickadee	70	S	1							
		Spring	AMRO	American Robin	30	NW	1							
		Spring	NOFL	Northern Flicker	60	NW	1							
		Spring	COGR	Common Grackle	50	N	1							
		Spring	DOWO	Downy Woodpecker	40	SW	1							
		Spring	RWBL	Red-winged Blackbird	40	W	1			7:58	8:07	11	0	85%
		Spring	AMRO	American Robin	50	S	1							
		Spring	COGR	Common Grackle	50	N	1							
		Spring	DOWO	Downy Woodpecker	40	SW	1							
24-Apr-11	H	Spring	REWO	Red-bellied Woodpecker	50	E	1							
		Spring	BLJA	Blue Jay	30	N	3							
		Spring	BLJA	Blue Jay	30	E	1							
		Spring	MOJO	Mourning Dove	80	S	1							
		Spring	BAOR	Baltimore Oriole	30	SW	1							
		Spring	FISP	Field Sparrow	30	SW	1			8:13	8:22	11	0	90%
		Spring	AMRO	American Robin	40	NW	1							
		Spring	BHCO	Brown-headed Cowbird	40	W	1							
		Spring	AMCR	American Crow	30	S	3							

Pascerine Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flyover # in Flock	Behavior/notes	Survey Time Start	Survey Time Stop	Temp (C)	Wind	Cloud		
24-Apr-11	J	Spring	GRCA	Gray Catbird	5	E	1								
		Spring	ETTI	Tufted Titmouse	15	NW	1								
		Spring	ETTI	Tufted Titmouse	60	W	1								
		Spring	RBWO	Red-bellied Woodpecker	30	SW	1								
		Spring	HOLA	Horned Lark	50	NE	1								
		Spring	EUST	European Starling	10	NE	5								
		Spring	DOWO	Dowry Woodpecker	30	E	1								
		Spring	HOWR	House Wren	30	SE	1								
		Spring	RBWO	Red-bellied Woodpecker	4	SW	1								
		Spring	MODO	Mourning Dove	30	N	1								
		Spring	AMRO	American Robin	30	N	1								
		Spring	NOFL	Northern Flicker	40	SW	1								
		Spring	AMCR	American Crow	60	W	1								
		Spring	GRCA	Gray Catbird	5	E	1								
24-Apr-11	K	Spring	ETTI	Tufted Titmouse	15	NW	1								
		Spring	ETTI	Tufted Titmouse	60	W	1								
		Spring	RBWO	Red-bellied Woodpecker	30	SW	1								
		Spring	HOLA	Horned Lark	50	NE	1								
		Spring	EUST	European Starling	10	NE	5								
		Spring	DOWO	Dowry Woodpecker	30	E	1								
		Spring	AMRO	American Robin	70	NW	1								
		Spring	NOFL	Northern Flicker	50	E	1								
		Spring	KILL	Killdeer	40	NW	1								
		Spring	AMRO	American Robin	10	NE	1								
		Spring	RWBL	Red-winged Blackbird	60	E	32								
		Spring	COGR	Common Grackle	20	W	1								
		Spring	EUST	European Starling	10	W	6								
		Spring	BLJA	Blue Jay	40	W	1								
24-Apr-11	K	Spring	RBWO	Red-bellied Woodpecker	50	NW	1								
		Spring	AMRO	American Robin	5	E	1								
		Spring	ETTI	Tufted Titmouse	15	NW	1								
		Spring	HOSP	House Sparrow	10	SE	3								
		Spring	BAOR	Baltimore Oriole	10	S	1								
		Spring	BLJA	Blue Jay	15	SW	2								
		Spring	COGR	Common Grackle	20	W	2								
		Spring	RBWO	Red-bellied Woodpecker	30	N	1								
		Spring	RWBL	Red-winged Blackbird	20	N	4								
		Spring	BHCO	Brown-headed Cowbird	15	SW	1								
		Spring	NOFL	Northern Flicker	50	S	1								
		Spring	DOWO	Dowry Woodpecker	10	W	1								
		Spring	CAGO	Canada Goose	60	N	3								
		27-Apr-11	A	Spring	NAWA	Nashville Warbler	30	S	1						
Spring	NOFL			Northern Flicker	50	S	1								
Spring	DOWO			Dowry Woodpecker	10	W	1								
Spring	AMCR			American Crow	50	N	4								
Spring	AMCR			American Crow	80	NE	4								
Spring	BLJA			Blue Jay	50	W	1								
Spring	ETTI			Tufted Titmouse	40	NE	1								
Spring	RWBL			Red-winged Blackbird	5	S	8								
Spring	HOSP			House Sparrow	3	S	4								
Spring	CHSP			Chipping Sparrow	5	W	4								
Spring	RWBL			Red-winged Blackbird	10	W	1								
Spring	AMRO			American Robin	15	SE	1								
Spring	AMCR			American Crow	50	S	1								
Spring	BHCO			Brown-headed Cowbird	40	W	1								
27-Apr-11	B	Spring	BLJA	Blue Jay	40	W	1								
		Spring	NOFL	Northern Flicker	50	NW	1								
		Spring	AMRO	American Robin	30	E	1								
		Spring	WOTH	Wood Thrush	50	SE	1								
		Spring	AMCR	American Crow	60	SE	3								
		Spring	NOFL	Northern Flicker	40	S	1								
		Spring	RSHA	Red-shouldered Hawk	30	S	1								
		27-Apr-11	C	Spring	AMRO	American Robin	50	E	1						
				Spring	AMCR	American Crow	60	SE	3						
				Spring	NOFL	Northern Flicker	40	S	1						
				Spring	RSHA	Red-shouldered Hawk	30	S	1						
				Spring	AMRO	American Robin	30	E	1						
				Spring	WOTH	Wood Thrush	50	SE	1						
				Spring	AMCR	American Crow	60	SE	3						
Spring	NOFL			Northern Flicker	40	S	1								
Spring	RSHA			Red-shouldered Hawk	30	S	1								
Spring	AMRO			American Robin	30	E	1								
Spring	WOTH			Wood Thrush	50	SE	1								
Spring	AMCR			American Crow	60	SE	3								
Spring	NOFL			Northern Flicker	40	S	1								
Spring	RSHA			Red-shouldered Hawk	30	S	1								

Passerine Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flyover # In Flock	Behavior/notes	Survey Time Start	Survey Time Stop	Survey Temp (C)	Wind	Cloud	
27-Apr-11	D	Spring	ETTI	Tufted Titmouse	20	NW	2							
		Spring	WTSP	White-throated Sparrow	40	SW	1		646	655	14	4	55%	
27-Apr-11	E	Spring	AMCR	American Crow	50	NE	2							
		Spring	AMRO	American Robin	30	N	1							
		Spring	BLJA	Blue Jay	40	NE	1							
		Spring	HOSP	House Sparrow	50	NW	7							
		Spring	CHSP	Chipping Sparrow	40	S	1			7:35	7:44	14	6	50%
		Spring	SOSP	Song Sparrow	30	SW	1							
		Spring	BLJA	Blue Jay	40	E	1							
		Spring	AMGO	American Goldfinch	20	W	2							
		Spring	AMCR	American Crow	20	SW	3							
		Spring	AMRO	American Robin	50	NW	1							
27-Apr-11	F	Spring	MODO	Mourning Dove	60	S	1		6:34	6:43	14	0	40%	
		Spring	AMGO	American Goldfinch	20	NW	2							
		Spring	BAOR	Baltimore Oriole	30	N	1							
		Spring	COGR	Common Grackle	15	N	4							
27-Apr-11	G	Spring	ETTI	Tufted Titmouse	45	SW	1							
		Spring	COGR	Common Grackle	50	E	2							
		Spring	AMGO	American Goldfinch	20	NW	2							
		Spring	NOCA	Northern Cardinal	40	NW	1			7:47	7:56	15	0	50%
		Spring	CHSP	Chipping Sparrow	30	W	1							
		Spring	BLJA	Blue Jay	50	NE	1							
		Spring	AMRO	American Robin	50	SW	1							
		Spring	COGR	Common Grackle	40	N	1							
		Spring	DOWO	Downy Woodpecker	40	S	1							
		Spring	RBWO	Red-bellied Woodpecker	50	ENE	1							
27-Apr-11	H	Spring	BLJA	Blue Jay	40	N	3							
		Spring	BCGH	Black-capped Chickadee	50	S	1							
		Spring	AMRO	American Robin	30	NW	1			8:00	8:09	15	2	60%
		Spring	NOCA	Northern Cardinal	40	SE	1							
		Spring	EUST	European Starling	30	SW	1							
		Spring	ETTI	Tufted Titmouse	40	W	1							
		Spring	WBNU	White-breasted Nuthatch	30	N	1							
		Spring	MODO	Mourning Dove	80	SW	3							
		Spring	BAOR	Baltimore Oriole	20	SW	1			8:12	8:21	16	2	50%
		Spring	AMRO	American Robin	50	NW	1							
27-Apr-11	J	Spring	FISP	Field Sparrow	30	SW	1							
		Spring	KILL	Killdeer	30	SE	1							
		Spring	AMRO	American Robin	50	W	1							
		Spring	AMRO	American Robin	35	NW	1							
		Spring	AMRO	American Robin	40	NE	1							
		Spring	RWBL	Red-winged Blackbird	60	S	1							
		Spring	BHCO	Brown-headed Cowbird	20	E	3							
		Spring	AMRO	American Robin	20	E	1							
		Spring	COGR	Common Grackle	40	NW	1							
		Spring	ETTI	Tufted Titmouse	50	W	1			6:02	6:11	15	0	50%
27-Apr-11	K	Spring	EUST	European Starling	30	N	4							
		Spring	SOSP	Song Sparrow	10	N	1							
		Spring	DEJU	Dark-eyed Junco	10	N	2							
		Spring	BLJA	Blue Jay	60	NE	1							
		Spring	BLJA	Blue Jay	60	E	2							
		Spring	AMRO	American Robin	50	E	1							
		Spring	AMRO	American Robin	30	NW	1							
		Spring	AMRO	American Robin	10	W	1			6:16	6:25	16	0	50%
		Spring	ETTI	Tufted Titmouse	45	E	1							
		Spring	KILL	Killdeer	70	SE	1							
Spring	MODO	Mourning Dove	20	E	1									
Spring	NOFL	Northern Flicker	100	SE	1									

Passerine Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flyover # in Flock	Behavior/notes	Survey Time Start	Survey Time Stop	Survey Temp (C)	Survey Weather	Conditions	
2-May-11	A	Spring	DOWO	Dowry Woodpecker	20	E	1							
		Spring	AMRO	American Robin	30	SE	1							
		Spring	COGR	Common Grackle	20	E	1							
		Spring	NAWA	Nashville Warbler	30	S	1							
		Spring	NOFL	Northern Flicker	50	S	1							
		Spring	DOWO	Dowry Woodpecker	10	W	1							
		Spring	CAGO	Canada Goose	80	N	5			659	708	10	5	90%
		Spring	AMCR	American Crow	80	NE	4							
		Spring	BLJA	Blue Jay	50	W	1							
		Spring	ETTI	Tufted Titmouse	40	NE	1							
		Spring	ETTI	Tufted Titmouse	40	NE	1							
		Spring	SCTA	Scarlet Tanager	30	S	1							
		Spring	BHCO	Brown-headed Cowbird	10	W	1							
		Spring	NOFL	Northern Flicker	60	W	1							
		Spring	AMCR	American Crow	60	N	1							
Spring	AMCR	American Crow	30	SW	1									
Spring	RWB	Red-winged Blackbird	10	SW	7									
Spring	NOCA	Northern Cardinal	30	NE	1									
Spring	AMRO	American Robin	50	NE	1			646	655	10	5	55%		
Spring	BHCO	Brown-headed Cowbird	60	N	1									
Spring	ETTI	Tufted Titmouse	80	NE	1									
Spring	AMRO	American Robin	40	W	1									
Spring	BLJA	Blue Jay	40	W	1									
Spring	CHSP	Chipping Sparrow	30	E	1									
Spring	AMRO	American Robin	20	E	1									
Spring	GCFL	Great Crested Flycatcher	30	S	1									
Spring	ETTI	Tufted Titmouse	25	E	1									
Spring	FISP	Field Sparrow	50	NW	1									
Spring	BHCO	Brown-headed Cowbird	90	NW	1									
Spring	BLJA	Blue Jay	30	SW	1									
Spring	SOSP	Song Sparrow	20	NW	1			634	643	10	15	55%		
Spring	AMRO	American Robin	60	SW	1									
Spring	RBGR	Rose-breasted Grosbeak	50	W	1									
Spring	BRTH	Brown Thrasher	70	W	1									
Spring	RBWO	Red-bellied Woodpecker	30	E	2									
Spring	RBWO	Red-bellied Woodpecker	20	NW	1									
Spring	FISP	Field Sparrow	50	N	1									
Spring	AMRO	American Robin	70	NE	1			619	628	10	4	90%		
Spring	AMGO	American Goldfinch	20	E	1									
Spring	KILL	Killdeer	25	SW	1									
Spring	NOFL	Northern Flicker	40	W	1									
Spring	AMGO	American Goldfinch	20	W	3									
Spring	SOSP	Song Sparrow	30	SW	1									
Spring	BLJA	Blue Jay	40	E	1									
Spring	AMRO	American Robin	40	N	1									
Spring	MODO	Mourning Dove	30	NW	1									
Spring	MODO	Mourning Dove	15	S	1									
Spring	RBGR	Rose-breasted Grosbeak	40	E	1									
Spring	BLJA	Blue Jay	35	E	1			712	721	9	4	55%		
Spring	RBWO	Red-bellied Woodpecker	60	SW	1									
Spring	RBWO	Red-bellied Woodpecker	100	W	1									
Spring	HOSP	House Sparrow	50	NW	8									
Spring	WBNU	White-breasted Nuthatch	60	NE	1									
Spring	CHSP	Chipping Sparrow	40	S	1									
Spring	BACR	Baltimore Oriole	30	SE	1									

Passerine Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flyover # in Flock	Behaviors/notes	Survey Time Start	Survey Time Stop	Temp (C)	Wind	Cloud	
2 May-11	E	Spring	NOCA	Northern Cardinal	30	NE	2							
		Spring	RHWO	Red-headed Woodpecker	40	W	2							
		Spring	AMRO	American Robin	50	NW	1							
		Spring	WOTH	Wood Thrush	45	WSW	1							
		Spring	COSR	Common Grackle	10	N	1							
		Spring	AMGO	American Goldfinch	10	NW	2			604	6:13	9	4	90%
		Spring	RBGR	Rose-breasted Grosbeak	15	N	1							
		Spring	BAOR	Baltimore Oriole	20	NW	1							
		Spring	MODO	Mourning Dove	60	S	1							
		Spring	AMCR	American Crow	70	SW	1							
2 May-11	G	Spring	FISP	Field Sparrow	100	SE	1							
		Spring	CHSP	Chipping Sparrow	20	W	1							
		Spring	RBGR	Rose-breasted Grosbeak	40	NW	1							
		Spring	FISP	Field Sparrow	60	NW	1							
		Spring	RWBL	Red-winged Blackbird	30	NW	1							
		Spring	ETTI	Tufted Titmouse	50	S	1			725	7:34	10	9	85%
		Spring	BLJA	Blue Jay	40	E	1							
		Spring	COSR	Common Grackle	40	E	2							
		Spring	AMGO	American Goldfinch	20	NW	1							
		Spring	NOCA	Northern Cardinal	100	W	1							
2 May-11	H	Spring	BCGH	Black-capped Chickadee	70	S	1							
		Spring	AMRO	American Robin	30	NW	1							
		Spring	NOCA	Northern Cardinal	40	SE	1							
		Spring	EUST	European Starling	30	SW	1			738	7:47	11	2	100%
		Spring	MAWA	Nashville Warbler	20	S	1							
		Spring	WIFL	Willow Flycatcher	40	W	1							
		Spring	BAOR	Baltimore Oriole	50	N	1							
		Spring	GBHE	Great Blue Heron	20	S	1							
		Spring	NOCA	Northern Cardinal	40	S	1							
		Spring	BLJA	Blue Jay	40	SW	2							
2 May-11	I	Spring	ETTI	Tufted Titmouse	60	NW	1							
		Spring	WBNU	White-breasted Nuthatch	30	NW	1							
		Spring	BLJA	Blue Jay	30	E	1							
		Spring	MODO	Mourning Dove	80	S	1			805	8:14	11	2	55%
		Spring	BAOR	Baltimore Oriole	30	SW	1							
		Spring	NOHA	Northern Harrier	60	NW	1							
		Spring	RBNU	Red-breasted Nuthatch	40	NW	1							
		Spring	BHCO	Brown-headed Cowbird	40	W	1							
		Spring	AMRO	American Robin	20	E	1							
		Spring	HOWR	House Wren	30	SE	1							
2 May-11	J	Spring	RBWO	Red-bellied Woodpecker	4	SW	1							
		Spring	MODO	Mourning Dove	30	N	1							
		Spring	AMRO	American Robin	30	N	1							
		Spring	NOFL	Northern Flicker	40	SW	1							
		Spring	AMCR	American Crow	60	W	1							
		Spring	GRCA	Gray Catbird	5	E	1							
		Spring	ETTI	Tufted Titmouse	15	NW	1							
		Spring	ETTI	Tufted Titmouse	60	W	1							
		Spring	AMRO	American Robin	5	E	1							
		Spring	ETTI	Tufted Titmouse	15	NW	1							
2 May-11	K	Spring	HOSP	House Sparrow	10	SE	3							
		Spring	BAOR	Baltimore Oriole	10	S	1							
		Spring	BLJA	Blue Jay	15	SW	2			550	5:59	10	6	50%
		Spring	COSR	Common Grackle	20	W	2							
		Spring	RBWO	Red-bellied Woodpecker	30	N	1							
		Spring	RWBL	Red-winged Blackbird	20	N	4							
		Spring	BHCO	Brown-headed Cowbird	15	SW	1							

Passerine Migration Field Data.

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flyover # in Flock	Behavior/notes	Survey Time Start	Survey Time Stop	Survey Temp (C)	Wind	Cloud	
4-May-11	A	Spring	AMRO	American Robin	20	S	2							
		Spring	CHSP	Chipping Sparrow	20	N	1							
		Spring	ETTL	Tufted Titmouse	5	NE	1							
		Spring	AMCR	American Crow	5	S	4			7:12	7:21	7	5	100%
		Spring	MYWA	Yellow-rumped Warbler	10	W	1							
		Spring	BCCH	Black-capped Chickadee	2	SW	1							
		Spring	MYWA	Yellow-rumped Warbler	20	W	2							
		Spring	RBWO	Red-bellied Woodpecker	60	SW	1							
		Spring	RWBL	Red-winged Blackbird	20	SW	8							
		Spring	ETTL	Tufted Titmouse	50	NE	1							
4-May-11	B	Spring	WOTH	Wood Thrush	60	NE	1							
		Spring	REVI	Red-eyed Vireo	30	NE	1							
		Spring	AMCR	American Crow	80	S	1			6:59	7:08	7	2	100%
		Spring	EUS1	European Starling	60	SW	12							
		Spring	PW01	Pileated Woodpecker	20	N	1							
		Spring	BAOR	Baltimore Oriole	40	NE	1							
		Spring	HOSP	House Sparrow	10	S	1							
		Spring	NOCA	Northern Cardinal	5	S	1							
		Spring	BAOR	Baltimore Oriole	20	S	1							
		Spring	AMCR	American Crow	10	W	1			6:46	6:55	8	0	100%
4-May-11	C	Spring	BCCH	Black-capped Chickadee	30	S	1							
		Spring	HOLA	Horned Lark	50	NW	1							
		Spring	MODO	Mourning Dove	20	S	1							
		Spring	FISP	Field Sparrow	50	N	1							
		Spring	HOWR	House Wren	20	E	1							
		Spring	WOTH	Wood Thrush	50	SW	1							
		Spring	RBWO	Red-bellied Woodpecker	20	NE	1			6:32	6:41	8	0	100%
		Spring	ETTL	Tufted Titmouse	15	N	1							
		Spring	BLJA	Blue Jay	20	NW	1							
		Spring	AMRO	American Robin	5	N	1							
4-May-11	D	Spring	NOFL	Northern Flicker	5	E	2							
		Spring	CHSP	Chipping Sparrow	10	S	1							
		Spring	AMRO	American Robin	10	N	1							
		Spring	REVI	Red-eyed Vireo	30	E	1							
		Spring	AMRO	American Robin	15	S	1			7:25	7:34	8	0	100%
		Spring	BAOR	Baltimore Oriole	50	E	1							
		Spring	AMRO	American Robin	5	W	1							
		Spring	WTSP	White-throated Sparrow	40	W	3							
		Spring	AMRO	American Robin	30	W	1							
		Spring	SOSP	Song Sparrow	20	S	1							
4-May-11	E	Spring	AMCR	American Crow	40	NW	1			6:17	6:26	9	2	100%
		Spring	HOWR	House Wren	40	W	1							
		Spring	AMRO	American Robin	20	NW	1							
		Spring	HOLA	Horned Lark	20	E	2							
		Spring	KILL	Killdeer	30	NW	1							
		Spring	BHCO	Brown-headed Cowbird	20	NW	2							
		Spring	AMRO	American Robin	5	S	2							
		Spring	WBNU	White-breasted Nuthatch	5	E	1							
		Spring	BLJA	Blue Jay	20	NW	1			7:39	7:48	8	0	100%
		Spring	WOTH	Wood Thrush	60	S	1							
4-May-11	F	Spring	AMGO	American Goldfinch	10	W	2							
		Spring	AMCR	American Crow	100	NW	1							
		Spring	BCCH	Black-capped Chickadee	30	W	1							
		Spring	CHSP	Chipping Sparrow	30	NE	1							
		Spring	AMRO	American Robin	60	E	1							
		Spring	MODO	Mourning Dove	40	NE	1							
		Spring	BHCO	Brown-headed Cowbird	30	W	1							
		Spring	YTVI	Yellow-throated Vireo	20	W	1							
		Spring	RWBL	Red-winged Blackbird	10	S	1							
		Spring	NOCA	Northern Cardinal	50	SW	1			7:54	8:03	9	5	100%
4-May-11	G	Spring	SOSP	Song Sparrow	60	NW	1							
		Spring	WBNU	White-breasted Nuthatch	50	W	1							
		Spring	CHSP	Chipping Sparrow	30	NE	1							
		Spring	AMRO	American Robin	60	E	1							
		Spring	MODO	Mourning Dove	40	NE	1							
		Spring	BHCO	Brown-headed Cowbird	30	W	1							
		Spring	YTVI	Yellow-throated Vireo	20	W	1							
		Spring	RWBL	Red-winged Blackbird	10	S	1							
		Spring	NOCA	Northern Cardinal	50	SW	1							
		Spring	SOSP	Song Sparrow	60	NW	1							
4-May-11	H	Spring	WBNU	White-breasted Nuthatch	50	W	1							

Passerine Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flyover # in Flock	Behavior/notes	Survey Time Start	Survey Time Stop	Survey Temp (C)	Wind	Cloud	
4-May-11	I	Spring	REVI	Red-eyed Vireo	15	W	1							
		Spring	BCGH	Black-capped Chickadee	30	NE	1							
		Spring	EAKI	Eastern Kingbird	10	W	1							
		Spring	BAOR	Baltimore Oriole	20	SW	1							
		Spring	NOCA	Northern Cardinal	30	W	1							
		Spring	HOWR	House Wren	40	NE	1							
		Spring	BAOR	Baltimore Oriole	25	SW	1							
		Spring	WBNU	White-breasted Nuthatch	40	NW	1			807	816	9	0	100%
		Spring	SOSP	Song Sparrow	50	S	1							
		Spring	NOCA	Northern Cardinal	60	SW	1							
		Spring	BLJA	Blue Jay	40	S	1							
		Spring	AMCR	American Crow	70	N	4							
		Spring	GRHE	Green Heron	20	S	1							
		Spring	COGR	Common Grackle	70	N	2							
Spring	EWPE	Eastern Wood-Pewee	80	NW	1									
Spring	CHSP	Chipping Sparrow	50	SW	1									
4-May-11	J	Spring	WOTH	Wood Thrush	30	E	1							
		Spring	AMRO	American Robin	30	SE	1							
		Spring	WBNU	White-breasted Nuthatch	40	S	1							
		Spring	ETTI	Tufted Titmouse	55	S	1							
		Spring	WOTH	Wood Thrush	30	S	1							
		Spring	AMCR	American Crow	100	W	2			545	554	7	5	100%
		Spring	MYWA	Yellow-rumped Warbler	30	SW	1							
		Spring	HOWR	House Wren	40	SW	1							
		Spring	MODO	Mourning Dove	30	N	1							
		Spring	DOWO	Dowry Woodpecker	20	W	1							
		Spring	BHCO	Brown-headed Cowbird	20	NW	1							
		Spring	AMRO	American Robin	10	E	2							
		Spring	AMRO	American Robin	30	NE	1							
		Spring	CHSP	Chipping Sparrow	20	N	1							
Spring	RWBL	Red-winged Blackbird	10	N	2									
Spring	COGR	Common Grackle	10	N	1									
Spring	MOCO	Mourning Dove	30	NW	1									
Spring	SOSP	Song Sparrow	30	SW	1			559	608	7	0	100%		
Spring	BCGH	Black-capped Chickadee	40	SW	1									
Spring	AMRO	American Robin	40	NW	3									
Spring	HOSP	House Sparrow	10	NW	6									
Spring	SOSP	Song Sparrow	5	W	1									
Spring	WBNU	White-breasted Nuthatch	40	NW	1									
Spring	SOSP	Song Sparrow	10	NW	1									
Spring	CHSP	Chipping Sparrow	25	N	1									
Spring	MYWA	Yellow-rumped Warbler	20	W	1									
Spring	AMRO	American Robin	25	S	1									
Spring	AMRO	American Robin	30	NE	1									
Spring	RBWO	Red-bellied Woodpecker	50	SW	1			709	718	17	9	95%		
Spring	AMCR	American Crow	20	W	3									
Spring	WAVI	Warbling Vireo	10	N	1									
Spring	INBU	Indigo Bunting	15	NE	1									
Spring	ETTI	Tufted Titmouse	10	NE	1									
Spring	RWBL	Red-winged Blackbird	20	SW	6									
Spring	COGR	Common Grackle	25	SW	2									
Spring	REVI	Red-eyed Vireo	25	NE	1									
Spring	ETTI	Tufted Titmouse	40	NE	1									
Spring	WOTH	Wood Thrush	70	NE	1									
Spring	AMCR	American Crow	100	S	3			655	704	17	4	100%		
Spring	EUST	European Starling	50	E	4									
Spring	BAOR	Baltimore Oriole	30	NE	1									
Spring	HOSP	House Sparrow	10	S	6									
Spring	NOCA	Northern Cardinal	10	N	1									
Spring	AMRO	American Robin	25	W	1									

Passerine Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flyover # in Flock	Behavior/notes	Survey Time Start	Survey Time Stop	Survey Temp (C)	Survey Weather	Conditions	
10-May-11	C	Spring	WOTH	Wood Thrush	60	SW	1							
		Spring	CHSP	Chipping Sparrow	50	E	1							
		Spring	AMRO	American Robin	30	SW	1							
		Spring	ETTU	Tufted Titmouse	25	W	1							
		Spring	BHCO	Brown-headed Cowbird	35	W	1							
		Spring	WBNU	White-breasted Nuthatch	30	W	1			641	650	16	9	55%
		Spring	EWPE	Eastern Wood-Pewee	40	SE	1							
		Spring	INBU	Indigo Bunting	30	W	1							
		Spring	AMGO	American Goldfinch	10	W	1							
		Spring	HOWR	House Wren	50	NW	1							
Spring	AMCR	American Crow	10	WNW	3									
Spring	HOLA	Horned Lark	60	NW	2									
Spring	MODO	Mourning Dove	25	S	2									
Spring	SOSP	Song Sparrow	40	SE	1									
Spring	GCFL	Great Crested Flycatcher	60	NE	1									
Spring	BRTH	Brown Thrasher	40	N	1									
Spring	RBWO	Red-bellied Woodpecker	100	E	1									
Spring	EUST	European Starling	20	NE	6				628	637	16	9	90%	
Spring	EABL	Eastern Bluebird	30	S	2									
Spring	BLJA	Blue Jay	25	NNW	1									
Spring	RBWO	Red-bellied Woodpecker	40	E	2									
Spring	AMRO	American Robin	30	N	1									
Spring	WOTH	Wood Thrush	50	E	1									
Spring	BLJA	Blue Jay	40	NE	1									
Spring	AMRO	American Robin	10	NE	1									
Spring	SOSP	Song Sparrow	20	S	1									
Spring	WOTH	Wood Thrush	30	N	1									
Spring	ETTU	Tufted Titmouse	30	SE	1									
Spring	AMGO	American Goldfinch	20	W	4									
Spring	CHSP	Chipping Sparrow	10	SW	1									
Spring	MODO	Mourning Dove	15	S	2									
Spring	MYWA	Yellow-rumped Warbler	25	W	2									
Spring	RBWO	Red-bellied Woodpecker	100	W	1				723	732	17	5	55%	
Spring	NOFL	Northern Flicker	15	E	1									
Spring	HOSP	House Sparrow	40	NE	5									
Spring	AMRO	American Robin	5	NW	1									
Spring	COGR	Common Grackle	30	W	1									
Spring	EWPE	Eastern Wood-Pewee	40	E	1									
Spring	KILL	Killdeer	60	NE	2									
Spring	EUST	European Starling	5	W	1									
Spring	AMRO	American Robin	40	NE	1									
Spring	HOWR	House Wren	50	SE	1									
Spring	WBNU	White-breasted Nuthatch	50	NE	1									
Spring	AMGO	American Goldfinch	25	N	3									
Spring	BHCO	Brown-headed Cowbird	15	N	1									
Spring	ETTU	Tufted Titmouse	100	E	1									
Spring	CAGO	Canada Goose	10	W	2									
Spring	AMCR	American Crow	15	SW	2				614	623				
Spring	RBGR	Rose-breasted Grosbeak	20	N	1									
Spring	WOTH	Wood Thrush	60	NW	1									
Spring	SOSP	Song Sparrow	40	N	1									
Spring	EUST	European Starling	30	N	1									
Spring	RBWO	Red-bellied Woodpecker	30	SW	1									
Spring	RBWO	Red-bellied Woodpecker	50	SE	1									
Spring	INBU	Indigo Bunting	20	SE	1									
Spring	AMGO	American Goldfinch	10	SW	4									
Spring	AMRO	American Robin	50	S	1									
Spring	WOTH	Wood Thrush	60	NW	1									
Spring	MODO	Mourning Dove	70	N	2				738	747	18	9	100%	
Spring	CHSP	Chipping Sparrow	25	W	1									
Spring	KILL	Killdeer	40	NW	1									
Spring	BLJA	Blue Jay	40	E	1									
Spring	AMCR	American Crow	100	NNW	3									

Passerine Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flyover # In Flock	Behavior/notes	Survey Time Start	Survey Time Stop	Survey Temp (C)	Survey Weather	Conditions	
10-May-11	H	Spring	GRCA	Gray Catbird	20	W	1							
		Spring	EUST	European Starling	40	S	3							
		Spring	AMRO	American Robin	30	NE	1							
		Spring	EWPE	Eastern Wood-Pewee	15	SE	1							
		Spring	RBGR	Rose-breasted Grosbeak	10	W	1							
		Spring	BAOR	Baltimore Oriole	15	S	1			751	800	18	4	100%
		Spring	BRNS	Barn Swallow	5	W	1							
		Spring	BLJA	Blue Jay	15	S	1							
		Spring	NOCA	Northern Cardinal	50	SW	1							
		Spring	CHSP	Chipping Sparrow	40	E	1							
Spring	RWBL	Red-winged Blackbird	70	NW	2									
10-May-11	I	Spring	MODO	Mourning Dove	50	NE	1							
		Spring	ETTI	Tufted Titmouse	50	W	1							
		Spring	NOCA	Northern Cardinal	50	S	1							
		Spring	SOBP	Song Sparrow	50	SE	1							
		Spring	MODO	Mourning Dove	50	S	2							
		Spring	HOWR	House Wren	30	NE	1							
		Spring	WBNJ	White-breasted Nuthatch	30	NW	1							
		Spring	EWPE	Eastern Wood-Pewee	60	NW	1			806	815	19	4	100%
		Spring	REVI	Red-eyed Vireo	20	W	1							
		Spring	AMCR	American Crow	50	N	5							
10-May-11	J	Spring	BLJA	Blue Jay	20	E	1							
		Spring	BHCO	Brown-headed Cowbird	50	SW	2							
		Spring	BLJA	Blue Jay	60	SW	1							
		Spring	ETTI	Tufted Titmouse	30	S	1							
		Spring	GRCA	Gray Catbird	35	N	1							
		Spring	BHCO	Brown-headed Cowbird	15	N	2							
		Spring	GRCA	Gray Catbird	10	SE	2							
		Spring	HOWR	House Wren	50	N	1							
		Spring	NOFL	Northern Flicker	45	SW	1							
		Spring	CHSP	Chipping Sparrow	40	N	1							
10-May-11	K	Spring	AMRO	American Robin	30	N	1							
		Spring	AMGO	American Goldfinch	15	SE	2							
		Spring	RBWO	Red-bellied Woodpecker	70	SW	1			545	554	15	5	55%
		Spring	COGR	Common Grackle	10	N	1							
		Spring	ETTI	Tufted Titmouse	20	NW	1							
		Spring	MODO	Mourning Dove	30	N	2							
		Spring	DOWO	Downy Woodpecker	20	W	1							
		Spring	WOTH	Wood Thrush	50	NW	1							
		Spring	AMGO	American Goldfinch	20	E	2							
		Spring	RWBL	Red-winged Blackbird	70	NW	4							
10-May-11	K	Spring	COGR	Common Grackle	50	N	3							
		Spring	HOLA	Horned Lark	30	E	1							
		Spring	MODO	Mourning Dove	30	W	2							
		Spring	HOWR	House Wren	20	SW	1							
		Spring	RWBL	Red-winged Blackbird	15	S	1							
		Spring	RWBL	Red-winged Blackbird	20	E	2							
		Spring	BAOR	Baltimore Oriole	15	S	1							
		Spring	HAWO	Hairy Woodpecker	15	NW	1							
		Spring	CHSP	Chipping Sparrow	15	NW	1			558	607	15	2	90%
		Spring	AMRO	American Robin	20	E	4							
Spring	COGR	Common Grackle	30	E	2									
Spring	HOSP	House Sparrow	15	NW	7									
Spring	MODO	Mourning Dove	30	N	2									
Spring	BLJA	Blue Jay	20	NW	1									
Spring	RBWO	Red-bellied Woodpecker	50	NW	1									

Passerine Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flyover # in Flock	Behavior/notes	Survey Time Start	Survey Time Stop	Survey Temp (C)	Survey Weather	Conditions	
12-May-11	A	Spring	RBWO	Red-bellied Woodpecker	50	SW	1							
		Spring	AMCR	American Crow	20	W	4							
		Spring	DOWO	Downy Woodpecker	20	NE	1							
		Spring	ETTI	Tufted Titmouse	45	NE	1							
		Spring	AMRO	American Robin	30	SE	1							
		Spring	BLJA	Blue Jay	40	SW	1							
		Spring	COGR	Common Grackle	20	E	2							
		Spring	NOFL	Northern Flicker	70	SSE	1							
		Spring	WOTH	Wood Thrush	50	SW	1							
		Spring	AMGO	American Goldfinch	30	W	3							
		Spring	RBWO	Red-bellied Woodpecker	30	SE	1							
		Spring	RBGR	Rose-breasted Grosbeak	10	NE	1							
		Spring	RWBL	Red-winged Blackbird	15	W	4							
		Spring	SOSP	Song Sparrow	20	W	1							
12-May-11	B	Spring	WEVI	White-eyed Vireo	15	NW	1							
		Spring	AMCR	American Crow	20	SE	3							
		Spring	CHSP	Chipping Sparrow	30	W	1							
		Spring	BRTH	Brown Thrasher	20	NW	1							
		Spring	NOCA	Northern Cardinal	20	W	1							
		Spring	RBGR	Rose-breasted Grosbeak	40	N	1			741	750	17	0	100%
		Spring	WBNU	White-breasted Nuthatch	20	N	1							
		Spring	PWA	Pine Warbler	40	E	1							
		Spring	AMRO	American Robin	15	W	2							
		Spring	AMCR	American Crow	100	W	2							
		Spring	ETTI	Tufted Titmouse	30	N	1							
		Spring	INBU	Indigo Bunting	5	W	2							
		Spring	CAGO	Canada Goose	100	NW	5							
		Spring	COGR	Common Grackle	5	N	1							
12-May-11	C	Spring	SCTA	Scarlet Tanager	20	SW	1							
		Spring	BAGR	Baltimore Oriole	15	S	1							
		Spring	EAME	Eastern Meadowlark	40	NW	1							
		Spring	INBU	Indigo Bunting	30	W	1							
		Spring	AMGO	American Goldfinch	10	W	1							
		Spring	HOWR	House Wren	50	NW	1							
		Spring	AMCR	American Crow	70	S	2							
		Spring	WOTH	Wood Thrush	60	SW	1							
		Spring	CHSP	Chipping Sparrow	50	E	1			728	737	17	0	80%
		Spring	COHA	Cougar's Hawk	30	SW	1							
		Spring	ETTI	Tufted Titmouse	25	W	1							
		Spring	BHCO	Brown-headed Cowbird	35	W	1							
		Spring	WBNU	White-breasted Nuthatch	30	W	1							
		Spring	EWPE	Eastern Wood Pewee	40	SE	1							
12-May-11	D	Spring	EABL	Eastern Bluebird	40	W	2							
		Spring	RBGR	Rose-breasted Grosbeak	30	W	1							
		Spring	BOBO	Bobolink	30	W	1							
		Spring	CHSP	Chipping Sparrow	20	W	1							
		Spring	AMRO	American Robin	40	NW	1							
		Spring	EUST	European Starling	15	NE	1							
		Spring	HOWR	House Wren	50	NW	1							
		Spring	ETTI	Tufted Titmouse	40	NW	1							
		Spring	MYWA	Yellow-rumped Warbler	30	NE	1							
		Spring	RBWO	Red-bellied Woodpecker	40	E	2							
		Spring	AMRO	American Robin	30	N	1							
		Spring	OROR	Orchard Oriole	10	N	1							
		Spring	RBGR	Rose-breasted Grosbeak	40	NE	1			715	724	18	0	80%
		Spring	EABL	Eastern Bluebird	30	SE	1							
Spring	BAOR	Baltimore Oriole	50	SE	1									
Spring	FISP	Field Sparrow	70	N	1									
Spring	CAGO	Canada Goose	60	N	6									
Spring	SOSP	Song Sparrow	50	SE	1									
Spring	GCFL	Great Crested Flycatcher	60	NE	1									
Spring	CSWA	Chesnut-sided Warbler	15	NE	1									

Passerine Migration Field Data.

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flyover # in Flock	Behavior/notes	Survey Time Start	Survey Time Stop	Survey Temp (C)	Survey Weather	Conditions	
12-May-11	E	Spring	CHSP	Chipping Sparrow	20	N	1							
		Spring	AMRO	American Robin	30	E	1							
		Spring	TEWA	Tennessee Warbler	25	NW	1							
		Spring	EUST	European Starling	5	W	1							
		Spring	AMRO	American Robin	40	NE	1							
		Spring	HOWR	House Wren	50	SE	1							
		Spring	GRCA	Gray Catbird	30	NE	1							
		Spring	RBWO	Red-bellied Woodpecker	70	W	1							
		Spring	SOSP	Song Sparrow	40	W	1							
		Spring	BLJA	Blue Jay	40	NW	1							
		Spring	ETTI	Tufted Titmouse	50	NW	1							
		Spring	BLJA	Blue Jay	40	N	1							
		Spring	AMRO	American Robin	5	NW	1							
		Spring	COGR	Common Grackle	30	W	1							
		Spring	EWPE	Eastern Wood-Pewee	40	E	1							
		Spring	KILL	Killdeer	60	NE	2							
		Spring	NOFL	Northern Flicker	70	SE	1							
		Spring	RHWO	Red-headed Woodpecker	15	N	1							
		Spring	HOFI	House Finch	20	W	1							
		Spring	RWBL	Red-winged Blackbird	25	NW	3							
Spring	COGR	Common Grackle	15	NW	2									
Spring	AMGO	American Goldfinch	20	W	3									
Spring	CAGO	Canada Goose	10	W	2									
Spring	AMCR	American Crow	15	SW	2									
Spring	RSHA	Red-shouldered Hawk	15	SW	1									
Spring	BHVI	Blue-headed Vireo	30	W	1									
Spring	AMGO	American Goldfinch	40	N	1									
Spring	BHCO	Brown-headed Cowbird	15	N	1									
Spring	ETTI	Tufted Titmouse	100	E	1									
Spring	SCIA	Scarlet Tanager	70	W	1									
Spring	GCFL	Great Crested Flycatcher	100	E	1									
Spring	WOTH	Wood Thrush	80	NW	1									
Spring	SOSP	Song Sparrow	50	N	1									
Spring	EUST	European Starling	30	N	1									
Spring	MODO	Mourning Dove	30	N	1									
Spring	LEFL	Least Flycatcher	30	N	1									
Spring	RBWO	Red-bellied Woodpecker	40	W	1									
Spring	AMGO	American Goldfinch	10	W	3									
Spring	AMRO	American Robin	50	S	1									
Spring	WOTH	Wood Thrush	50	NW	1									
Spring	RBWO	Red-bellied Woodpecker	50	SE	1									
Spring	INBU	Indigo Bunting	30	SE	1									
Spring	AMRE	American Redstart	15	SE	1									
Spring	TUVU	Turkey Vulture	10	E	1									
Spring	COGR	Common Grackle	20	N	1									
Spring	INBU	Indigo Bunting	30	W	1									
Spring	GCFL	Great Crested Flycatcher	60	S	1									
Spring	MODO	Mourning Dove	30	NW	1									
Spring	AMRO	American Robin	40	W	1									
Spring	RBWO	Red-bellied Woodpecker	30	W	1									
12-May-11	F	Spring	AMGO	American Goldfinch	20	W	3							
		Spring	AMCR	American Crow	15	SW	2							
		Spring	RSHA	Red-shouldered Hawk	15	SW	1							
		Spring	BHVI	Blue-headed Vireo	30	W	1							
		Spring	AMGO	American Goldfinch	40	N	1							
		Spring	BHCO	Brown-headed Cowbird	15	N	1							
		Spring	ETTI	Tufted Titmouse	100	E	1							
		Spring	SCIA	Scarlet Tanager	70	W	1							
		Spring	GCFL	Great Crested Flycatcher	100	E	1							
		Spring	WOTH	Wood Thrush	80	NW	1							
12-May-11	G	Spring	SOSP	Song Sparrow	50	N	1							
		Spring	EUST	European Starling	30	N	1							
		Spring	MODO	Mourning Dove	30	N	1							
		Spring	LEFL	Least Flycatcher	30	N	1							
		Spring	RBWO	Red-bellied Woodpecker	40	W	1							
		Spring	AMGO	American Goldfinch	10	W	3							
		Spring	AMRO	American Robin	50	S	1							
		Spring	WOTH	Wood Thrush	50	NW	1							
		Spring	RBWO	Red-bellied Woodpecker	50	SE	1							
		Spring	INBU	Indigo Bunting	30	SE	1							
12-May-11	G	Spring	AMRE	American Redstart	15	SE	1							
		Spring	TUVU	Turkey Vulture	10	E	1							
		Spring	COGR	Common Grackle	20	N	1							
		Spring	INBU	Indigo Bunting	30	W	1							
		Spring	GCFL	Great Crested Flycatcher	60	S	1							
		Spring	MODO	Mourning Dove	30	NW	1							
		Spring	AMRO	American Robin	40	W	1							
		Spring	RBWO	Red-bellied Woodpecker	30	W	1							
		Spring	AMGO	American Goldfinch	20	W	3							
		Spring	AMCR	American Crow	15	SW	2							

Passerine Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flyover # in Flock	Behavior/notes	Survey Time Start	Survey Time Stop	Survey Temp (C)	Wind	Cloud	
12-May-11	H	Spring	AMRO	American Robin	15	E	2							
		Spring	EWPE	Eastern Wood-Pewee	20	SE	1							
		Spring	AMRO	American Robin	30	NE	1							
		Spring	AMRO	American Robin	45	NW	1							
		Spring	NOCA	Northern Cardinal	50	S	1							
		Spring	RBGR	Rose-breasted Grosbeak	30	SW	1							
		Spring	ETTI	Tufted Titmouse	40	SW	1							
		Spring	COGR	Common Grackle	30	S	2			821	830	18	0	100%
		Spring	EUST	European Starling	40	NW	4							
		Spring	RBGR	Rose-breasted Grosbeak	10	W	1							
		Spring	BAOR	Baltimore Oriole	15	W	1							
		Spring	BRNS	Barn Swallow	5	W	1							
		Spring	GRCA	Gray Catbird	10	W	1							
		Spring	EUST	European Starling	10	S	1							
Spring	BLJA	Blue Jay	10	S	1									
12-May-11	I	Spring	EWPE	Eastern Wood-Pewee	40	NW	1							
		Spring	REVI	Red-eyed Vireo	20	W	1							
		Spring	AMGR	American Crow	50	N	3							
		Spring	NOCA	Northern Cardinal	45	S	1							
		Spring	BHCO	Brown-headed Cowbird	50	W	2							
		Spring	BLJA	Blue Jay	30	W	1							
		Spring	MODO	Mourning Dove	70	S	1							
		Spring	ETTI	Tufted Titmouse	60	W	1							
		Spring	HOWR	House Wren	40	NE	1							
		Spring	SOSP	Song Sparrow	50	SE	1			833	842	18	0	100%
		Spring	COGR	Common Grackle	50	N	2							
		Spring	BAOR	Baltimore Oriole	20	NW	1							
		Spring	CHSP	Chipping Sparrow	40	SW	1							
		Spring	AMRO	American Robin	20	N	1							
Spring	AMRO	American Robin	50	SW	1									
Spring	REVI	Red-eyed Vireo	10	E	1									
Spring	REVO	Red-bellied Woodpecker	70	NW	1									
Spring	RWBL	Red-winged Blackbird	50	N	3									
12-May-11	J	Spring	AMRO	American Robin	20	N	1							
		Spring	WOTH	Wood Thrush	50	Start Time	1							
		Spring	AMRO	American Robin	30	SW	1							
		Spring	AMGO	American Goldfinch	15	SE	2							
		Spring	REVO	Red-bellied Woodpecker	70	SW	1							
		Spring	COGR	Common Grackle	10	N	1							
		Spring	ETTI	Tufted Titmouse	50	NW	1							
		Spring	AMCO	American Coot	60	W	3							
		Spring	RWBL	Red-winged Blackbird	20	N	2							
		Spring	AMRO	American Robin	30	W	2							
		Spring	HOWR	House Wren	40	N	1							
		Spring	HOSP	House Sparrow	40	N	1							
		Spring	CHSP	Chipping Sparrow	30	N	1							
		Spring	BLJA	Blue Jay	100	NE	1							
Spring	ACFL	Acadian Flycatcher	40	SW	1									
Spring	BHCO	Brown-headed Cowbird	30	SW	1									
Spring	GRCA	Gray Catbird	15	N	1									
Spring	BHCO	Brown-headed Cowbird	15	N	2									
Spring	GRCA	Gray Catbird	40	E	2									
Spring	TEWA	Tennessee Warbler	25	SE	2									
Spring	OVEN	Ovenbird	40	W	1									
Spring	WBNU	White-breasted Nuthatch	40	S	1									
Spring	WOTH	Wood Thrush	60	WNW	1									
Spring	AMGO	American Goldfinch	10	E	5			620	629	17	0	70%		

Passerine Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flyover # In Flock	Behavior/notes	Survey Time Start	Survey Time Stop	Survey Temp (C)	Survey Weather	Conditions	
12-May-11	K	Spring	AMRO	American Robin	15	SW	1							
		Spring	WAVI	Warbling Vireo	20	W	1							
		Spring	MODO	Mourning Dove	30	W	2							
		Spring	HOWR	House Wren	15	SW	1							
		Spring	RWBL	Red-winged Blackbird	15	S	1							
		Spring	NOBW	Northern Bobwhite	35	W	1		Probably Domestic					
		Spring	AMRO	American Robin	25	SW	1							
		Spring	FISP	Field Sparrow	40	NE	1							
		Spring	RPHE	Ring-necked Pheasant	25	NW	1		Probably Domestic	6:36	6:45	17	0	70%
		Spring	KILL	Killdeer	50	SE	3							
		Spring	TEWA	Tennessee Warbler	20	S	1							
		Spring	RWBL	Red-winged Blackbird	20	E	1							
		Spring	BAOR	Baltimore Oriole	15	S	1							
		Spring	HAWO	Hairy Woodpecker	5	NW	1							
		Spring	CHSP	Chipping Sparrow	15	NW	1							
		Spring	EUST	European Starling	20	NW	3							
		Spring	CAGO	Canada Goose	100	NW	4							
		Spring	SOSP	Song Sparrow	20	N	1							
		Spring	WEWA	Worm-eating Warbler	30	NW	1							
		Spring	ETTI	Tufted Titmouse	10	N	1							
Spring	NOCA	Northern Cardinal	25	NE	2									
Spring	RHWO	Red-headed Woodpecker	20	W	2									
Spring	COGR	Common Grackle	25	N	2									
Spring	WOTH	Wood Thrush	40	SW	1									
Spring	AMRO	American Robin	50	N	1									
Spring	WBNJ	White-breasted Nuthatch	60	E	1									
Spring	AMCR	American Crow	70	SSW	8				6:26	6:35	18	2	50%	
Spring	AMGO	American Goldfinch	30	W	4									
Spring	SCTA	Scarlet Tanager	60	SW	1									
Spring	MYWA	Yellow-rumped Warbler	15	W	1									
Spring	RBWO	Red-bellied Woodpecker	60	SW	1									
Spring	RBGR	Rose-breasted Grosbeak	20	N	1									
Spring	EWPE	Eastern Wood-pewee	15	E	1									
Spring	RWBL	Red-winged Blackbird	20	SW	7									
Spring	AMCR	American Crow	30	SW	4									
Spring	WOTH	Wood Thrush	50	NE	1									
Spring	CHSP	Chipping Sparrow	40	W	1									
Spring	AMRO	American Robin	15	S	2									
Spring	EUST	European Starling	20	W	2									
Spring	BAOR	Baltimore Oriole	40	NE	1									
Spring	HOLA	Horned Lark	70	NW	1				6:13	6:22	18	2	65%	
Spring	HOSP	House Sparrow	10	S	3									
Spring	HEVI	Red-eyed Vireo	30	NNE	1									
Spring	BLJA	Blue Jay	50	SE	1									
Spring	AMCR	American Crow	70	NW	2									
Spring	TEWA	Tennessee Warbler	15	NE	2									
Spring	HOLA	Horned Lark	60	NW	2									
Spring	BHCO	Brown-headed Cowbird	50	W	2									
Spring	FISP	Field Sparrow	50	NW	1									
Spring	AMRO	American Robin	30	E	1									
Spring	AMRO	American Robin	40	SW	1									
Spring	RBGR	Rose-breasted Grosbeak	10	S	2									
Spring	ETTI	Tufted Titmouse	20	E	1									
Spring	RICCH	Black-capped Chickadee	20	S	2									
Spring	AMCR	American Crow	30	W	4									
Spring	BLJA	Blue Jay	25	S	1									
Spring	CHSP	Chipping Sparrow	25	E	1									
Spring	BHCO	Brown-headed Cowbird	30	SE	1				5:57	6:06	17	0	50%	
Spring	SOSP	Song Sparrow	25	NW	1									

Passerine Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flyover # in Flock	Behavior/notes	Survey Time Start	Survey Time Stop	Survey Temp (C)	Wind	Cloud	
15-May-11	D	Spring	AMGO	American Goldfinch	30	E	3							
		Spring	HOWR	House Wren	20	E	1							
		Spring	AMRO	American Robin	10	N	1							
		Spring	RBWO	Red-bellied Woodpecker	20	NNE	1			542	551	16	2	50%
		Spring	AMRO	American Robin	70	NE	1							
		Spring	FISP	Field Sparrow	40	N	1							
		Spring	MODO	Mourning Dove	30	S	2							
		Spring	RBWO	Red-bellied Woodpecker	20	W	1							
		Spring	EABL	Eastern Bluebird	50	S	2							
		Spring	RBWO	Red-bellied Woodpecker	60	W	1							
15-May-11	E	Spring	AMRO	American Robin	30	N	1							
		Spring	CHSP	Chipping Sparrow	10	S	1							
		Spring	MODO	Mourning Dove	20	S	2							
		Spring	RBWO	Red-bellied Woodpecker	60	SW	1							
		Spring	NOFL	Northern Flicker	50	W	1							
		Spring	RBGR	Rose-breasted Grosbeak	30	E	1							
		Spring	BLJA	Blue Jay	15	SW	1			640	649	19	0	50%
		Spring	SOSP	Song Sparrow	30	SW	1							
		Spring	AMRO	American Robin	40	SW	1							
		Spring	BAOR	Baltimore Oriole	40	E	1							
15-May-11	F	Spring	REVI	Red-eyed Vireo	30	E	1							
		Spring	RBWO	Red-bellied Woodpecker	100	W	1							
		Spring	MODO	Mourning Dove	40	W	1							
		Spring	WOTH	Wood Thrush	50	W	1							
		Spring	BRTH	Brown Thrasher	40	N	1							
		Spring	NOCA	Northern Cardinal	40	NE	1							
		Spring	AMRO	American Robin	40	NW	1							
		Spring	WOTH	Wood Thrush	50	SW	1							
		Spring	HOLA	Horned Lark	30	E	2							
		Spring	HOWR	House Wren	40	W	1			529	538			
15-May-11	G	Spring	RBGR	Rose-breasted Grosbeak	20	NW	1							
		Spring	MODO	Mourning Dove	20	S	3							
		Spring	AMCR	American Crow	80	E	8							
		Spring	FISP	Field Sparrow	60	SW	1							
		Spring	COGR	Common Grackle	10	S	8							
		Spring	FISP	Field Sparrow	80	SE	1							
		Spring	TUNU	Turkey Vulture	15	E	1							
		Spring	COGR	Common Grackle	20	N	1							
		Spring	INBU	Indigo Bunting	40	W	1							
		Spring	GCFL	Great Crested Flycatcher	60	S	1							
15-May-11	G	Spring	MODO	Mourning Dove	30	N	1							
		Spring	AMRO	American Robin	40	W	1							
		Spring	RBWO	Red-bellied Woodpecker	20	W	1							
		Spring	CHSP	Chipping Sparrow	25	W	1							
		Spring	KILL	Killdeer	40	NW	1							
		Spring	BLJA	Blue Jay	70	E	1							
		Spring	AMCR	American Crow	100	W	4			654	703	16	0	60%
		Spring	AMGO	American Goldfinch	10	W	3							
		Spring	INBU	Indigo Bunting	30	SE	1							
		Spring	AMGO	American Goldfinch	50	SW	2							
Spring	AMRO	American Robin	50	S	1									
Spring	WOTH	Wood Thrush	50	NW	1									
Spring	MODO	Mourning Dove	70	N	2									
Spring	CHSP	Chipping Sparrow	15	W	1									
Spring	KILL	Killdeer	40	NW	1									
Spring	BLJA	Blue Jay	20	E	1									

Passerine Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flyover # in Flock	Behavior/notes	Survey Time Start	Survey Time Stop	Temp (C)	Wind	Cloud	
15-May-11	H	Spring	EWPE	Eastern Wood-Pewee	20	E	1							
		Spring	AMRO	American Robin	30	E	1							
		Spring	EUST	European Starling	30	SW	1							
		Spring	RBGR	Rose-breasted Grosbeak	40	W	1							
		Spring	MODO	Mourning Dove	40	NE	1							
		Spring	RWBL	Red-winged Blackbird	60	NNW	4			7:05	7:15	20	0	75%
		Spring	COGR	Common Grackle	50	NW	2							
		Spring	NOCA	Northern Cardinal	15	SE	1							
		Spring	BAOR	Baltimore Oriole	30	SW	1							
		Spring	GRCA	Gray Catbird	30	SW	1							
		Spring	SOSP	Song Sparrow	60	S	1							
		Spring	ETIT	Tufted Titmouse	40	W	1							
		Spring	NOCA	Northern Cardinal	30	W	1							
		Spring	BLJA	Blue Jay	30	E	1							
15-May-11	I	Spring	MODO	Mourning Dove	80	S	2							
		Spring	BHCO	Brown-headed Cowbird	50	W	1							
		Spring	COGR	Common Grackle	50	N	2							
		Spring	EWPE	Eastern Wood-Pewee	50	N	1							
		Spring	CHSP	Chipping Sparrow	50	SW	1							
		Spring	BLJA	Blue Jay	50	SW	1			7:21	7:30	20	2	75%
		Spring	RBWO	Red-bellied Woodpecker	70	NW	1							
		Spring	ETIT	Tufted Titmouse	60	W	1							
		Spring	BAOR	Baltimore Oriole	30	SSW	1							
		Spring	NOCA	Northern Cardinal	50	S	1							
		Spring	HOWR	House Wren	30	NE	1							
		Spring	SOSP	Song Sparrow	40	S	1							
		Spring	COGR	Common Grackle	25	S	3							
		Spring	ETIT	Tufted Titmouse	15	NW	1							
15-May-11	J	Spring	AMRO	American Robin	20	NE	1							
		Spring	WOTH	Wood Thrush	30	S	1							
		Spring	MODO	Mourning Dove	30	N	2							
		Spring	ETIT	Tufted Titmouse	60	S	1							
		Spring	AMCR	American Crow	80	W	2			7:36	7:45	22	2	70%
		Spring	DOWO	Downy Woodpecker	10	W	1							
		Spring	BHCO	Brown-headed Cowbird	20	S	2							
		Spring	NOFL	Northern Flicker	40	SW	1							
		Spring	RBWO	Red-bellied Woodpecker	10	SW	1							
		Spring	AMRO	American Robin	50	N	1							
		Spring	AMRO	American Robin	10	E	2							
		Spring	BAOR	Baltimore Oriole	20	S	1							
		Spring	COGR	Common Grackle	30	W	2							
		Spring	BHCO	Brown-headed Cowbird	15	SSW	1							
15-May-11	K	Spring	RWBL	Red-winged Blackbird	20	N	5							
		Spring	SOSP	Song Sparrow	30	SW	1							
		Spring	CHSP	Chipping Sparrow	20	N	1							
		Spring	RBWO	Red-bellied Woodpecker	40	NW	1			7:51	8:00	22	0	60%
		Spring	BLJA	Blue Jay	30	SW	1							
		Spring	HOSP	House Sparrow	20	NW	9							
		Spring	BCCH	Black-capped Chickadee	10	W	1							
		Spring	CAGO	Canada Goose	30	NW	3							
		Spring	AMCR	American Crow	30	S	3							
		Spring	SOSP	Song Sparrow	40	NW	1							
		Spring	AMRO	American Robin	10	W	1							
		Spring	SAVS	Savannah Sparrow	50	W	1							
		Spring	ETIT	Tufted Titmouse	40	E	1			7:08	7:17	4	4	70%
		Spring	BHCO	Brown-headed Cowbird	40	SE	1							
Spring	AMRO	American Robin	40	E	1									
Spring	BAOR	Baltimore Oriole	70	WNW	1									

Passerine Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flyover # in Flock	Behavior/notes	Survey Time Start	Survey Time Stop	Temp (C)	Wind	Weather	Conditions			
16-May-11	B	Spring	RWBK	Red-winged Blackbird	10	SW	3										
		Spring	INEU	Indigo Bunting	20	W	1										
		Spring	WAVI	Warbling Vireo	15	W	1										
		Spring	AMCR	American Crow	40	ESE	1										
		Spring	EUST	European Starling	20	W	1			720	729	6	0		75%		
		Spring	SOSP	Song Sparrow	40	W	1										
		Spring	HOFI	House Finch	10	W	1										
		Spring	BHCO	Brown-headed Cowbird	40	NW	1										
		Spring	BAOR	Baltimore Oriole	20	NW	1										
		Spring	TEWA	Tennessee Warbler	20	S	1										
16-May-11	C	Spring	RWBK	Red-winged Blackbird	60	NW	1										
		Spring	MALL	Mallard	20	W	3										
		Spring	RTHA	Red-tailed Hawk	50	NW	1										
		Spring	CHSP	Chipping Sparrow	30	E	1										
		Spring	AMRO	American Robin	20	E	1										
		Spring	GCFL	Great Crested Flycatcher	30	S	1										
		Spring	ETTI	Tufted Titmouse	30	E	1			733	742	6	7		70%		
		Spring	FISP	Field Sparrow	60	NW	1										
		Spring	BHCO	Brown-headed Cowbird	50	NW	1										
		Spring	BLJA	Blue Jay	30	SW	1										
16-May-11	D	Spring	SOSP	Song Sparrow	10	NW	1										
		Spring	AMRO	American Robin	60	SW	1										
		Spring	RBGR	Rose-breasted Grosbeak	50	W	1										
		Spring	RBWO	Red-bellied Woodpecker	70	W	1										
		Spring	BAOR	Baltimore Oriole	30	W	1										
		Spring	WBNU	White-breasted Nuthatch	40	E	1			748	757	6	0		70%		
		Spring	SOSP	Song Sparrow	5	S	1										
		Spring	EABL	Eastern Bluebird	20	S	1										
		Spring	HOSP	House Sparrow	20	NW	6										
		Spring	WOTH	Wood Thrush	60	E	1										
16-May-11	E	Spring	BLJA	Blue Jay	40	E	1										
		Spring	BAOR	Baltimore Oriole	50	S	2										
		Spring	RBNU	Red-breasted Nuthatch	20	E	1										
		Spring	CHSP	Chipping Sparrow	30	W	1										
		Spring	AMGO	American Goldfinch	40	NW	2			651	700	4	10		80%		
		Spring	AMRO	American Robin	35	E	1										
		Spring	HOWR	House Wren	40	NE	1										
		Spring	SOSP	Song Sparrow	60	NW	1										
		Spring	BLJA	Blue Jay	20	E	1										
		Spring	AMRO	American Robin	60	S	1										
16-May-11	F	Spring	BLJA	Blue Jay	20	E	1										
		Spring	AMCR	American Crow	20	N	1										
		Spring	SOSP	Song Sparrow	30	SW	1										
		Spring	TEWA	Tennessee Warbler	5	W	1										
		Spring	AMRE	American Redstart	5	W	1										
		Spring	AMCR	American Crow	15	SW	2			803	812	4	0		80%		
		Spring	RBGR	Rose-breasted Grosbeak	20	N	1										
		Spring	WOTH	Wood Thrush	60	NW	1										
		Spring	AMRO	American Robin	30	N	1										
		Spring	FISP	Field Sparrow	60	SW	1										
16-May-11	G	Spring	COGR	Common Grackle	30	NE	1										
		Spring	AMRO	American Robin	100	N	1										
		Spring	ETTI	Tufted Titmouse	50	S	1										
		Spring	AMCR	American Crow	60	W	3										
		Spring	AMGO	American Goldfinch	75	S	2										
		Spring	INEU	Indigo Bunting	60	N	1										
		Spring	BLJA	Blue Jay	50	E	1			636	645	4	7		80%		
		Spring	GCFL	Great Crested Flycatcher	40	S	1										
		Spring	AMRO	American Robin	20	SE	1										
		Spring	CHSP	Chipping Sparrow	20	W	1										

Passerine Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flyover # In Flock	Behavior/notes	Survey Time Start	Survey Time Stop	Temp (C)	Wind	Cloud	
16-May-11	H	Spring	OVEN	Ovenbird	50	W	1							
		Spring	AMCR	American Crow	80	S	1							
		Spring	AMRO	American Robin	30	E	1			6:23	6:32	4	7	100%
		Spring	RBGR	Rose-breasted Grosbeak	40	SW	1							
		Spring	RWBL	Red-winged Blackbird	60	NW	1							
		Spring	AMRO	American Robin	30	E	1							
		Spring	AMRO	American Robin	50	NE	2							
		Spring	EATO	Eastern Towhee	40	S	1							
		Spring	AMCR	American Crow	30	W	1							
		Spring	AMCR	American Crow	40	E	1			6:10	6:19	4	9	100%
16-May-11	I	Spring	ACFL	Acadian Flycatcher	50	WSW	1							
		Spring	COGR	Common Grackle	30	SW	2							
		Spring	BAOR	Baltimore Oriole	40	S	1							
		Spring	AMRO	American Robin	20	N	1							
		Spring	MOJO	Mourning Dove	40	N	1							
		Spring	REWO	Red-bellied Woodpecker	25	SW	1							
		Spring	AMRO	American Robin	40	NW	1			5:55	6:04	15	9	100%
		Spring	WOTH	Wood Thrush	40	SW	1							
		Spring	INEU	Indigo Bunting	25	N	1							
		Spring	AMRO	American Robin	20	W	1							
16-May-11	K	Spring	AMRO	American Robin	30	NW	1							
		Spring	HOSP	House Sparrow	20	N	4			8:08	8:17			75%
		Spring	CHSW	Chimney Swift	15	SE	1							
		Spring	AMRO	American Robin	10	E	1							
		Spring	COGR	Common Grackle	20	E	2							
		Spring	AMCR	American Crow	60	SW	3							
		Spring	RBGR	Rose-breasted Grosbeak	25	NE	1							
		Spring	EWPE	Eastern Wood-Peece	20	ESE	1							
		Spring	AMGO	American Goldfinch	30	WSW	3							
		Spring	RHWO	Red-headed Woodpecker	10	W	1			5:29	5:38	13	2	100%
22-May-11	A	Spring	NOFL	Northern Flicker	60	SW	1							
		Spring	BLJA	Blue Jay	40	W	1							
		Spring	CHSP	Chipping Sparrow	50	N	1							
		Spring	AMRO	American Robin	40	E	1							
		Spring	SOSP	Song Sparrow	40	NW	1							
		Spring	BHCO	Brown-headed Cowbird	40	SSE	1							
		Spring	MOZA	Mourning Dove	60	NW	1							
		Spring	BLJA	Blue Jay	50	SE	1							
		Spring	RWBL	Red-winged Blackbird	10	SE	2							
		Spring	SOSP	Song Sparrow	40	W	1							
22-May-11	B	Spring	INEU	Indigo Bunting	20	NW	1							
		Spring	ETTI	Tufted Titmouse	40	NE	1							
		Spring	BAOR	Baltimore Oriole	50	NE	1							
		Spring	WOTH	Wood Thrush	60	NE	1							
		Spring	BLJA	Blue Jay	45	W	1							
		Spring	NOCA	Northern Cardinal	30	NE	1							
		Spring	AMRO	American Robin	70	W	1			6:39	6:48	13	0	100%
		Spring	RBGR	Rose-breasted Grosbeak	10	S	1							
		Spring	AMCR	American Crow	30	SW	4							
		Spring	SOSP	Song Sparrow	25	NW	1							
22-May-11	C	Spring	AMRO	American Robin	30	E	1							
		Spring	BLJA	Blue Jay	30	SSW	1							
		Spring	BHCO	Brown-headed Cowbird	70	NW	1							
		Spring	ETTI	Tufted Titmouse	20	W	1							
		Spring	AMRO	American Robin	50	NW	1							
		Spring	FISP	Field Sparrow	60	NW	1							
		Spring	RWBL	Red-winged Blackbird	40	NW	3			6:26	6:35	12	2	100%

Passerine Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flyover # in Flock	Behavior/notes	Survey Time Start	Survey Time Stop	Survey Temp (C)	Wind	Cloud	
22-May-11	D	Spring	RBWO	Red-bellied Woodpecker	30	NNE	1							
		Spring	AMRO	American Robin	80	NE	1							
		Spring	FISP	Field Sparrow	30	N	1							
		Spring	MODO	Mourning Dove	30	S	2							
		Spring	RBWO	Red-bellied Woodpecker	20	W	1							
		Spring	BLJA	Blue Jay	40	N	1							
		Spring	RWBL	Red-winged Blackbird	30	S	2			611	12	12	0	100%
		Spring	RBWO	Red-bellied Woodpecker	20	W	1							
		Spring	EABL	Eastern Bluebird	50	S	2							
		Spring	SOSP	Song Sparrow	60	W	1							
		Spring	WOTH	Wood Thrush	60	SW	1							
		Spring	KILL	Killdeer	30	SE	1							
		Spring	CHSP	Chipping Sparrow	20	S	1							
		22-May-11	E	Spring	RBWO	Red-bellied Woodpecker	50	SW	1					
Spring	RBGR			Rose-breasted Grosbeak	40	E	1							
Spring	SOSP			Song Sparrow	30	SW	1							
Spring	BAOR			Baltimore Oriole	30	E	1							
Spring	RBWO			Red-bellied Woodpecker	90	W	1							
Spring	WOTH			Wood Thrush	40	W	1							
Spring	NOFL			Northern Flicker	15	SE	1							
Spring	AMRO			American Robin	20	N	1							
Spring	AMRO			American Robin	15	S	1							
Spring	AMRO			American Robin	40	NW	1							
Spring	BLJA			Blue Jay	40	E	1							
Spring	MODO			Mourning Dove	30	NW	1							
Spring	HOSP			House Sparrow	40	NW	6							
Spring	CHSP			Chipping Sparrow	30	SE	1							
22-May-11	F	Spring	AMGO	American Goldfinch	10	NW	4							
		Spring	HOWR	House Wren	50	NE	1							
		Spring	BLJA	Blue Jay	20	E	1							
		Spring	NOCA	Northern Cardinal	50	NE	1							
		Spring	WOTH	Wood Thrush	50	SW	1							
		Spring	HOWR	House Wren	30	W	1							
		Spring	MODO	Mourning Dove	25	S	2							
		Spring	FISP	Field Sparrow	70	SW	1							
		Spring	AMCR	American Crow	30	NE	3							
		Spring	AMRE	American Redstart	20	W	1							
		Spring	AMRO	American Robin	30	N	1							
		Spring	SOSP	Song Sparrow	30	S	1							
		Spring	AMRO	American Robin	20	NW	1							
		Spring	HOLA	Horned Lark	30	E	1							
22-May-11	G	Spring	RBGR	Rose-breasted Grosbeak	20	N	1							
		Spring	COSR	Common Grackle	30	NW	3							
		Spring	INBU	Indigo Bunting	40	W	1							
		Spring	MODO	Mourning Dove	40	NW	2							
		Spring	CHSP	Chipping Sparrow	25	W	1							
		Spring	KILL	Killdeer	50	NW	1							
		Spring	BLJA	Blue Jay	50	E	1							
		Spring	AMCR	American Crow	50	W	5							
		Spring	WOTH	Wood Thrush	90	NW	1							
		Spring	RBWO	Red-bellied Woodpecker	40	SE	1							
		Spring	MODO	Mourning Dove	80	NW	1							
		Spring	INBU	Indigo Bunting	30	SE	1							
		Spring	GCFL	Great Crested Flycatcher	30	SW	1							

Passerine Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flyover # in Flock	Behaviors/notes	Survey Time Start	Survey Time Stop	Temp (C)	Wind	Cloud	
22-May-11	H	Spring	AMRO	American Robin	30	E	1							
		Spring	RBGR	Rose-breasted Grosbeak	50	W	1							
		Spring	RWBL	Red-winged Blackbird	60	NW	1							
		Spring	COGR	Common Grackle	40	NW	2							
		Spring	NOCA	Northern Cardinal	20	SE	1							
		Spring	BAOR	Baltimore Oriole	30	W	1			7:37	7:46	17	2	100%
		Spring	GRCA	Gray Catbird	40	SW	1							
		Spring	ETTI	Tufted Titmouse	40	W	1							
		Spring	CHSP	Chipping Sparrow	30	NE	1							
		Spring	BHCO	Brown-headed Cowbird	40	W	2							
		Spring	SOSP	Song Sparrow	50	W	1							
		Spring	BCCH	Black-capped Chickadee	50	S	1							
		Spring	AMCR	American Crow	90	S	3							
		Spring	BLJA	Blue Jay	30	E	1							
		Spring	BHCO	Brown-headed Cowbird	50	W	2							
		22-May-11	I	Spring	EWPE	Eastern Wood-Pewee	40	N	1					
Spring	BLJA			Blue Jay	50	SW	1							
Spring	ETTI			Tufted Titmouse	40	W	1							
Spring	NOCA			Northern Cardinal	40	W	1							
Spring	SOSP			Song Sparrow	30	S	1							
Spring	REVI			Red-eyed Vireo	20	W	1							
Spring	BAOR			Baltimore Oriole	20	SW	1			7:52	8:01	17	0	100%
Spring	HOWR			House Wren	50	NE	1							
Spring	NOCA			Northern Cardinal	60	NW	1							
Spring	AMCR			American Crow	80	N	5							
Spring	COGR			Common Grackle	50	NW	3							
Spring	CHSP			Chipping Sparrow	50	SW	1							
Spring	AMRO			American Robin	20	N	1							
Spring	WBNU			White-breasted Nuthatch	20	NW	1							
Spring	MODO			Mourning Dove	90	S	1							
22-May-11	J			Spring	AMRO	American Robin	30	SE	1					
		Spring	ETTI	Tufted Titmouse	50	S	1							
		Spring	AMCR	American Crow	50	W	4							
		Spring	HOWR	House Wren	40	SW	1							
		Spring	MODO	Mourning Dove	30	N	1							
		Spring	DOWO	Downy Woodpecker	30	W	1							
		Spring	BHCO	Brown-headed Cowbird	20	NW	1							
		Spring	RBWO	Red-bellied Woodpecker	10	SW	1			5:29	5:38	13	2	100%
		Spring	AMRO	American Robin	30	N	1							
		Spring	NOEL	Northern Flicker	40	SW	1							
		Spring	ETTI	Tufted Titmouse	15	NW	1							
		Spring	WOTH	Wood Thrush	40	SW	1							
		Spring	INBU	Indigo Bunting	30	N	1							
		Spring	MODO	Mourning Dove	50	S	1							
		Spring	NOEL	Northern Flicker	30	SW	1							
		22-May-11	K	Spring	AMRO	American Robin	40	E	1					
Spring	BAOR			Baltimore Oriole	20	S	1							
Spring	COGR			Common Grackle	20	W	4							
Spring	RWBL			Red-winged Blackbird	30	N	2							
Spring	BHCO			Brown-headed Cowbird	20	SW	1							
Spring	SOSP			Song Sparrow	30	SW	1							
Spring	BLJA			Blue Jay	40	SW	1							
Spring	BCCH			Black-capped Chickadee	20	W	1			5:42	6:01	13	2	100%
Spring	AMRO			American Robin	30	NE	1							
Spring	CHSP			Chipping Sparrow	20	N	1							
Spring	MODO			Mourning Dove	40	NW	1							
Spring	HOSP			House Sparrow	40	NW	4							
Spring	SOSP			Song Sparrow	5	N	1							
Spring	RBWO			Red-bellied Woodpecker	40	NW	1							
Spring	WAVI			Warbling Vireo	25	N	1							

Passerine Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flyover # in Flock	Behavior/notes	Survey Time Start	Survey Time Stop	Survey Temp (C)	Survey Weather	Conditions	
23-May-11	A	Spring	NOCA	Northern Cardinal	25	NE	2							
		Spring	RHW	Red-headed Woodpecker	20	W	2							
		Spring	COGR	Common Grackle	25	N	2							
		Spring	RBGR	Rose-breasted Grosbeak	25	NE	1							
		Spring	EWPE	Eastern Wood-Pewee	20	ESE	1							
		Spring	AMGO	American Goldfinch	30	WSW	3							
		Spring	RHW	Red-headed Woodpecker	10	W	1							
		Spring	NOFL	Northern Flicker	60	SW	1							
		Spring	BLJA	Blue Jay	40	W	1							
		Spring	EWPE	Eastern Wood-Pewee	15	E	1			533	542	17	9	75%
		Spring	REBW	Red-bellied Woodpecker	50	SW	1							
		Spring	AMCR	American Crow	20	W	4							
		Spring	BHCO	Brown-headed Cowbird	40	SSE	1							
		Spring	WOTH	Wood Thrush	50	SW	1							
Spring	WOTH	Wood Thrush	40	SW	1									
Spring	AMRO	American Robin	50	N	1									
Spring	WBNU	White-breasted Nuthatch	60	E	1									
Spring	AMCR	American Crow	70	SSW	6									
Spring	AMGO	American Goldfinch	30	W	2									
Spring	RWB	Red-winged Blackbird	20	SW	7									
Spring	AMCR	American Crow	30	SW	4									
Spring	WOTH	Wood Thrush	50	NE	1									
Spring	CHSP	Chipping Sparrow	40	W	1									
Spring	AMRO	American Robin	15	S	2									
Spring	EUST	European Starling	20	W	2									
Spring	BAOR	Baltimore Oriole	40	NE	1									
Spring	HOLA	Horned Lark	70	NW	1									
Spring	HOSP	House Sparrow	10	S	3									
Spring	REVI	Red-eyed Vireo	30	NNE	1									
Spring	BLJA	Blue Jay	50	SE	1				644	653	17	0	85%	
Spring	AMCR	American Crow	70	NW	2									
Spring	BLJA	Blue Jay	45	W	1									
Spring	NOCA	Northern Cardinal	30	NE	1									
Spring	AMRO	American Robin	70	W	1									
Spring	INEU	Indigo Bunting	10	SE	1									
Spring	SOSP	Song Sparrow	40	W	1									
Spring	INEU	Indigo Bunting	20	NW	1									
Spring	BHCO	Brown-headed Cowbird	40	W	1									
Spring	AMRO	American Robin	30	SW	1									
Spring	RBGR	Rose-breasted Grosbeak	20	S	1									
Spring	BLJA	Blue Jay	30	S	1									
Spring	SOSP	Song Sparrow	30	NW	1				632	641	17	9	80%	
Spring	AMRO	American Robin	20	E	1									
Spring	ETTI	Tufted Titmouse	20	E	1									
Spring	CHSP	Chipping Sparrow	30	E	1									
Spring	REBW	Red-bellied Woodpecker	60	WNW	1									
Spring	AMGO	American Goldfinch	30	E	1									
Spring	AMRO	American Robin	20	N	1									
Spring	FISP	Field Sparrow	40	N	1									
Spring	EABL	Eastern Bluebird	40	S	1									
Spring	REBW	Red-bellied Woodpecker	50	W	1									
Spring	BAOR	Baltimore Oriole	20	W	1				619	628	15	5	90%	
Spring	SOSP	Song Sparrow	10	S	1									
Spring	MOOD	Mourning Dove	30	S	2									
Spring	AMRO	American Robin	50	SW	1									
Spring	KILL	Killdeer	40	SW	1									

Passerine Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flyover # in Flock	Behavior/notes	Survey Time Start	Survey Time Stop	Survey Temp (C)	Survey Weather	Conditions	
23-May-11	E	Spring	CHSP	Chipping Sparrow	15	S	1							
		Spring	RBWO	Red-bellied Woodpecker	50	SW	1							
		Spring	RBGR	Rose-breasted Grosbeak	30	E	1							
		Spring	AMRO	American Robin	40	SW	1							
		Spring	REVI	Red-eyed Vireo	30	E	1							
		Spring	MODD	Mourning Dove	40	W	2							
		Spring	WOTH	Wood Thrush	60	W	1							
		Spring	NOFL	Northern Flicker	10	E	1			711	720	16	9	75%
		Spring	AMRO	American Robin	15	S	1							
		Spring	AMGO	American Goldfinch	20	W	1							
		Spring	MODD	Mourning Dove	50	S	1							
		Spring	BLJA	Blue Jay	40	E	1							
Spring	HOWR	House Wren	40	NE	1									
Spring	HOSP	House Sparrow	20	NW	5									
Spring	BRTH	Brown Thrasher	40	N	1									
Spring	AMRO	American Robin	40	NW	1									
Spring	HOLA	Horned Lark	50	E	2									
Spring	RBGR	Rose-breasted Grosbeak	20	NW	1									
Spring	MODD	Mourning Dove	30	S	1									
Spring	FISP	Field Sparrow	60	SW	1									
Spring	AMCR	American Crow	40	N	3			605	614	17	9	80%		
Spring	SOSP	Song Sparrow	30	SW	1									
Spring	AMCR	American Crow	15	SW	1									
Spring	WOTH	Wood Thrush	50	NW	1									
Spring	HOWR	House Wren	40	W	1									
Spring	HOLA	Horned Lark	70	SE	1									
Spring	NOCA	Northern Cardinal	50	N	1									
Spring	INBU	Indigo Bunting	40	W	1									
Spring	MODD	Mourning Dove	30	N	1									
Spring	RBWO	Red-bellied Woodpecker	30	W	1									
Spring	KILL	Killdeer	50	NW	1									
Spring	AMCR	American Crow	50	W	5									
Spring	MODD	Mourning Dove	60	N	2									
Spring	BLJA	Blue Jay	30	E	1									
Spring	AMRO	American Robin	60	S	1									
Spring	WOTH	Wood Thrush	50	NW	1									
Spring	CHSP	Chipping Sparrow	30	W	1									
Spring	WOTH	Wood Thrush	50	NW	1									
Spring	TUVU	Turkey Vulture	100	S	3									
Spring	GCFL	Great Crested Flycatcher	40	S	1									
Spring	ETTI	Tufted Titmouse	50	S	1									
Spring	AMRO	American Robin	30	E	1									
Spring	RBGR	Rose-breasted Grosbeak	40	W	1									
Spring	MODD	Mourning Dove	30	NE	1									
Spring	RWBL	Red-winged Blackbird	50	NW	3									
Spring	BAOR	Baltimore Oriole	40	SW	1									
Spring	ETTI	Tufted Titmouse	50	W	1									
Spring	EWPE	Eastern Wood-Pewee	30	E	1									
Spring	EUST	European Starling	20	SW	3									
Spring	RWBL	Red-winged Blackbird	60	NW	1									
Spring	SOSP	Song Sparrow	50	S	1									
Spring	NOCA	Northern Cardinal	30	SW	1									
Spring	WIFL	Willow Flycatcher	50	W	1									
Spring	AMRO	American Robin	60	W	1									
23-May-11	H	Spring	AMRO	American Robin	60	W	1							
		Spring	AMRO	American Robin	60	W	1							
		Spring	AMRO	American Robin	60	W	1							
		Spring	AMRO	American Robin	60	W	1							
		Spring	AMRO	American Robin	60	W	1							
		Spring	AMRO	American Robin	60	W	1							
		Spring	AMRO	American Robin	60	W	1							
		Spring	AMRO	American Robin	60	W	1							
		Spring	AMRO	American Robin	60	W	1							
		Spring	AMRO	American Robin	60	W	1							
		Spring	AMRO	American Robin	60	W	1							
		Spring	AMRO	American Robin	60	W	1							

Passerine Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flyover # in Flock	Behavior/notes	Survey Time Start	Survey Time Stop	Survey Temp (C)	Wind	Cloud		
23-May-11	J	Spring	BLJA	Blue Jay	30	NE	1								
		Spring	MODO	Mourning Dove	70	S	1								
		Spring	COGR	Common Grackle	40	NE	2								
		Spring	CHSP	Chipping Sparrow	50	SW	1								
		Spring	ETTI	Tufted Titmouse	50	W	1								
		Spring	BAOR	Baltimore Oriole	30	SW	1								
		Spring	HOWR	House Wren	40	NE	1			755	804	17	5		90%
		Spring	COGR	Common Grackle	20	S	1								
		Spring	BCCH	Black-capped Chickadee	30	NE	1								
		Spring	EWPE	Eastern Wood-Pewee	40	NW	1								
		Spring	AMCR	American Crow	60	N	1								
		Spring	NOCA	Northern Cardinal	40	S	1								
23-May-11	J	Spring	AMRO	American Robin	30	SE	1								
		Spring	ETTI	Tufted Titmouse	50	S	1								
		Spring	WOTH	Wood Thrush	40	S	1								
		Spring	HOWR	House Wren	50	SW	1								
		Spring	BHCO	Brown-headed Cowbird	20	NW	1								
		Spring	RBWO	Red-bellied Woodpecker	10	SW	1								
		Spring	GRCA	Gray Catbird	10	NW	1			536	545	15	9		80%
		Spring	ETTI	Tufted Titmouse	15	NW	1								
		Spring	MODO	Mourning Dove	30	N	1								
		Spring	INBU	Indigo Bunting	20	N	1								
		Spring	RWBL	Red-winged Blackbird	40	SE	1								
		Spring	AMCR	American Crow	90	W	6								
23-May-11	K	Spring	ETTI	Tufted Titmouse	20	NW	1								
		Spring	HOSP	House Sparrow	10	SE	4								
		Spring	BLJA	Blue Jay	20	SW	1								
		Spring	RBWO	Red-bellied Woodpecker	40	NW	1								
		Spring	BHCO	Brown-headed Cowbird	20	SW	1								
		Spring	AMRO	American Robin	10	E	1								
		Spring	CHSP	Chipping Sparrow	20	NW	1								
		Spring	MODO	Mourning Dove	40	NW	2			540	558	15	9		85%
		Spring	HOSP	House Sparrow	20	NW	5								
		Spring	SOSP	Song Sparrow	10	N	1								
		Spring	AMRO	American Robin	30	NW	1								
		Spring	CHSW	Chimney Swift	20	SW	2								
Spring	COGR	Common Grackle	30	W	4										
Spring	BLJA	Blue Jay	40	NW	2										
Spring	BAOR	Baltimore Oriole	20	S	1										
20-May-11	A	Spring	WOTH	Wood Thrush	40	SW	1								
		Spring	AMRO	American Robin	50	N	1								
		Spring	WBNU	White-breasted Nuthatch	60	E	1								
		Spring	AMCR	American Crow	70	SSW	8								
		Spring	NOCA	Northern Cardinal	40	SE	1								
		Spring	AMGO	American Goldfinch	30	WSW	3								
		Spring	RHWO	Red-headed Woodpecker	10	W	1								
		Spring	NOFL	Northern Flicker	60	SW	1								
		Spring	BLJA	Blue Jay	40	W	1								
		Spring	CHSP	Chipping Sparrow	50	N	1								
		Spring	AMRO	American Robin	40	E	1								
		Spring	SOSP	Song Sparrow	40	NW	1								
Spring	BHCO	Brown-headed Cowbird	40	SSE	1										
Spring	WOTH	Wood Thrush	50	SW	1										
Spring	COGR	Common Grackle	20	E	2										
Spring	AMCR	American Crow	60	SW	3										
Spring	RBGR	Rose-breasted Grosbeak	25	NE	1										
Spring	EWPE	Eastern Wood-Pewee	20	ESE	1										
Spring	AMGO	American Goldfinch	30	W	4										
Spring	AMRO	American Robin	10	E	1										
Spring	COGR	Common Grackle	20	E	2										
20-May-11	A	Spring	WOTH	Wood Thrush	40	SW	1								
		Spring	AMRO	American Robin	50	N	1								
		Spring	WBNU	White-breasted Nuthatch	60	E	1								
		Spring	AMCR	American Crow	70	SSW	8								
		Spring	NOCA	Northern Cardinal	40	SE	1								
		Spring	AMGO	American Goldfinch	30	WSW	3								
		Spring	RHWO	Red-headed Woodpecker	10	W	1								
		Spring	NOFL	Northern Flicker	60	SW	1								
		Spring	BLJA	Blue Jay	40	W	1								
		Spring	CHSP	Chipping Sparrow	50	N	1								
		Spring	AMRO	American Robin	40	E	1								
		Spring	SOSP	Song Sparrow	40	NW	1								
Spring	BHCO	Brown-headed Cowbird	40	SSE	1										
Spring	WOTH	Wood Thrush	50	SW	1										
Spring	COGR	Common Grackle	20	E	2										
Spring	AMCR	American Crow	60	SW	3										
Spring	RBGR	Rose-breasted Grosbeak	25	NE	1										
Spring	EWPE	Eastern Wood-Pewee	20	ESE	1										
Spring	AMGO	American Goldfinch	30	W	4										
Spring	AMRO	American Robin	10	E	1										
Spring	COGR	Common Grackle	20	E	2										

Passerine Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flyover # in Flock	Behavior/notes	Survey Time Start	Survey Time Stop	Survey Temp (C)	Wind	Cloud	
29-May-11	B	Spring	HOLA	Horned Lark	60	NW	1							
		Spring	WOTH	Wood Thrush	50	SE	1							
		Spring	RWBL	Red-winged Blackbird	10	SE	2							
		Spring	SOSP	Song Sparrow	40	W	1							
		Spring	INBU	Indigo Bunting	20	NW	1							
		Spring	ETTI	Tufted Titmouse	40	NE	1							
		Spring	BAOR	Baltimore Oriole	40	NE	1							
		Spring	HOLA	Horned Lark	70	NW	1			7:25	7:34	20	0	0%
		Spring	HOSP	House Sparrow	10	S	3							
		Spring	REVI	Red-eyed Vireo	30	NNE	1							
		Spring	WAVI	Warbling Vireo	20	W	1							
		Spring	AMCR	American Crow	70	NW	2							
		Spring	WOTH	Wood Thrush	45	W	1							
		Spring	NOCA	Northern Cardinal	30	NE	1							
Spring	AMRO	American Robin	70	W	1									
29-May-11	C	Spring	BHCO	Brown-headed Cowbird	50	W	1							
		Spring	FISP	Field Sparrow	40	NW	1							
		Spring	RBGR	Rose-breasted Grosbeak	20	S	1							
		Spring	BCCH	Black-capped Chickadee	20	S	1							
		Spring	BLJA	Blue Jay	20	S	1							
		Spring	SOSP	Song Sparrow	30	NW	1							
		Spring	GCFL	Great Crested Flycatcher	30	S	1							
		Spring	BHCO	Brown-headed Cowbird	100	NW	1			7:38	7:47	21	0	0%
		Spring	AMRO	American Robin	50	SW	1							
		Spring	BRTN	Brown Thrasher	60	W	1							
		Spring	CHSP	Chipping Sparrow	30	E	1							
		Spring	RBGR	Rose-breasted Grosbeak	50	W	1							
		Spring	RBWO	Red-bellied Woodpecker	40	W	1							
		Spring	AMGO	American Goldfinch	30	E	2							
29-May-11	D	Spring	AMRO	American Robin	15	N	1							
		Spring	AMRO	American Robin	80	NE	1							
		Spring	MODO	Mourning Dove	30	SW	1							
		Spring	EABL	Eastern Bluebird	50	S	2							
		Spring	WBNU	White-breasted Nuthatch	40	E	1							
		Spring	FISP	Field Sparrow	60	N	1			7:42	7:51	22	0	0%
		Spring	WOTH	Wood Thrush	60	SW	1							
		Spring	BLJA	Blue Jay	30	W	1							
		Spring	RBWO	Red-bellied Woodpecker	30	E	1							
		Spring	KILL	Killdeer	30	SW	1							
		Spring	AMRO	American Robin	30	N	1							
		Spring	MODO	Mourning Dove	20	S	2							
		Spring	NOFL	Northern Flicker	40	W	1							
		Spring	BLJA	Blue Jay	20	S	1							
29-May-11	E	Spring	AMRO	American Robin	50	SW	1							
		Spring	REVI	Red-eyed Vireo	25	E	1							
		Spring	MODO	Mourning Dove	30	W	1							
		Spring	CHSP	Chipping Sparrow	20	S	1			6:56	7:05	20	0	0%
		Spring	BAOR	Baltimore Oriole	50	E	1							
		Spring	AMGO	American Goldfinch	20	W	1							
		Spring	RBWO	Red-bellied Woodpecker	60	SW	1							
		Spring	WBNU	White-breasted Nuthatch	50	NE	1							
		Spring	BLJA	Blue Jay	40	E	1							

Passerine Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flyover # in Flock	Behavior/notes	Survey Time Start	Survey Time Stop	Temp (C)	Wind	Cloud	
20-May-11	F	Spring	BRTN	Brown Thrasher	40	N	1							
		Spring	AMRO	American Robin	50	NW	1							
		Spring	HOLA	Horned Lark	40	E	2							
		Spring	RBGR	Rose-breasted Grosbeak	20	NW	1							
		Spring	AMCR	American Crow	80	E	4							
		Spring	COGR	Common Grackle	20	S	1							
		Spring	SOSP	Song Sparrow	30	SW	1							
		Spring	WOTH	Wood Thrush	60	NW	1			757	806	22	0	0%
		Spring	FISP	Field Sparrow	60	SW	1							
		Spring	AMCR	American Crow	40	W	2							
		Spring	NOCA	Northern Cardinal	25	NE	1							
		Spring	COGR	Common Grackle	10	N	2							
		Spring	AMGO	American Goldfinch	10	NW	3							
		Spring	FISP	Field Sparrow	100	SE	1							
		20-May-11	G	Spring	LUVU	Turkey Vulture	20	E	3					
Spring	INEU			Indigo Bunting	40	W	1							
Spring	MODD			Mourning Dove	35	N	2							
Spring	RBWO			Red-bellied Woodpecker	20	W	1							
Spring	KILL			Killdeer	40	NW	1							
Spring	AMCR			American Crow	100	W	1							
Spring	INEU			Indigo Bunting	40	SE	1							
Spring	WOTH			Wood Thrush	50	NW	1							
Spring	MODD			Mourning Dove	70	S	2							
Spring	BLJA			Blue Jay	20	E	1							
Spring	INEU			Indigo Bunting	20	SE	1							
Spring	CHSP			Chipping Sparrow	30	W	1							
Spring	AMRO			American Robin	50	S	1							
Spring	GCFL			Great Crested Flycatcher	60	S	1							
Spring	AMRO			American Robin	40	W	1							
20-May-11	H	Spring	EWPE	Eastern Wood-Pewee	20	E	1							
		Spring	EUST	European Starling	30	SW	2							
		Spring	MODD	Mourning Dove	40	NE	1							
		Spring	COGR	Common Grackle	50	NW	2							
		Spring	BAOR	Baltimore Oriole	30	SW	1							
		Spring	SOSP	Song Sparrow	50	S	1							
		Spring	BCCH	Black-capped Chickadee	30	W	1							
		Spring	RWBL	Red-winged Blackbird	10	S	3							
		Spring	SOSP	Song Sparrow	60	NW	1							
		Spring	AMRO	American Robin	30	NW	1							
		Spring	GBHE	Great Blue Heron	70	N	1							
		Spring	RWBL	Red-winged Blackbird	60	NW	3							
		Spring	AMRO	American Robin	30	E	1							
		Spring	NOCA	Northern Cardinal	30	W	1							
		20-May-11	I	Spring	MODD	Mourning Dove	70	S	2					
Spring	COGR			Common Grackle	50	N	1							
Spring	CHSP			Chipping Sparrow	50	SW	1							
Spring	RBWO			Red-bellied Woodpecker	60	NW	1							
Spring	BAOR			Baltimore Oriole	25	SW	1							
Spring	HOWR			House Wren	20	NE	1							
Spring	COGR			Common Grackle	30	S	4							
Spring	BCCH			Black-capped Chickadee	30	NE	1							
Spring	WBNU			White-breasted Nuthatch	40	W	1							
Spring	COGR			Common Grackle	70	S	5							
Spring	NOCA			Northern Cardinal	40	S	1							
Spring	BHCO			Brown-headed Cowbird	40	W	1							
Spring	EATO			Eastern Towhee	30	S	2							
Spring	RWBL			Red-winged Blackbird	20	NE	1							

Passerine Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flyover # in Flock	Behavior/notes	Survey Time Start	Survey Time Stop	Temp (C)	Wind	Cloud	
30-May-11	C	Spring	HOLA	Horned Lark	50	NW	2							
		Spring	AMRO	American Robin	30	E	1							
		Spring	ETTI	Tufted Titmouse	20	E	1							
		Spring	AMCR	American Crow	40	W	1							
		Spring	CHSP	Chipping Sparrow	30	E	1							
		Spring	AMRO	American Robin	50	NW	1			632	641	18	9	80%
		Spring	FISP	Field Sparrow	30	NW	1							
		Spring	BLJA	Blue Jay	30	SW	1							
		Spring	RBGR	Rose-breasted Grosbeak	40	W	1							
		Spring	RWBL	Red-winged Blackbird	50	NW	2							
Spring	SOBP	Song Sparrow	15	NW	1									
Spring	RBWO	Red-bellied Woodpecker	60	W	1									
Spring	HOWR	House Wren	20	E	1									
Spring	RBWO	Red-bellied Woodpecker	30	NE	1									
Spring	FISP	Field Sparrow	40	N	1									
Spring	RBWO	Red-bellied Woodpecker	40	SW	1									
Spring	BAOR	Baltimore Oriole	20	W	1									
Spring	SOBP	Song Sparrow	10	S	1									
Spring	HOWR	House Wren	30	E	1			617	626	17	9	50%		
Spring	ETTI	Tufted Titmouse	20	W	1									
Spring	AMRO	American Robin	10	N	1									
Spring	AMGO	American Goldfinch	20	E	1									
Spring	CHSP	Chipping Sparrow	10	S	1									
Spring	RBWO	Red-bellied Woodpecker	50	SW	1									
Spring	RBGR	Rose-breasted Grosbeak	30	E	1									
Spring	SOBP	Song Sparrow	30	SW	1									
Spring	BAOR	Baltimore Oriole	30	E	1									
Spring	RBWO	Red-bellied Woodpecker	90	W	1									
Spring	WOTH	Wood Thrush	50	W	1									
Spring	AMRO	American Robin	20	S	1									
Spring	NOFL	Northern Flicker	40	W	1									
Spring	BLJA	Blue Jay	30	E	1									
Spring	HOSP	House Sparrow	40	NW	6									
Spring	WOTH	Wood Thrush	60	E	1									
Spring	HOWR	House Wren	40	NE	1									
Spring	EWPE	Eastern Wood-Pewee	40	NE	1									
Spring	AMCR	American Crow	100	NW	4									
Spring	NOCA	Northern Cardinal	40	NE	1									
Spring	WOTH	Wood Thrush	50	SW	1									
Spring	HOWR	House Wren	50	W	1									
Spring	MODO	Mourning Dove	30	S	1									
Spring	FISP	Field Sparrow	60	SW	1									
Spring	AMCR	American Crow	25	NE	2									
Spring	RBGR	Rose-breasted Grosbeak	25	NE	1									
Spring	AMRO	American Robin	40	NE	1									
Spring	AMRO	American Robin	30	W	1									
Spring	HOLA	Horned Lark	20	E	1									
Spring	RHWO	Red-headed Woodpecker	30	W	1									
30-May-11	E	Spring	AMCR	American Crow	20	SW	1							
		Spring	AMRO	American Robin	20	SW	1							
		Spring	AMRO	American Robin	20	SW	1							
		Spring	AMRO	American Robin	20	SW	1							
		Spring	AMRO	American Robin	20	SW	1							
		Spring	AMRO	American Robin	20	SW	1							
		Spring	AMRO	American Robin	20	SW	1							
		Spring	AMRO	American Robin	20	SW	1							
		Spring	AMRO	American Robin	20	SW	1							
		Spring	AMRO	American Robin	20	SW	1							
30-May-11	F	Spring	AMCR	American Crow	25	NE	2							
		Spring	RBGR	Rose-breasted Grosbeak	25	NE	1							
		Spring	AMRO	American Robin	40	NE	1							
		Spring	AMRO	American Robin	30	W	1							
		Spring	HOLA	Horned Lark	20	E	1							
		Spring	RHWO	Red-headed Woodpecker	30	W	1							
		Spring	AMCR	American Crow	25	NE	2							
		Spring	RBGR	Rose-breasted Grosbeak	25	NE	1							
		Spring	AMRO	American Robin	40	NE	1							
		Spring	AMRO	American Robin	30	W	1							
Spring	HOLA	Horned Lark	20	E	1									
Spring	RHWO	Red-headed Woodpecker	30	W	1									
30-May-11	G	Spring	AMCR	American Crow	25	NE	2							
		Spring	RBGR	Rose-breasted Grosbeak	25	NE	1							
		Spring	AMRO	American Robin	40	NE	1							
		Spring	AMRO	American Robin	30	W	1							
		Spring	HOLA	Horned Lark	20	E	1							
		Spring	RHWO	Red-headed Woodpecker	30	W	1							
		Spring	AMCR	American Crow	25	NE	2							
		Spring	RBGR	Rose-breasted Grosbeak	25	NE	1							
		Spring	AMRO	American Robin	40	NE	1							
		Spring	AMRO	American Robin	30	W	1							
Spring	HOLA	Horned Lark	20	E	1									
Spring	RHWO	Red-headed Woodpecker	30	W	1									
30-May-11	H	Spring	AMCR	American Crow	25	NE	2							
		Spring	RBGR	Rose-breasted Grosbeak	25	NE	1							
		Spring	AMRO	American Robin	40	NE	1							
		Spring	AMRO	American Robin	30	W	1							
		Spring	HOLA	Horned Lark	20	E	1							
		Spring	RHWO	Red-headed Woodpecker	30	W	1							
		Spring	AMCR	American Crow	25	NE	2							
		Spring	RBGR	Rose-breasted Grosbeak	25	NE	1							
		Spring	AMRO	American Robin	40	NE	1							
		Spring	AMRO	American Robin	30	W	1							
Spring	HOLA	Horned Lark	20	E	1									
Spring	RHWO	Red-headed Woodpecker	30	W	1									
30-May-11	I	Spring	AMCR	American Crow	25	NE	2							
		Spring	RBGR	Rose-breasted Grosbeak	25	NE	1							
		Spring	AMRO	American Robin	40	NE	1							
		Spring	AMRO	American Robin	30	W	1							
		Spring	HOLA	Horned Lark	20	E	1							
		Spring	RHWO	Red-headed Woodpecker	30	W	1							
		Spring	AMCR	American Crow	25	NE	2							
		Spring	RBGR	Rose-breasted Grosbeak	25	NE	1							
		Spring	AMRO	American Robin	40	NE	1							
		Spring	AMRO	American Robin	30	W	1							
Spring	HOLA	Horned Lark	20	E	1									
Spring	RHWO	Red-headed Woodpecker	30	W	1									
30-May-11	J	Spring	AMCR	American Crow	25	NE	2							
		Spring	RBGR	Rose-breasted Grosbeak	25	NE	1							
		Spring	AMRO	American Robin	40	NE	1							
		Spring	AMRO	American Robin	30	W	1							
		Spring	HOLA	Horned Lark	20	E	1							
		Spring	RHWO	Red-headed Woodpecker	30	W	1							
		Spring	AMCR	American Crow	25	NE	2							
		Spring	RBGR	Rose-breasted Grosbeak	25	NE	1							
		Spring	AMRO	American Robin	40	NE	1							
		Spring	AMRO	American Robin	30	W	1							
Spring	HOLA	Horned Lark	20	E	1									
Spring	RHWO	Red-headed Woodpecker	30	W	1									
30-May-11	K	Spring	AMCR	American Crow	25	NE	2							
		Spring	RBGR	Rose-breasted Grosbeak	25	NE	1							
		Spring	AMRO	American Robin	40	NE	1							
		Spring	AMRO	American Robin	30	W	1							
		Spring	HOLA	Horned Lark	20	E	1							
		Spring	RHWO	Red-headed Woodpecker	30	W	1							
		Spring	AMCR	American Crow	25	NE	2							
		Spring	RBGR	Rose-breasted Grosbeak	25	NE	1							
		Spring	AMRO	American Robin	40	NE	1							
		Spring	AMRO	American Robin	30	W	1							
Spring	HOLA	Horned Lark	20	E	1									
Spring	RHWO	Red-headed Woodpecker	30	W	1									
30-May-11	L	Spring	AMCR	American Crow	25	NE	2							
		Spring	RBGR	Rose-breasted Grosbeak	25	NE	1							
		Spring	AMRO	American Robin	40	NE	1							
		Spring	AMRO	American Robin	30	W	1							
		Spring	HOLA	Horned Lark	20	E	1							
		Spring	RHWO	Red-headed Woodpecker	30	W	1							
		Spring	AMCR	American Crow	25	NE	2							
		Spring	RBGR	Rose-breasted Grosbeak	25	NE	1							
		Spring	AMRO	American Robin	40	NE	1							
		Spring	AMRO	American Robin	30	W	1							
Spring	HOLA	Horned Lark	20	E	1									

Passerine Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flyover # in Flock	Behavior/notes	Start	Stop	Temp (C)	Wind	Cloud	
30-May-11	G	Spring	COGR	Common Grackle	20	N	1							
		Spring	GCFL	Great Crested Flycatcher	50	S	1							
		Spring	AMRO	American Robin	40	W	1							
		Spring	CHSP	Chipping Sparrow	30	W	1							
		Spring	BLJA	Blue Jay	70	E	1							
		Spring	AMGO	American Goldfinch	10	W	3							
		Spring	AMRO	American Robin	50	S	1							
		Spring	MODO	Mourning Dove	10	N	2			7:30	7:39	20	5	50%
		Spring	KILL	Killdeer	50	NW	1							
		Spring	RBWO	Red-bellied Woodpecker	50	SE	1							
		Spring	WOTH	Wood Thrush	60	NW	1							
		Spring	BLJA	Blue Jay	40	W	1							
		Spring	TUVU	Turkey Vulture	10	E	1							
		Spring	MODO	Mourning Dove	30	NW	1							
Spring	ETTI	Tufted Titmouse	50	S	1									
Spring	AMRO	American Robin	20	SE	1									
30-May-11	H	Spring	AMRO	American Robin	30	E	1							
		Spring	RBGR	Russet-breasted Grosbeak	40	W	1							
		Spring	RWBL	Red-winged Blackbird	50	NW	5							
		Spring	NOCA	Northern Cardinal	15	SE	1							
		Spring	GRCA	Gray Catbird	40	SW	1							
		Spring	ETTI	Tufted Titmouse	40	W	1							
		Spring	CHSP	Chipping Sparrow	30	NE	1							
		Spring	NOCA	Northern Cardinal	50	SW	1			7:44	7:53	20	2	100%
		Spring	BCGH	Black-capped Chickadee	70	S	1							
		Spring	BAOR	Baltimore Oriole	50	N	1							
		Spring	AMCR	American Crow	80	S	1							
		Spring	BLJA	Blue Jay	30	E	1							
		Spring	BHCO	Brown-headed Cowbird	50	W	1							
		Spring	EWPE	Eastern Wood-Pewee	50	N	1							
30-May-11	I	Spring	BLJA	Blue Jay	50	SW	1							
		Spring	ETTI	Tufted Titmouse	60	W	1							
		Spring	NOCA	Northern Cardinal	50	S	1							
		Spring	SOSP	Song Sparrow	40	S	1							
		Spring	REVI	Red-eyed Vireo	20	W	1			8:00	8:09	20	9	85%
		Spring	EAKI	Eastern Kingbird	20	W	1							
		Spring	AMCR	American Crow	60	N	3							
		Spring	CHSP	Chipping Sparrow	50	SW	1							
		Spring	MODO	Mourning Dove	80	S	1							
		Spring	AMRO	American Robin	50	NE	1							
		Spring	AMCR	American Crow	30	W	1							
		Spring	AMRO	American Robin	30	SE	1							
		Spring	ETTI	Tufted Titmouse	50	S	1							
		Spring	HOWR	House Wren	30	SW	1							
30-May-11	J	Spring	DOWO	Dowry Woodpecker	20	W	1							
		Spring	AMRO	American Robin	20	E	1							
		Spring	RBWO	Red-bellied Woodpecker	10	W	1			5:37	5:46	16	9	85%
		Spring	GRCA	Gray Catbird	10	E	1							
		Spring	AMRO	American Robin	20	N	1							
		Spring	INBU	Indigo Bunting	40	W	1							
		Spring	WOTH	Wood Thrush	30	S	1							
		Spring	ETTI	Tufted Titmouse	20	NW	1							
		Spring	HOSP	House Sparrow	20	SE	6							
		Spring	BLJA	Blue Jay	15	SW	1							
		Spring	BHCO	Brown-headed Cowbird	20	SW	2							
		Spring	AMRO	American Robin	30	E	4							
		Spring	MODO	Mourning Dove	30	NW	1			5:49	5:58	16	9	80%
		Spring	SOSP	Song Sparrow	30	SW	1							
Spring	BICGH	Black-capped Chickadee	40	S	1									
Spring	AMRO	American Robin	50	S	1									
Spring	BAOR	Baltimore Oriole	25	S	1									
Spring	RBWO	Red-bellied Woodpecker	50	NW	1									

Passerine Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flyover # in Flock	Behavior/notes	Start	Stop	Temp (C)	Wind	Cloud	
18-Aug-11	A	Autumn	NOCA	Northern Cardinal	5	W	1							
		Autumn	AMRO	American Robin	5	S	1							
		Autumn	INBU	Indigo Bunting	10	E	2							
		Autumn	BLJA	Blue Jay	25	SW	2			816	825	21	0	0%
		Autumn	INBU	Indigo Bunting	70	NW	1							
		Autumn	BAGR	Baltimore Oriole	40	E	1							
		Autumn	MODO	Mourning Dove	60	W	2							
		Autumn	AMCR	American Crow	30	W	2							
		Autumn	WITU	Wild Turkey	80	W	1							
		Autumn	SOSP	Song Sparrow	20	SW	1			832	841	22	2	0%
18-Aug-11	B	Autumn	AMRO	American Robin	20	W	1							
		Autumn	AMRO	American Robin	70	E	4							
		Autumn	AMCR	American Crow	100	SE	4							
		Autumn	NOCA	Northern Cardinal	45	SW	1							
		Autumn	RTHA	Red-tailed Hawk	70	W	1			846	855	22	0	0%
		Autumn	RBWD	Red-bellied Woodpecker	30	SE	1							
		Autumn	AMCR	American Crow	30	NW	3							
		Autumn	AMCR	American Crow	70	NW	1							
		Autumn	EWPE	Eastern Wood-Pewee	20	N	1			903	912	21	2	0%
		Autumn	SOSP	Song Sparrow	30	S	1							
18-Aug-11	D	Autumn	FISP	Field Sparrow	30	SW	1							
		Autumn	BLJA	Blue Jay	20	NW	2							
		Autumn	AMGO	American Goldfinch	5	S	2							
		Autumn	MODO	Mourning Dove	70	N	4							
		Autumn	EUST	European Starling	80	N	2							
		Autumn	MODO	Mourning Dove	30	W	2							
		Autumn	EWPE	Eastern Wood-Pewee	25	NW	1							
		Autumn	MODO	Mourning Dove	40	S	1							
		Autumn	EUST	European Starling	60	S	4			800	809	20	0	0%
		Autumn	AMRO	American Robin	30	SE	1							
18-Aug-11	E	Autumn	SOSP	Song Sparrow	20	SW	1							
		Autumn	CHSP	Chipping Sparrow	10	S	1							
		Autumn	EWPE	Eastern Wood-Pewee	40	S	1							
		Autumn	CHSW	Chimney Swift	5	W	1							
		Autumn	SOSP	Song Sparrow	50	SW	1							
		Autumn	EATO	Eastern Towhee	60	NW	1							
		Autumn	FISP	Field Sparrow	10	NW	1							
		Autumn	SOSP	Song Sparrow	5	W	2			632	641	16	0	5%
		Autumn	FISP	Field Sparrow	60	E	1							
		Autumn	NOCA	Northern Cardinal	60	S	1							
18-Aug-11	F	Autumn	VBCL	Yellow-billed Cuckoo	40	W	1							
		Autumn	AMRO	American Robin	70	E	1							
		Autumn	AMCR	American Crow	100	SW	2							
		Autumn	AMCR	American Crow	90	N	1							
		Autumn	HOSP	House Sparrow	30	NW	3							
		Autumn	INBU	Indigo Bunting	20	NW	1							
		Autumn	GRCA	Gray Catbird	2	N	1							
		Autumn	CARW	Carolina Wren	40	S	1							
		Autumn	GRCA	Gray Catbird	30	SW	1							
		Autumn	AMGO	American Goldfinch	40	SW	4							
18-Aug-11	H	Autumn	HOWR	House Wren	20	SW	2							
		Autumn	MODO	Mourning Dove	40	SE	1							
		Autumn	NOCA	Northern Cardinal	30	S	1							
		Autumn	CARW	Carolina Wren	60	NW	1							
		Autumn	BHCO	Brown-headed Cowbird	5	S	1							
		Autumn	AMCR	American Crow	90	E	1							
		Autumn	NOCA	Northern Cardinal	30	NE	1							
		Autumn	NOCA	Northern Cardinal	20	S	1							
		Autumn	DOWO	Dowry Woodpecker	30	SW	1							
		Autumn	RBWD	Red-bellied Woodpecker	40	SW	1							
18-Aug-11	J	Autumn	ETTI	Tufted Titmouse	15	W	1							
		Autumn	NOCA	Northern Cardinal	30	NE	1							
		Autumn	NOCA	Northern Cardinal	20	S	1							
		Autumn	DOWO	Dowry Woodpecker	30	SW	1							
		Autumn	RBWD	Red-bellied Woodpecker	40	SW	1							
		Autumn	ETTI	Tufted Titmouse	15	W	1							
		Autumn	NOCA	Northern Cardinal	30	NE	1							
		Autumn	NOCA	Northern Cardinal	20	S	1							
		Autumn	DOWO	Dowry Woodpecker	30	SW	1							
		Autumn	RBWD	Red-bellied Woodpecker	40	SW	1							

Passerine Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flyover # in Flock	Behavior/notes	Survey Time Start	Survey Time Stop	Temp (C)	Wind	Cloud	
18-Aug-11	J	Autumn	BLJA	Blue Jay	20	NW	1							
		Autumn	AMRO	American Robin	30	N	4							
		Autumn	INBU	Indigo Bunting	20	SE	1							
		Autumn	AMRO	American Robin	25	NW	1							
		Autumn	WBSU	White-breasted Nuthatch	10	E	1			7:01	7:10	17	0	0%
		Autumn	SOSP	Song Sparrow	25	NE	1							
		Autumn	AMGO	American Goldfinch	30	NW	1							
		Autumn	MODO	Mourning Dove	30	N	3							
		Autumn	REVI	Red-eyed Vireo	10	W	1							
		Autumn	EWPE	Eastern Wood-Pewee	20	E	1							
18-Aug-11	K	Autumn	BLJA	Blue Jay	30	W	2							
		Autumn	BLJA	Blue Jay	40	SW	1							
		Autumn	HOFI	House Finch	20	W	4							
		Autumn	BLJA	Blue Jay	50	N	1			6:46	6:55	16	0	0%
		Autumn	BLJA	Blue Jay	40	S	1							
		Autumn	AMRO	American Robin	60	NNE	1							
		Autumn	HOSP	House Sparrow	20	N	2							
		Autumn	NOCA	Northern Cardinal	5	W	1							
		Autumn	AMRO	American Robin	5	S	1							
		Autumn	INBU	Indigo Bunting	10	E	2							
1-Sep-11	A	Autumn	BLJA	Blue Jay	25	SW	2							
		Autumn	INBU	Indigo Bunting	70	NW	1			8:16	8:25	21	0	0%
		Autumn	BAOR	Baltimore Oriole	40	E	1							
		Autumn	MODO	Mourning Dove	60	W	2							
		Autumn	AMCR	American Crow	30	W	2							
		Autumn	WITU	Wild Turkey	80	W	1							
		Autumn	SOSP	Song Sparrow	20	SW	1			8:32	8:41	22	2	0%
		Autumn	AMRO	American Robin	20	W	1							
		Autumn	AMRO	American Robin	70	E	4							
		Autumn	AMCR	American Crow	100	SE	4							
1-Sep-11	C	Autumn	NOCA	Northern Cardinal	45	SW	1							
		Autumn	RIHA	Red-tailed Hawk	70	W	1			8:46	8:55	23	0	0%
		Autumn	REWD	Red-bellied Woodpecker	30	SE	1							
		Autumn	AMCR	American Crow	30	NW	3							
		Autumn	AMCR	American Crow	70	NW	1							
		Autumn	EWPE	Eastern Wood-Pewee	20	N	1							
		Autumn	SOSP	Song Sparrow	30	S	1			9:03	9:12	21	2	0%
		Autumn	FISP	Field Sparrow	30	SW	1							
		Autumn	BLJA	Blue Jay	20	NW	2							
		Autumn	AMGO	American Goldfinch	5	S	2							
1-Sep-11	E	Autumn	MODO	Mourning Dove	70	NW	4							
		Autumn	EUST	European Starling	80	NW	2							
		Autumn	MODO	Mourning Dove	30	W	2							
		Autumn	EWPE	Eastern Wood-Pewee	25	NW	1							
		Autumn	MODO	Mourning Dove	40	S	1							
		Autumn	EUST	European Starling	60	S	4							
		Autumn	AMRO	American Robin	30	SE	1							
		Autumn	SOSP	Song Sparrow	20	SW	1			8:00	8:09	20	0	0%
		Autumn	CHSP	Chipping Sparrow	10	S	1							
		Autumn	EWPE	Eastern Wood-Pewee	40	S	1							
1-Sep-11	F	Autumn	CHSW	Chimney Swift	5	W	1							
		Autumn	SOSP	Song Sparrow	50	SW	1							
		Autumn	EATO	Eastern Towhee	60	NW	1							
		Autumn	FISP	Field Sparrow	10	NW	1							
		Autumn	SOSP	Song Sparrow	5	W	2							
		Autumn	FISP	Field Sparrow	60	E	1							
		Autumn	NOCA	Northern Cardinal	60	S	1							
		Autumn	YBCU	Yellow-billed Cuckoo	40	W	1							
		Autumn	AMRO	American Robin	70	E	1			6:32	6:41	17	0	5%
		Autumn	AMCR	American Crow	90	N	1							
1-Sep-11	G	Autumn	AMCR	American Crow	100	SW	2							
		Autumn	HOSP	House Sparrow	30	NW	3			7:45	7:54	21	0	0%
		Autumn	INBU	Indigo Bunting	20	NW	1							

Passerine Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flyover # in Flock	Behavior/notes	Survey Start	Survey Stop	Survey Temp (C)	Wind	Cloud	
1-Sep-11	H	Autumn	GRCA	Gray Catbird	20	N	1							
		Autumn	CAPW	Carolina Wren	40	S	1							
		Autumn	GRCA	Gray Catbird	30	SW	1							
		Autumn	AMGO	American Goldfinch	40	SW	4							
		Autumn	HOWW	House Wren	20	SW	2			732	741	20	0	0%
		Autumn	MODO	Mourning Dove	40	SE	1							
		Autumn	NOLA	Northern Cardinal	30	S	1							
		Autumn	CAPW	Carolina Wren	60	NW	1							
		Autumn	BHCO	Brown-headed Cowbird	5	S	1							
		Autumn	AMCR	American Crow	30	E	1							
1-Sep-11	I	Autumn	NOLA	Northern Cardinal	30	NE	1							
		Autumn	NOLA	Northern Cardinal	20	S	1							
		Autumn	NOLA	Northern Cardinal	40	SE	1			715	724	19	0	0%
		Autumn	DOWW	Downy Woodpecker	30	SW	1							
		Autumn	RBWO	Red-bellied Woodpecker	40	SW	1							
		Autumn	ETIT	Tufted Titmouse	15	W	1							
		Autumn	BLIA	Blue Jay	20	NW	1							
		Autumn	AMRO	American Robin	30	NW	4							
		Autumn	INRU	Indigo Bunting	20	SE	1							
		Autumn	AMRO	American Robin	25	NW	1							
1-Sep-11	J	Autumn	WBRU	White-breasted Nuthatch	10	E	1							
		Autumn	SOSP	Song Sparrow	25	NE	1			701	710	18	0	0%
		Autumn	AMGO	American Goldfinch	30	NW	1							
		Autumn	MODO	Mourning Dove	30	N	3							
		Autumn	REVI	Red-eyed Vireo	10	W	1							
		Autumn	EWPE	Eastern Wood-Pewee	20	E	1							
		Autumn	BLIA	Blue Jay	40	W	2							
		Autumn	HOHI	House Finch	20	W	4							
		Autumn	BLIA	Blue Jay	50	N	1			646	655	16	0	0%
		Autumn	AMRO	American Robin	60	NNE	1							
6-Sep-11	A	Autumn	HOSP	House Sparrow	20	N	2							
		Autumn	ROPI	Rock Pigeon	70	NW	1			753	802	13	2	100%
		Autumn	RBWO	Red-bellied Woodpecker	60	N	1							
		Autumn	BLIA	Blue Jay	50	E	1			740	749	12	7	100%
		Autumn	NOLA	Northern Cardinal	20	NW	1							
		Autumn	EWPE	Eastern Wood-Pewee	20	W	1			727	736	12	7	100%
		Autumn	AMCR	American Crow	120	S	8			714	723	13	10	100%
		Autumn	AMRO	American Robin	10	N	1							
		Autumn	BLIA	Blue Jay	20	N	2							
		Autumn	BLIA	Blue Jay	30	S	1			814	823	13	7	100%
6-Sep-11	E	Autumn	HOSP	House Sparrow	40	SW	4							
		Autumn	TUVU	Turkey Vulture	30	SW	1							
		Autumn	AMRO	American Robin	30	NE	2							
		Autumn	AMCR	American Crow	60	SW	3							
		Autumn	BLIA	Blue Jay	50	W	2			658	707	13	7	100%
		Autumn	BLIA	Blue Jay	60	N	1							
		Autumn	MODO	Mourning Dove	10	NW	1							
		Autumn	TUVU	Turkey Vulture	120	W	3			830	839	12	10	95%
		Autumn	MODO	Mourning Dove	30	N	1							
		Autumn	MODO	Mourning Dove	10	NW	3			843	852	14	2	100%
6-Sep-11	F	Autumn	TUVU	Turkey Vulture	50	N	2							
		Autumn	AMGO	American Goldfinch	5	N	5							
		Autumn	MODO	Mourning Dove	60	W	1							
		Autumn	MODO	Mourning Dove	50	E	1			858	907	14	7	100%
		Autumn	BLIA	Blue Jay	70	E	1							
		Autumn	PWBL	Red-winged Blackbird	70	S	5							
		Autumn	BRNS	Barn Swallow	70	S	7			917	926	14	7	100%
		Autumn	MODO	Mourning Dove	70	N	1							
		Autumn	MODO	Mourning Dove	70	N	1			935	944	15	2	100%

Passerine Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flyover # in Flock	Behavior/notes	Survey Time Start	Survey Time Stop	Survey Temp (C)	Wind	Cloud	
12-Sep-11	A	Autumn	AMCR	American Crow	70	WNW	1							
		Autumn	BLJA	Blue Jay	70	WNW	1							
		Autumn	ETTI	Tufted Titmouse	5	NW	3							
		Autumn	WBNU	White-breasted Nuthatch	20	N	1							
		Autumn	BLJA	Blue Jay	20	SW	1							
		Autumn	BCCH	Black-capped Chickadee	10	W	4							
		Autumn	RBWO	Red-bellied Woodpecker	80	S	1			819	828	17	0	0%
		Autumn	NOFL	Northern Flicker	40	N	1							
		Autumn	CEDW	Cedar Waxwing	20	SW	9							
		Autumn	HOWR	House Wren	10	N	2							
		Autumn	DOWO	Downy Woodpecker	20	W	1							
		Autumn	AMCR	American Crow	30	E	4							
12-Sep-11	B	Autumn	AMGO	American Goldfinch	20	W	3							
		Autumn	RIHA	Red-tailed Hawk	50	W	1		Perched					
		Autumn	BLJA	Blue Jay	30	S	1							
		Autumn	AMCR	American Crow	80	NE	3							
		Autumn	BLJA	Blue Jay	60	W	1			804	813	17	2	0%
		Autumn	NOCA	Northern Cardinal	20	S	1							
		Autumn	EAPH	Eastern Phoebe	10	W	1							
		Autumn	EWPE	Eastern Wood-Pewee	50	S	1							
		Autumn	AMCR	American Crow	90	SE	1							
		Autumn	ETTI	Tufted Titmouse	50	SSW	1							
		Autumn	TUVU	Turkey Vulture	120	NNW	1			751	800	16	0	0%
		12-Sep-11	C	Autumn	BOBO	Bobolink	30	NW	2					
Autumn	WBNU			White-breasted Nuthatch	40	W	1							
Autumn	AMCR			American Crow	100	NW	3							
Autumn	BLJA			Blue Jay	20	NW	2							
Autumn	EWPE			Eastern Wood-Pewee	40	NW	1							
Autumn	AMCR			American Crow	15	S	1							
Autumn	EUST			European Starling	10	S	4			737	746	16	0	0%
Autumn	EUST			European Starling	20	N	6							
Autumn	EUST			European Starling	40	E	32							
Autumn	AMCR			American Crow	50	E	5							
Autumn	MODO			Mourning Dove	40	S	1							
12-Sep-11	D			Autumn	BLJA	Blue Jay	40	NE	2					
		Autumn	AMBO	American Robin	20	NE	1							
		Autumn	AMGO	American Goldfinch	10	W	2							
		Autumn	MODO	Mourning Dove	60	NE	1							
		Autumn	DOWO	Downy Woodpecker	50	NE	1							
		Autumn	PHWO	Red-headed Woodpecker	30	NE	3							
		Autumn	EUST	European Starling	40	NW	4			843	852	19	7	5%
		Autumn	HOSP	House Sparrow	30	NE	2							
		Autumn	BLJA	Blue Jay	40	W	3							
		Autumn	EWPE	Eastern Wood-Pewee	60	W	1							
		Autumn	WBNU	White-breasted Nuthatch	30	NW	2							
		12-Sep-11	E	Autumn	EABL	Eastern Bluebird	30	NW	1					
Autumn	CEDW			Cedar Waxwing	30	NW	10							
Autumn	BCCH			Black-capped Chickadee	40	W	1							
Autumn	PIWO			Pileated Woodpecker	30	S	1							
Autumn	NOLA			Northern Cardinal	20	NW	1							
Autumn	WBNU			White-breasted Nuthatch	10	S	2							
Autumn	AMCR			American Crow	70	NW	1							
Autumn	BLJA			Blue Jay	40	NW	1							
Autumn	DOWO			Downy Woodpecker	50	E	1							
Autumn	RBWO			Red-bellied Woodpecker	30	E	1							
Autumn	AMCR			American Crow	60	E	3							
Autumn	ETTI			Tufted Titmouse	30	E	2							
12-Sep-11	F	Autumn	AMGO	American Goldfinch	50	E	2							
		Autumn	RWBL	Red-winged Blackbird	80	E	2							
		Autumn	AMRO	American Robin	40	E	2							
		Autumn	AMCR	American Crow	40	E	2							
		Autumn	BLJA	Blue Jay	40	W	3							
		Autumn	EWPE	Eastern Wood-Pewee	60	W	1							
		Autumn	WBNU	White-breasted Nuthatch	30	NW	2							
		Autumn	EABL	Eastern Bluebird	30	NW	1							
		Autumn	CEDW	Cedar Waxwing	30	NW	10							
		Autumn	BCCH	Black-capped Chickadee	40	W	1							
		Autumn	PIWO	Pileated Woodpecker	30	S	1							
		Autumn	NOLA	Northern Cardinal	20	NW	1							
12-Sep-11	G	Autumn	WBNU	White-breasted Nuthatch	10	S	2							
		Autumn	AMCR	American Crow	70	NW	1							
		Autumn	BLJA	Blue Jay	40	NW	1							
		Autumn	DOWO	Downy Woodpecker	50	E	1							
		Autumn	RBWO	Red-bellied Woodpecker	30	E	1							
		Autumn	AMCR	American Crow	60	E	3							
		Autumn	ETTI	Tufted Titmouse	30	E	2							
		Autumn	AMGO	American Goldfinch	50	E	2							
		Autumn	RWBL	Red-winged Blackbird	80	E	2							
		Autumn	AMRO	American Robin	40	E	2							
		Autumn	AMCR	American Crow	40	E	2							

Passerine Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flyover # in Flock	Behavior/notes	Survey Time Start	Survey Time Stop	Survey Temp (C)	Wind	Cloud	
12-Sep-11	H	Autumn	MODO	Mourning Dove	5	N	2							
		Autumn	MODO	Mourning Dove	50	N	1							
		Autumn	WAVI	Warbling Vireo	60	NW	1							
		Autumn	BLJA	Blue Jay	60	SE	2			909	918	19	2	5%
		Autumn	GRCA	Gray Catbird	5	W	2							
		Autumn	AMRO	American Robin	5	E	2							
		Autumn	RHWO	Red-headed Woodpecker	5	E	1							
		Autumn	AMGO	American Goldfinch	5	W	2							
		Autumn	AMRO	American Robin	40	S	12							
		Autumn	BLJA	Blue Jay	20	NE	1							
12-Sep-11	J	Autumn	ETTI	Tufted Titmouse	10	N	2							
		Autumn	REVI	Red-eyed Vireo	40	WSW	1							
		Autumn	EWPE	Eastern Wood Pewee	50	NW	1			922	931	20	2	5%
		Autumn	NAWA	Nashville Warbler	10	N	1							
		Autumn	AMRO	American Robin	10	N	3							
		Autumn	RBWO	Red-bellied Woodpecker	20	E	2							
		Autumn	MODO	Mourning Dove	60	S	4							
		Autumn	NOFL	Northern Flicker	50	SE	1							
		Autumn	TUVU	Turkey Vulture	30	W	3							
		Autumn	AMRO	American Robin	10	W	2							
12-Sep-11	J	Autumn	HOSP	House Sparrow	20	N	2							
		Autumn	MODO	Mourning Dove	30	N	2							
		Autumn	MODO	Mourning Dove	100	N	2			939	948	20	0	5%
		Autumn	BLJA	Blue Jay	40	N	1							
		Autumn	AMGO	American Goldfinch	10	N	2							
		Autumn	KILL	Killdeer	20	W	2							
		Autumn	AMRE	American kestrel	30	N	1							
		Autumn	MODO	Mourning Dove	50	S	3							
		Autumn	AMGO	American Goldfinch	30	S	6			953	1002	19	2	10%
		Autumn	BLJA	Blue Jay	10	W	2							
19-Sep-11	A	Autumn	AMRO	American Robin	20	N	2							
		Autumn	BLJA	Blue Jay	30	SW	3							
		Autumn	AMCR	American Crow	100	WNW	3							
		Autumn	RBWO	Red-bellied Woodpecker	20	N	2							
		Autumn	DOWO	Downy Woodpecker	10	N	1							
		Autumn	DOWO	Downy Woodpecker	15	S	1			848	857	14	0	100%
		Autumn	RBWO	Red-bellied Woodpecker	40	WSW	1							
		Autumn	NOFL	Northern Flicker	5	N	1							
		Autumn	COYE	Common Yellowthroat	5	N	1							
		Autumn	WBNU	White-breasted Nuthatch	30	E	2							
19-Sep-11	B	Autumn	BLJA	Blue Jay	20	W	1							
		Autumn	AMRO	American Robin	40	W	1							
		Autumn	RBWO	Red-bellied Woodpecker	10	E	1							
		Autumn	WBNU	White-breasted Nuthatch	40	SW	1			903	903	14	0	100%
		Autumn	AMRO	American Robin	20	E	1							
		Autumn	EWPE	Eastern Wood-Pewee	50	NE	1							
		Autumn	GCCH	Gray-checked Thrush	5	NE	1							
		Autumn	ETTI	Tufted Titmouse	20	NE	2							
		Autumn	BLJA	Blue Jay	90	NW	2							
		Autumn	WBNU	White-breasted Nuthatch	20	SE	2							
19-Sep-11	C	Autumn	AMCR	American Crow	120	NNW	2			919	928	14	0	100%
		Autumn	ETTI	Tufted Titmouse	10	SE	3							
		Autumn	RBWO	Red-bellied Woodpecker	80	NE	1							
19-Sep-11	D	Autumn	AMCR	American Crow	100	ENE	2	Excessive noise, road work in progress.	933	942	14	0	100%	

Passerine Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flyover # in Flock	Behavior/notes	Survey Start	Survey Stop	Survey Temp (C)	Wind	Cloud	
19-Sep-11	E	Autumn	AMRO	American Robin	20	E	2							
		Autumn	BLJA	Blue Jay	40	W	1							
		Autumn	DOWO	Downy Woodpecker	30	W	1							
		Autumn	BLJA	Blue Jay	20	E	1							
		Autumn	DOWO	Downy Woodpecker	30	N	1							
		Autumn	AMGO	American Goldfinch	15	S	2							
		Autumn	BLJA	Blue Jay	110	W	1							
		Autumn	MODO	Mourning Dove	30	W	5			829	838	13	0	100%
		Autumn	RBWO	Red-bellied Woodpecker	30	S	1							
		Autumn	BLJA	Blue Jay	30	N	4							
		Autumn	WBNU	White-breasted Nuthatch	40	SW	1							
		Autumn	AMGO	American Goldfinch	25	SW	3							
		Autumn	PHWO	Red-headed Woodpecker	15	NW	1							
		Autumn	MODO	Mourning Dove	10	E	2							
Autumn	EUST	European Starling	30	SW	3									
19-Sep-11	F	Autumn	BLJA	Blue Jay	20	NW	4							
		Autumn	BLJA	Blue Jay	60	NE	2							
		Autumn	AMRO	American Robin	60	NE	1			948	957	14		100%
		Autumn	DOWO	Downy Woodpecker	30	NW	1							
		Autumn	AMCR	American Crow	30	S	1							
		Autumn	BLJA	Blue Jay	100	SW	1							
		Autumn	AMCR	American Crow	100	E	4							
		Autumn	MODO	Mourning Dove	20	E	1							
		Autumn	EABL	Eastern Bluebird	60	E	1							
		Autumn	BLJA	Blue Jay	100	NW	1			816	825	13	0	100%
		Autumn	BLJA	Blue Jay	40	S	1							
		Autumn	AMRO	American Robin	30	W	1							
		Autumn	COGR	Common Grackle	20	N	1							
		Autumn	AMRO	American Robin	40	W	2							
19-Sep-11	H	Autumn	EUST	European Starling	30	SE	5							
		Autumn	MODO	Mourning Dove	10	S	4							
		Autumn	WAVI	Warbling Vireo	30	W	1							
		Autumn	RBWO	Red-bellied Woodpecker	50	W	1			801	810	13	0	100%
		Autumn	ETTI	Tufted Titmouse	80	W	1							
		Autumn	MODO	Mourning Dove	15	S	1							
		Autumn	NOCA	Northern Cardinal	5	E	1							
		Autumn	AMRO	American Robin	30	SW	3							
		Autumn	DOWO	Downy Woodpecker	10	S	1			747	756	13	0	100%
		Autumn	WAVI	Warbling Vireo	30	E	1							
		Autumn	PHWO	Red-headed Woodpecker	20	N	1							
		Autumn	EUST	European Starling	10	E	1							
		Autumn	AMRO	American Robin	20	W	1							
		Autumn	REVI	Red-eyed Vireo	20	SW	1							
19-Sep-11	J	Autumn	BLJA	Blue Jay	40	NW	1			1022	1034	15	0	100%
		Autumn	BLJA	Blue Jay	50	NNE	1							
		Autumn	BLJA	Blue Jay	10	NW	3							
		Autumn	DOWO	Downy Woodpecker	30	W	1			1008	1017	15	0	100%
		Autumn	EUST	European Starling	50	ESE	12							
		Autumn	BLJA	Blue Jay	15	S	4							
		Autumn	RBWO	Red-bellied Woodpecker	30	SW	2							
		Autumn	WBNU	White-breasted Nuthatch	5	S	1							
		Autumn	ETTI	Tufted Titmouse	5	W	1							
		Autumn	AMGO	American Goldfinch	10	W	4			804	813	11	2	100%
		Autumn	RBWO	Red-bellied Woodpecker	25	NE	1							
		Autumn	BICCH	Black-capped Chickadee	5	W	4							
		Autumn	COVE	Common Yellowthroat	5	NE	1							
		Autumn	GBHE	Great Blue Heron	30	NE	1							

Passerine Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flyover # in Flock	Behavior/notes	Survey Time Start	Survey Time Stop	Survey Temp (C)	Survey Weather	Conditions	
27-Sep-11	B	Autumn	AMCR	American Crow	80	ENE	4							
		Autumn	WBNU	White-breasted Nuthatch	20	NE	2							
		Autumn	WBWL	Red-winged Blackbird	30	WSW	36							
		Autumn	BLJA	Blue Jay	60	ENE	1							
		Autumn	AMCR	American Crow	50	S	1							
		Autumn	BLJA	Blue Jay	80	SE	3							
		Autumn	AMGO	American Goldfinch	30	SW	1							
		Autumn	RBWO	Red-bellied Woodpecker	20	N	1							
		Autumn	AMCR	American Crow	30	WSW	2							
		Autumn	BLJA	Blue Jay	50	WSW	1							
27-Sep-11	C	Autumn	BLJA	Blue Jay	40	SW	1							
		Autumn	RBWO	Red-bellied Woodpecker	20	ESE	1							
		Autumn	AMHO	American Robin	30	S	1							
		Autumn	PBGR	Rose-breasted Grosbeak	20	ESE	1							
		Autumn	NOFL	Northern Flicker	40	SSW	2							
		Autumn	WBNU	White-breasted Nuthatch	25	S	2							
		Autumn	AMCR	American Crow	110	E	2							
		Autumn	AMCR	American Crow	100	W	2							
		Autumn	BEVI	Red-eyed Vireo	10	W	1							
		Autumn	CAGO	Canada Goose	100	NE	8							
27-Sep-11	D	Autumn	AMCR	American Crow	100	E	3							
		Autumn	NOFL	Northern Flicker	30	E	1							
		Autumn	AMCR	American Crow	50	E	3							
		Autumn	RBWO	Red-bellied Woodpecker	40	SW	1							
		Autumn	AMHO	American Robin	60	E	1							
		Autumn	AMGO	American Goldfinch	30	W	3							
		Autumn	HOSP	House Sparrow	5	N	1							
		Autumn	WBNU	White-breasted Nuthatch	10	N	1							
		Autumn	BLJA	Blue Jay	50	NE	1							
		Autumn	MODO	Mourning Dove	30	W	4							
27-Sep-11	E	Autumn	BLJA	Blue Jay	60	S	1							
		Autumn	BLJA	Blue Jay	40	S	3							
		Autumn	KILL	Killdeer	10	S	1							
		Autumn	NOCA	Northern Cardinal	10	E	1							
		Autumn	BLJA	Blue Jay	40	NW	2							
		Autumn	RBWO	Red-bellied Woodpecker	30	NW	1							
		Autumn	BLJA	Blue Jay	20	W	7							
		Autumn	MODO	Mourning Dove	100	E	2							
		Autumn	WBNU	White-breasted Nuthatch	30	NW	1							
		Autumn	WBNU	White-breasted Nuthatch	20	S	1							
27-Sep-11	G	Autumn	EABL	Eastern Bluebird	10	S	2							
		Autumn	AMCR	American Crow	100	SE	1							
		Autumn	AMHO	American Robin	30	SW	2							
		Autumn	EABL	Eastern Bluebird	20	E	2							
		Autumn	EABL	Eastern Bluebird	30	N	1							
		Autumn	BLJA	Blue Jay	20	SW	2							
		Autumn	MODO	Mourning Dove	5	E	1							
		Autumn	EABL	Eastern Bluebird	5	W	4							
		Autumn	CEOW	Cedar Waxwing	5	W	3							
		Autumn	MODO	Mourning Dove	70	S	7							
27-Sep-11	H	Autumn	AMHO	American Robin	30	SW	4							
		Autumn	BLJA	Blue Jay	30	SW	1							
		Autumn	EABL	Eastern Bluebird	80	S	8							
		Autumn	EABL	Eastern Bluebird	40	N	3							
		Autumn	MODO	Mourning Dove	20	N	1							
		Autumn	NOFL	Northern Flicker	15	NW	2							
		Autumn	WBNU	White-breasted Nuthatch	5	W	2							
		Autumn	AMHO	American Robin	40	SE	1							
		Autumn	BLJA	Blue Jay	40	N	2							
		Autumn	BLJA	Blue Jay	10	W	1							
27-Sep-11	I	Autumn	AMCR	American Crow	5	W	1							
		Autumn	AMCR	American Crow	70	E	3							
		Autumn	HOSP	House Sparrow	30	NW	7							
		Autumn	AMCR	American Crow	100	E	3							
		Autumn	AMCR	American Crow	100	E	3							
		Autumn	AMCR	American Crow	100	E	3							
		Autumn	AMCR	American Crow	100	E	3							
		Autumn	AMCR	American Crow	100	E	3							
		Autumn	AMCR	American Crow	100	E	3							
		Autumn	AMCR	American Crow	100	E	3							
27-Sep-11	J	Autumn	AMCR	American Crow	100	E	3							
		Autumn	AMCR	American Crow	100	E	3							
		Autumn	AMCR	American Crow	100	E	3							
		Autumn	AMCR	American Crow	100	E	3							
		Autumn	AMCR	American Crow	100	E	3							
		Autumn	AMCR	American Crow	100	E	3							
		Autumn	AMCR	American Crow	100	E	3							
		Autumn	AMCR	American Crow	100	E	3							
		Autumn	AMCR	American Crow	100	E	3							
		Autumn	AMCR	American Crow	100	E	3							
27-Sep-11	K	Autumn	AMCR	American Crow	100	E	3							
		Autumn	AMCR	American Crow	100	E	3							
		Autumn	AMCR	American Crow	100	E	3							
		Autumn	AMCR	American Crow	100	E	3							
		Autumn	AMCR	American Crow	100	E	3							
		Autumn	AMCR	American Crow	100	E	3							
		Autumn	AMCR	American Crow	100	E	3							
		Autumn	AMCR	American Crow	100	E	3							
		Autumn	AMCR	American Crow	100	E	3							
		Autumn	AMCR	American Crow	100	E	3							

Passerine Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flyover # in Flock	Behavior/notes	Survey Start	Survey Stop	Survey Temp (C)	Survey Wind	Survey Weather Conditions
3-Oct-11	A	Autumn	RTHA	Red-tailed Hawk	60	E	1	Light Drizzle	936	945	12	2	100%
		Autumn	BLIA	Blue Jay	20	S	1						
		Autumn	BLIA	Blue Jay	80	WNW	3						
		Autumn	YRWA	Yellow-rumped Warbler	15	W	1						
		Autumn	AMCR	American Crow	50	E	2						
		Autumn	BLIA	Blue Jay	30	N	1						
		Autumn	RBWO	Red-bellied Woodpecker	40	W	1						
		Autumn	BLIA	Blue Jay	20	NW	1						
		Autumn	WBNU	White-breasted Nuthatch	30	E	2						
		Autumn	RBWO	Red-bellied Woodpecker	40	N	1						
3-Oct-11	B	Autumn	RBWO	Red-bellied Woodpecker	60	SSE	2		948	957	12	0	100%
		Autumn	ETI	Tufted Titmouse	40	NW	1						
		Autumn	RWBL	Red-winged Blackbird	50	WSW	3						
		Autumn	AMCR	American Crow	80	W	7						
		Autumn	NOFL	Northern Flicker	20	ESE	1						
		Autumn	BICCH	Black-capped Chickadee	60	S	1						
		Autumn	BLIA	Blue Jay	70	S	1						
		Autumn	PBWO	Red-bellied Woodpecker	30	W	1						
		Autumn	NOFL	Northern Flicker	40	W	1						
		Autumn	BLIA	Blue Jay	40	E	2	Light Drizzle					
3-Oct-11	C	Autumn	CAGO	Canada Goose	90	S	6		1000	1009	13	2	100%
		Autumn	MODO	Mourning Dove	30	S	1						
		Autumn	YRWA	Yellow-rumped Warbler	5	E	2						
		Autumn	RCKI	Ruby-crowned Kinglet	5	E	1						
		Autumn	ETI	Tufted Titmouse	5	E	1						
		Autumn	RBWO	Red-bellied Woodpecker	20	S	1						
		Autumn	WBNU	White-breasted Nuthatch	20	N	1						
		Autumn	BLIA	Blue Jay	100	N	1						
		Autumn	BLIA	Blue Jay	30	S	1						
		Autumn	RBWO	Red-bellied Woodpecker	50	SW	1						
3-Oct-11	D	Autumn	AMCR	American Crow	110	SE	2		919	928	14	2	100%
		Autumn	RBWO	Red-bellied Woodpecker	30	W	2						
		Autumn	AMRO	American Robin	20	E	1						
		Autumn	BLIA	Blue Jay	40	N	1						
		Autumn	RBWO	Red-bellied Woodpecker	30	N	1						
		Autumn	EABL	Eastern Bluebird	60	W	2						
		Autumn	MODL	Northern Flicker	60	NW	1						
		Autumn	BLIA	Blue Jay	40	NW	1						
		Autumn	BLIA	Blue Jay	90	ESE	1						
		Autumn	FISP	Field Sparrow	10	E	1						
3-Oct-11	E	Autumn	BLIA	Blue Jay	10	S	1		740	749	13	0	95%
		Autumn	NOCA	Northern Cardinal	60	NW	1						
		Autumn	AMRO	American Robin	40	N NW	1						
		Autumn	AMGO	American Goldfinch	5	S	3						
		Autumn	AMCR	American Crow	100	NW	2						
		Autumn	SCSP	Song Sparrow	60	N	1						
		Autumn	SWTH	Swainson's Thrush	5	E	1						
		Autumn	RBWO	Red-bellied Woodpecker	40	SE	1						
		Autumn	EABL	Eastern Bluebird	60	N	2						
		Autumn	RBWO	Red-bellied Woodpecker	50	W	1						
3-Oct-11	F	Autumn	CHSW	Chimney Swift	20	S	3		909	918	14	0	100%
		Autumn	BLIA	Blue Jay	60	NW	1						
		Autumn	AMRO	American Robin	70	S	3						
		Autumn	HOSP	House Sparrow	40	E	4						
		Autumn	NOFL	Northern Flicker	50	SE	1						
		Autumn	HAWO	Hairy Woodpecker	40	S	1						
		Autumn	BLIA	Blue Jay	70	E	1						
		Autumn	MODO	Mourning Dove	10	NW	3						
		Autumn	NOCA	Northern Cardinal	30	E	2						
		Autumn	AMRO	American Robin	70	N	1						
3-Oct-11	G	Autumn	AMRO	American Robin	30	SSW	1		842	851	14	0	100%
		Autumn	RBWO	Red-bellied Woodpecker	30	SW	2						
		Autumn	AMRO	American Robin	30	SW	2						
		Autumn	EUST	European Starling	60	N	6						
		Autumn	AMRO	American Robin	70	N	1						
		Autumn	RBWO	Red-bellied Woodpecker	30	SSW	1						
		Autumn	AMRO	American Robin	30	SW	2						
		Autumn	EUST	European Starling	60	N	6						
		Autumn	AMRO	American Robin	70	N	1						
		Autumn	RBWO	Red-bellied Woodpecker	30	SSW	1						
3-Oct-11	H	Autumn	AMRO	American Robin	70	N	1		855	904	14	0	100%
		Autumn	AMRO	American Robin	70	N	1						
		Autumn	AMRO	American Robin	70	N	1						
		Autumn	AMRO	American Robin	70	N	1						
		Autumn	AMRO	American Robin	70	N	1						
		Autumn	AMRO	American Robin	70	N	1						
		Autumn	AMRO	American Robin	70	N	1						
		Autumn	AMRO	American Robin	70	N	1						
		Autumn	AMRO	American Robin	70	N	1						
		Autumn	AMRO	American Robin	70	N	1						
3-Oct-11	I	Autumn	AMRO	American Robin	70	N	1		842	851	14	0	100%
		Autumn	AMRO	American Robin	70	N	1						
		Autumn	AMRO	American Robin	70	N	1						
		Autumn	AMRO	American Robin	70	N	1						
		Autumn	AMRO	American Robin	70	N	1						
		Autumn	AMRO	American Robin	70	N	1						
		Autumn	AMRO	American Robin	70	N	1						
		Autumn	AMRO	American Robin	70	N	1						
		Autumn	AMRO	American Robin	70	N	1						
		Autumn	AMRO	American Robin	70	N	1						

Passerine Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flock #	Flower #	Behavior/notes	Start	Stop	Temp (C)	Wind	Cloud	
3-Oct-11	J	Autumn	MODO	Mourning Dove	100	N	4								
		Autumn	MODO	Mourning Dove	30	N	2								
		Autumn	BLIA	Blue Jay	40	N	1				823	832	14	0	100%
		Autumn	NOCA	Northern Cardinal	30	W	1								
		Autumn	AMRO	American Robin	40	N	2								
3-Oct-11	K	Autumn	BLIA	Blue Jay	60	S	1								
		Autumn	MODO	Mourning Dove	100	S	2		Light Drizzle						
		Autumn	BLIA	Blue Jay	60	NNW	1								
		Autumn	RBWO	Red-bellied Woodpecker	10	W	2								
		Autumn	BLIA	Blue Jay	30	W	1								
		Autumn	NOFL	Northern Flicker	50	SW	1								
		Autumn	BLIA	Blue Jay	80	NNW	2				759	808	12	0	95%
		Autumn	AMRO	American Robin	40	N	1								
		Autumn	AMGO	American Goldfinch	30	E	1								
		Autumn	RWBL	Red-winged Blackbird	96	ENE	4								
10-Oct-11	A	Autumn	EABL	Eastern Bluebird	30	S	3	P							
		Autumn	BLIA	Blue Jay	30	W	3	F/G							
		Autumn	RBWO	Red-bellied Woodpecker	20	NE	2		Perched, Calling						
		Autumn	EUST	European Starling	30	N	5	F			1000	1009	21	0	50%
		Autumn	MYWA	Yellow-rumped Warbler	10	W	2		Feeding						
		Autumn	AMGO	American Goldfinch	10	S	2		In Flight						
		Autumn	BLIA	Blue Jay	25	W	2		Perched						
		Autumn	BLIA	Blue Jay	40	NE	11		Calling						
		Autumn	RBWO	Red-bellied Woodpecker	30	E	1		Calling, Perched						
		Autumn	RBWO	Red-bellied Woodpecker	20	NW	1		Calling, Perched						
10-Oct-11	B	Autumn	BLIA	Blue Jay	50	N	1		Calling						
		Autumn	BLIA	Blue Jay	50	W	1		Flying						
		Autumn	RWBL	Red-winged Blackbird	60	W	1		Flying						
		Autumn	AMCR	American Crow	40	E	4		Flying						
		Autumn	NOFL	Northern Flicker	30	E	2		Flying						
		Autumn	COGR	Common Grackle	10	NE	1		Flying						
		Autumn	RWBL	Red-winged Blackbird	60	SE	1		Calling						
		Autumn	AMCR	American Crow	90	ENE	3		Flying, Calling						
		Autumn	AMCR	American Crow	70	NNW	3		Calling						
		Autumn	SCSP	Song Sparrow	40	SE	1		Flying						
10-Oct-11	C	Autumn	AMCR	American Crow	10	SW	2		Flying, Calling						
		Autumn	CAGO	Canada Goose	80	S	3		Flying, Calling						
		Autumn	BLIA	Blue Jay	70	N	2		Flying, Calling						
		Autumn	CAGO	Canada Goose	110	S	21		Flying, Calling						
		Autumn	NOCA	Northern Cardinal	50	N	2		Perched, Singing						
		Autumn	RWBL	Red-winged Blackbird	30	E	1000		Flying						
		Autumn	RWBL	Red-winged Blackbird	30	NW	500		Flying						
		Autumn	BLIA	Blue Jay	30	W	2		Perched, Calling						
		Autumn	AMCR	American Crow	80	SW	2		Flying						
		Autumn	COGR	Common Grackle	30	E	6		Flying						
10-Oct-11	D	Autumn	KILL	Killdeer	50	SE	5		Flying						
		Autumn	SCSP	Song Sparrow	10	SW	1		Perched						
		Autumn	RBWO	Red-bellied Woodpecker	20	S	1		Perched						
		Autumn	BLIA	Blue Jay	30	S	2		Flying, Calling						
		Autumn	PHWO	Red-headed Woodpecker	30	NE	2		Feeding						
		Autumn	EUST	European Starling	40	S	800		Flying, Perched						
		Autumn	RWBL	Red-winged Blackbird	40	S	1200		Flying						
		Autumn	COGR	Common Grackle	40	S	80		Flying						
		Autumn	BRCO	Brown-headed Cowbird	40	S	10		Flying						
		Autumn	RWBL	Red-winged Blackbird	20	S	4		Flying						
10-Oct-11	E	Autumn	MODO	Mourning Dove	90	N	1		Perched						
		Autumn	AMCR	American Crow	70	ENE	3		Flying, Calling						
		Autumn	AMCR	American Crow	40	SE	1		Flying						
		Autumn	CAGO	Canada Goose	80	S	3		Flying, Calling						
		Autumn	BLIA	Blue Jay	70	N	2		Flying, Calling						
		Autumn	CAGO	Canada Goose	110	S	21		Flying, Calling						
		Autumn	NOCA	Northern Cardinal	50	N	2		Perched, Singing						
		Autumn	RWBL	Red-winged Blackbird	30	E	1000		Flying						
		Autumn	RWBL	Red-winged Blackbird	30	NW	500		Flying						
		Autumn	BLIA	Blue Jay	30	W	2		Perched, Calling						
10-Oct-11	E	Autumn	AMCR	American Crow	80	SW	2		Flying						
		Autumn	COGR	Common Grackle	30	E	6		Flying						
		Autumn	KILL	Killdeer	50	SE	5		Flying						
		Autumn	SCSP	Song Sparrow	10	SW	1		Perched						
		Autumn	RBWO	Red-bellied Woodpecker	20	S	1		Perched						
		Autumn	BLIA	Blue Jay	30	S	2		Flying, Calling						
		Autumn	PHWO	Red-headed Woodpecker	30	NE	2		Feeding						
		Autumn	EUST	European Starling	40	S	800		Flying, Perched						
		Autumn	RWBL	Red-winged Blackbird	40	S	1200		Flying						
		Autumn	COGR	Common Grackle	40	S	80		Flying						
Autumn	BRCO	Brown-headed Cowbird	40	S	10		Flying								
Autumn	RWBL	Red-winged Blackbird	20	S	4		Flying								
Autumn	MODO	Mourning Dove	90	N	1		Perched								

Passerine Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flyover # In Flock	Behavior/notes	Start	Stop	Temp (C)	Wind	Cloud	
10-Oct-11	F	Autumn	AMCR	American Crow	5	E	2	Perched						
		Autumn	AMCR	American Crow	100	SW	4	Calling						
		Autumn	AMGO	American Goldfinch	20	W	2	Flying						
		Autumn	AMRO	American Robin	20	SW	1	Perched, Calling						
		Autumn	RBWO	Red-bellied Woodpecker	40	S	1	Perched, Calling		807	816	15	0	40%
		Autumn	BLJA	Blue Jay	50	W	1	Calling						
		Autumn	SAVS	Savannah Sparrow	40	SE	1	Perched, Feeding						
		Autumn	HOLA	Homed Lark	30	E	2	Flying						
		Autumn	AMCR	American Crow	80	S	2	Calling						
		Autumn	RWBK	Red-winged Blackbird	70	E	950	Flying						
10-Oct-11	G	Autumn	COGR	Common Grackle	70	E	20	Flying						
		Autumn	MODD	Mourning Dove	70	W	2	Flying						
		Autumn	RWBK	Red-winged Blackbird	70	W	700	Flying		928	937	18	0	20%
		Autumn	COGR	Common Grackle	100	NE	3	Flying						
		Autumn	MALL	Mallard	90	E	2	Flying						
		Autumn	RBWO	Red-bellied Woodpecker	40	S	1	Flying						
		Autumn	AMRO	American Robin	30	W	4	Perched, Calling						
		Autumn	ETTI	Tufted Titmouse	20	W	3	Feeding						
		Autumn	YBSA	Yellow-bellied Sapsucker	10	W	1	Feeding						
		Autumn	AMRO	American Robin	15	SE	6	Perched, Calling						
10-Oct-11	H	Autumn	AMRO	American Robin	40	NW	2	Perched, Calling						
		Autumn	EUST	European Starling	50	W	7	Flying						
		Autumn	AMRO	American Robin	40	S	3	Perched, Calling		914	923	18	0	
		Autumn	CEED	Cedar Waxwing	30	W	4	Flying						
		Autumn	NOFL	Northern Flicker	60	W	1	Calling						
		Autumn	NOCA	Northern Cardinal	5	SSE	1	Flying						
		Autumn	KILL	Killdeer	10	W	1	Flying						
		Autumn	AMRO	American Robin	30	SW	5	Perched, Calling						
		Autumn	RWBK	Red-winged Blackbird	70	S	1	Flying						
		Autumn	AMRO	American Robin	40	W	4	Perched, Calling						
10-Oct-11	J	Autumn	BLJA	Blue Jay	20	SW	1	Perched, Calling						
		Autumn	BLJA	Blue Jay	10	W	3	Perched, Calling						
		Autumn	EUST	European Starling	100	N	3	Flying		902	911	17	0	30%
		Autumn	BLJA	Blue Jay	40	N	1	Perched, Calling						
		Autumn	ETTI	Tufted Titmouse	80	W	1	Feeding						
		Autumn	EABL	Eastern Bluebird	40	E	6	Flying						
		Autumn	EAPH	Eastern Phoebe	20	S	1	Flycatching						
		Autumn	WBNU	White-breasted Nuthatch	30	N	2	Feeding						
		Autumn	MODD	Mourning Dove	10	N	1	Perched						
		Autumn	COGR	Common Grackle	70	S	2	Flying						
10-Oct-11	J	Autumn	HETH	Horned Lark	40	E	1	Feeding						
		Autumn	RBWO	Red-bellied Woodpecker	40	N	1	Feeding						
		Autumn	AMRO	American Robin	40	SSW	2	Perched, Calling						
		Autumn	AMRO	American Robin	30	W	1	Perched, Calling						
		Autumn	RBWO	Red-bellied Woodpecker	30	W	1	Feeding						
		Autumn	MODD	Mourning Dove	10	N	2	Perched		1043	1052	16	0	40%
		Autumn	EABL	Eastern Bluebird	60	N	3	Flying, Calling						
		Autumn	AMGO	American Goldfinch	50	N	6	Flying, Calling						
		Autumn	BLJA	Blue Jay	50	N	2	Flying						
		Autumn	BLJA	Blue Jay	50	NW	1	Calling						
10-Oct-11	K	Autumn	ETTI	Tufted Titmouse	40	N	2	Feeding						
		Autumn	SOSP	Song Sparrow	50	NE	1	Singing						
		Autumn	NOFL	Northern Flicker	50	E	1	Calling						
		Autumn	SEDO	Short-billed Dowitcher	60	NE	2	Flying						
		Autumn	RBWO	Red-bellied Woodpecker	30	N	1	Feeding						
		Autumn	ETTI	Tufted Titmouse	100	E	1	Feeding						
		Autumn	BLJA	Blue Jay	100	ESE	2	Calling						
		Autumn	NOFL	Northern Flicker	30	N	1	Flying		827	836	16	0	45%
		Autumn	COGR	Common Grackle	20	N	1	Flying						
		Autumn	KILL	Killdeer	50	S	2	Flying, Calling						
Autumn	HOHI	House Finch	20	W	2	Flying								

Passerine Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flock #	Behavior/notes	Start	Stop	Temp (C)	Wind	Cloud
10-Oct-11	Between F & A	Autumn	RTHA	Red-tailed Hawk				41 11' 24.3"	803	0	20	0	45%
20-Oct-11	A	Autumn	BCCH	Black-capped Chickadee	30	NE	1	Feeding	930	939	10	2	100%
		Autumn	AMCR	American Crow	30	W	2	Perched					
20-Oct-11	B	Autumn	RBWO	Red-bellied Woodpecker	20	N	1	Feeding	942	951	10	10	100%
		Autumn	BLJA	Blue Jay	10	W	2	Calling/Flying					
20-Oct-11	C	Autumn	BLJA	Blue Jay	40	S	1	Calling	956	1005	11	2	100%
20-Oct-11	D	Autumn	No Observations						1008	1017	11	2	100%
		Autumn	AMRO	American Robin	10	N	2	Flying/Perched					
		Autumn	BLJA	Blue Jay	50	W	3	Calling/Flying					
		Autumn	AMRO	American Robin	20	W	1	Calling/Perched					
20-Oct-11	E	Autumn	AMCR	American Crow	30	SE	1	Calling/Flying	916	925	10	0	100%
		Autumn	COGR	Common Grackle	20	E	1	Perched					
		Autumn	BLJA	Blue Jay	10	E	2	Perched					
20-Oct-11	F	Autumn	BLJA	Blue Jay	20	W	1	Perched	1024	1033	11	7	100%
20-Oct-11	G	Autumn	No Observations						903	912	10	2	100%
20-Oct-11	H	Autumn	No Observations						849	858	10	2	100%
20-Oct-11	I	Autumn	No Observations						836	845	10	2	100%
20-Oct-11	J	Autumn	NOCA	Northern Cardinal	15	W	1	Perched	819	828	10	7	100%
		Autumn	MODO	Mourning Dove	90	N	1	Perched					
20-Oct-11	K	Autumn	No Observations						804	813	10	0	100%
		Autumn	AMCR	American Crow	40	S	3	Calling					
		Autumn	RBWO	Red-bellied Woodpecker	15	SE	1	Perched					
		Autumn	RBWO	Red-bellied Woodpecker	30	W	1	Calling					
24-Oct-11	A	Autumn	RWB	Red-winged Blackbird	80	NW	220	Flying	808	817	11	2	100%
		Autumn	BLJA	Blue Jay	40	W	2	Flying					
		Autumn	MYWA	Yellow-rumped Warbler	20	NW	2	Calling					
		Autumn	WTSP	White-throated Sparrow	10	NE	2	Calling					
		Autumn	WTSP	White-throated Sparrow	25	SW	2	Singing					
		Autumn	RBWO	Red-bellied Woodpecker	20	SW	1	Perched					
24-Oct-11	B	Autumn	BLJA	Blue Jay	40	W	2	Flying					
		Autumn	RWB	Red-winged Blackbird	70	NE	75	Flying	1001		12	2	100%
		Autumn	COGR	Common Grackle	70	NE	10	Flying					
		Autumn	DOWO	Downy Woodpecker	10	S	1	Feeding					
		Autumn	AMRO	American Robin	20	SE	1	Perched					
		Autumn	RBWO	Red-bellied Woodpecker	40	SW	1	Feeding					
		Autumn	BLJA	Blue Jay	30	NW	2	Flying					
24-Oct-11	C	Autumn	BCCH	Black-capped Chickadee	10	S	3	Feeding	948	958	12	0	100%
		Autumn	ETI	Tufted Titmouse	10	S	2	Feeding					
		Autumn	WBNU	White-breasted Nuthatch	10	S	2	Feeding					
		Autumn	AMCR	American Crow	100	W	4	Flying					
		Autumn	WIWR	Winter Wren	20	SE	1	Flying					
		Autumn	TUVU	Turkey Vulture	5	W	1	Singing					
24-Oct-11	D	Autumn	RWB	Red-winged Blackbird	70	N	70	Feeding	1014	1023	11	7	100%
		Autumn	GCCK	Golden-crowned Kinglet	10	W	2	Feeding					
		Autumn	TRES	Tree Swallow	70	N	120	Feeding, Flying					
		Autumn	RBWO	Red-bellied Woodpecker	40	NW	2	Calling					
		Autumn	HOSP	House Sparrow	30	NW	8	Flying					
		Autumn	BLJA	Blue Jay	40	S	1	Calling					
24-Oct-11	E	Autumn	BLJA	Blue Jay	20	N	2	Calling	823	832	10	0	100%
		Autumn	COGR	Common Grackle	20	N	2	Flying					
		Autumn	AMRO	American Robin	40	W	3	Calling					
		Autumn	RBWO	Red-bellied Woodpecker	5	E	1	Feeding					
24-Oct-11	F	Autumn	BLJA	Blue Jay	100	ENE	2	Calling	1030	1039	13	0	90%
		Autumn	BLJA	Blue Jay	50	W	3	Calling					
		Autumn	BLJA	Blue Jay	90	SW	1	Calling					
24-Oct-11	G	Autumn	RWB	Red-winged Blackbird	40	E	22	Flying	836	845	10	2	100%
		Autumn	AMCR	American Crow	10	S	1	Perched					
		Autumn	AMCR	American Crow	110	N	2	Flying					

Pasadena Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flock #	Behavior/notes	Start	Stop	Temp (C)	Wind	Cloud
24-Oct-11	H	Autumn	AMRO	American Robin	10	W	6	Perched					
		Autumn	AMRO	American Robin	40	S	4	Perched, Calling					
		Autumn	INCA	Northern Cardinal	10	E	1	Perched					
		Autumn	RBWO	Red-bellied Woodpecker	30	N	1	Feeding					
		Autumn	BLJA	Blue Jay	50	N	1	Calling	849	858	10	2	100%
		Autumn	BLJA	Blue Jay	5	E	1	Calling					
		Autumn	TRES	Tree Swallow	35	NW	330	Flying/feeding					
		Autumn	MYWA	Yellow-rumped Warbler	10	W	2	Perched					
		Autumn	CEDW	Cedar Waxwing	10	W	8	Feeding					
		Autumn	MYWA	Yellow-rumped Warbler	30	N	3	Feeding					
24-Oct-11	J	Autumn	RWBL	Red-winged Blackbird	5	W	5	Flying	903	912	11	2	100%
		Autumn	BLJA	Blue Jay	60	E	1	Calling					
24-Oct-11	J	Autumn	RHWO	Red-headed Woodpecker	20	E	1	Feeding					
		Autumn	MODD	Mourning Dove	80	N	2	Perched					
		Autumn	BLJA	Blue Jay	10	NW	2	Flying					
		Autumn	INCA	Northern Cardinal	20	SE	1	Perched					
		Autumn	AMRO	American Robin	30	S	1	Flying					
		Autumn	RBWO	Red-bellied Woodpecker	70	W	2	Feeding					
		Autumn	AMCR	American Crow	80	SW	3	Flying					
		Autumn	RBWO	Red-bellied Woodpecker	30	W	1	Feeding					
		Autumn	BLJA	Blue Jay	20	NW	2	Calling					
		Autumn	AMRO	American Robin	30	N	2	Perched					
24-Oct-11	K	Autumn	AMCR	American Crow	100	N	4	Flying	931	940	12	2	100%
		Autumn	MODD	Mourning Dove	80	S	2	Perched					
		Autumn	SCSP	Song Sparrow	20	ENE	1	Flying					
		Autumn	AMRO	American Robin	20	SW	1	Flying					
		Autumn	DOWO	Downy Woodpecker	20	W	1	Feeding					
		Autumn	EABL	Eastern Bluebird	80	W	3	Calling					
		Autumn	MYWA	Yellow-rumped Warbler	30	W	1	Feeding					
		Autumn	RWBL	Red-winged Blackbird	50	W	200	Flying					
		Autumn	COGR	Common Grackle	50	W	50	Flying					
		Autumn	RBWO	Red-bellied Woodpecker	60	SE	1	Calling					
3-Nov-11	A	Autumn	BLJA	Blue Jay	90	NW	1	Calling	854	903	14	2	100%
		Autumn	EUST	European Starling	10	W	2	Flying					
		Autumn	COGR	Common Grackle	20	SW	1	Flying					
		Autumn	ETTI	Tufted Titmouse	70	S	1	Calling					
		Autumn	AMGO	American Goldfinch	10	W	1	Flying					
		Autumn	BLJA	Blue Jay	60	NE	2	Calling					
		Autumn	AMRO	American Robin	40	S	2	Calling					
		Autumn	AMCR	American Crow	60	NE	5	Calling					
		Autumn	ETTI	Tufted Titmouse	20	NE	1	Calling	842	851	14	5	95%
		Autumn	RBWO	Red-bellied Woodpecker	10	SE	1	Calling					
3-Nov-11	C	Autumn	COGR	Common Grackle	30	E	1	Flying					
		Autumn	AMCR	American Crow	100	S	6	Calling					
		Autumn	WBNU	White-breasted Nuthatch	30	SSW	1	Calling					
		Autumn	RWBL	Red-winged Blackbird	50	W	8	Flying					
		Autumn	RWBL	Red-winged Blackbird	100	W	250	Flying					
		Autumn	COGR	Common Grackle	100	W	30	Flying					
		Autumn	INCA	Northern Cardinal	10	S	1	Flying					
		Autumn	AMCR	American Crow	60	SE	1	Calling	827	836	14	0	95%
		Autumn	AMGO	American Goldfinch	10	N	1	Calling					
		Autumn	RWBL	Red-winged Blackbird	70	W	1200	Flying					
3-Nov-11	D	Autumn	COGR	Common Grackle	70	W	50	Flying					
		Autumn	BHCO	Brown-headed Cowbird	70	W	20	Flying					
		Autumn	AMCR	American Crow	100	SE	3	Calling					
		Autumn	AMGO	American Goldfinch	20	S	4	Flying	814	823	9	5	80%
		Autumn	COGR	Common Grackle	10	SW	1	Flying					
		Autumn	RWBL	Red-winged Blackbird	5	E	200	Perched					
		Autumn	HOSP	House Sparrow	5	W	17	Perched					
		Autumn	COGR	Common Grackle	10	N	2	Flying					
		Autumn	BLJA	Blue Jay	40	NE	2	Calling	912	921	16	0	100%
		Autumn	AMGO	American Goldfinch	30	NW	4	Flying					
Autumn	BLJA	Blue Jay	20	W	1	Calling							

Passerine Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flower # In Flock	Behavior/notes	Start	Stop	Temp (C)	Wind	Cloud
3-Nov-11	F	Autumn	AMCR	American Crow	100	NW	1	Calling					
		Autumn	NOCA	Northern Cardinal	15	N	1	Calling					
		Autumn	RWB	Red-winged Blackbird	40	S	60	Hyng	754	803	16	2	50%
3-Nov-11	G	Autumn	COGR	Common Grackle	10	S	3	Hyng, Calling					
		Autumn	AMRO	American Robin	20	S	1	Calling					
		Autumn	AMCR	American Crow	10	S	1	Hyng	926	935	16	0	100%
3-Nov-11	H	Autumn	REBW	Red-bellied Woodpecker	20	NW	1	Hyng					
		Autumn	DOWO	Dowry Woodpecker	10	SW	1	Calling					
		Autumn	REBW	Red-bellied Woodpecker	30	W	1	Calling					
		Autumn	BCEH	Black-capped Chickadee	10	W	1	Feeding					
		Autumn	ETTI	Tufted Titmouse	40	S	1	Calling					
		Autumn	HOFI	House Finch	30	S	3	Perched					
		Autumn	RWB	Red-winged Blackbird	5	S	140	Hyng	940	949	17	0	70%
		Autumn	BLIA	Blue Jay	20	S	1	Calling					
		Autumn	ELST	European Starling	10	S	20	Hyng					
		Autumn	HAWO	Hairy Woodpecker	5	E	1	Perched					
3-Nov-11	I	Autumn	EABL	Eastern Bluebird	90	N	8	Perched	954	1003	17	0	80%
		Autumn	WBNU	White-breasted Nuthatch	20	E	1	Feeding, Calling					
		Autumn	BLIA	Blue Jay	40	NE	2	Calling					
3-Nov-11	J	Autumn	REBW	Red-bellied Woodpecker	40	S	1	Feeding, Calling	1008	1017	18	0	75%
		Autumn	RWB	Red-winged Blackbird	70	N	75	Hyng					
		Autumn	AMCR	American Crow	90	SW	4	Calling					
		Autumn	COGR	Common Grackle	70	N	12	Hyng					
		Autumn	REBW	Red-bellied Woodpecker	20	WSW	1	Perched					
		Autumn	BLIA	Blue Jay	40	WNW	2	Calling					
3-Nov-11	K	Autumn	SOSP	Song Sparrow	50	E	1	Singing					
		Autumn	AMRO	American Robin	20	N	5	Calling					
		Autumn	EABL	Eastern Bluebird	60	SE	3	Hyng	1023	1032	19	0	90%
		Autumn	MODO	Mourning Dove	100	S	4	Perched					
		Autumn	RWB	Red-winged Blackbird	40	NW	30	Hyng	808	817	4	5	20%
		Autumn	RTHA	Red-tailed Hawk	70	E	1	Hopping/Calling	755	804	4	2	85%
10-Nov-11	C	Autumn	RWB	Red-winged Blackbird	80	W	650	Hyng					
		Autumn	REBW	Red-bellied Woodpecker	60	SW	1	Calling	742	751	4	0	90%
		Autumn	RWB	Red-winged Blackbird	40	W	700	Hyng					
10-Nov-11	D	Autumn	BLIA	Blue Jay	20	N	1	Hyng					
		Autumn	WBNU	White-breasted Nuthatch	20	N	1	Feeding					
		Autumn	DOWO	Dowry Woodpecker	10	N	1	Feeding	730	739	4	5	50%
		Autumn	MYWA	Yellow-rumped Warbler	20	N	1	Feeding					
		Autumn	ETTI	Tufted Titmouse	30	W	2	On Roadside					
		Autumn	BLIA	Blue Jay	10	W	1	Hyng					
10-Nov-11	E	Autumn	HOFI	House Finch	15	W	6	Hyng					
		Autumn	BLIA	Blue Jay	40	NE	5	Calling					
		Autumn	AMCR	American Crow	40	NE	7	Calling					
		Autumn	RHWO	Red-headed Woodpecker	30	NE	1	Perched					
		Autumn	HOSP	House Sparrow	20	W	3	Hyng	826	835	5	2	50%
		Autumn	RWB	Red-winged Blackbird	30	N	30	Hyng					
		Autumn	WBNU	White-breasted Nuthatch	20	E	1	Feeding					
		Autumn	RTHA	Red-tailed Hawk	40	S	1	Calling					
		Autumn	RTHA	Red-tailed Hawk	30	W	1	Hyng					
		Autumn	RTHA	Red-tailed Hawk	90	N	1	Feeding					
10-Nov-11	F	Autumn	COGR	Common Grackle	5	W	2	Hyng					
		Autumn	WBNU	White-breasted Nuthatch	30	WNW	2	Feeding					
		Autumn	NOCA	Northern Cardinal	10	NW	1	Perched	726	725	4	0	60%
		Autumn	RWB	Red-winged Blackbird	20	E	120	Hyng					
		Autumn	AMRO	American Robin	5	NW	1	Perched					
10-Nov-11	G	Autumn	No Observations					840	849	5	2	60%	
		Autumn	WBNU	White-breasted Nuthatch	30	S	1	Feeding					
10-Nov-11	H	Autumn	REBW	Red-bellied Woodpecker	20	WSW	1	Perched					
		Autumn	NOCA	Northern Cardinal	10	S	2	Calling	853	902	6	2	60%
		Autumn	BLIA	Blue Jay	50	W	1	Calling					
		Autumn	HOSP	House Sparrow	40	S	1	Perched					

Passerine Migration Field Data

Date	Point	Season	Code	Species Name	Estimated Distance (m)	Direction (Bearing)	Flock #	Behavior/notes	Start	Stop	Temp (C)	Wind	Cloud	
10-Nov-11	I	Autumn	EABL	Eastern Bluebird	40	SE	2	Calling						
		Autumn	BLJA	Blue Jay	30	S	1	Flying						
		Autumn	BLJA	Blue Jay	40	W	2	Calling		907	916	7	2	80%
		Autumn	WBNU	White-breasted Nuthatch	20	W	1	Calling						
		Autumn	AMRO	American Robin	30	N	2	Calling						
10-Nov-11	J	Autumn	RWB	Red-winged Blackbird	50	E	125	Flying						
		Autumn	WBNU	White-breasted Nuthatch	30	S	1	Calling		925	934	7	2	80%
		Autumn	RWB	Red-winged Blackbird	30	N	75	Flying						
		Autumn	BLJA	Blue Jay	10	W	1	Flying						
		Autumn	COGR	Common Grackle	5	E	20	Flying						
10-Nov-11	K	Autumn	ELST	European Starling	15	S	4	Perched						
		Autumn	RWB	Red-winged Blackbird	30	N	18	Flying						
		Autumn	AMRO	American Robin	50	NW	2	Calling						
		Autumn	AMRO	American Robin	20	W	3	Calling		700	709	3	0	60%
		Autumn	RWB	Red-winged Blackbird	70	S	350	Flying						
		Autumn	MODO	Mourning Dove	60	NE	1	Calling						
		Autumn	COGR	Common Grackle	70	S	20	Flying						
		Autumn	WBNU	White-breasted Nuthatch	5	SW	1	Feeding						
		Autumn	AMGO	American Goldfinch	10	W	4	Flying						
		Autumn	NOCA	Northern Cardinal	10	N	1	Perched						
15-Nov-11	A	Autumn	DOWO	Downy Woodpecker	5	N	1	Calling						
		Autumn	EITL	Tufted Titmouse	15	E	3	Feeding						
		Autumn	WBNU	White-breasted Nuthatch	20	E	2	Calling		731	740	9	0	0%
		Autumn	RWB	Red-bellied Woodpecker	20	E	1	Feeding						
		Autumn	DEJU	Dark-eyed Junco	25	E	2	Feeding						
		Autumn	AMRO	American Robin	40	NE	2	Calling						
		Autumn	HOLA	Horned Lark	40	N	4	Feeding						
		Autumn	RWB	Red-bellied Woodpecker	50	SE	1	Calling						
		Autumn	NOFL	Northern Flicker	30	W	1	Calling		757	806	9	0	0%
		Autumn	BLJA	Blue Jay	30	W	2	Flying						
15-Nov-11	D	Autumn	BCCH	Black-capped Chickadee	10	S	2	Feeding						
		Autumn	WBNU	White-breasted Nuthatch	10	N	1	Feeding						
		Autumn	EABL	Eastern Bluebird	40	S	2	Perched						
		Autumn	BLJA	Blue Jay	20	W	2	Calling		810	819	9	0	0%
		Autumn	DEJU	Dark-eyed Junco	40	N	5	Feeding						
		Autumn	BLJA	Blue Jay	30	E	1	Calling						
		Autumn	RHWO	Red-headed Woodpecker	50	NW	3	Calling						
		Autumn	AMCR	American Crow	60	N	5	Flying		716	725	9	0	10%
		Autumn	NOHA	Northern Harrier	100	S	1	Flying						
		Autumn	KILL	Killdeer	100	S	1	Calling						
15-Nov-11	F	Autumn	HOLA	Horned Lark	40	S	6	Flying						
		Autumn	BLJA	Blue Jay	10	NW	3	Perched						
		Autumn	KILL	Killdeer	20	S	1	Calling		826	835	10	0	5%
		Autumn	RWB	Red-winged Blackbird	5	E	80	Flying						
		Autumn	COGR	Common Grackle	5	E	12	Flying		703	712	9	0	5%
15-Nov-11	G	Autumn	No Observations											
		Autumn	EABL	Eastern Bluebird	40	N	3	Perched						
		Autumn	RWB	Red-bellied Woodpecker	10	SE	1	Calling		928	937	11	0	0%
		Autumn	AMRO	American Robin	30	S	3	Calling						
		Autumn	CEW	Cedar Waxwing	10	W	7	Feeding						
15-Nov-11	I	Autumn	BLJA	Blue Jay	40	SW	2	Calling		915	924	11	0	0%
		Autumn	AMRO	American Robin	10	N	1	Perched						
		Autumn	ELST	European Starling	100	S	9	Perched						
		Autumn	RTHA	Red-tailed Hawk	30	NE	2	Flying						
		Autumn	RWB	Red-bellied Woodpecker	20	SE	1	Calling		858	907	11	0	0%
15-Nov-11	J	Autumn	BLJA	Blue Jay	40	N	1	Perched						
		Autumn	WTSP	White-throated Sparrow	30	E	3	Feeding						
		Autumn	AMRO	American Robin	30	N	2	Calling						
		Autumn	BLJA	Blue Jay	40	N	1	Flying		844	853	11	2	5%
		Autumn	DOWO	Downy Woodpecker	5	W	1	Feeding						
15-Nov-11	K	Autumn	AMCR	American Crow	40	N	7	Flying						

APPENDIX B

Photographs from Passerine Migration Survey Points

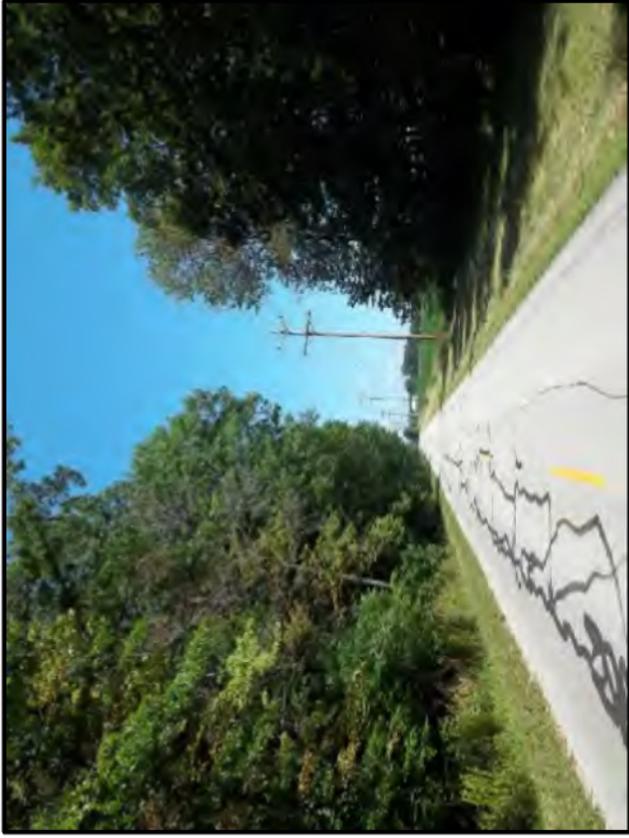


Photo 1. Point A, facing east.



Photo 2. Point A, facing west.

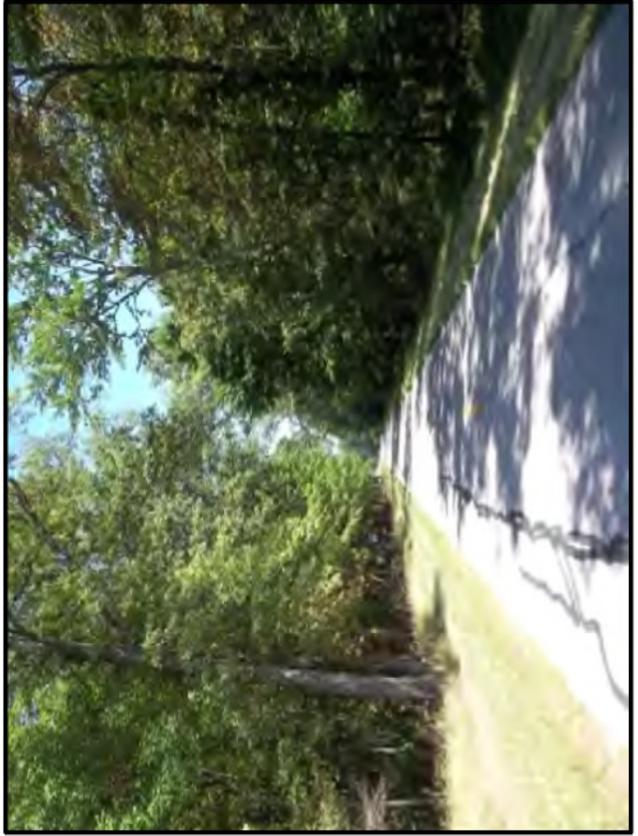


Photo 3. Point B, facing east.



Photo 4. Point B, facing west.



Photo 5. Point C, facing east.

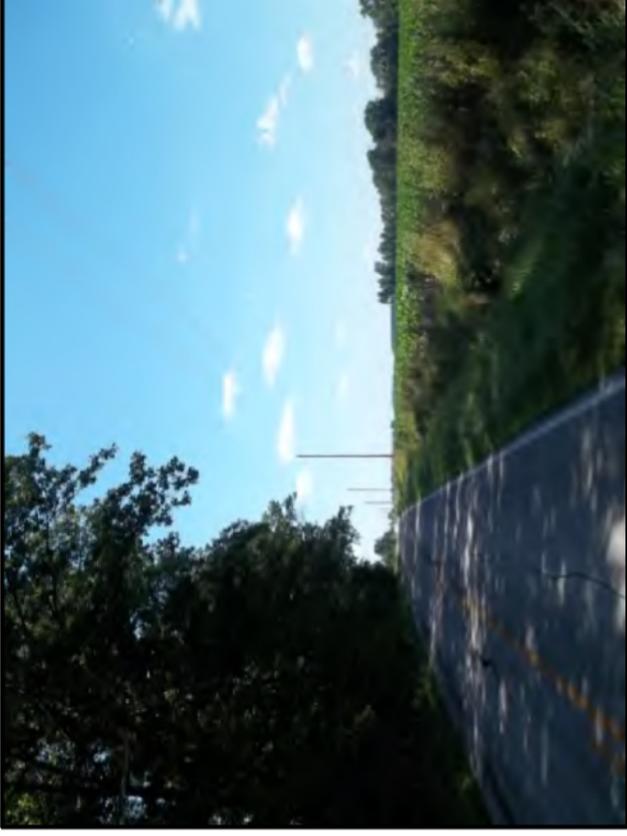


Photo 6. Point C, facing west.



Photo 7. Point D, facing north.

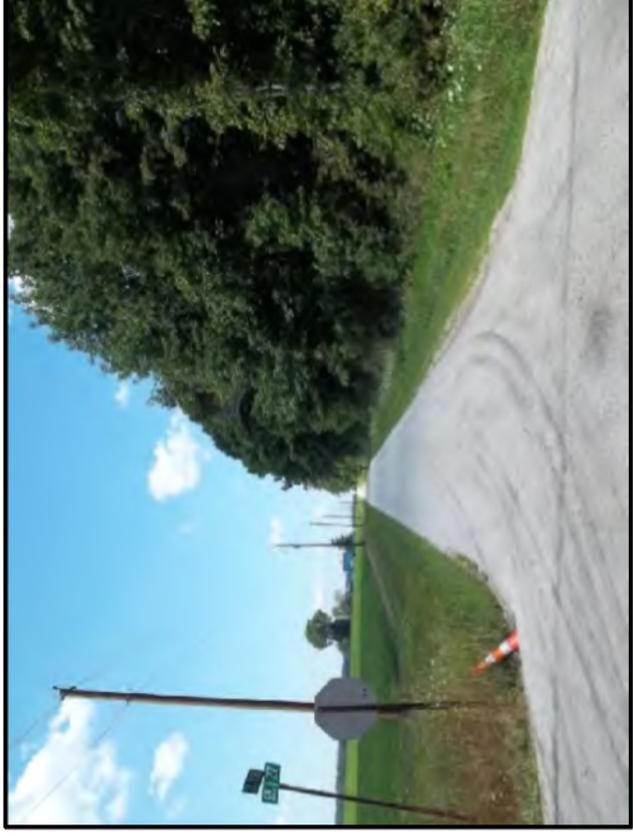


Photo 8. Point D, facing west.



Photo 9. Point E, facing east.



Photo 10. Point E, facing west.

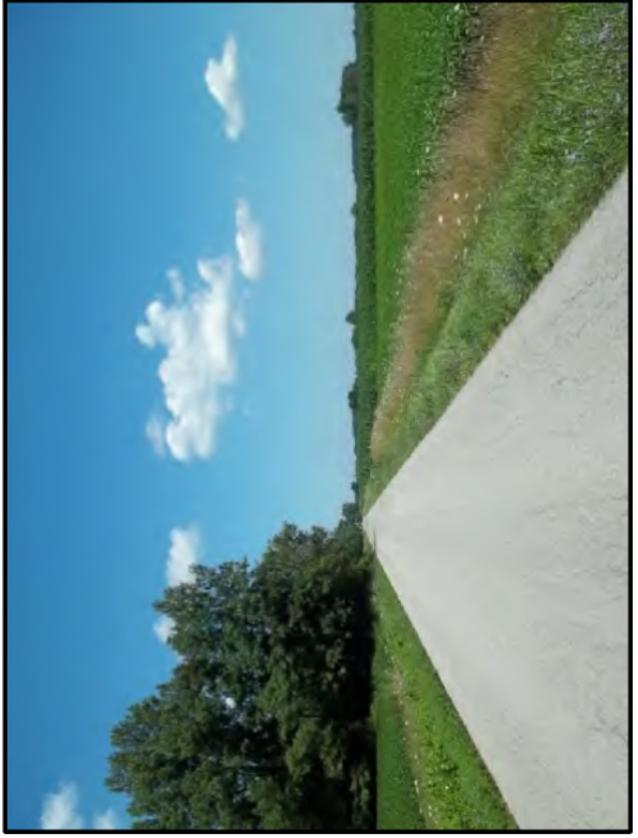


Photo 11. Point F, facing north.



Photo 12. Point F, facing west.



Photo 13. Point G, facing east.



Photo 14. Point G, facing west.

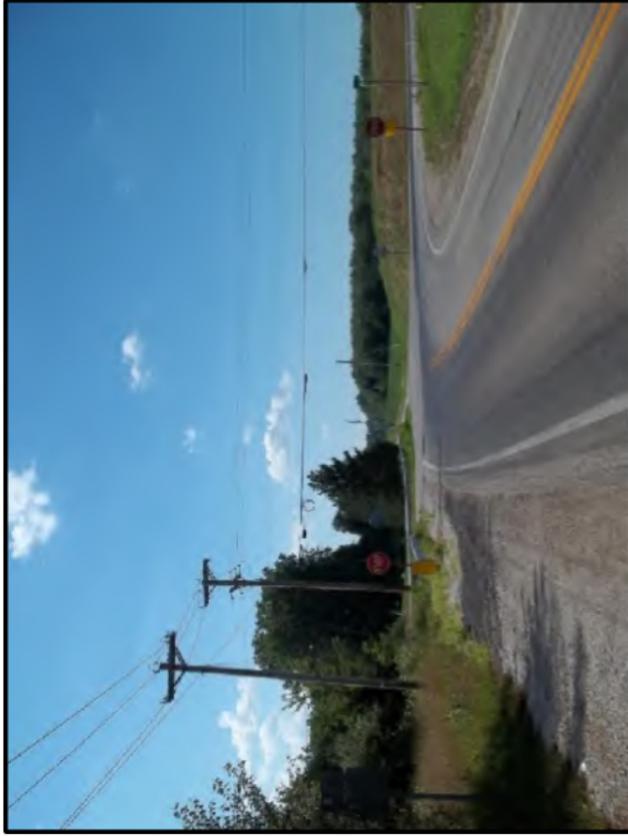


Photo 15. Point H, facing north.

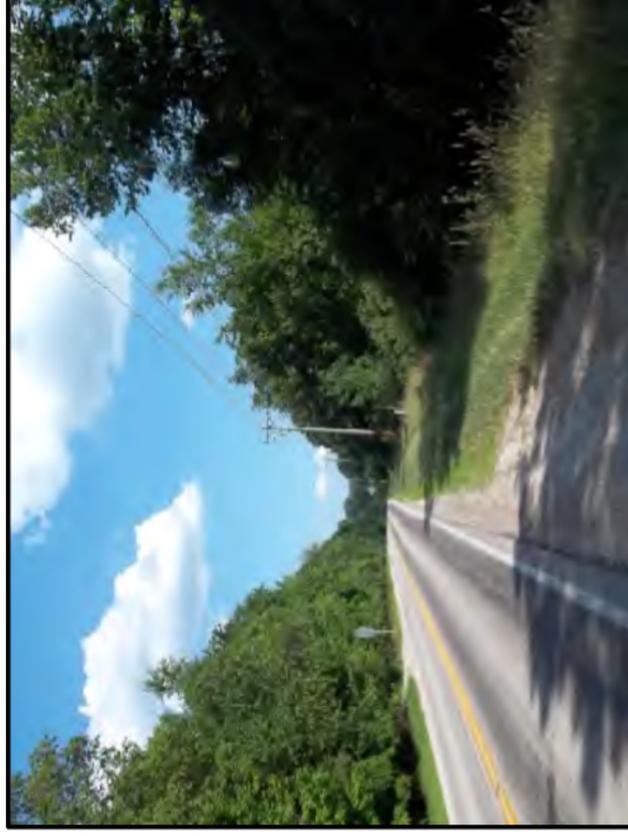


Photo 16. Point H, facing south.



Photo 17. Point I, facing north.



Photo 18. Point I, facing south.



Photo 19. Point J, facing north.



Photo 20. Point J, facing south.



Photo 21. Point K, facing north.



Photo 22. Point K, facing south.

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in

Case No(s). 17-2295-EL-BGN

Summary: Application Exhibit L through N electronically filed by Teresa Orahod on behalf of Dylan F. Borchers