

2021 WILDLIFE MONITORING REPORT

PER PROVINCIAL ENVIRONMENTAL ASSESSMENT NOTICE OF APPROVAL CONDITION 5

REPORT PREPARED FOR:

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EXECUTIVE SUMMARY

The Rainy River Mine (RRM) is owned by New Gold Inc. (New Gold). The mine is located approximately 65 km northwest of Fort Frances and 420 km northwest of Thunder Bay, Ontario. It is located off of Highway 600 within the Township of Chapple and the District of Rainy River. Construction at the site began in 2015 with commercial operations commencing in 2017. At present, operations at RRM are comprised of open pit and underground mining with ore processed at the Rainy River Mill, located on site. Other mine related infrastructure includes an underground mine portal, waste rock stockpiles, rock crushing facilities, ore storage facilities, a processing plant, a Tailings Management Area (TMA), watercourse diversions, site drainage works, a fuel tank farm, explosives manufacturing facilities and explosives storage facilities.

Baseline studies commenced at the site in 2009 and continued through to 2015 leading up to the start of construction. These baseline surveys resulted in a thorough knowledge of the natural environment local study area (NLSA). Development of the site and acceptance through the Federal environmental assessment (EA) process required a number of follow-up monitoring programs as part of the commitments made by New Gold. With respect to birds these monitoring programs were designed to verify the accuracy of the EA predictions. This current report provides the methods, results and interpretation of the 2021 migratory bird community surveys conducted at RRM.

The baseline surveys for the avian community used in the previous iterations of this assessment were from the 2014 and 2015. Data from 2016 represents an assessment of the potential effects of construction activities on the bird community. The 2018 and the current 2021 survey data represent the two iterations of post-construction (operations) of the mine and assess the potential effect of that phase of the mine life on the bird community and how it relates to predictions made as part of the EA. Methods for all surveys conducted since 2014/15 have been comparable and occurred at established control and potentially impacted point count locations.

Detailed statistical analysis of the results herein is limited to the 2018 vs. 2021 surveys due to access to raw data, whereas a qualitative assessment of potential changes in the bird community since the baseline are also provided. Potential changed both within a year (i.e., control vs impact) and between years are presented for four major metrics including the distribution (% occurrence), abundance (birds/station), density (birds/ha), and richness (species/station). For the assessment the control stations were those located at least 5 km from the mine site as noted in previous reports and predicted to be the outside the maximum extent of the potentially impacted area. In addition to the four metrics the composition of the community with respect to its preferred habitat is also discussed.

In 2021 there were a total of 132 bird species recorded during the morning point counts. This is the same total number of species identified during 2018. Similarly, in both 2018 and 2021 there were 54 SCC bird species identified during the point counts. Of the 132 species observed in 2021 the overall number was similar in the control and impact stations with 116 and 112 identified in these station types, respectively.

The patterns of occurrence, abundance and density of SCC species were very similar in 2021 and 2018. That is, the SCC bird species that had the highest occurrence, abundance and density were the same in both surveys. Similarities were also noted for non-SCC species in both 2018 and 2021. This indicates little change in the overall bird community.

Within both the 2018 and 2021 surveys the dominant species, both SCC and non-SCC in control and impact stations were consistent indicating no within year effect of the mine. When combined with the BACI-style analysis the results indicate that there has not been any substantial change in the bird assemblage related to mine activities at site between 2018 and 2021 with respect to the metric of occurrence, abundance or density.

Qualitative assessment of trends since baseline indicated that trends for both SCC and Non-SCC between control and impact sites showed a general decline in 2015 and 2016 consistent with the period of construction, but most metrics describing migratory bird populations utilizing the RRM site show an increase similar to the baseline period or within an equilibrium consistent between both impact and control sites

Generally, the patterns indicate that:

- 1) Species have generally rebounded from any decrease observed during the construction phase (2016);
- 2) Both the 2018 and 2021 results are consistent indicating no temporal change; and,
- 3) Within both 2018 and 2021 surveys metric values and species assemblages in control and impacts stations are generally similar and not indicative of a mine-related effect.

However, there were a few instances in the analysis that potentially indicate slight mine-related effects species richness is statistically different in the impact stations compared to control. This is likely related to a higher number of edge-shrub-successional habitat guild birds at impact stations. Although statistically different the noted differences are around two species which may not be ecologically important.

As outlined in the FMP, the next breeding bird survey will be completed in 2024 and will provide more data to confirm or refute trends.

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1.0 Introduction

1.1 Project Background

The Rainy River Mine (RRM) is owned by New Gold Inc. (New Gold). The mine is located approximately 65 km northwest of Fort Frances and 420 km northwest of Thunder Bay Ontario off Highway 600 within the Township of Chapple and the District of Rainy River (Error! Reference source not found.). Exploration on the Rainy River project began in 1967. Fifty years later (i.e., 2017) production commenced and New Gold now operates a gold mine that is comprised of both open pit and underground workings. At total build out the site will occupy approximately 6,100 ha comprised of:

- An open pit and underground mine portal;
- Waste rock stockpiles;
- Rock crushing facilities;
- Ore storage facilities;
- A Tailings Management Area (TMA);
- Watercourse diversions and site drainage works,
- A fuel tank farm;
- Explosives manufacturing and storage facilities;
- A 230 kilovolt transmission line; and,
- Associated buildings and infrastructure.

Baseline data collection for the current development began in 2009 and continued up until construction began in 2015. The large amount of baseline data resulted in a comprehensive understanding of the flora and fauna both within the RRM site footprint and in the surrounding vicinity. Results of the baseline surveys resulted supported the creation of baseline reports eventually culminating in the assessment of the potential environmental impacts of the RRM project which was outline in the Final EA (AMEC 2014) submitted to the Federal and Provincial governments as well as Indigenous and public stakeholders for review. Acceptance of the EA was issued in January 2015, construction began in the winter of 2015 and the mill came into production in 2017.

As part of the EA process New Gold was required to create and initiate the implementation of a Follow-up Monitoring plan (FMP, Amec Foster Wheeler, 2016b). The FMP, in accordance with the Canadian Environmental Assessment Act (CEAA, 2012) is intended to collect data to verify EA predictions of potential impact on both wildlife and wildlife habitat as it related to the project development and to monitor if rehabilitation efforts associated with those habitats and the terrestrial environment are effective.

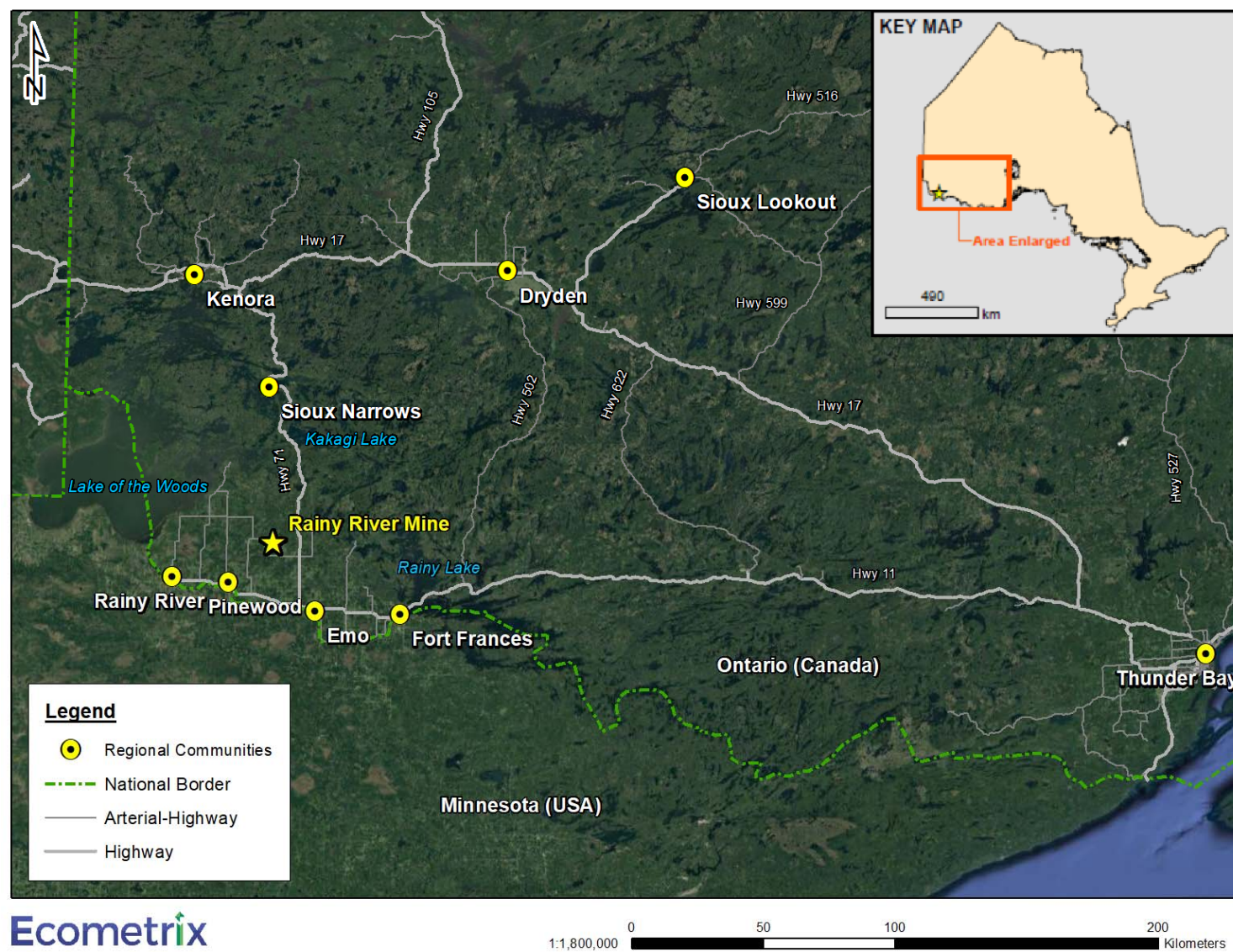


Figure 1-1: Regional Location of the Rainy River Mine

1.2 Objective and Scope

The RRM covers 11 major ecosites and therefore has a diverse composition of local flora and fauna. The EA approval for the mine came with over 1,400 conditions in the form of both mitigation measures during construction and operations and in the form of monitoring commitments to confirm the assumptions reported in the EA documentation and assessment. These monitoring programs and commitments range in complexity from simple wildlife logs to rigorous Species at Risk (SAR) monitoring conducted to meet requirements of a specific permit. The RRM Final EA (AMEC 2014) estimated the development of RRM would affect approximately 2,170 hectares (ha) of terrestrial habitat. To attempt to minimize the affect the final project footprint selected was as compact as possible and greatly avoided SAR territories.

This report, and the results provided herein detail the 2021 Migratory Bird Monitoring undertaken by Northern Bioscience (NBS) and Cerulean Environmental Ltd. (Cerulean) in conjunction with Ecometrix Incorporated (Ecometrix). This survey and the comparison of the result of this survey to previous iterations were conducted to determine the potential effect of the mine on migratory bird community. SAR specific requirements as outlined in New Gold current ESA (Permit # FF-CC-001-14) were provided by New Gold under separate cover.

2.0 Methodology

The 2021 migratory bird surveys were conducted Northern Bioscience and Cerulean in a consistent manner to surveys conducted as part of the baseline (AMEC 2015) and previous FMP studies (Amec 2016b, Wood 2019) conducted to evaluate the potential project-related effects on the avian community. As outlined in the FMP for breeding birds at RRM, methods followed Environment Canada (EC) guidelines for surveys as outlined in Mining Project Baseline Desktop Assessment and Survey Requirements (EC 2014a), Incidental Take of Migratory Birds in Canada (EC 2014b), and General Nesting Periods of Migratory Birds in Canada (EC 2018).

2.1 Avian Community

2.1.1 Morning Point Count Surveys

Morning point count surveys were conducted at 185 long-term monitoring stations (**Figure 2-1**) covering the full breadth of available habitat types. These stations were the same as those visited in the 2018 survey. Conducting counts at the same locations allowed the analyses of any changes both temporally and spatially. To this end statistical comparisons between 2018 and 2021 were conducted on the bird distribution (percent occurrence), abundance, density, and species richness. Raw data was unavailable for the similar surveys conducted in 2014, 2015 and 2016 and therefore a quantitative analysis of the full dataset was not conducted. However, averages of these metrics were available from previous reports and were semi-qualitatively assessed (trend over time) for the purposes of this report.

The morning point count survey follows a control-impact design with 95 total control stations and 90 impact (potentially impacted) stations. A design such as this is intended to standardize the variables aside from those associated with the mine. For example, habitats sampled in both area types are the same. The then results in statistical analyses that should be able to determine if the mine is having an effect as that is presumed to be the difference between the two types of stations.

Point count surveys were conducted following standardized protocols (Fuller and Langslow 1994; OBBA 2001; EC 2014a) to target most breeding bird species known to be in the vicinity of the RRM. Like the 2018 survey the 2021 study included two surveys at each station during the breeding bird season. All point counts were conducted by qualified biologists that were highly experienced in visual and auditory identification of birds. To reduce temporal bias, stations were surveyed in reverse order during the second round of counts. All survey days began before sunrise and extended a maximum of five hours, depending on weather conditions, particularly wind.

Each point count consisted of ten minutes of listening the same as 2018 and represents an increase compared to the five-minute period stated in the OBBA 2001 guideline. All birds either heard or observed were recorded on field sheets with observations grouped into distance intervals of 0 to 50 metres (m), 50 to 100 m, > 100 m, and flyovers. The time within each point count was also noted with intervals of 0-3, 3 to 5 and 5 to 10 minutes. To eliminate duplication

of counts of a single individual, each bird identified (sight or sound) was mapped on field sheets for both distance and direction.

The first round of surveys was conducted between June 7 and 14, 2021 and the second round of surveys was conducted between June 19 and 26, 2021. Incidental observations with particular attention to SAR and species not encountered as part of the breeding bird counts were documented.

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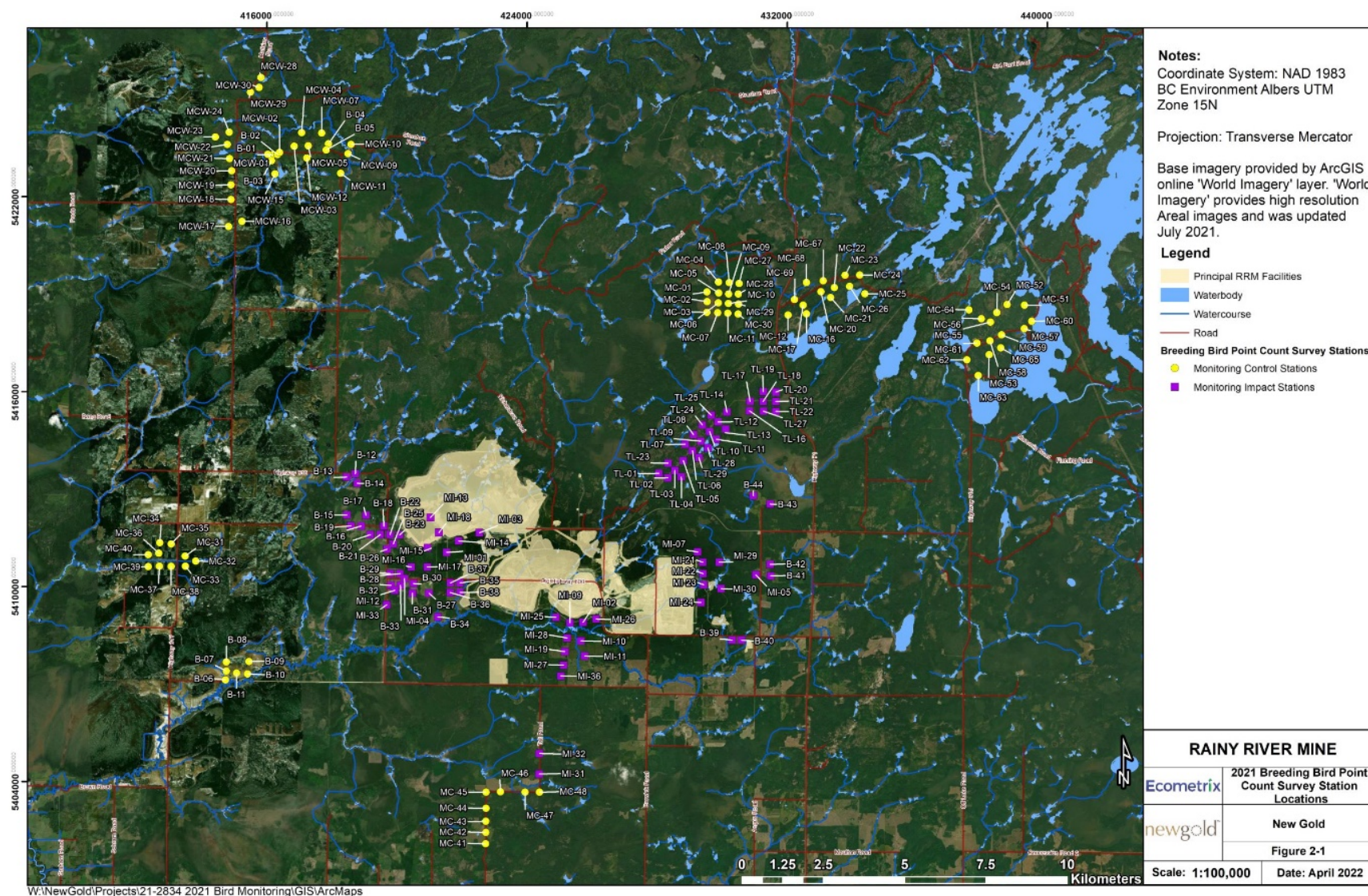


Figure 2-1: 2021 Breeding Bird Point Count Survey Station Locations

2.1.2 Analytical Methods

To determine the potential effect of mine-related activities on the bird community the point count survey locations are divided into control and impact stations. Determination of which stations were considered control and those that were potentially impacted were the same as in previous studies and based on the prediction that the maximum potential impact distance for the mine is 5 km. That is, all control points are 5 km from the mine site (**Figure 2-1**). This assumption was based on the expectation of noise from mine-related activities above and ambient habitat (approximately 40 decibels; dBA). Control and impact stations were established in similar habitat and representative of the ecosite types.

Transmission line impact stations are within the right-of-way whereas the control stations for the transmission line are at least 1 km away (Figure 2-1). The RRM is in a previously disturbed area with established roads and therefore birds within the control are also subject to a certain level of disturbance and anthropogenic influence. However, the positioning of the control and impact stations serve to assess mine-related activities.

The breeding migratory bird FMP at the RRM was designed according to EC guidelines for surveys as provided in EC 2014a. Four metrics were calculated to compare the yearly changes in the bird populations to assess the potential for a mine-related effects through the comparison of control and impact stations. These metrics include:

- **Species Distribution (mean species occurrence, %):** the number of sites occupied by a species divided by the total number of observed sites in a given treatment. The calculation is:

$$Occurrence_{ij} = \left(\text{Number of sites occupied}_{ij} / \text{Number of sites}_j \right) \times 100 ,$$

where i is an individual species and j is a treatment (Control or Impact).

- **Species Abundance (mean species abundance, birds/station):** the sum of the maximum number of individuals of a species across sampling rounds per site divided by the total number of observed sites in a given treatment. The calculation is:

$$\text{Mean abundance}_{ij} = \left(\left(\sum_{r=1}^n \max (\text{Number of individuals}_{r1}, \text{Number of individuals}_{r2}) \right) \right)_j / \text{Number of sites}_j ,$$

where i is an individual species, j is a treatment (Control or Impact), and r indicates the round of sampling.

- **Species density (mean species abundance, birds/ha):** the sum of the maximum number of individuals of a species across sampling rounds within 100 m per site divided by the total number of observed sites in a given treatment, divided by 3.14159 ha.

$$\text{Mean density}_{ij} = \frac{\left(\sum_{i=1}^n \max(\text{Number of individuals}_{r1}, \text{Number of individuals}_{r2}) \right)_j / \text{Number of sites}_j}{3.14159 \text{ ha}}$$

where i is an individual species, j is a treatment (Control or Impact), and r indicates the round of sampling.

- **Species richness (number of species):** the maximum total number of species recorded across all rounds regardless of distance.

The Ontario Landbird Conservation Plan was created by Partners in Flight (PIF), the Ontario Ministry of Natural Resources and Forestry (MNRF), Bird Studies Canada (BSC), and EC. Ontario is divided into three Bird Conservation Regions (BCR) with a plan developed for each. The objective of these plans is to maintain the occurrence, diversity and abundance of birds within a given region within the natural variability by guiding appropriate conservation. The RRM is located within the Boreal Hardwood Transition (North American BCR 12) are (PIF 2008; EC 2014c).

Within each BCR area there are BCR 12 priority species. Within this report, Species of Conservation Concern (SCC) include those BCR 12 priority species and any provincially or federally listed SAR (PIF 2008, EC 2014c, ECCC 2018, MNRF 2018). Analysis of the four metrics are presented for both SC as well as non-SCC. In addition to the four metrics birds were divided into four guilds based on preferred habitat. These categories were the same as those used in previous studies and include:

- Edge - shrub - successional (species typical of shrubby and/or young habitats, including shrub swamps, bogs and fens);
- Forest (species typical of treed habitats, including treed swamp);
- Wetland - open water (species typical of large rivers, lakes and marshes); and
- Grassland - open country (species typical of open habitats).

Instances of observations were excluded are noted, where appropriate.

2.1.3 Statistical Methods

Statistical comparisons were made between Control and Impact for the distribution, abundance, density and richness metrics. These were carried out on two datasets 1) all species that were observed at >25% of the point count stations during either the 2018 or 2021 studies, and 2) all SCC only. For each dataset and metric respectively, Control and Impact were compared using single-factor ANOVA. Whether that relationship between the Control and Impact stations

changed between sampling years (i.e., before-after-control-impact (BACI)-style analysis for 2018 and 2021) was also assessed by introducing an interaction term between Control/Impact and sampling year using multi-factor ANOVA.

Alpha was set to 0.05 for statistical significance and the F values for factors with their associated degrees of freedom and p -values were reported for each test. Assumptions associated with the statistical models we assessed using residual plots and formal tests (e.g., Levene's test) where necessary.

Statistical comparisons between Control and Impact for richness were also carried out on four datasets representing species guilds: Edge - shrub - successional, Forested, Wetland / open water, and Grassland - open country. For each guild, the same comparative statistical analyses as above were conducted.

We used *R* v. 4.1.2 through *RStudio* build 382 with base libraries and additional libraries of *broom* v.0.7.12, *tidyr* v.1.2.0, *patchwork* v.1.1.1, *ggplot2* v. 3.3.5, *dplyr* v. 1.0.8, and *readxl* v. 1.3.1 and their dependencies.

For the guilds analysis Wetland / open-water and Grassland / open-country, the statistical assumptions of normality in residuals within groups were violated. This was because most richness values were either 1 or 2 across treatments and years. However, based on the plots of the raw data across treatments and sampling years, it is still reasonable conclusions are available.

3.0 Results

The 2021 breeding bird survey is a component of the RRM FMP and was designed to evaluate any potential effects from mine-related activities on the bird community in the vicinity of the mine. The 2021 survey represents the second operational phase survey, detailed comparisons are limited to those from the 2018 survey as a results of data availability, however qualitative comparisons to data collected during construction (2016) and baseline conditions 2014/15 were also completed when appropriate.

The RRM currently has a permit under the Endangered Species Act Clause 17(2) (c) (Permit Number FF-C-001-14) for Bobolink and Eastern Whip-Poor-Will as part of their operating conditions. Specific monitoring requirements with respect to survey design and schedule for those species is outlined within that Permit. In 2021, there were no requirements to monitor either species. Other requirements under the ESA permit such as SAR awareness training have been provided by New Gold under separate cover. For the purposes of this report and all analysis the two SAR and any additional SAR species noted during point counts are included but are treated the same as other SCC.

The percent occurrence for species with greater than 25% occurrence at station from the 2021 surveys is presented in **Appendix A** and a multi-year listing of population metrics is presented in **Appendix B**.

3.1 Avian Community

Since 2009 a total of 164 bird species have been recorded in the RRM avian monitoring studies. However, within each individual monitoring year the count varies slightly. In 2021, 132 bird species and 5,901 individual birds were observed as part of the morning point counts. This number of species is consistent with 2018 (i.e., 132 species) and an increase in abundance from 3,715 observations. Both 2018 and 2021 species and abundance numbers are higher than during the 2016 construction phase survey which reported 115 species and 3,890 observations. Summaries of presence/absence of all species for each year observed during point count surveys and incidental observations are provided in **Appendix B**.

3.2 Species of Conservation Concern

There were 54 bird SCC recorded during the point counts in 2021. This is 40.9% of all the bird species identified during point counts at all stations. Of this total 49 SCC were observed in the impacted areas whereas only 46 were represented in counts from the control sites. These numbers appear to indicate that operations are not impacting the presence of SCC in the immediate vicinity of the site. The 54 species are all considered BCR 12 priority species, 7 of which are also designated as SAR: including the American White Pelican, Barn Swallow, Bobolink, Canadian Warbler, Eastern Wood-Pewee, Golden-winged Warbler, and Wood Thrush.

In 2018, there were also 54 bird SCC recorded during point counts resulting in the same percentage of total bird species identified.

3.3 Species Occurrence

In 2021, there were 116 and 112 species identified at impact and control stations, respectively. At impact stations these 116 species were observed at a total of 90 stations while at the control stations the 112 species were observed at 94 stations.

3.3.1 Species of Conservation Concern Occurrence

Six SCC occurred at over half of the impact stations in 2021. These species and the percentage of impact stations where they were identified are as follows:

- Nashville Warbler (recorded at 67.8% of all impact stations);
- White-throated Sparrow (65.6%);
- Common Yellowthroat (62.2%);
- Chestnut-sided Warbler (57.8%);
- Veery (56.7%); and,
- Black-billed Cuckoo (55.5%).

The Nashville warbler, White-throated Sparrow, Chestnut-sided Warbler and the Common Yellowthroat were among the five most widely distributed SCC recorded at impact stations in 2018. The percent occurrence for species with greater than 25% occurrence at station from the 2021 surveys is presented in **Appendix A** and a multi-year listing of population metrics is presented in **Appendix B**.

Nashville Warbler, White-throated Sparrow, Black-billed Cuckoo and Chestnut-sided Warbler were four of the five most widely occurring species across the control stations with the fifth being Veery. The five most widely occurring SCC recorded at control stations in 2021, including the percentage of stations where presence was observed, were:

- Nashville Warbler (86.3%);
- White-throated Sparrow (64.2%);
- Black-billed Cuckoo (54.7%)
- Veery (54.7%);
- Chestnut-sided Warbler (54.7%)

Four of five species (Nashville warbler, White-throated Sparrow, Chestnut-sided Warbler and Veery) were also most widely occurring SCC recorded at control stations in 2018. These results indicate that there is little difference in the occurrence of SCC species between the impact and control stations, and there has been little change in the occurrence of the birds between 2018 and 2021.

3.3.2 Non-Species of Conservation Concern Occurrence

The five most widely occurring non-SCC recorded at impact stations in 2021, including the percentage of stations where presence was observed, were:

- Blue Jay (75.6%)
- American Robin (73.3%)
- Red-eyed Vireo (73.3%)
- Ovenbird (70%)
- American Crow (50.0%)

Ovenbird, Red-eyed Vireo, American Robin, and Blue Jay were also among the five most widely distributed non-SCC recorded at impact stations in 2018. Four of these five species were also noted with the highest occurrence across the control stations in 2021. The five most widely occurring non-SCC recorded at control stations in 2021, including the percentage of stations where presence was observed, were:

- Ovenbird (75.8%)
- Blue Jay (72.6%)
- Red-eyed Vireo (73.6%)
- American Robin (56.8%)
- American Crow (40.0%)

Three of these five species (Ovenbird, Red-eyed Vireo, and American Robin) were also amongst the five most widely occurring non-SCC recorded at control stations in 2018.

Similar to the SCC species, the non-SCC occurrence (i.e., distribution) results indicate little difference between the impact and control stations in 2021. Also, the lists of dominant species with respect to this metric in both 2018 and 2021 despite some small changes in the order among the top five indicate there has been little temporal change between the 2018 and 2021 surveys. Percent occurrence for species with >25% occurrence from the 2021 surveys is presented in **Appendix A** and a multi-year comparison of population metrics is presented in **Appendix B**.

3.3.3 Trends in Spatial Occurrence

Trends in the occurrence of the five most widely distributed SCC species (Nashville Warbler, White-throated Sparrow, Chestnut-sided Warbler, Common Yellowthroat and Veery) are provided in **Figure 3-1**. Generally, the occurrence of each of these species in 2021 was similar or higher than during the baseline period. There is an indication of a reduced distribution of Common Yellowthroat, Chestnut-sided Warbler and Veery in 2016 coinciding with the construction phase but a corresponding increase was noted in all three species in 2018 and the decrease in 2016 was generally more pronounced at the control stations than the impact stations. Therefore, this change is likely not mine-related. White-throated sparrow continues to show similarities in species occurrence at impact sites the 2021 percent occurrence of approximately 60%. Common Yellowthroat, Chestnut-sided Warbler and Veery occurred at a higher percentage of impact sites compared to control sites whereas that Nashville Warbler was more prevalent at control stations. Some of these differences may be attributable to habitat differences as the former two species prefer edge habitat compared to the latter species, which prefers forested habitat.

However, habitat guilds may have some limitations as some species including Veery are also known to utilize forested habitats.

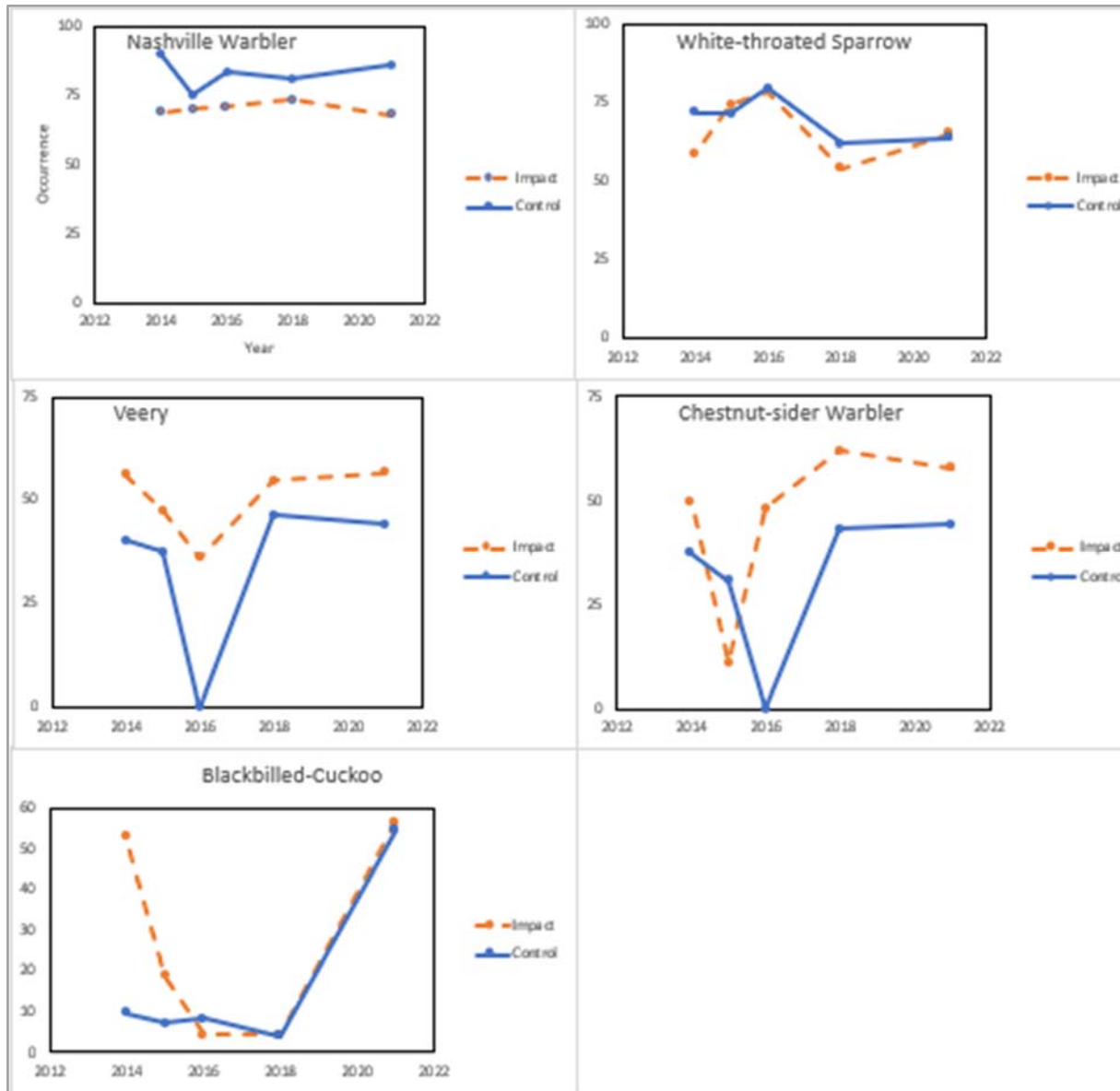


Figure 3-1: Mean Occurrence of SCC birds: Nashville Warbler, White-throated Sparrow, Veery, Chestnut-sided Warbler, and Black-billed Cuckoo between 2014 and 2021

The overall pattern of the five most common non-SSC birds with respect to occurrence was similar to those observed with SCC birds in that, a decrease was reported for some species in 2016 which was subsequently followed by increases in 2018 and 2021. Some of the species assessed include the Red-eyed Vireo, Ovenbird, American Crow, Blue Jay, and the American Robin. The American Crow and Blue Jay have increased in presence across the study area at

both impact and control stations. Subsequent monitoring surveys in the following years will confirm if this trend continues (**Figure 3-2**).

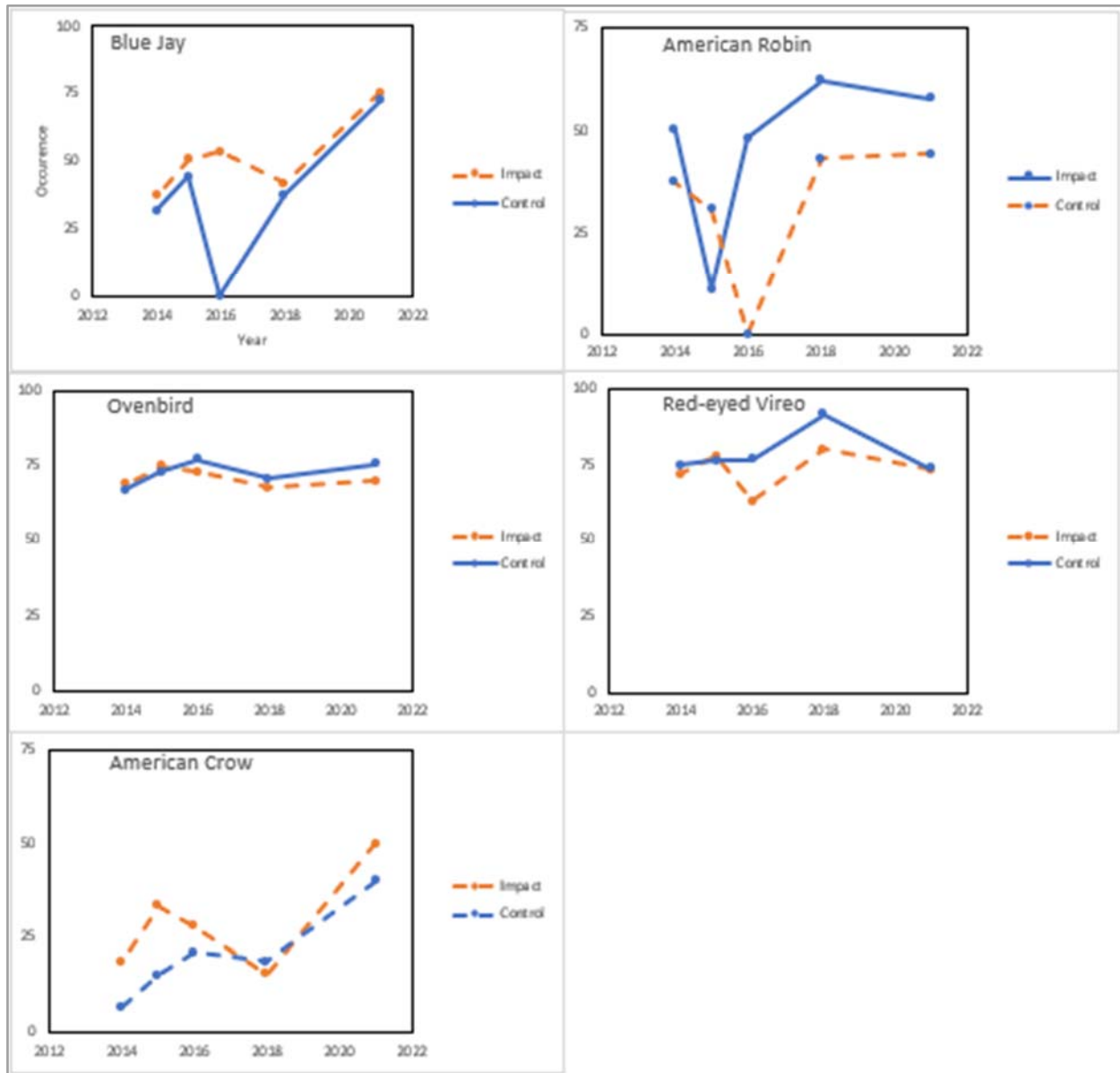


Figure 3-2: Mean occurrence of non-SCC birds: Blue Jay, American Robin, Ovenbird, Red-eyed Vireo, and American Crow

3.3.4 BACI Analysis – Occurrence

As mentioned previously a true before-after-control-impact (BACI) statistical assessment was not completed as part of this assessment owing to the lack of raw data from the baseline surveys. However, a BACI style statistical design was used to assess the difference between control and impact stations between the 2018 and 2021 surveys. The interaction of interest was treatment (control vs. impact) by year (2018 vs. 2021).

Statistical comparisons were conducted on species that were recorded at >25% of the point count station during either the 2021 or 2018 studies. The analysis of species occurrence during 2021 revealed that there was no significant difference in the occurrence of all species meeting the above criteria between control and impact sites in 2021 ($F = 0.663$, $p = 0.419$) or 2018 ($F = 1.42$, $p = 0.238$). The same result was noted when only the SCC were included for both the 2021 ($F = 0.243$, $p = 0.623$) and 2018 ($F = 0.711$, $p = 0.401$) datasets. There was also no significant change in the relationship between control and impact between years (i.e., an interaction) for all species ($F = 0.036$, $p = 0.849$) or SCC only ($F = 0.044$, $p = 0.833$). These results indicate that the occurrence of bird species, and SCC species, were not dependent on point count station type or the year in which surveys were completed.

Figure 3-3 provides the mean occurrence in both the control and impact stations in 2018 and 2021. In this and all following figures, control is represented by the blue boxes and impact stations are represented by the green boxes. In each box and whisker plot the bold black line represents the median value whereas the top of the box is the 75th percentile and the bottom of the box is the 25th percentile. The vertical lines (i.e., whiskers) represent the normal minimum and normal maximum range of the data with individual points representing potential outliers.

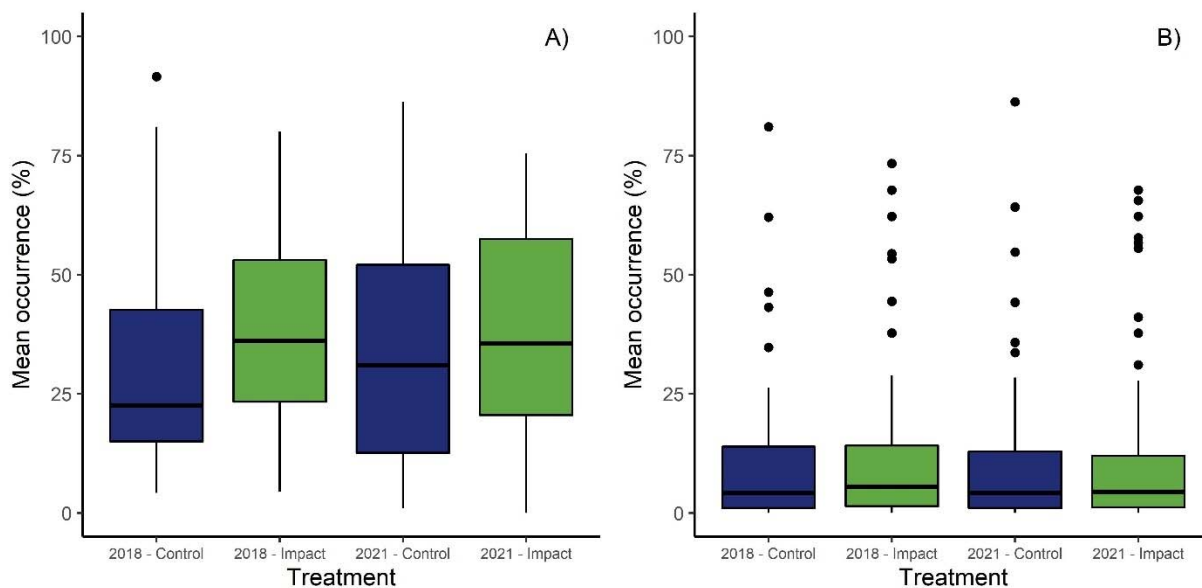


Figure 3-3: Comparison of Distribution (Percent Occurrence) of Birds in 2018 (left) and 2021 (right) across Impact (green) and Control (blue) Point Count Stations for all species (A) and only SCC(B)

3.4 Species Abundance

The most abundant birds were those with the highest abundance coupled with a relatively high (>25%) percent occurrence. A total of 3,268 and 2,633 individual birds were recorded at impact and control stations, respectively, during the 2021 morning points counts. Despite the greater

abundance of individual birds at impact stations, the lists of most abundant species were comparable.

3.4.1 Species of Conservation Concern Abundance

The five SCC that were the most abundant at impact stations during the 2021 surveys were:

- Bobolink (1.38 birds/point counts);
- Nashville Warbler (1.32 birds/point count stations);
- White-throated Sparrow (1.12 birds/point count station);
- American Pelican (1.08 birds/point count station); and,
- Common Yellowthroat (1.04).

The Nashville warbler, Common Yellowthroat, White-throated sparrow and Bobolink were also among the SCC bird with the highest abundance at impact stations in 2018 (**Figure 3-4**).

Abundances for all species from the 2021 surveys are presented in **Appendix B** and a multi-year comparison of population metrics is presented in **Appendix C**.

The five most abundant SCC recorded at control stations in 2021 included:

- Nashville Warbler (1.44 birds/point count station);
- White-throated Sparrow (1.04 birds/point count station);
- Veery (0.83 birds/point count station);
- Chestnut-sided Warbler (0.69 birds/point count station), and,
- Black-billed Cuckoo (0.69 birds/point count station).

3.4.2 Non-Species of Conservation Concern Abundance

Some of the non-SCC with the highest abundance at impact stations in 2021 included:

- American Crow (1.62 birds/point count);
- Blue Jay (1.38 birds/point count);
- Ovenbird (1.22 birds/point count);
- Red-winged Blackbird (1.12birds/point count); and,
- Red eyed Vireo (1.04 birds/point count).

In 2016 and 2018 the Red-eyed Vireo were amongst the most abundant non-SCC recorded at impact stations and in 2018 the Ovenbird was also in the top five most abundant species.

The five most abundant non-SCC recorded at control stations in 2021 were:

- Ovenbird (1.48 birds/point count);
- Red-eyed Vireo (1.31 birds/point count);
- Blue Jay (1.00 birds/point count);
- American Robin (0.78 birds/point count); and,
- American Crow (0.59 birds/point count).

3.4.3 Trends in Abundance

The SSC birds with the highest abundances had decreases in their mean abundance during 2015 and/or 2016. Since then, mean abundances across both impact and control point stations have either slightly increased or stabilized as a lower level than the baseline levels of 2014. Species such as the Chestnut-sided Warbler and the Veery have slightly increased post 2016 to levels exceeding that of the baseline period (**Figure 3-4**).

Non-SCC birds showed similar patterns to those noted by SCC bird species. Abundance increased since 2015/2016 for the most abundant species: Blue Jay, American Robin, Red-eyed Vireo. The Ovenbird however has maintained an abundance of 3 to 3.5 birds/point count since 2014. In 2021 abundances of the American Crow (mean abundance = 1.60 birds/point count) were higher than usual at impacted sights (**Figure 3-5**).

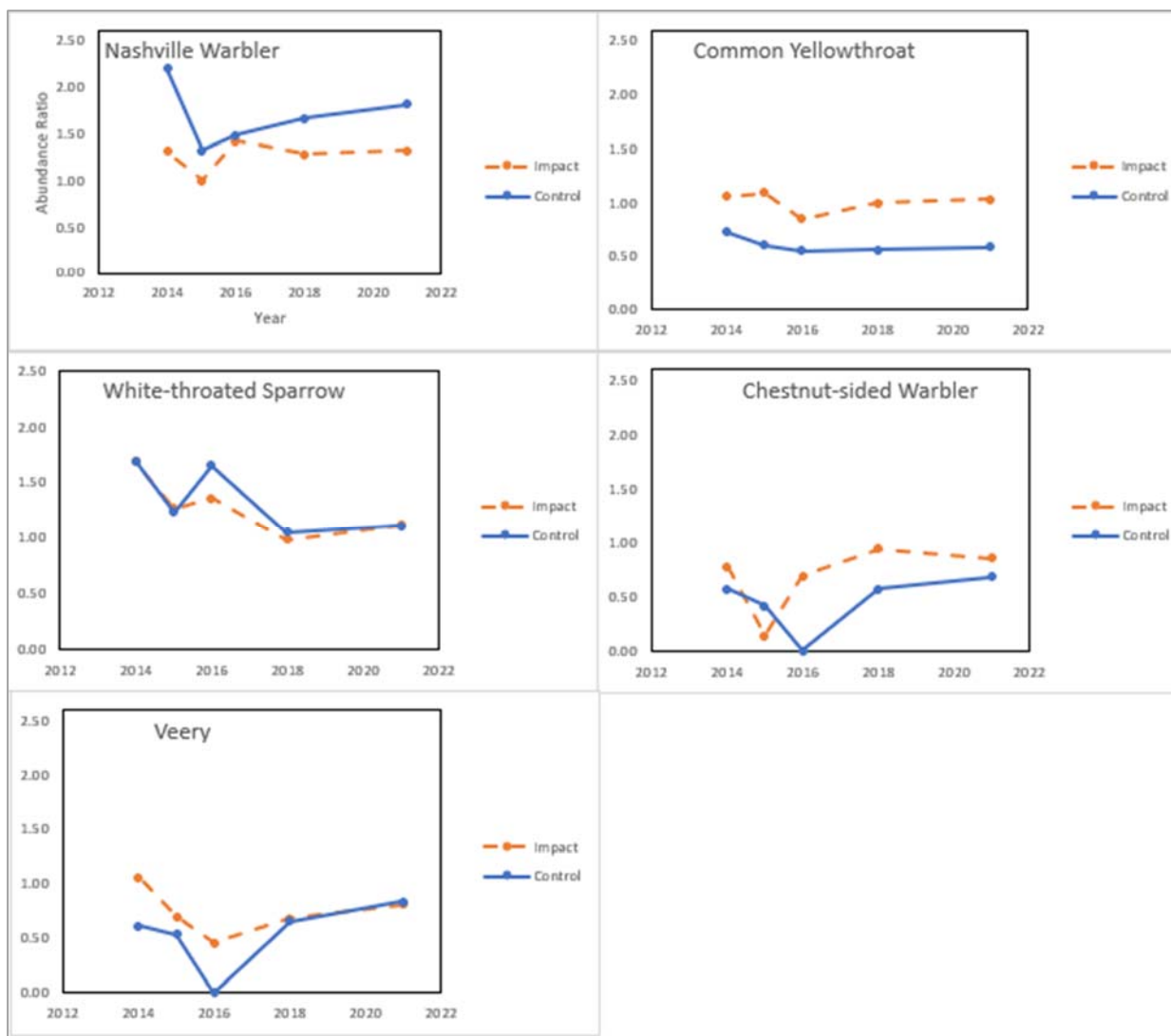


Figure 3-4: Mean Abundance of Five most Abundant SCC birds (Nashville Warbler, Common Yellowthroat, White-throated Sparrow, Chestnut-sided Warbler, and Veery)

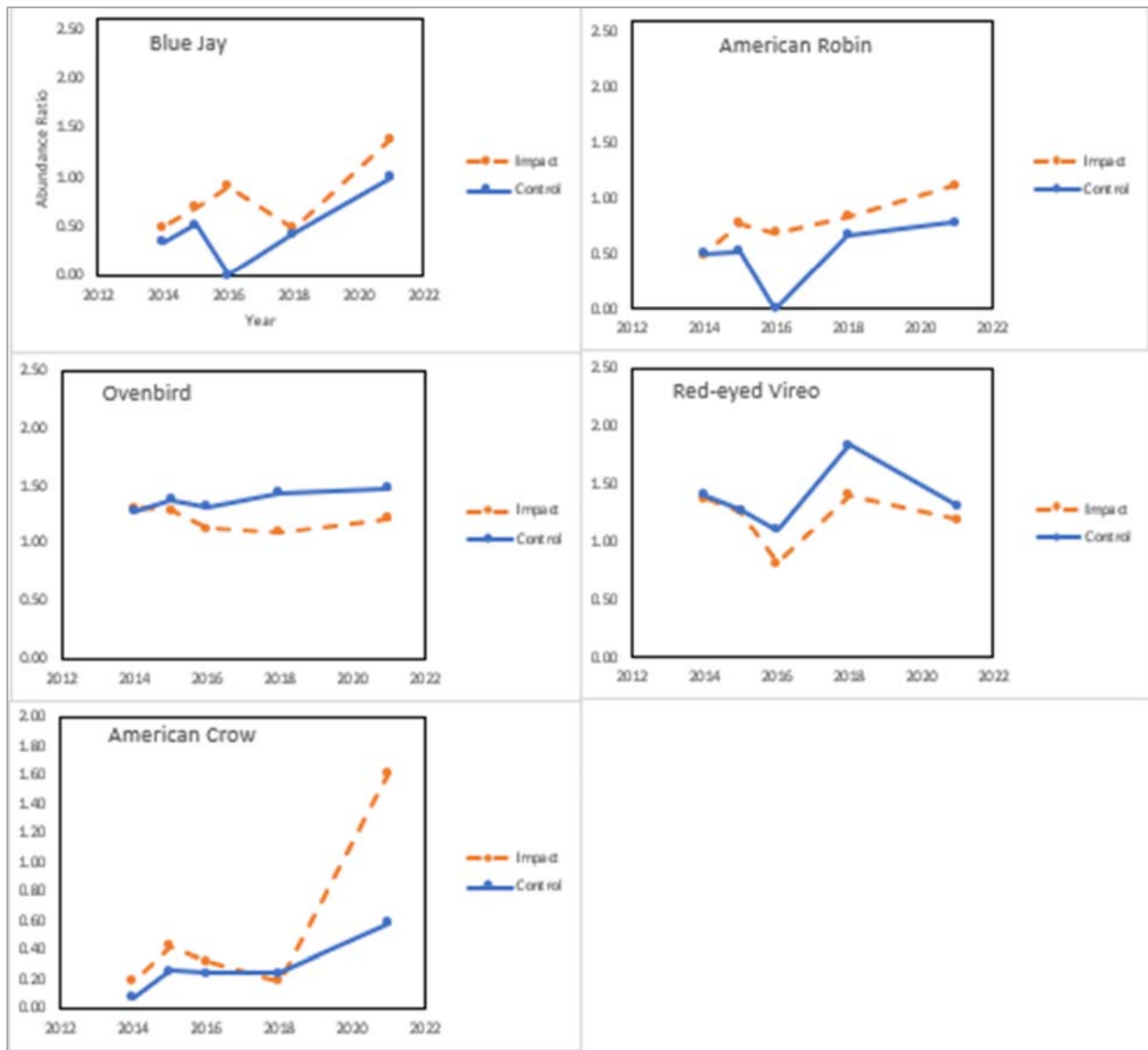


Figure 3-5: Mean Abundance of 5 non-SCC birds: Blue Jay, American Crow, Ovenbird, Red-eyed Vireo, and American Crow

3.4.4 BACI Analysis – Abundance

Statistical comparisons were conducted on species that were observed at >25% of the point count station during either the 2018 or 2021 studies. The analysis of species abundance during 2021 revealed that there was no significant difference between the abundance at control and impact sites during 2021 ($F = 1.84$, $p = 0.180$). The same pattern was evident when the 2018 data was analyzed ($F = 0.790$, $p = 0.378$). With respect to SCC birds the statistical comparisons also resulted in no significant difference in either the 2021 ($F = 0.906$, $p = 0.343$) or 2018 ($F = 0.328$, $p = 0.568$) results when comparing control to impact stations (**Figure 3-6**).

The analysis of the effect of year and station type (impact vs. control) on mean abundance revealed that there was no significant difference between the abundance of SCC between the last two surveys (2018 and 2021). There was no change in the relationship between control and impact between years (i.e., an interaction) for species that occurred in at least 25% of sites at least once ($F = 0.186$, $p = 0.667$, or SCC only ($F = 0.106$, $p = 0.745$) (**Figure 3-6**)

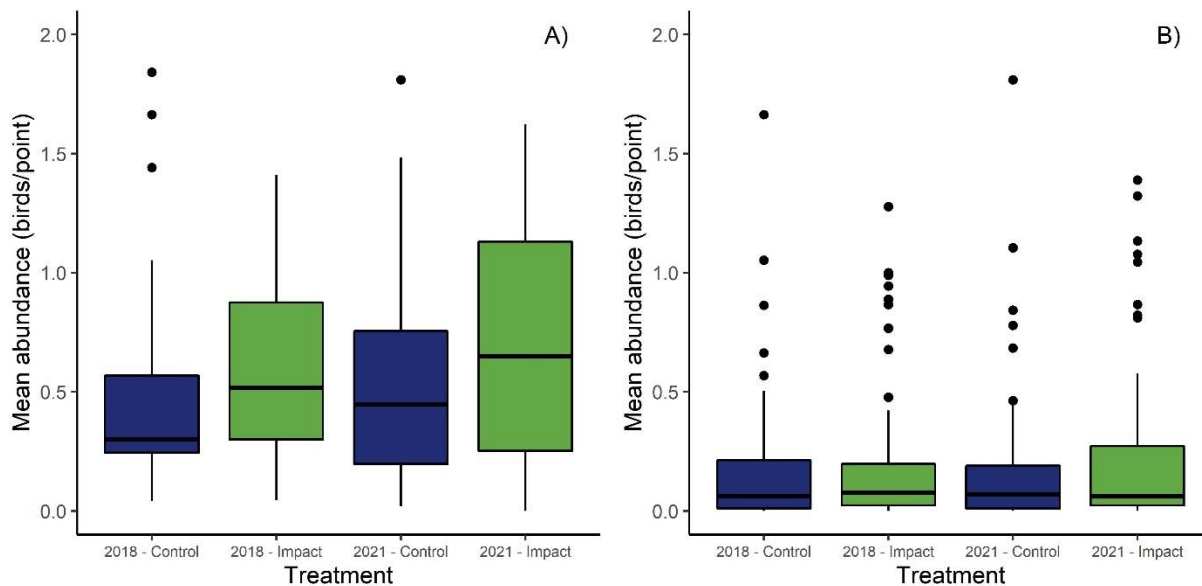


Figure 3-6: Comparison of Abundance of Birds in 2018 (left) and 2021 (right) across Impact (green) and Control (blue) Point Count Stations for species that occurred in at least 25% of sites at least once (A) and only SCC (B)

3.5 Species Density

Species identified in flocks or large groups were excluded from the lists of dominant species and analyses as they represent outliers in the statistical analyses. Densities for species that occurred in at least 25% of sites at least once from the 2021 surveys are presented in **Appendix B** and a multi-year comparison of population metrics is presented in **Appendix C**.

3.5.1 Species of Conservation Concern Density

The five SCC recorded with the highest densities across all impact stations in 2021 were:

- Bobolink (0.407 birds/ha);
- Nashville Warbler (0.382 birds/ha);
- Common Yellowthroat (0.290 birds/ha);
- White-throated Sparrow (0.275 birds/ha); and,
- Chestnut-sided Warbler (0.229 birds/ha).

These were the same five species with the highest densities in 2018 impact counts although their ranking within the top five varied slightly.

Four of these five species were also amongst the five SCC with the highest densities across the control stations. The five SCC with the highest densities at control stations in 2021 were:

- Nashville Warbler (average 0.546 birds/ha across all control stations);
- White-throated Sparrow (0.308 birds/ha);
- Veery (0.235 birds/ha);
- Chestnut-sided Warbler (0.204 birds/ha); and,
- Common Yellowthroat (0.134 birds/ha).

As with the impact stations all five of the species with the highest density in 2021 were the same as in 2018 at the control points.

3.5.2 Non-Species of Conservation Concern Density

In 2021, the five non-SCC with the highest densities at impact stations were:

- Ovenbird (0.422 birds/ha);
- Red-eyed Vireo (0.392 birds/ha);
- Blue Jay (0.248 birds/ha);
- American Robin (0.204 birds/ha); and,
- Hermit Thrush (0.167 birds/ha).

Three of these species (Red-eyed Vireo, American Robin, and Ovenbird) also had the highest non-SCC densities recorded at impact stations in 2018.

Three of these species listed above were also amongst the five non-SCC with the highest densities across the control stations. The five non-SCC with the highest densities recorded at control stations in 2021 were:

- Ovenbird (0.422 birds/ha);
- Red-eyed Vireo (0.392 birds/ha);
- Blue Jay (0.248 birds/ha);
- American Robin (0.204 birds/ha); and,
- Hermit Thrush (0.167 birds/ha).

Three of five of these species also had the highest non-SCC densities recorded at control stations in 2018.

3.5.3 Trends in Density

SCC birds have recorded densities that are similar to patterns seen in the mean occurrence and mean abundance of species. Generally, lower densities have been noted in 2015 and 2016 followed by increases in subsequent survey years. Some of the species with the highest densities

are noted in **Figure 3-7**. The Nashville Warbler has shown a steady increase in density among control point count stations since 2014 while sharp increases were noted for Veery and Black-billed Cuckoo since 2016 and 2018 respectively.

Non-SCC birds have shown yearly changes in density that are similar at both the control and impact point count stations with little indication of a mine related effect (**Figure 3-8**).

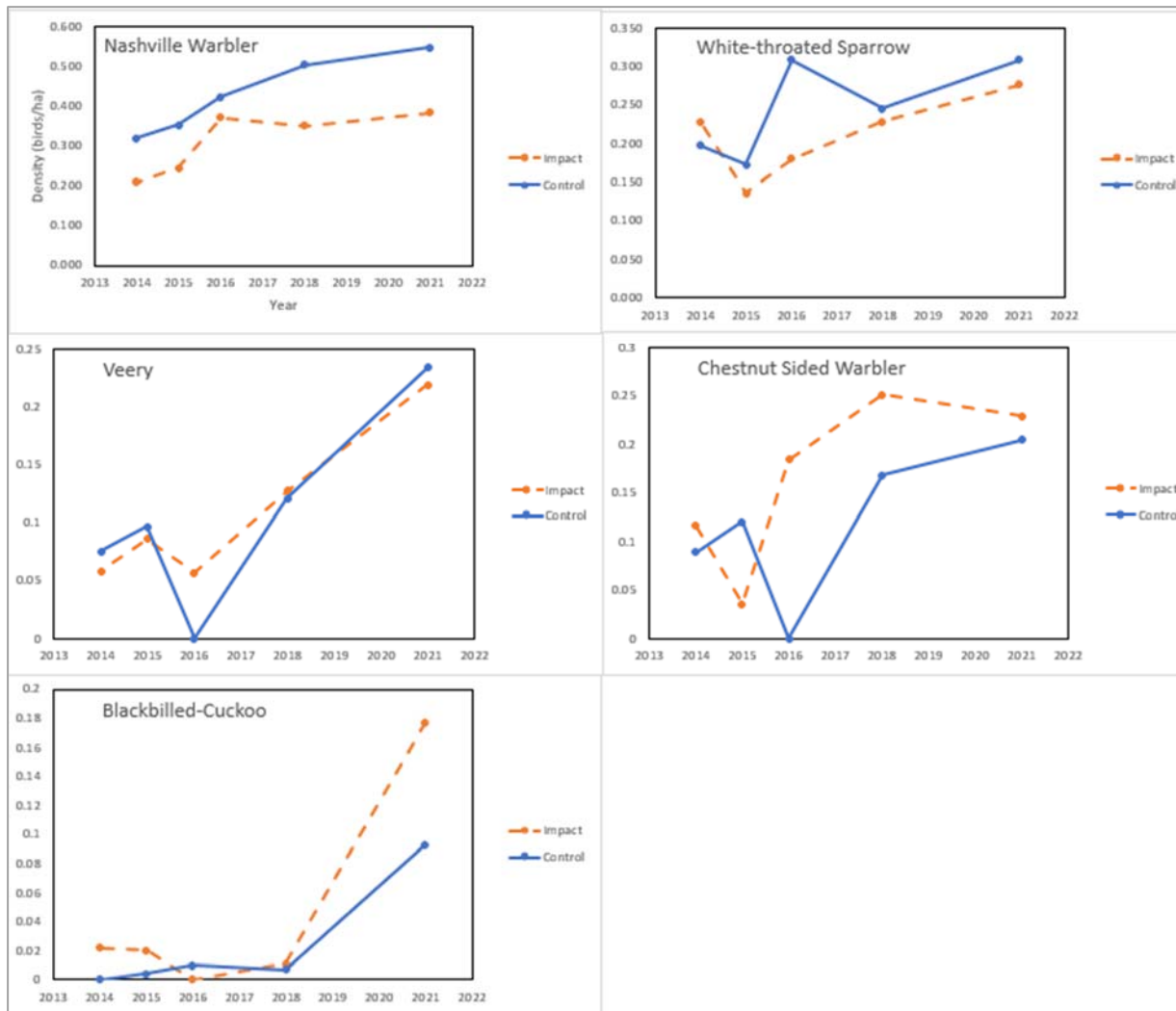


Figure 3-7: Mean density of five SCC birds: Nashville Warbler, White-throated Sparrow, Veery, Chestnut-sided Warbler and Black-billed Cuckoo from 2014 to 2021

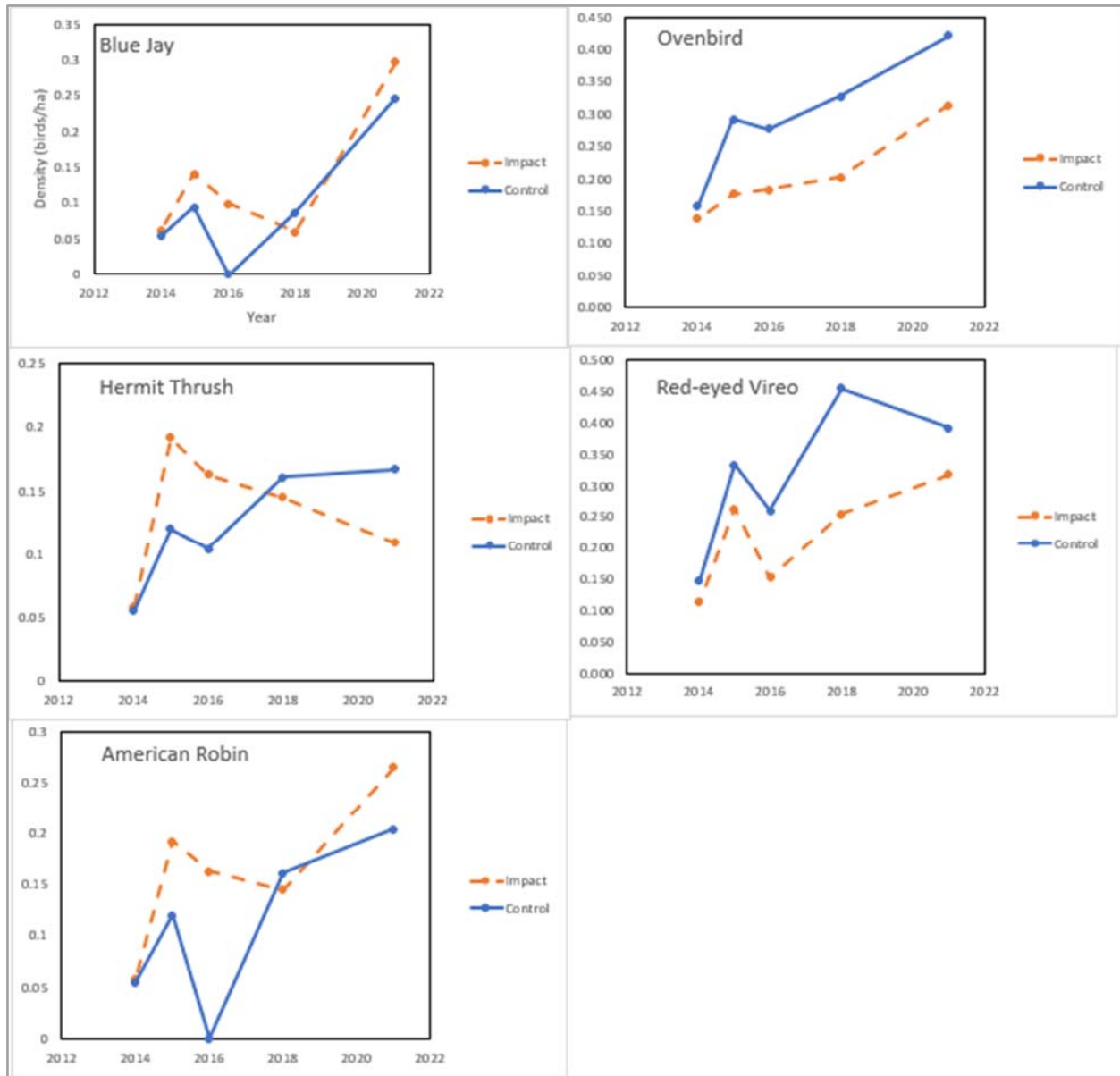


Figure 3-8: Mean density of five non-SCC birds: Blue Jay, Ovenbird, Hermit Thrush, Red-eyed Vireo, and American Robin, from 2014 to 2021

3.5.4 BACI Analysis – Density

Analysis of species density revealed that there was no significant difference in the density of species that occurred in at least 25% of sites at least once between control and impact sites in 2021 ($F = 0.643$, $p = 0.426$) or in 2018 ($F = 0.429$, $p = 0.837$). A similar result was reported for the density of SCC birds among impact and control sites in both 2021 ($F = 0.372$, $p = 0.543$) and 2018 ($F = 0.099$, $p = 0.754$). The number of birds observed standardized for area (i.e., density) at the point count stations were the same in both control and impact stations in both 2018 and 2021.

The BACI style analysis on the density of birds in 2021 and 2018 surveys indicated that there was no significant difference between the density of bird, including SCC over the last two surveys (2018 and 2021). There were no significant differences between control and impact for 2021 between years (i.e., an interaction) for species that occurred in at least 25% of sites at least once ($F = 0.229$, $p = 0.633$) or SCC only ($F = 0.0698$, $p = 0.792$) (**Figure 3-9**). These results indicate a similar relationship between control and impact in both years.

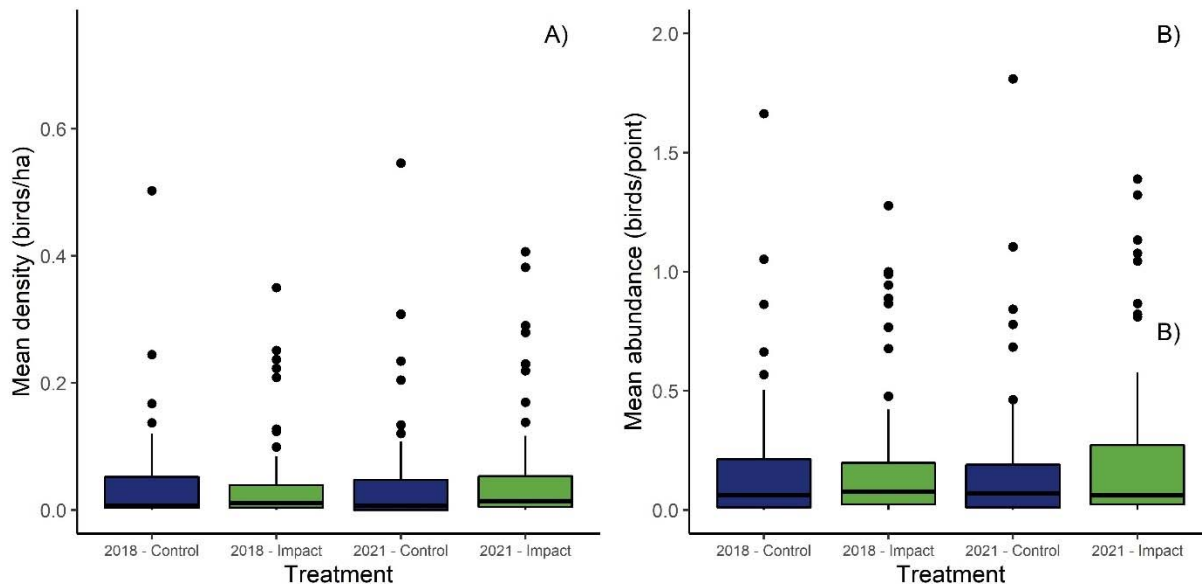


Figure 3-9: Comparison of Mean Density of Birds in 2018 (left) and 2021 (right) across Impact (green) and Control (blue) Point Count Stations for species that occurred in at least 25% of sites at least once (A) and only SCC (B)

3.6 Species Richness

In 2021 there was a total of 112 and 116 bird species observed in the control and impact stations, respectively. There were 46 and 49 SCC bird species in the point counts at the control and impact stations, respectively, in 2021. These numbers are similar to those observed in 2018 study that reported 132 species in total (113 in impact stations and 120 in the control stations). Of the total species identified in 2018, 54 were SCC; with 49 SCC species were observed in control stations and 46 SCC at impact stations during 2018.

3.6.1 BACI Analysis – Species Richness

The analysis of species richness revealed that in 2021 there was a significant difference in the occurrence of species that occurred in at least 25% of sites at least once between control and impact sites ($F = 12.0$, $p = <0.001$). In 2018 there was also a similar significant difference in the species richness ($F = 15.4$, $p = <0.001$) noted. In 2018, there were on average 2 more species per impact site than for control sites. In 2021, This trend continued with the ratio being 1.5:1

(impact:control). For SCC specifically, there were on average 1.3 more species per impact site in 2018 and 0.79 more species per impact site in 2021 compared to control sites.

In both instances the mean richness at impacts stations was higher than the mean species richness at control stations. It should be noted that despite the significant result in both years this difference is not necessarily ecologically important as the absolute difference in the mean number of species is less than or equal to two species in both instances. Meaning, on average, two more species were observed in impact sites compared to control sites.

Additional analysis assessing the relationship between control and impact sites between both years (2018 and 2021) confirmed the difference between control and impact sites ($F = 27.4$, $p < 0.001$). There was no statistical significance for an interaction between year and site type ($F = 0.536$, $p = 0.811.654$). This result means that the number of species identified at each point count was different in the control sites when compared to impact sites.

Analysis of species richness for SCC species revealed that there was a significant difference in the species richness for SCC species between control and impact sites in 2021 ($F = 3.85$, $p = 0.051$) and in 2018 ($F = 11.7$, $p < 0.001$). A similar result was reported for the species richness SCC birds among impact and control sites when both 2021 and 2018 data was analyzed together ($F = 14.6$, $p < 0.001$).

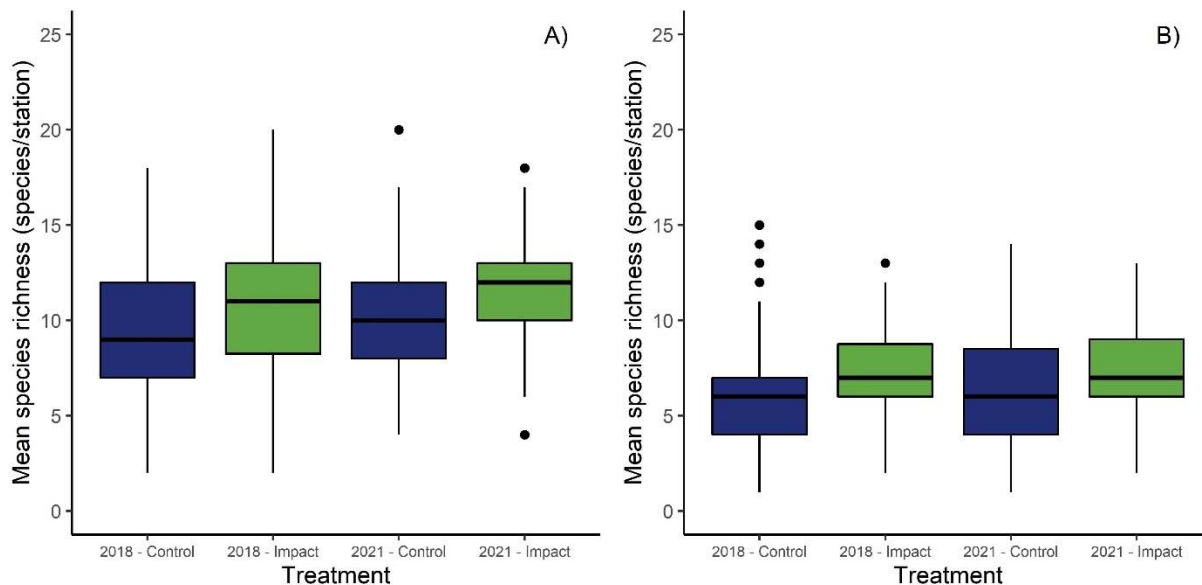


Figure 3-10: Comparison of Mean Species Richness of Birds in 2018 (left) and 2021 (right) across Impact (green) and Control (blue) Point Count Stations for species that occurred in at least 25% of sites at least once

3.7 Effects on Guilds

Statistical analyses were conducted to evaluate if there were mine-related effects on different bird guilds as defined but by their habitat preferences. Each bird species identified during point counts was part of one of the following guilds:

- Edge-Shrub-Successional;
- Wetland-Open Water;
- Forested; and,
- Grassland-Open Country.

Similar to the other metrics assessed, analysis of guilds was applied to identify potential effects on to SCC and non-SCC birds within different guild categories as described by their guild classifications. Box and whisker plots for the results of the mean species richness within the four guilds are provided in **Figure 3-11** to **Figure 3-14**.

In 2018, there was a significance difference in the number bird species that utilized edge-shrub-successional habitats within impact sites compared to the control sites ($F = 20.3$, $p < 0.001$). This result was the same in 2021 ($F = 7.67$, $p = 0.006$). BACI design analysis of both 2018 and 2021 data combined indicated a significant difference between impact and control stations ($F = 0.002$, $p < 0.001$). A significant interaction between site type and year was found, indicating that the change between years was not consistent between sites for edge-shrub successional habitat species.

Wetland-open water guild bird richness comparisons between control and impact sites did not results in a significant difference, unlike the edge-shrub-successional guild species. The type of station (impact or control) was not a factor in determining the presence of species that utilized wetland-open water areas in 2018 ($F = 0.477$, $p = 0.492$) nor in 2021 ($F = 2.09$, $p = 0.152$). When both 2018 and 2021 were compared together, a significant difference in the effect for year ($F = 11.7$, $p < 0.001$) was evident but not for the interaction between station type and year ($F = 0.697$, $p = 0.405$). This means that the differences in the presence of wetland-open water guilds was primarily year dependant and not by the station type.

Significant differences were noted when evaluating the effects on the presence of birds within the guild that use forested areas. A significant difference in the guild presence between control and impact was found in 2021 ($F = 5.43$, $p = 0.021$) but not in for 2018 ($F = 1.92$, $p = 0.168$). When both years were compared the result indicated that any difference was dependent on if the point count station was an impact or control site. ($F = 6.85$, $p = 0.009$).

In contrast, for the grassland-open country guild, no significant differences were identified between impact and control sites in 2021 ($F = 2.18$, $p = 0.145$) or in 2018 ($F = 0.036$, $p = 0.851$). However, the interaction was significant between station type and year in when undertaking the BACI analysis indicating the changes at sites between years was not consistent.

Despite the statistical assumptions of normality in residuals within groups being violated (for the guilds Wetland / open-water and Grassland / open-country), the plots of the raw data across treatments and sampling years, it is still reasonable to conclude no strong differences in richness between Control or Impact within years and no difference in this relationship between years for those guilds.

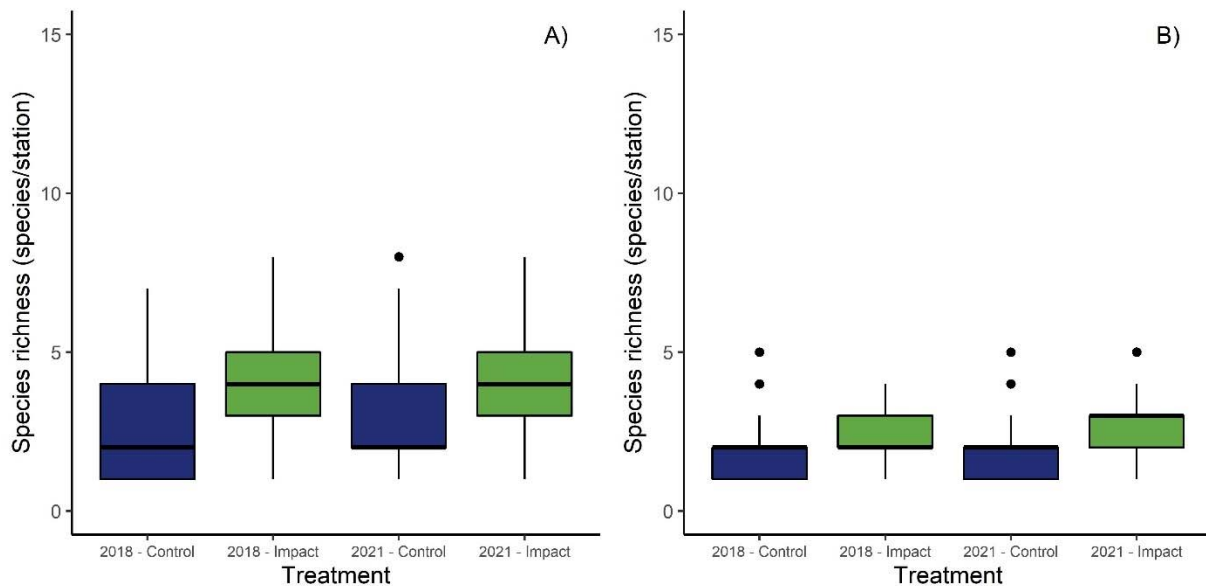


Figure 3-11: Comparison of Mean Species Richness of Edge-shrub-successional habitats birds in 2018 (left) and 2021 (right) across Impact (green) and Control (blue) Point Count Stations for species that occurred in at least 25% of sites at least once (a) and only SCC (b)

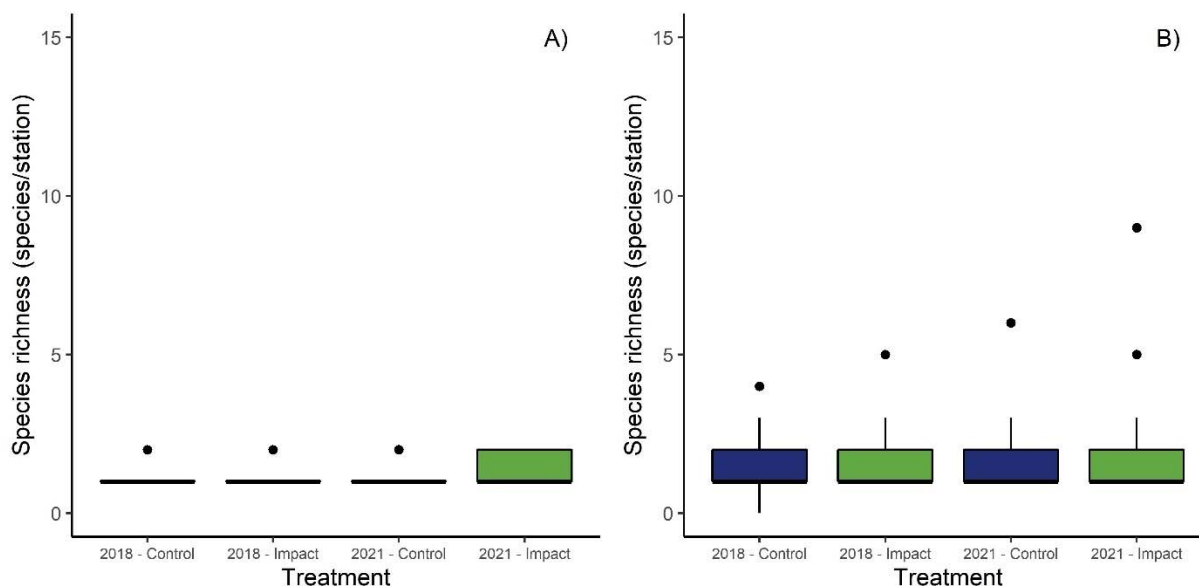


Figure 3-12: Comparison of Mean Species Richness of guild utilizing wetland-open water areas in 2018 (left) and 2021 (right) across Impact (green) and Control (blue) Point Count Stations for species that occurred in at least 25% of sites at least once (a) and only SCC (b)

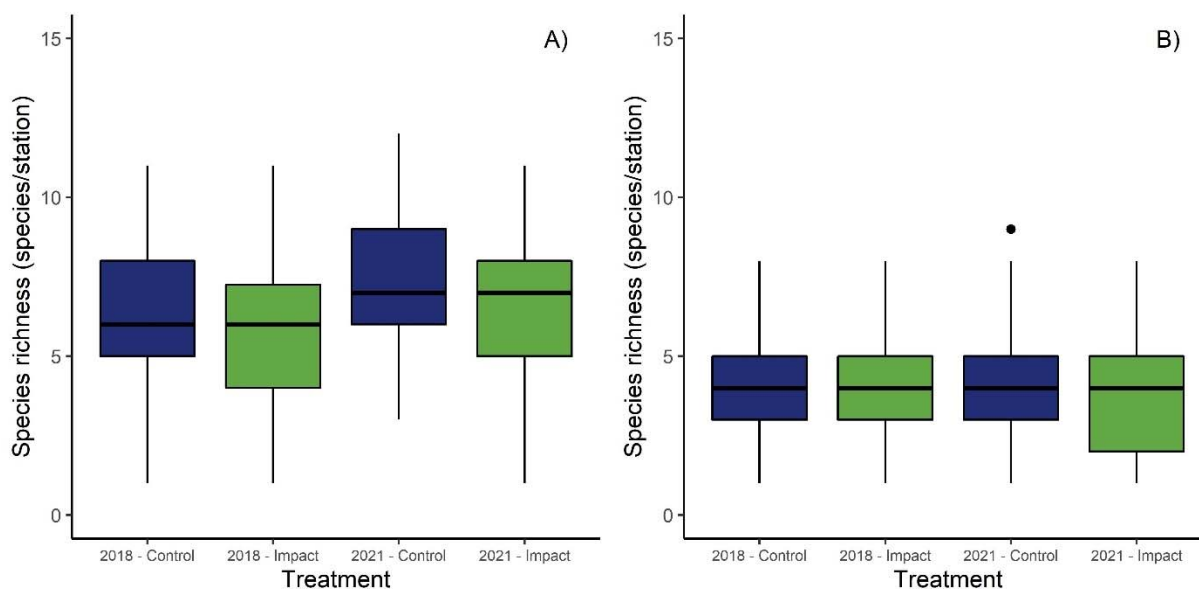


Figure 3-13: Comparison of Mean Species Richness of guild utilizing forested areas in 2018 (left) and 2021 (right) across Impact (green) and Control (blue) Point Count Stations for species that occurred in at least 25% of sites at least once (a) and only SCC (b)

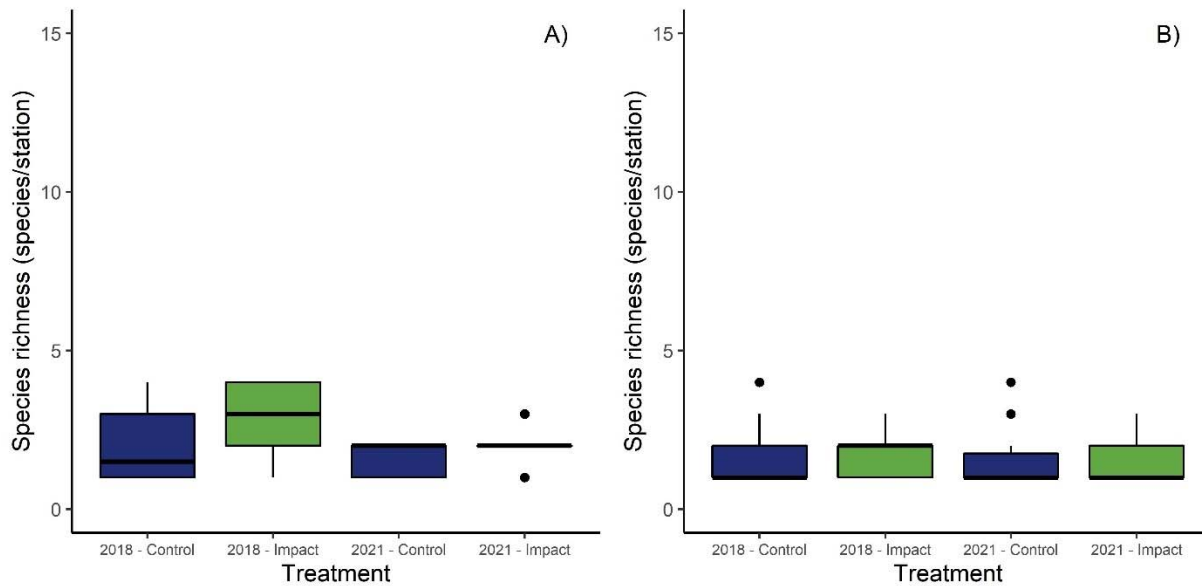


Figure 3-14: Comparison of Mean Species Richness of guild utilizing grassland-open country areas in 2018 (left) and 2021 (right) across Impact (green) and Control (blue) Point Count Stations for species that occurred in at least 25% of sites at least once (a) and only SCC (b)

3.7.1 Guild Analysis – Species of Conservation Concern

The analysis of the potential mine-related effects on the four different guilds when only SCC birds were used in the analyses yielded comparable results to those analyses conducted on species that occurred in at least 25% of sites at least once. In 2018 and 2021 there were significance differences, ($F = 7.67$, $p = 0.006$) and ($F = 16.2$, $p < 0.001$) respectively for the presence of SCC birds that utilized edge-shrub-successional habitats within impact sites compared to control sites. BACI comparison indicated that significant differences in edge-shrub successional habitat SCC bird richness was the results of the type of station ($F = 22.7$, $p < 0.001$). In both 2018 and 2021, this was characterized by approximately 1.2 more species per impact site compared to the control sites for species greater than 25% occurrence. When considering SCC only, there were approximately 0.45 more species per impacted site in 2018 and 0.70 more in 2021 compared to control sites. As such, the average difference for remained below two species.

Similarly, the edge successional guild the comparisons of SCC birds in the forested guild, identified significant differences between impact and control sites in 2021 ($F = 4.04$, $p = 0.0459$) but not in 2018 ($F = 0.146$, $p = 0.703$). When both years were compared together, to significant effects of station type (impact vs. control) across years ($F = 1.22$, $p = 0.271$). This difference was characterized by an average of 0.72 fewer species per site at impact sites in 2021 (for the group having greater than 25% occurrence). There were on average 0.58 fewer species per impact site compared to control sites for SCC ($p < 0.05$).

For the wetland-open water guild, there were no significant differences between impact or control sites in 2021 ($F = 0.209$, $p=0.152$) or in 2018 ($F = 0.477$, $p=0.492$) when using only the SCC bird species. Additionally, no significant effects were identified when comparisons were made across both 2018 and 2021 ($F = 0.003$, $p= 0.954$) indicating a similar pattern between site types in both years.

No significant difference was detected when evaluating the potential effects on the presence of SSC birds within the guild that use grassland-open country areas in 2021 ($F = 0.009$, $p= 0.925$) but nor in 2018 ($F = 0.036$, $p= 0.851$). BACI style analyses comparing data across both 2018 and 2021 results in no significance ($F = 0.0376$, $p= 0.847$).

3.8 Incidental Observations

The 2021 incidental records of bird species observed, during transit between point counts, prior to the start of the surveys or after the count was completed generally include species already identified in several the point count records. These species included Bald Eagle, Baltimore Oriole, Barn Swallow, Cliff Swallow, Bobolink, Broad-winged Hawk, Canada Warbler, Eastern Wood-Pewee, Great Crested Flycatcher, Scarlet Tanager, and Wilson's Snipe. Two species seen outside the timing of the specific counts were Solitary Sandpiper and Green-winged Teal.

The 2021 dataset did not include reference to additional incidental observation of other taxa, commonly specified in previous reports.

4.0 Conclusions

In 2021 there were a total of 132 bird species recorded during the morning point counts. This is the same total number of species identified during 2018. Similarly, in both 2018 and 2021 there were 54 SCC bird species identified during the point counts. Of the 132 species observed in 2021 the overall number was similar in the control and impact stations with 116 and 112 identified in these station types, respectively.

The patterns of occurrence, abundance and density of SCC species were very similar in 2021 and 2018. That is, the SCC bird species that had the highest occurrence, abundance and density were the same in both surveys. Similarities were also noted for non-SCC species in both 2018 and 2021. This indicates little change in the overall bird community.

Within both the 2018 and 2021 surveys the dominant species, both SCC and non-SCC in control and impact stations were consistent indicating no within year effect of the mine. When combined with the BACI-style analysis the results indicate that there has not been any substantial change in the bird assemblage related to mine activities at site between 2018 and 2021 with respect to the metric of occurrence, abundance or density.

Qualitative assessment of trends since baseline indicated that trends for both SCC and Non-SCC between control and impact sites showed a general decline in 2015 and 2016 consistent with the period of construction, but most metrics describing migratory bird populations utilizing the RRM site show an increase similar to the baseline period or within an equilibrium consistent between both impact and control sites

Generally, the patterns indicate that:

- 4) Species have generally rebounded from any decrease observed during the construction phase (2016);
- 5) Both the 2018 and 2021 results are consistent indicating no temporal change; and,
- 6) Within both 2018 and 2021 surveys metric values and species assemblages in control and impacts stations are generally similar and not indicative of a mine-related effect.

However, there were a few instances in the analysis that potentially indicate slight mine-related effects species richness is statistically different in the impact stations compared to control. This is likely related to a higher number of edge-shrub-successional habitat guild birds at impact stations. Although statistically different the noted differences are around two species which may not be ecologically important.

As outlined in the FMP, the next breeding bird survey will be completed in 2024 and will provide more data to confirm or refute trends.

5.0 References

AMEC. 2011. Rainy River Gold Project, 2011 Wildlife Baseline Study. AMEC. 2012. Rainy River Gold Project, 2012 Terrestrial Baseline Study.

AMEC. 2014. Rainy River Project, Township of Chapple, Final Environmental Assessment Report (Environmental Impact Statement), Version 2.

AMEC. 2015. 2015 Rainy River Project Wildlife Monitoring Report.

Amec Foster Wheeler. 2016a. Rainy River Project 2016 Wildlife Monitoring Report.

Amec Foster Wheeler. 2016b. Rainy River Project Follow-Up Monitoring Plan for Terrestrial Systems and Habitat Restoration (Including Monitoring for Species at Risk).

Canadian Environmental Assessment Act. 2021. Accessed online <https://laws-lois.justice.gc.ca/eng/acts/C-15.21/index.html>

Environment Canada (EC). 2018. General Nesting Periods of Migratory Birds. Accessed online: <https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/general-nesting-periods.html>

Environment Canada (EC). 2014a. Mining Project Baseline Desktop Assessment and Survey Requirements. Ottawa, Canada.

Environment Canada (EC). 2014b. Incidental Take of Migratory Birds in Canada. Ottawa, Canada.

Environment Canada (EC). 2014c. Bird Conservation Strategy for Bird Conservation Region 12 in Ontario and Manitoba: Boreal Hardwood Transition. Canadian Wildlife Service, Environment Canada. Ottawa, ON. 152 pp + appendices.

Environment and Climate Change Canada (ECCC). 2018. Species at Risk Public Registry database. Accessed online: http://www.sararegistry.gc.ca/species/schedules_e.cfm?id=1

Fuller, R.J. and D.R. Langslow. 1984. Estimating numbers of birds by point counts: how long should counts last? Bird Study, 31:195-202.

Klohn Crippen Berger (KCB). 2011. Rainy River Gold Project, Baseline Report 2008-2010.

Ministry of Natural Resources and Forestry (MNRF). 2018. Species at Risk in Ontario (SARO) List. Accessed Online: <https://www.ontario.ca/page/species-risk-ontario>

Ontario Breeding Bird Atlas (OBBA). 2001. Guide for Participants. Atlas Management Board, Federation of Ontario Naturalists, Don Mills.

Partners in Flight (PIF). 2008. Ontario Landbird Conservation Plan: Lower Great Lakes/ St. Lawrence Plain, North American Bird Conservation Region 13. Ontario Ministry of Natural Resources, Bird Studies Canada, Environment Canada. Draft Version 2.0.

R Core Team (2021). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL <https://www.R-project.org/>.

StatSoft Inc. 2009. STATISTICA (data analysis software system), Version 9.0. www.statsoft.com.

Steidl, R.J., J.P. Hayes and E. Schaubert. 1997. Statistical Power Analysis in Wildlife Research. *Journal of Wildlife Management*, 61:270-279.

Wood. 2019. Wildlife Monitoring Report. New Gold Inc. Rainy River Mine

Appendix A Species with > 25% Occurrence at Point Count Stations (2018 and 2021)

Common Name	Guild	S. Rank	ESA/SARA Status	BCR.12. Status	Control or Impact	Year	Mean Occurrence	Mean Abundance	Mean Density
Alder Flycatcher	Edge/Shrub/Successional	S5B	--	--	Control	2021	17.89	0.25	0.070
American Bittern	Wetland/Open Water	S4B	--	--	Control	2021	3.16	0.03	0.000
American Crow	Forest	S5B	--	--	Control	2021	40.00	0.59	0.094
American Goldfinch	Edge/Shrub/Successional	S5B	--	--	Control	2021	5.26	0.09	0.013
American Kestrel	Grassland/Open Country	S4	--	1	Control	2021	3.16	0.03	0.007
American Redstart	Edge/Shrub/Successional	S5B	--	--	Control	2021	7.37	0.07	0.020
American Robin	Edge/Shrub/Successional	S5B	--	--	Control	2021	56.84	0.79	0.204
American White Pelican	Wetland/Open Water	S2B	THR/--	1	Control	2021	4.21	0.09	0.003
Baltimore Oriole	Edge/Shrub/Successional	S4B	--	--	Control	2021	3.16	0.03	0.007
Barn Swallow	Grassland/Open Country	S4B	THR/THR	1	Control	2021	3.16	0.11	0.017
Black-and-white Warbler	Forest	S5B	--	--	Control	2021	40.00	0.44	0.127
Black-billed Cuckoo	Edge/Shrub/Successional	S5B	--	1	Control	2021	54.74	0.78	0.094
Black-billed Magpie	Edge/Shrub/Successional	S3?	--	--	Control	2021	1.05	0.01	0.000
Black-backed Woodpecker	Forest	S4B	--	--	Control	2021	1.05	0.01	0.003
Black-capped Chickadee	Forest	S5	--	--	Control	2021	18.95	0.22	0.067
Belted Kingfisher	Wetland/Open Water	S4B	--	1	Control	2021	2.11	0.02	0.000
Brown-headed Cowbird	Edge/Shrub/Successional	S4B	--	--	Control	2021	2.11	0.03	0.007
Blue-headed Vireo	Forest	S5B	--	--	Control	2021	3.16	0.03	0.010
Blackburnian Warbler	Forest	S5B	--	1	Control	2021	13.68	0.18	0.057
Blue Jay	Forest	S5	--	--	Control	2021	72.63	1.00	0.248

Common Name	Guild	S. Rank	ESA/SARA Status	BCR.12. Status	Control or Impact	Year	Mean Occurrence	Mean Abundance	Mean Density
Bobolink	Grassland/Open Country	S4B	THR/THR	1	Control	2021	9.47	0.22	0.047
Boreal Chickadee	Forest	S5	--	--	Control	2021	1.05	0.02	0.007
Brown Creeper	Forest	S5B	--	--	Control	2021	2.11	0.03	0.010
Brown Thrasher	Edge/Shrub/Successional	S4B	--	1	Control	2021	1.05	0.01	0.000
Black-throated Green Warbler	Forest	S5B	--	1	Control	2021	20.00	0.26	0.077
Broad-winged Hawk	Forest	S5B	--	1	Control	2021	4.21	0.04	0.000
Canada Jay	Forest	S5	--	--	Control	2021	7.37	0.12	0.027
Canada Goose	Wetland/Open Water	S5	--	1	Control	2021	6.32	0.32	0.000
Canada Warbler	Forest	S4B	SC/THR	1	Control	2021	4.21	0.05	0.017
Clay-colored Sparrow	Edge/Shrub/Successional	S4B	--	--	Control	2021	13.68	0.18	0.054
Cedar Waxwing	Edge/Shrub/Successional	S5B	--	--	Control	2021	13.68	0.22	0.064
Chipping Sparrow	Edge/Shrub/Successional	S5B	--	--	Control	2021	11.58	0.15	0.037
Cliff Swallow	Wetland/Open Water	S4B	--	1	Control	2021	2.11	0.09	0.003
Cape May Warbler	Forest	S5B	--	--	Control	2021	1.05	0.01	0.003
Common Goldeneye	Wetland/Open Water	S5	--	1	Control	2021	1.05	0.02	0.003
Common Grackle	Edge/Shrub/Successional	S5B	--	--	Control	2021	6.32	0.11	0.027
Common Loon	Wetland/Open Water	S5B, S5N	--	--	Control	2021	11.58	0.14	0.007
Common Merganser	Wetland/Open Water	S5B, S5N	--	1	Control	2021	1.05	0.01	0.000
Connecticut Warbler	Forest	S4B	--	1	Control	2021	9.47	0.16	0.047
Common Raven	Forest	S5	--	--	Control	2021	7.37	0.15	0.000
Common Yellowthroat	Edge/Shrub/Successional	S5B	--	1	Control	2021	28.42	0.46	0.134
Chestnut-sided Warbler	Edge/Shrub/Successional	S5B	--	1	Control	2021	44.21	0.68	0.204
Dark-eyed Junco	Forest	S5B	--	--	Control	2021	12.63	0.20	0.064

Common Name	Guild	S. Rank	ESA/SARA Status	BCR.12. Status	Control or Impact	Year	Mean Occurrence	Mean Abundance	Mean Density
Eastern Kingbird	Edge/Shrub/Successional	S4B	--	--	Control	2021	3.16	0.03	0.003
Eastern Phoebe	Edge/Shrub/Successional	S5B	--	--	Control	2021	1.05	0.02	0.007
Eastern Wood-Pewee	Forest	S4B	SC/SC	1	Control	2021	7.37	0.07	0.007
European Starling	Edge/Shrub/Successional	SNA	--	--	Control	2021	2.11	0.03	0.007
Great Blue Heron	Wetland/Open Water	S4	--	--	Control	2021	1.05	0.01	0.000
Great Crested Flycatcher	Forest	S4B	--	--	Control	2021	3.16	0.03	0.003
Golden-crowned Kinglet	Forest	S5B	--	--	Control	2021	7.37	0.12	0.037
Great Gray Owl	Forest	S4	--	1	Control	2021	1.05	0.01	0.003
Gray Catbird	Edge/Shrub/Successional	S4B	--	1	Control	2021	2.11	0.03	0.003
Golden-winged Warbler	Edge/Shrub/Successional	S4B	SC/THR	1	Control	2021	8.42	0.08	0.020
Hairy Woodpecker	Forest	S5	--	--	Control	2021	8.42	0.08	0.017
Hermit Thrush	Forest	S5B	--	--	Control	2021	40.00	0.57	0.168
Hooded Merganser	Wetland/Open Water	S5B, S5N	--	1	Control	2021	1.05	0.01	0.000
Indigo Bunting	Edge/Shrub/Successional	S4B	--	--	Control	2021	4.21	0.04	0.010
Killdeer	Grassland/Open Country	S5B, S5N	--	1	Control	2021	1.05	0.01	0.000
LeConte's Sparrow	Grassland/Open Country	S4B	--	--	Control	2021	1.05	0.02	0.007
Least Flycatcher	Forest	S4B	--	1	Control	2021	15.79	0.25	0.074
Lincoln's Sparrow	Edge/Shrub/Successional	S5B	--	--	Control	2021	2.11	0.03	0.010
Mallard	Wetland/Open Water	S5	--	1	Control	2021	2.11	0.02	0.000
Magnolia Warbler	Forest	S5B	--	--	Control	2021	8.42	0.11	0.030
Mourning Dove	Edge/Shrub/Successional	S5	--	--	Control	2021	2.11	0.03	0.003
Mourning Warbler	Forest	S4B	--	1	Control	2021	35.79	0.42	0.107
Nashville Warbler	Forest	S5B	--	1	Control	2021	86.32	1.81	0.546

Common Name	Guild	S. Rank	ESA/SARA Status	BCR.12. Status	Control or Impact	Year	Mean Occurrence	Mean Abundance	Mean Density
Northern Flicker	Forest	S4B	--	1	Control	2021	15.79	0.17	0.034
Northern Parula	Forest	S4B	--	--	Control	2021	14.74	0.19	0.047
Northern Waterthrush	Forest	S5B	--	--	Control	2021	3.16	0.03	0.000
Orange-crowned Warbler	Forest	S4B	--	--	Control	2021	1.05	0.01	0.000
Ovenbird	Forest	S4B	--	--	Control	2021	75.79	1.48	0.422
Palm Warbler	Edge/Shrub/Successional	S5B	--	--	Control	2021	6.32	0.13	0.037
Pied-billed Grebe	Wetland/Open Water	S4B, S4N	--	--	Control	2021	3.16	0.03	0.003
Philadelphia Vireo	Forest	S5B	--	--	Control	2021	9.47	0.09	0.027
Pine Siskin	Forest	S4B	--	--	Control	2021	1.05	0.01	0.000
Pine Warbler	Forest	S5B	--	--	Control	2021	1.05	0.01	0.003
Pileated Woodpecker	Forest	S5	--	--	Control	2021	15.79	0.16	0.017
Purple Finch	Forest	S4B	--	1	Control	2021	1.05	0.01	0.000
Rose-breasted Grosbeak	Forest	S4B	--	1	Control	2021	33.68	0.45	0.121
Red-breasted Nuthatch	Forest	S5	--	--	Control	2021	35.79	0.46	0.131
Ruby-crowned Kinglet	Forest	S4B	--	1	Control	2021	14.74	0.19	0.060
Red-eyed Vireo	Forest	S5B	--	--	Control	2021	73.68	1.32	0.392
Ring-necked Duck	Wetland/Open Water	S5	--	1	Control	2021	1.05	0.02	0.007
Rock Pigeon	Grassland/Open Country	SNA	--	--	Control	2021	1.05	0.02	0.007
Red-tailed Hawk	Forest	S5	--	--	Control	2021	2.11	0.02	0.003
Ruby-throated Hummingbird	Edge/Shrub/Successional	S5B	--	--	Control	2021	6.32	0.09	0.020
Ruffed Grouse	Forest	S4	--	1	Control	2021	6.32	0.06	0.017
Red-winged Blackbird	Wetland/Open Water	S4	--	--	Control	2021	12.63	0.47	0.121
Sandhill Crane	Wetland/Open Water	S5B	--	1	Control	2021	25.26	0.36	0.027
Savannah Sparrow	Grassland/Open Country	S4B	--	--	Control	2021	11.58	0.15	0.047

Common Name	Guild	S. Rank	ESA/SARA Status	BCR.12. Status	Control or Impact	Year	Mean Occurrence	Mean Abundance	Mean Density
Scarlet Tanager	Forest	S4B	--	--	Control	2021	3.16	0.04	0.010
Sedge Wren	Grassland/Open Country	S4B	--	1	Control	2021	5.26	0.13	0.030
Sora	Wetland/Open Water	S4B	--	--	Control	2021	2.11	0.02	0.000
Song Sparrow	Edge/Shrub/Successional	S5B	--	1	Control	2021	12.63	0.19	0.054
Swamp Sparrow	Wetland/Open Water	S5B	--	1	Control	2021	8.42	0.13	0.034
Swainson's Thrush	Forest	S4B	--	--	Control	2021	6.32	0.06	0.017
Tennessee Warbler	Forest	S5B	--	1	Control	2021	4.21	0.04	0.007
Tree Swallow	Wetland/Open Water	S4B	--	1	Control	2021	3.16	0.07	0.003
Trumpeter Swan	Wetland/Open Water	S4	--	--	Control	2021	3.16	0.08	0.020
Turkey Vulture	Edge/Shrub/Successional	S5B	--	--	Control	2021	5.26	0.05	0.000
Veery	Forest	S4B	--	1	Control	2021	54.74	0.84	0.235
Warbling Vireo	Edge/Shrub/Successional	S5B	--	--	Control	2021	1.05	0.01	0.000
Wilson's Snipe	Wetland/Open Water	S5B	--	1	Control	2021	12.63	0.14	0.023
Winter Wren	Forest	S5B	--	--	Control	2021	10.53	0.12	0.030
Wood Duck	Wetland/Open Water	S5	--	1	Control	2021	2.11	0.03	0.007
Wood Thrush	Forest	S4B	SC/THR	1	Control	2021	10.53	0.13	0.037
White-throated Sparrow	Forest	S5B	--	1	Control	2021	64.21	1.11	0.308
White-winged Crossbill	Forest	S5B	--	--	Control	2021	1.05	0.01	0.000
Yellow-bellied Flycatcher	Forest	S5B	--	--	Control	2021	20.00	0.29	0.067
Yellow-bellied Sapsucker	Forest	S5B	--	1	Control	2021	5.26	0.06	0.013
Yellow-rumped Warbler	Forest	S5B	--	--	Control	2021	11.58	0.12	0.030
Yellow Warbler	Edge/Shrub/Successional	S5B	--	--	Control	2021	1.05	0.01	0.003
Alder Flycatcher	Edge/Shrub/Successional	S5B	--	--	Impact	2021	33.33	0.40	0.099
American Bittern	Wetland/Open Water	S4B	--	--	Impact	2021	3.33	0.04	0.011

Common Name	Guild	S. Rank	ESA/SARA Status	BCR.12. Status	Control or Impact	Year	Mean Occurrence	Mean Abundance	Mean Density
American Crow	Forest	S5B	--	--	Impact	2021	50.00	1.62	0.202
American Goldfinch	Edge/Shrub/Successional	S5B	--	--	Impact	2021	10.00	0.19	0.025
American Kestrel	Grassland/Open Country	S4	--	1	Impact	2021	3.33	0.03	0.007
American Redstart	Edge/Shrub/Successional	S5B	--	--	Impact	2021	8.89	0.13	0.039
American Robin	Edge/Shrub/Successional	S5B	--	--	Impact	2021	73.33	1.12	0.265
American Woodcock	Edge/Shrub/Successional	S4B	--	1	Impact	2021	1.11	0.07	0.021
American White Pelican	Wetland/Open Water	S2B	THR/--	1	Impact	2021	11.11	1.08	0.018
Bald Eagle	Wetland/Open Water	S2N, S4B	SC/--	1	Impact	2021	4.44	0.06	0.011
Baltimore Oriole	Edge/Shrub/Successional	S4B	--	--	Impact	2021	2.22	0.02	0.004
Barn Swallow	Grassland/Open Country	S4B	THR/THR	1	Impact	2021	11.11	0.40	0.064
Black-and-white Warbler	Forest	S5B	--	--	Impact	2021	33.33	0.38	0.095
Black-billed Cuckoo	Edge/Shrub/Successional	S5B	--	1	Impact	2021	55.56	0.82	0.170
Black-billed Magpie	Edge/Shrub/Successional	S3?	--	--	Impact	2021	10.00	0.18	0.014
Black-capped Chickadee	Forest	S5	--	--	Impact	2021	15.56	0.18	0.050
Belted Kingfisher	Wetland/Open Water	S4B	--	1	Impact	2021	3.33	0.03	0.004
Brown-headed Cowbird	Edge/Shrub/Successional	S4B	--	--	Impact	2021	18.89	0.22	0.046
Blue Jay	Forest	S5	--	--	Impact	2021	75.56	1.39	0.297
Bobolink	Grassland/Open Country	S4B	THR/THR	1	Impact	2021	37.78	1.39	0.407
Boreal Chickadee	Forest	S5	--	--	Impact	2021	1.11	0.02	0.007
Brewer's Blackbird	Edge/Shrub/Successional	S4B	--	--	Impact	2021	3.33	0.04	0.007
Brown Creeper	Forest	S5B	--	--	Impact	2021	2.22	0.03	0.007

Common Name	Guild	S. Rank	ESA/SARA Status	BCR.12. Status	Control or Impact	Year	Mean Occurrence	Mean Abundance	Mean Density
Black-throated Green Warbler	Forest	S5B	--	1	Impact	2021	5.56	0.06	0.018
Broad-winged Hawk	Forest	S5B	--	1	Impact	2021	1.11	0.01	0.000
Canada Jay	Forest	S5	--	--	Impact	2021	4.44	0.07	0.014
Canada Goose	Wetland/Open Water	S5	--	1	Impact	2021	7.78	0.28	0.000
Canada Warbler	Forest	S4B	SC/THR	1	Impact	2021	5.56	0.07	0.021
Clay-colored Sparrow	Edge/Shrub/Successional	S4B	--	--	Impact	2021	48.89	0.99	0.276
Cedar Waxwing	Edge/Shrub/Successional	S5B	--	--	Impact	2021	18.89	0.39	0.067
Chipping Sparrow	Edge/Shrub/Successional	S5B	--	--	Impact	2021	8.89	0.09	0.018
Cliff Swallow	Wetland/Open Water	S4B	--	1	Impact	2021	4.44	0.22	0.028
Cape May Warbler	Forest	S5B	--	--	Impact	2021	1.11	0.01	0.000
Common Goldeneye	Wetland/Open Water	S5	--	1	Impact	2021	1.11	0.02	0.000
Common Grackle	Edge/Shrub/Successional	S5B	--	--	Impact	2021	3.33	0.06	0.000
Common Loon	Wetland/Open Water	S5B, S5N	--	--	Impact	2021	16.67	0.19	0.000
Connecticut Warbler	Forest	S4B	--	1	Impact	2021	4.44	0.06	0.014
Common Raven	Forest	S5	--	--	Impact	2021	12.22	0.16	0.007
Common Tern	Wetland/Open Water	S5	--	1	Impact	2021	1.11	0.01	0.000
Common Yellowthroat	Edge/Shrub/Successional	S5B	--	1	Impact	2021	62.22	1.04	0.290
Chestnut-sided Warbler	Edge/Shrub/Successional	S5B	--	1	Impact	2021	57.78	0.87	0.230
Double-crested Cormorant	Wetland/Open Water	S5B	--	--	Impact	2021	1.11	0.03	0.000
Dark-eyed Junco	Forest	S5B	--	--	Impact	2021	3.33	0.03	0.011
Dickcissel	Grassland/Open Country	S5	--	--	Impact	2021	4.44	0.08	0.004
Downy Woodpecker	Forest	S5	--	--	Impact	2021	1.11	0.01	0.004
Eastern Kingbird	Edge/Shrub/Successional	S4B	--	--	Impact	2021	6.67	0.08	0.007
Eastern Wood-Pewee	Forest	S4B	SC/SC	1	Impact	2021	8.89	0.12	0.018

Common Name	Guild	S. Rank	ESA/SARA Status	BCR.12. Status	Control or Impact	Year	Mean Occurrence	Mean Abundance	Mean Density
European Starling	Edge/Shrub/Successional	SNA	--	--	Impact	2021	7.78	0.19	0.042
Great Blue Heron	Wetland/Open Water	S4	--	--	Impact	2021	5.56	0.10	0.000
Great Crested Flycatcher	Forest	S4B	--	--	Impact	2021	3.33	0.03	0.011
Golden-crowned Kinglet	Forest	S5B	--	--	Impact	2021	1.11	0.01	0.004
Gray Catbird	Edge/Shrub/Successional	S4B	--	1	Impact	2021	3.33	0.03	0.007
Golden-winged Warbler	Edge/Shrub/Successional	S4B	SC/THR	1	Impact	2021	7.78	0.10	0.028
Hairy Woodpecker	Forest	S5	--	--	Impact	2021	10.00	0.11	0.021
Herring Gull	Wetland/Open Water	S5B, S5N	--	1	Impact	2021	1.11	0.02	0.000
Hermit Thrush	Forest	S5B	--	--	Impact	2021	22.22	0.36	0.110
Hooded Merganser	Wetland/Open Water	S5B, S5N	--	1	Impact	2021	1.11	0.07	0.021
House Wren	Edge/Shrub/Successional	S5B	--	--	Impact	2021	6.67	0.08	0.021
Indigo Bunting	Edge/Shrub/Successional	S4B	--	--	Impact	2021	7.78	0.08	0.021
Killdeer	Grassland/Open Country	S5B, S5N	--	1	Impact	2021	2.22	0.03	0.011
Least Flycatcher	Forest	S4B	--	1	Impact	2021	17.78	0.26	0.074
Lincoln's Sparrow	Edge/Shrub/Successional	S5B	--	--	Impact	2021	1.11	0.01	0.004
Mallard	Wetland/Open Water	S5	--	1	Impact	2021	3.33	0.10	0.018
Magnolia Warbler	Forest	S5B	--	--	Impact	2021	2.22	0.02	0.007
Merlin	Forest	S5B	--	--	Impact	2021	2.22	0.02	0.004
Mourning Dove	Edge/Shrub/Successional	S5	--	--	Impact	2021	1.11	0.01	0.004
Mourning Warbler	Forest	S4B	--	1	Impact	2021	27.78	0.40	0.117
Nashville Warbler	Forest	S5B	--	1	Impact	2021	67.78	1.32	0.382
Northern Flicker	Forest	S4B	--	1	Impact	2021	15.56	0.18	0.014
Northern Harrier	Grassland/Open Country	S4B	--	--	Impact	2021	1.11	0.01	0.000

Common Name	Guild	S. Rank	ESA/SARA Status	BCR.12. Status	Control or Impact	Year	Mean Occurrence	Mean Abundance	Mean Density
Northern Parula	Forest	S4B	--	--	Impact	2021	2.22	0.03	0.011
Northern Waterthrush	Forest	S5B	--	--	Impact	2021	3.33	0.03	0.011
Olive-sided Flycatcher	Forest	S4B	SC/THR	1	Impact	2021	1.11	0.01	0.004
Ovenbird	Forest	S4B	--	--	Impact	2021	70.00	1.22	0.315
Palm Warbler	Edge/Shrub/Successional	S5B	--	--	Impact	2021	1.11	0.03	0.011
Pied-billed Grebe	Wetland/Open Water	S4B, S4N	--	--	Impact	2021	5.56	0.06	0.004
Philadelphia Vireo	Forest	S5B	--	--	Impact	2021	11.11	0.12	0.035
Pileated Woodpecker	Forest	S5	--	--	Impact	2021	15.56	0.16	0.018
Purple Finch	Forest	S4B	--	1	Impact	2021	1.11	0.01	0.004
Rose-breasted Grosbeak	Forest	S4B	--	1	Impact	2021	27.78	0.31	0.074
Red-breasted Nuthatch	Forest	S5	--	--	Impact	2021	20.00	0.21	0.060
Ruby-crowned Kinglet	Forest	S4B	--	1	Impact	2021	3.33	0.04	0.011
Red-eyed Vireo	Forest	S5B	--	--	Impact	2021	73.33	1.20	0.318
Red-headed Woodpecker	Edge/Shrub/Successional	S4B	EN/THR	1	Impact	2021	4.44	0.04	0.011
Ring-necked Duck	Wetland/Open Water	S5	--	1	Impact	2021	1.11	0.02	0.007
Red-tailed Hawk	Forest	S5	--	--	Impact	2021	1.11	0.01	0.004
Ruffed Grouse	Forest	S4	--	1	Impact	2021	2.22	0.02	0.007
Red-winged Blackbird	Wetland/Open Water	S4	--	--	Impact	2021	32.22	1.21	0.145
Sandhill Crane	Wetland/Open Water	S5B	--	1	Impact	2021	31.11	0.58	0.060
Savannah Sparrow	Grassland/Open Country	S4B	--	--	Impact	2021	38.89	0.72	0.212
Scarlet Tanager	Forest	S4B	--	--	Impact	2021	6.67	0.07	0.018
Sedge Wren	Grassland/Open Country	S4B	--	1	Impact	2021	12.22	0.23	0.071
Song Sparrow	Edge/Shrub/Successional	S5B	--	1	Impact	2021	41.11	0.52	0.138
Spruce Grouse	Forest	S5	--	--	Impact	2021	1.11	0.07	0.021

Common Name	Guild	S. Rank	ESA/SARA Status	BCR.12. Status	Control or Impact	Year	Mean Occurrence	Mean Abundance	Mean Density
Spotted Sandpiper	Wetland/Open Water	S5	--	1	Impact	2021	1.11	0.01	0.004
Sharp-shinned Hawk	Forest	S5	--	--	Impact	2021	1.11	0.02	0.007
Sharp-tailed Grouse	Grassland/Open Country	S4	--	--	Impact	2021	2.22	0.12	0.035
Swamp Sparrow	Wetland/Open Water	S5B	--	1	Impact	2021	10.00	0.11	0.028
Swainson's Thrush	Forest	S4B	--	--	Impact	2021	3.33	0.03	0.011
Tree Swallow	Wetland/Open Water	S4B	--	1	Impact	2021	7.78	0.16	0.007
Trumpeter Swan	Wetland/Open Water	S4	--	--	Impact	2021	3.33	0.18	0.007
Turkey Vulture	Edge/Shrub/Successional	S5B	--	--	Impact	2021	5.56	0.06	0.004
Veery	Forest	S4B	--	1	Impact	2021	56.67	0.81	0.219
Vesper Sparrow	Grassland/Open Country	S4B	--	1	Impact	2021	2.22	0.02	0.007
Warbling Vireo	Edge/Shrub/Successional	S5B	--	--	Impact	2021	3.33	0.03	0.011
White-breasted Nuthatch	Forest	S5	--	--	Impact	2021	1.11	0.01	0.004
Western Meadowlark	Grassland/Open Country	S3B	--	--	Impact	2021	4.44	0.04	0.011
Wilson's Snipe	Wetland/Open Water	S5B	--	1	Impact	2021	4.44	0.04	0.011
Winter Wren	Forest	S5B	--	--	Impact	2021	1.11	0.01	0.004
Wood Duck	Wetland/Open Water	S5	--	1	Impact	2021	2.22	0.04	0.014
Wood Thrush	Forest	S4B	SC/THR	1	Impact	2021	10.00	0.10	0.032
White-throated Sparrow	Forest	S5B	--	1	Impact	2021	65.56	1.12	0.276
Yellow-bellied Flycatcher	Forest	S5B	--	--	Impact	2021	12.22	0.16	0.035
Yellow-bellied Sapsucker	Forest	S5B	--	1	Impact	2021	5.56	0.06	0.014
Yellow-rumped Warbler	Forest	S5B	--	--	Impact	2021	6.67	0.07	0.021
Yellow Warbler	Edge/Shrub/Successional	S5B	--	--	Impact	2021	4.44	0.04	0.014
Alder Flycatcher	Edge/Shrub/Successional	S5B	--	--	Control	2018	21.05	0.36	0.101

Common Name	Guild	S. Rank	ESA/SARA Status	BCR.12. Status	Control or Impact	Year	Mean Occurrence	Mean Abundance	Mean Density
American Bittern	Wetland/Open Water	S4B	--	--	Control	2018	5.26	0.05	0.000
American Crow	Forest	S5B	--	--	Control	2018	18.95	0.25	0.023
American Goldfinch	Edge/Shrub/Successional	S5B	--	--	Control	2018	14.74	0.22	0.054
American Kestrel	Grassland/Open Country	S4	--	1	Control	2018	3.16	0.03	0.007
American Pipit	Grassland/Open Country	S4	--	--	Control	2018	1.05	0.01	0.003
American Redstart	Edge/Shrub/Successional	S5B	--	--	Control	2018	26.32	0.32	0.094
American Robin	Edge/Shrub/Successional	S5B	--	--	Control	2018	48.42	0.67	0.161
American Woodcock	Edge/Shrub/Successional	S4B	--	1	Control	2018	1.05	0.01	0.003
American White Pelican	Wetland/Open Water	S2B	THR/--	1	Control	2018	2.11	0.16	0.003
Bald Eagle	Wetland/Open Water	S2N, S4B	SC/--	1	Control	2018	1.05	0.01	0.003
Baltimore Oriole	Edge/Shrub/Successional	S4B	--	--	Control	2018	2.11	0.02	0.007
Barn Swallow	Grassland/Open Country	S4B	THR/THR	1	Control	2018	4.21	0.51	0.137
Black-and-white Warbler	Forest	S5B	--	--	Control	2018	50.53	0.58	0.171
Black-billed Cuckoo	Edge/Shrub/Successional	S5B	--	1	Control	2018	4.21	0.04	0.007
Black-billed Magpie	Edge/Shrub/Successional	S3?	--	--	Control	2018	2.11	0.02	0.000
Bay-breasted Warbler	Forest	S5B	--	1	Control	2018	5.26	0.06	0.017
Black-backed Woodpecker	Forest	S4B	--	--	Control	2018	4.21	0.05	0.013
Black-capped Chickadee	Forest	S5	--	--	Control	2018	21.05	0.28	0.087
Brown-headed Cowbird	Edge/Shrub/Successional	S4B	--	--	Control	2018	4.21	0.04	0.013
Blue-headed Vireo	Forest	S5B	--	--	Control	2018	1.05	0.01	0.003
Blackburnian Warbler	Forest	S5B	--	1	Control	2018	16.84	0.21	0.060

Common Name	Guild	S. Rank	ESA/SARA Status	BCR.12. Status	Control or Impact	Year	Mean Occurrence	Mean Abundance	Mean Density
Blue Jay	Forest	S5	--	--	Control	2018	37.89	0.43	0.087
Bobolink	Grassland/Open Country	S4B	THR/THR	1	Control	2018	8.42	0.27	0.077
Brewer's Blackbird	Edge/Shrub/Successional	S4B	--	--	Control	2018	2.11	0.06	0.010
Brown Creeper	Forest	S5B	--	--	Control	2018	3.16	0.03	0.010
Black-throated Blue Warbler	Forest	S5B	--	1	Control	2018	1.05	0.01	0.003
Black-throated Green Warbler	Forest	S5B	--	1	Control	2018	26.32	0.33	0.094
Broad-winged Hawk	Forest	S5B	--	1	Control	2018	1.05	0.01	0.003
NA	NA	NA	NA	NA	Control	2018	1.05	0.01	0.003
Canada Jay	Forest	S5	--	--	Control	2018	9.47	0.18	0.054
Canada Goose	Wetland/Open Water	S5	--	1	Control	2018	4.21	0.86	0.000
Canada Warbler	Forest	S4B	SC/THR	1	Control	2018	6.32	0.06	0.020
Clay-colored Sparrow	Edge/Shrub/Successional	S4B	--	--	Control	2018	8.42	0.11	0.020
Cedar Waxwing	Edge/Shrub/Successional	S5B	--	--	Control	2018	20.00	0.47	0.131
Chipping Sparrow	Edge/Shrub/Successional	S5B	--	--	Control	2018	10.53	0.11	0.030
Cape May Warbler	Forest	S5B	--	--	Control	2018	2.11	0.03	0.010
Common Grackle	Edge/Shrub/Successional	S5B	--	--	Control	2018	4.21	0.06	0.010
Common Loon	Wetland/Open Water	S5B, S5N	--	--	Control	2018	7.37	0.07	0.003
Connecticut Warbler	Forest	S4B	--	1	Control	2018	1.05	0.01	0.003
Common Raven	Forest	S5	--	--	Control	2018	8.42	0.15	0.000
Common Yellowthroat	Edge/Shrub/Successional	S5B	--	1	Control	2018	34.74	0.57	0.168
Chestnut-sided Warbler	Edge/Shrub/Successional	S5B	--	1	Control	2018	43.16	0.57	0.168
Dark-eyed Junco	Forest	S5B	--	--	Control	2018	7.37	0.11	0.030
Downy Woodpecker	Forest	S5	--	--	Control	2018	4.21	0.04	0.010

Common Name	Guild	S. Rank	ESA/SARA Status	BCR.12. Status	Control or Impact	Year	Mean Occurrence	Mean Abundance	Mean Density
Eastern Kingbird	Edge/Shrub/Successional	S4B	--	--	Control	2018	3.16	0.06	0.020
Eastern Phoebe	Edge/Shrub/Successional	S5B	--	--	Control	2018	4.21	0.04	0.010
Eastern Wood-Pewee	Forest	S4B	SC/SC	1	Control	2018	7.37	0.08	0.020
European Starling	Edge/Shrub/Successional	SNA	--	--	Control	2018	4.21	0.09	0.023
Evening Grosbeak	Forest	S4B	SC/--	1	Control	2018	1.05	0.03	0.010
Eastern Whip-poor-will	Forest	S4B	THR/THR	1	Control	2018	1.05	0.01	0.003
Great Blue Heron	Wetland/Open Water	S4	--	--	Control	2018	2.11	0.03	0.000
Great Crested Flycatcher	Forest	S4B	--	--	Control	2018	1.05	0.01	0.000
Golden-crowned Kinglet	Forest	S5B	--	--	Control	2018	5.26	0.05	0.017
Gray Catbird	Edge/Shrub/Successional	S4B	--	1	Control	2018	1.05	0.01	0.003
Golden-winged Warbler	Edge/Shrub/Successional	S4B	SC/THR	1	Control	2018	10.53	0.14	0.030
Herring Gull	Wetland/Open Water	S5B, S5N	--	1	Control	2018	1.05	0.01	0.003
Hermit Thrush	Forest	S5B	--	--	Control	2018	41.05	0.48	0.094
Hooded Merganser	Wetland/Open Water	S5B, S5N	--	1	Control	2018	1.05	0.01	0.003
House Wren	Edge/Shrub/Successional	S5B	--	--	Control	2018	1.05	0.02	0.003
Killdeer	Grassland/Open Country	S5B, S5N	--	1	Control	2018	4.21	0.06	0.013
Least Flycatcher	Forest	S4B	--	1	Control	2018	14.74	0.20	0.057
Lincoln's Sparrow	Edge/Shrub/Successional	S5B	--	--	Control	2018	6.32	0.08	0.027
NA	NA	NA	NA	NA	Control	2018	8.42	0.14	0.044
Marbled Godwit	Wetland/Open Water	S3B	--	--	Control	2018	1.05	0.01	0.000
Magnolia Warbler	Forest	S5B	--	--	Control	2018	31.58	0.44	0.134
Mourning Dove	Edge/Shrub/Successional	S5	--	--	Control	2018	1.05	0.02	0.003

Common Name	Guild	S. Rank	ESA/SARA Status	BCR.12. Status	Control or Impact	Year	Mean Occurrence	Mean Abundance	Mean Density
Mourning Warbler	Forest	S4B	--	1	Control	2018	22.11	0.27	0.070
Nashville Warbler	Forest	S5B	--	1	Control	2018	81.05	1.66	0.503
Northern Flicker	Forest	S4B	--	1	Control	2018	11.58	0.14	0.034
Northern Harrier	Grassland/Open Country	S4B	--	--	Control	2018	1.05	0.01	0.003
Northern Parula	Forest	S4B	--	--	Control	2018	15.79	0.17	0.044
Northern Waterthrush	Forest	S5B	--	--	Control	2018	8.42	0.09	0.023
Orange-crowned Warbler	Forest	S4B	--	--	Control	2018	1.05	0.01	0.003
Olive-sided Flycatcher	Forest	S4B	SC/THR	1	Control	2018	1.05	0.01	0.003
Ovenbird	Forest	S4B	--	--	Control	2018	70.53	1.44	0.328
Palm Warbler	Edge/Shrub/Successional	S5B	--	--	Control	2018	7.37	0.13	0.040
Pied-billed Grebe	Wetland/Open Water	S4B, S4N	--	--	Control	2018	1.05	0.01	0.000
Philadelphia Vireo	Forest	S5B	--	--	Control	2018	3.16	0.03	0.010
Pine Siskin	Forest	S4B	--	--	Control	2018	2.11	0.03	0.010
Pine Warbler	Forest	S5B	--	--	Control	2018	1.05	0.01	0.003
Pileated Woodpecker	Forest	S5	--	--	Control	2018	6.32	0.06	0.013
Rose-breasted Grosbeak	Forest	S4B	--	1	Control	2018	15.79	0.18	0.050
Red-breasted Nuthatch	Forest	S5	--	--	Control	2018	23.16	0.25	0.064
Ruby-crowned Kinglet	Forest	S4B	--	1	Control	2018	17.89	0.20	0.050
Red-eyed Vireo	Forest	S5B	--	--	Control	2018	91.58	1.84	0.456
Ring-necked Duck	Wetland/Open Water	S5	--	1	Control	2018	1.05	0.01	0.003
Red-tailed Hawk	Forest	S5	--	--	Control	2018	2.11	0.02	0.003
Ruby-throated Hummingbird	Edge/Shrub/Successional	S5B	--	--	Control	2018	3.16	0.03	0.010
Ruffed Grouse	Forest	S4	--	1	Control	2018	24.21	0.25	0.047
Red-winged Blackbird	Wetland/Open Water	S4	--	--	Control	2018	16.84	0.28	0.074

Common Name	Guild	S. Rank	ESA/SARA Status	BCR.12. Status	Control or Impact	Year	Mean Occurrence	Mean Abundance	Mean Density
Sandhill Crane	Wetland/Open Water	S5B	--	1	Control	2018	10.53	0.14	0.003
Savannah Sparrow	Grassland/Open Country	S4B	--	--	Control	2018	10.53	0.19	0.054
Scarlet Tanager	Forest	S4B	--	--	Control	2018	1.05	0.01	0.003
Sedge Wren	Grassland/Open Country	S4B	--	1	Control	2018	9.47	0.24	0.067
Sora	Wetland/Open Water	S4B	--	--	Control	2018	1.05	0.01	0.000
Song Sparrow	Edge/Shrub/Successional	S5B	--	1	Control	2018	21.05	0.25	0.074
Spotted Sandpiper	Wetland/Open Water	S5	--	1	Control	2018	1.05	0.01	0.000
Sharp-shinned Hawk	Forest	S5	--	--	Control	2018	3.16	0.04	0.013
Sharp-tailed Grouse	Grassland/Open Country	S4	--	--	Control	2018	1.05	0.01	0.003
Swamp Sparrow	Wetland/Open Water	S5B	--	1	Control	2018	8.42	0.15	0.037
Swainson's Thrush	Forest	S4B	--	--	Control	2018	8.42	0.11	0.010
Tennessee Warbler	Forest	S5B	--	1	Control	2018	16.84	0.21	0.060
Tree Swallow	Wetland/Open Water	S4B	--	1	Control	2018	3.16	0.03	0.007
Trumpeter Swan	Wetland/Open Water	S4	--	--	Control	2018	10.53	0.15	0.003
Turkey Vulture	Edge/Shrub/Successional	S5B	--	--	Control	2018	1.05	0.01	0.003
Veery	Forest	S4B	--	1	Control	2018	46.32	0.66	0.121
Vesper Sparrow	Grassland/Open Country	S4B	--	1	Control	2018	1.05	0.01	0.003
Virginia Rail	Wetland/Open Water	S5B	--	--	Control	2018	1.05	0.01	0.000
Western Meadowlark	Grassland/Open Country	S3B	--	--	Control	2018	1.05	0.01	0.003
Wilson's Snipe	Wetland/Open Water	S5B	--	1	Control	2018	13.68	0.22	0.030
Wilson's Warbler	Edge/Shrub/Successional	S4B	--	--	Control	2018	3.16	0.03	0.010
Winter Wren	Forest	S5B	--	--	Control	2018	7.37	0.08	0.023
Wood Duck	Wetland/Open Water	S5	--	1	Control	2018	2.11	0.02	0.000
Wood Thrush	Forest	S4B	SC/THR	1	Control	2018	13.68	0.15	0.030
NA	NA	NA	NA	NA	Control	2018	2.11	0.02	0.007

Common Name	Guild	S. Rank	ESA/SARA Status	BCR.12. Status	Control or Impact	Year	Mean Occurrence	Mean Abundance	Mean Density
White-throated Sparrow	Forest	S5B	--	1	Control	2018	62.11	1.05	0.245
Yellow-bellied Flycatcher	Forest	S5B	--	--	Control	2018	24.21	0.28	0.077
Yellow-bellied Sapsucker	Forest	S5B	--	1	Control	2018	2.11	0.02	0.007
Yellow-rumped Warbler	Forest	S5B	--	--	Control	2018	17.89	0.20	0.057
Yellow Warbler	Edge/Shrub/Successional	S5B	--	--	Control	2018	16.84	0.22	0.060
Alder Flycatcher	Edge/Shrub/Successional	S5B	--	--	Impact	2018	36.67	0.56	0.120
American Bittern	Wetland/Open Water	S4B	--	--	Impact	2018	2.22	0.02	0.000
American Crow	Forest	S5B	--	--	Impact	2018	15.56	0.19	0.007
American Goldfinch	Edge/Shrub/Successional	S5B	--	--	Impact	2018	25.56	0.40	0.106
American Kestrel	Grassland/Open Country	S4	--	1	Impact	2018	2.22	0.02	0.007
American Redstart	Edge/Shrub/Successional	S5B	--	--	Impact	2018	16.67	0.17	0.050
American Robin	Edge/Shrub/Successional	S5B	--	--	Impact	2018	62.22	0.84	0.145
American Woodcock	Edge/Shrub/Successional	S4B	--	1	Impact	2018	1.11	0.01	0.000
American White Pelican	Wetland/Open Water	S2B	THR/--	1	Impact	2018	3.33	0.08	0.007
Bald Eagle	Wetland/Open Water	S2N, S4B	SC/--	1	Impact	2018	3.33	0.04	0.011
Baltimore Oriole	Edge/Shrub/Successional	S4B	--	--	Impact	2018	4.44	0.06	0.014
Barn Swallow	Grassland/Open Country	S4B	THR/THR	1	Impact	2018	8.89	0.28	0.064
Black-and-white Warbler	Forest	S5B	--	--	Impact	2018	52.22	0.64	0.159
Black-billed Cuckoo	Edge/Shrub/Successional	S5B	--	1	Impact	2018	4.44	0.04	0.011
Black-billed Magpie	Edge/Shrub/Successional	S3?	--	--	Impact	2018	13.33	0.20	0.028

Common Name	Guild	S. Rank	ESA/SARA Status	BCR.12. Status	Control or Impact	Year	Mean Occurrence	Mean Abundance	Mean Density
Bay-breasted Warbler	Forest	S5B	--	1	Impact	2018	1.11	0.01	0.004
Black-backed Woodpecker	Forest	S4B	--	--	Impact	2018	3.33	0.03	0.007
Black-capped Chickadee	Forest	S5	--	--	Impact	2018	26.67	0.30	0.071
Belted Kingfisher	Wetland/Open Water	S4B	--	1	Impact	2018	2.22	0.02	0.007
Brown-headed Cowbird	Edge/Shrub/Successional	S4B	--	--	Impact	2018	6.67	0.13	0.039
Blackburnian Warbler	Forest	S5B	--	1	Impact	2018	4.44	0.04	0.014
Blue Jay	Forest	S5	--	--	Impact	2018	42.22	0.49	0.060
Blackpoll Warbler	Forest	S4B	--	--	Impact	2018	1.11	0.01	0.004
Bobolink	Grassland/Open Country	S4B	THR/THR	1	Impact	2018	28.89	0.89	0.209
Brewer's Blackbird	Edge/Shrub/Successional	S4B	--	--	Impact	2018	3.33	0.07	0.007
Brown Creeper	Forest	S5B	--	--	Impact	2018	3.33	0.03	0.011
Brown Thrasher	Edge/Shrub/Successional	S4B	--	1	Impact	2018	1.11	0.01	0.000
Black-throated Green Warbler	Forest	S5B	--	1	Impact	2018	12.22	0.14	0.028
Canada Jay	Forest	S5	--	--	Impact	2018	3.33	0.06	0.011
Canada Goose	Wetland/Open Water	S5	--	1	Impact	2018	15.56	0.77	0.099
Canada Warbler	Forest	S4B	SC/THR	1	Impact	2018	6.67	0.08	0.025
Clay-colored Sparrow	Edge/Shrub/Successional	S4B	--	--	Impact	2018	37.78	0.54	0.124
Cedar Waxwing	Edge/Shrub/Successional	S5B	--	--	Impact	2018	17.78	0.33	0.106
Chipping Sparrow	Edge/Shrub/Successional	S5B	--	--	Impact	2018	16.67	0.17	0.046
Cliff Swallow	Wetland/Open Water	S4B	--	1	Impact	2018	1.11	0.02	0.007
Cape May Warbler	Forest	S5B	--	--	Impact	2018	1.11	0.01	0.004
Common Grackle	Edge/Shrub/Successional	S5B	--	--	Impact	2018	4.44	0.04	0.007
Common Loon	Wetland/Open Water	S5B, S5N	--	--	Impact	2018	3.33	0.03	0.000

Common Name	Guild	S. Rank	ESA/SARA Status	BCR.12. Status	Control or Impact	Year	Mean Occurrence	Mean Abundance	Mean Density
Connecticut Warbler	Forest	S4B	--	1	Impact	2018	2.22	0.03	0.007
Common Raven	Forest	S5	--	--	Impact	2018	15.56	0.27	0.025
Common Yellowthroat	Edge/Shrub/Successional	S5B	--	1	Impact	2018	67.78	1.00	0.237
Chestnut-sided Warbler	Edge/Shrub/Successional	S5B	--	1	Impact	2018	62.22	0.94	0.251
Dark-eyed Junco	Forest	S5B	--	--	Impact	2018	1.11	0.01	0.004
Downy Woodpecker	Forest	S5	--	--	Impact	2018	2.22	0.02	0.000
Eastern Bluebird	Grassland/Open Country	S5B	--	--	Impact	2018	3.33	0.03	0.011
Eastern Kingbird	Edge/Shrub/Successional	S4B	--	--	Impact	2018	7.78	0.08	0.018
Eastern Phoebe	Edge/Shrub/Successional	S5B	--	--	Impact	2018	3.33	0.03	0.004
Eastern Wood-Pewee	Forest	S4B	SC/SC	1	Impact	2018	5.56	0.06	0.007
European Starling	Edge/Shrub/Successional	SNA	--	--	Impact	2018	6.67	0.28	0.011
Great Blue Heron	Wetland/Open Water	S4	--	--	Impact	2018	3.33	0.03	0.004
Great Crested Flycatcher	Forest	S4B	--	--	Impact	2018	4.44	0.04	0.011
Golden-crowned Kinglet	Forest	S5B	--	--	Impact	2018	3.33	0.04	0.014
Gray Catbird	Edge/Shrub/Successional	S4B	--	1	Impact	2018	2.22	0.02	0.007
Golden-winged Warbler	Edge/Shrub/Successional	S4B	SC/THR	1	Impact	2018	13.33	0.14	0.046
Hairy Woodpecker	Forest	S5	--	--	Impact	2018	3.33	0.03	0.011
Hermit Thrush	Forest	S5B	--	--	Impact	2018	15.56	0.18	0.021
House Wren	Edge/Shrub/Successional	S5B	--	--	Impact	2018	3.33	0.04	0.004
Indigo Bunting	Edge/Shrub/Successional	S4B	--	--	Impact	2018	1.11	0.01	0.004
Killdeer	Grassland/Open Country	S5B, S5N	--	1	Impact	2018	5.56	0.08	0.011
Least Flycatcher	Forest	S4B	--	1	Impact	2018	13.33	0.19	0.039
NA	NA	NA	NA	NA	Impact	2018	35.56	0.62	0.191

Common Name	Guild	S. Rank	ESA/SARA Status	BCR.12. Status	Control or Impact	Year	Mean Occurrence	Mean Abundance	Mean Density
Marbled Godwit	Wetland/Open Water	S3B	--	--	Impact	2018	1.11	0.01	0.000
Mallard	Wetland/Open Water	S5	--	1	Impact	2018	3.33	0.07	0.004
Magnolia Warbler	Forest	S5B	--	--	Impact	2018	10.00	0.10	0.028
Marsh Wren	Wetland/Open Water	S4B	--	--	Impact	2018	1.11	0.01	0.000
Mourning Dove	Edge/Shrub/Successional	S5	--	--	Impact	2018	1.11	0.01	0.000
Mourning Warbler	Forest	S4B	--	1	Impact	2018	37.78	0.42	0.085
Nashville Warbler	Forest	S5B	--	1	Impact	2018	73.33	1.28	0.350
Northern Flicker	Forest	S4B	--	1	Impact	2018	11.11	0.11	0.021
Northern Parula	Forest	S4B	--	--	Impact	2018	2.22	0.02	0.000
Northern Waterthrush	Forest	S5B	--	--	Impact	2018	10.00	0.10	0.014
Northern Rough-winged Swallow	Wetland/Open Water	S4B	--	1	Impact	2018	1.11	0.02	0.007
Olive-sided Flycatcher	Forest	S4B	SC/THR	1	Impact	2018	3.33	0.03	0.004
Ovenbird	Forest	S4B	--	--	Impact	2018	67.78	1.10	0.202
Palm Warbler	Edge/Shrub/Successional	S5B	--	--	Impact	2018	2.22	0.02	0.004
Philadelphia Vireo	Forest	S5B	--	--	Impact	2018	4.44	0.04	0.014
Pine Siskin	Forest	S4B	--	--	Impact	2018	5.56	0.12	0.039
Pileated Woodpecker	Forest	S5	--	--	Impact	2018	12.22	0.12	0.000
Purple Finch	Forest	S4B	--	1	Impact	2018	4.44	0.04	0.011
Rose-breasted Grosbeak	Forest	S4B	--	1	Impact	2018	26.67	0.32	0.064
Red-breasted Nuthatch	Forest	S5	--	--	Impact	2018	23.33	0.24	0.060
Ruby-crowned Kinglet	Forest	S4B	--	1	Impact	2018	10.00	0.11	0.018
Red-eyed Vireo	Forest	S5B	--	--	Impact	2018	80.00	1.41	0.255
Rock Pigeon	Grassland/Open Country	SNA	--	--	Impact	2018	1.11	0.07	0.021
Red-tailed Hawk	Forest	S5	--	--	Impact	2018	7.78	0.09	0.004
Ruffed Grouse	Forest	S4	--	1	Impact	2018	20.00	0.20	0.032

Common Name	Guild	S. Rank	ESA/SARA Status	BCR.12. Status	Control or Impact	Year	Mean Occurrence	Mean Abundance	Mean Density
Red-winged Blackbird	Wetland/Open Water	S4	--	--	Impact	2018	23.33	0.30	0.057
Sandhill Crane	Wetland/Open Water	S5B	--	1	Impact	2018	18.89	0.34	0.039
Savannah Sparrow	Grassland/Open Country	S4B	--	--	Impact	2018	42.22	0.88	0.248
Sedge Wren	Grassland/Open Country	S4B	--	1	Impact	2018	27.78	0.48	0.124
Song Sparrow	Edge/Shrub/Successional	S5B	--	1	Impact	2018	53.33	0.87	0.209
Spotted Sandpiper	Wetland/Open Water	S5	--	1	Impact	2018	2.22	0.02	0.004
Sharp-shinned Hawk	Forest	S5	--	--	Impact	2018	1.11	0.01	0.000
Sharp-tailed Grouse	Grassland/Open Country	S4	--	--	Impact	2018	3.33	0.23	0.074
Swamp Sparrow	Wetland/Open Water	S5B	--	1	Impact	2018	12.22	0.18	0.032
Swainson's Thrush	Forest	S4B	--	--	Impact	2018	2.22	0.02	0.004
Tennessee Warbler	Forest	S5B	--	1	Impact	2018	11.11	0.12	0.035
Tree Swallow	Wetland/Open Water	S4B	--	1	Impact	2018	6.67	0.08	0.004
Trumpeter Swan	Wetland/Open Water	S4	--	--	Impact	2018	2.22	0.03	0.000
Turkey Vulture	Edge/Shrub/Successional	S5B	--	--	Impact	2018	1.11	0.01	0.000
Veery	Forest	S4B	--	1	Impact	2018	44.44	0.68	0.127
Virginia Rail	Wetland/Open Water	S5B	--	--	Impact	2018	1.11	0.01	0.000
Warbling Vireo	Edge/Shrub/Successional	S5B	--	--	Impact	2018	3.33	0.03	0.004
Western Meadowlark	Grassland/Open Country	S3B	--	--	Impact	2018	4.44	0.04	0.004
Wilson's Snipe	Wetland/Open Water	S5B	--	1	Impact	2018	7.78	0.10	0.004
Wilson's Warbler	Edge/Shrub/Successional	S4B	--	--	Impact	2018	1.11	0.01	0.004
Winter Wren	Forest	S5B	--	--	Impact	2018	7.78	0.08	0.011
Wood Thrush	Forest	S4B	SC/THR	1	Impact	2018	14.44	0.17	0.028
White-throated Sparrow	Forest	S5B	--	1	Impact	2018	54.44	0.99	0.223
Yellow-bellied Flycatcher	Forest	S5B	--	--	Impact	2018	14.44	0.19	0.050

Common Name	Guild	S. Rank	ESA/SARA Status	BCR.12. Status	Control or Impact	Year	Mean Occurrence	Mean Abundance	Mean Density
Yellow-bellied Sapsucker	Forest	S5B	--	1	Impact	2018	8.89	0.09	0.018
Yellow-rumped Warbler	Forest	S5B	--	--	Impact	2018	17.78	0.18	0.057
Yellow Warbler	Edge/Shrub/Successional	S5B	--	--	Impact	2018	13.33	0.18	0.032

Appendix B 2014 to 2018 Mean Occurrence, Mean Abundance and Mean Density for Bird Species – Data adopted from Wood (2018)

Year	Common Name	Station Type	Distribution	Abundance	Density
2016	Alder Flycatcher	Impact	16.90	0.17	0.039
2016	American Bittern	Impact	0.00	0.00	0.000
2016	American Crow	Impact	28.10	0.33	0.011
2016	American Goldfinch	Impact	14.60	0.19	0.050
2016	American Kestrel	Impact	2.20	0.02	0.004
2016	American Pipit	Impact	0.00	0.00	0.000
2016	American Redstart	Impact	4.50	0.04	0.011
2016	American Robin	Impact	49.40	0.69	0.163
2016	American Tree Sparrow	Impact	0.00	0.00	0.000
2016	American White Pelican	Impact	3.40	0.09	0.000
2016	American Woodcock	Impact	0.00	0.00	0.000
2016	Bald Eagle	Impact	0.00	0.00	0.000
2016	Baltimore Oriole	Impact	0.00	0.00	0.000
2016	Barn Swallow	Impact	7.90	0.33	0.000
2016	Barred Owl	Impact	0.00	0.00	0.000
2016	Bay-breasted Warbler	Impact	1.10	0.01	0.004
2016	Belted Kingfisher	Impact	0.00	0.00	0.000
2016	Black-and-white Warbler	Impact	41.60	0.48	0.134
2016	Black-backed Woodpecker	Impact	0.00	0.00	0.000
2016	Black-billed Cuckoo	Impact	4.50	0.04	0.000
2016	Black-billed Magpie	Impact	14.60	0.25	0.018
2016	Blackburnian Warbler	Impact	4.50	0.06	0.014
2016	Black-capped Chickadee	Impact	7.90	0.11	0.032
2016	Blackpoll Warbler	Impact	0.00	0.00	0.000
2016	Black-throated Blue Warbler	Impact	0.00	0.00	0.000
2016	Black-throated Green Warbler	Impact	13.50	0.13	0.039
2016	Blue Jay	Impact	53.90	0.91	0.099
2016	Blue-headed Vireo	Impact	0.00	0.00	0.000
2016	Bobolink	Impact	32.60	0.73	0.191
2016	Boreal Chickadee	Impact	0.00	0.00	0.000
2016	Brewer's Blackbird	Impact	2.20	0.03	0.011
2016	Broad-winged Hawk	Impact	3.40	0.03	0.004
2016	Brown Creeper	Impact	3.40	0.03	0.011
2016	Brown Thrasher	Impact	4.50	0.04	0.004
2016	Brown-headed Cowbird	Impact	2.20	0.02	0.007
2016	Canada Goose	Impact	11.20	0.30	0.000

Year	Common Name	Station Type	Distribution	Abundance	Density
2016	Canada Warbler	Impact	5.60	0.06	0.011
2016	Cape May Warbler	Impact	0.00	0.00	0.000
2016	Cedar Waxwing	Impact	15.70	0.43	0.103
2016	Chestnut-sided Warbler	Impact	48.30	0.69	0.184
2016	Chipping Sparrow	Impact	10.10	0.10	0.021
2016	Clay-colored Sparrow	Impact	30.30	0.51	0.117
2016	Cliff Swallow	Impact	0.00	0.00	0.000
2016	Common Goldeneye	Impact	0.00	0.00	0.000
2016	Common Grackle	Impact	2.20	0.02	0.007
2016	Common Loon	Impact	2.20	0.02	0.000
2016	Common Merganser	Impact	0.00	0.00	0.000
2016	Common Nighthawk	Impact	1.10	0.01	0.000
2016	Common Raven	Impact	24.70	0.29	0.018
2016	Common Tern	Impact	0.00	0.00	0.000
2016	Common Yellowthroat	Impact	60.70	0.85	0.173
2016	Connecticut Warbler	Impact	4.50	0.06	0.011
2016	Dark-eyed Junco	Impact	2.20	0.02	0.004
2016	Dickcissel	Impact	0.00	0.00	0.000
2016	Double-crested Cormorant	Impact	0.00	0.00	0.000
2016	Downy Woodpecker	Impact	1.10	0.01	0.004
2016	Eastern Bluebird	Impact	0.00	0.00	0.000
2016	Eastern Kingbird	Impact	2.20	0.02	0.007
2016	Eastern Phoebe	Impact	7.90	0.09	0.018
2016	Eastern Towhee	Impact	0.00	0.00	0.000
2016	Eastern Whip-poor-will	Impact	0.00	0.00	0.000
2016	Eastern Wood-Pewee	Impact	1.10	0.01	0.004
2016	European Starling	Impact	2.20	0.29	0.000
2016	Evening Grosbeak	Impact	0.00	0.00	0.000
2016	Golden-crowned Kinglet	Impact	0.00	0.00	0.000
2016	Golden-winged Warbler	Impact	9.00	0.11	0.032
2016	Gray Catbird	Impact	1.10	0.01	0.004
2016	Gray Jay	Impact	5.60	0.08	0.025
2016	Great Blue Heron	Impact	0.00	0.00	0.000
2016	Great Crested Flycatcher	Impact	5.60	0.06	0.011
2016	Great Gray Owl	Impact	0.00	0.00	0.000
2016	Green Heron	Impact	0.00	0.00	0.000
2016	Hairy Woodpecker	Impact	4.50	0.04	0.007
2016	Hermit Thrush	Impact	22.50	0.31	0.050
2016	Herring Gull	Impact	0.00	0.00	0.000
2016	Hooded Merganser	Impact	0.00	0.00	0.000
2016	House Wren	Impact	1.10	0.01	0.000

Year	Common Name	Station Type	Distribution	Abundance	Density
2016	Indigo Bunting	Impact	2.20	0.02	0.007
2016	Killdeer	Impact	4.50	0.06	0.007
2016	Least Flycatcher	Impact	24.70	0.33	0.064
2016	LeConte's Sparrow	Impact	30.30	0.60	0.170
2016	Lincoln's Sparrow	Impact	1.10	0.01	0.004
2016	Long-eared Owl	Impact	2.20	0.02	0.000
2016	Magnolia Warbler	Impact	12.40	0.12	0.035
2016	Mallard	Impact	3.40	0.04	0.004
2016	Marbled Godwit	Impact	0.00	0.00	0.000
2016	Marsh Wren	Impact	0.00	0.00	0.000
2016	Merlin	Impact	1.10	0.01	0.004
2016	Mourning Dove	Impact	0.00	0.00	0.000
2016	Mourning Warbler	Impact	12.40	0.15	0.039
2016	Nashville Warbler	Impact	70.80	1.42	0.371
2016	Northern Flicker	Impact	23.60	0.27	0.032
2016	Northern Harrier	Impact	4.50	0.04	0.004
2016	Northern Parula	Impact	2.20	0.02	0.004
2016	Northern Rough-winged Swallow	Impact	0.00	0.00	0.000
2016	Northern Waterthrush	Impact	5.60	0.07	0.007
2016	Olive-sided Flycatcher	Impact	0.00	0.00	0.000
2016	Orange-crowned Warbler	Impact	0.00	0.00	0.000
2016	Ovenbird	Impact	73.00	1.13	0.184
2016	Palm Warbler	Impact	1.10	0.01	0.004
2016	Philadelphia Vireo	Impact	0.00	0.00	0.000
2016	Pied-billed Grebe	Impact	0.00	0.00	0.000
2016	Pileated Woodpecker	Impact	2.20	0.02	0.004
2016	Pine Siskin	Impact	1.10	0.02	0.000
2016	Pine Warbler	Impact	0.00	0.00	0.000
2016	Purple Finch	Impact	0.00	0.00	0.000
2016	Red-breasted Nuthatch	Impact	1.10	0.16	0.035
2016	Red Crossbill	Impact	15.70	0.01	0.000
2016	Red-eyed Vireo	Impact	62.90	0.82	0.152
2016	Red-headed Woodpecker	Impact	2.20	0.02	0.007
2016	Red-shouldered Hawk	Impact	0.00	0.00	0.000
2016	Red-tailed Hawk	Impact	2.20	0.02	0.004
2016	Red-winged Blackbird	Impact	22.50	0.38	0.057
2016	Ring-billed Gull	Impact	2.20	0.02	0.000
2016	Ring-necked Duck	Impact	0.00	0.00	0.000
2016	Rock Pigeon	Impact	0.00	0.00	0.000
2016	Rose-breasted Grosbeak	Impact	27.00	0.27	0.032
2016	Ruby-crowned Kinglet	Impact	5.60	0.06	0.014

Year	Common Name	Station Type	Distribution	Abundance	Density
2016	Ruby-throated Hummingbird	Impact	2.20	0.02	0.007
2016	Ruffed Grouse	Impact	5.60	0.07	0.011
2016	Rusty Blackbird	Impact	0.00	0.00	0.000
2016	Sandhill Crane	Impact	19.10	0.26	0.007
2016	Savannah Sparrow	Impact	38.20	0.73	0.177
2016	Scarlet Tanager	Impact	3.40	0.06	0.007
2016	Sedge Wren	Impact	16.90	0.21	0.039
2016	Sharp-shinned Hawk	Impact	0.00	0.00	0.000
2016	Sharp-tailed Grouse	Impact	2.20	0.07	0.021
2016	Song Sparrow	Impact	40.40	0.63	0.131
2016	Sora	Impact	0.00	0.00	0.000
2016	Spotted Sandpiper	Impact	3.40	0.08	0.011
2016	Spruce Grouse	Impact	0.00		0.000
2016	Swainson's Thrush	Impact	0.00	0.00	0.000
2016	Swamp Sparrow	Impact	15.70	0.21	0.035
2016	Tennessee Warbler	Impact	2.20	0.03	0.011
2016	Tree Swallow	Impact	3.40	0.03	0.000
2016	Trumpeter Swan	Impact	3.40	0.13	0.000
2016	Turkey Vulture	Impact	4.50	0.08	0.007
2016	Veery	Impact	36.00	0.46	0.057
2016	Vesper Sparrow	Impact	0.00	0.00	0.000
2016	Virginia Rail	Impact	0.00	0.00	0.000
2016	Warbling Vireo	Impact	6.70	0.08	0.021
2016	Western Meadowlark	Impact	0.00	0.00	0.000
2016	White-breasted Nuthatch	Impact	0.00	0.00	0.000
2016	White-throated Sparrow	Impact	78.70	1.36	0.180
2016	White-winged Crossbill	Impact	0.00	0.00	0.000
2016	Wilson's Snipe	Impact	38.20	0.46	0.000
2016	Wilson's Warbler	Impact	0.00	0.00	0.011
2016	Winter Wren	Impact	10.10	0.11	0.014
2016	Wood Duck	Impact	0.00	0.00	0.000
2016	Wood Thrush	Impact	1.10	0.01	0.004
2016	Yellow Warbler	Impact	30.30	0.47	0.127
2016	Yellow-bellied Flycatcher	Impact	4.50	0.07	0.018
2016	Yellow-bellied Sapsucker	Impact	1.10	0.01	0.004
2016	Yellow-rumped Warbler	Impact	6.70	0.15	0.046
2016	Alder Flycatcher	Control	29.50	0.39	0.104
2016	American Bittern	Control	3.20	0.04	0.007
2016	American Crow	Control	21.10	0.25	0.007
2016	American Goldfinch	Control	12.60	0.16	0.017
2016	American Kestrel	Control	3.20	0.03	0.007

Year	Common Name	Station Type	Distribution	Abundance	Density
2016	American Pipit	Control	0.00	0.00	0.000
2016	American Redstart	Control	10.50	0.15	0.040
2016	American Robin	Control	41.10	0.49	0.104
2016	American Tree Sparrow	Control	0.00	0.00	0.000
2016	American White Pelican	Control	0.00	0.00	0.000
2016	American Woodcock	Control	0.00	0.00	0.000
2016	Bald Eagle	Control	1.10	0.01	0.000
2016	Baltimore Oriole	Control	0.00	0.00	0.000
2016	Barn Swallow	Control	2.10	0.06	0.000
2016	Barred Owl	Control	2.10	0.02	0.000
2016	Bay-breasted Warbler	Control	0.00	0.00	0.000
2016	Belted Kingfisher	Control	1.10	0.01	0.003
2016	Black-and-white Warbler	Control	54.70	0.64	0.178
2016	Black-backed Woodpecker	Control	0.00	0.00	0.000
2016	Black-billed Cuckoo	Control	8.40	0.09	0.010
2016	Black-billed Magpie	Control	0.00	0.00	0.000
2016	Blackburnian Warbler	Control	18.90	0.23	0.074
2016	Black-capped Chickadee	Control	17.90	0.26	0.077
2016	Blackpoll Warbler	Control	0.00	0.00	0.000
2016	Black-throated Blue Warbler	Control	0.00	0.00	0.000
2016	Black-throated Green Warbler	Control	26.30	0.35	0.077
2016	Blue Jay	Control	61.10	0.92	0.137
2016	Blue-headed Vireo	Control	2.10	0.03	0.010
2016	Bobolink	Control	10.50	0.21	0.044
2016	Boreal Chickadee	Control	0.00	0.00	0.000
2016	Brewer's Blackbird	Control	2.10	0.04	0.010
2016	Broad-winged Hawk	Control	0.00	0.00	0.000
2016	Brown Creeper	Control	4.20	0.04	0.013
2016	Brown Thrasher	Control	0.00	0.00	0.000
2016	Brown-headed Cowbird	Control	3.20	0.03	0.007
2016	Canada Goose	Control	11.60	0.14	0.000
2016	Canada Warbler	Control	5.30	0.06	0.017
2016	Cape May Warbler	Control	2.10	0.02	0.007
2016	Cedar Waxwing	Control	15.80	0.31	0.070
2016	Chestnut-sided Warbler	Control	47.40	0.80	0.241
2016	Chipping Sparrow	Control	8.40	0.11	0.017
2016	Clay-colored Sparrow	Control	7.40	0.16	0.047
2016	Cliff Swallow	Control	0.00	0.00	0.000
2016	Common Goldeneye	Control	0.00	0.00	0.000
2016	Common Grackle	Control	3.20	0.04	0.007
2016	Common Loon	Control	8.40	0.09	0.000

Year	Common Name	Station Type	Distribution	Abundance	Density
2016	Common Merganser	Control	0.00	0.00	0.000
2016	Common Nighthawk	Control	0.00	0.00	0.000
2016	Common Raven	Control	27.40	0.34	0.013
2016	Common Tern	Control	0.00	0.00	0.000
2016	Common Yellowthroat	Control	40.00	0.56	0.117
2016	Connecticut Warbler	Control	0.00	0.00	0.000
2016	Dark-eyed Junco	Control	1.10	0.01	0.003
2016	Dickcissel	Control	0.00	0.00	0.000
2016	Double-crested Cormorant	Control	0.00	0.00	0.000
2016	Downy Woodpecker	Control	9.50	0.11	0.034
2016	Eastern Bluebird	Control	0.00	0.00	0.000
2016	Eastern Kingbird	Control	3.20	0.03	0.003
2016	Eastern Phoebe	Control	11.60	0.12	0.027
2016	Eastern Towhee	Control	0.00	0.00	0.000
2016	Eastern Whip-poor-will	Control	0.00	0.00	0.000
2016	Eastern Wood-Pewee	Control	1.10	0.01	0.000
2016	European Starling	Control	2.10	0.07	0.003
2016	Evening Grosbeak	Control	0.00	0.00	0.000
2016	Golden-crowned Kinglet	Control	11.60	0.24	0.077
2016	Golden-winged Warbler	Control	8.40	0.12	0.030
2016	Gray Catbird	Control	2.10	0.02	0.007
2016	Gray Jay	Control	8.40	0.14	0.034
2016	Great Blue Heron	Control	1.10	0.01	0.000
2016	Great Crested Flycatcher	Control	1.10	0.02	0.003
2016	Great Gray Owl	Control	0.00	0.00	0.000
2016	Green Heron	Control	0.00	0.00	0.000
2016	Hairy Woodpecker	Control	4.20	0.04	0.007
2016	Hermit Thrush	Control	51.60	0.73	0.101
2016	Herring Gull	Control	0.00	0.00	0.000
2016	Hooded Merganser	Control	0.00	0.00	0.000
2016	House Wren	Control	2.10	0.02	0.003
2016	Indigo Bunting	Control	1.10	0.01	0.003
2016	Killdeer	Control	1.10	0.01	0.000
2016	Least Flycatcher	Control	22.10	0.28	0.067
2016	LeConte's Sparrow	Control	8.40	0.13	0.040
2016	Lincoln's Sparrow	Control	7.40	0.12	0.037
2016	Long-eared Owl	Control	0.00	0.00	0.000
2016	Magnolia Warbler	Control	23.20	0.32	0.094
2016	Mallard	Control	1.10	0.01	0.000
2016	Marbled Godwit	Control	0.00	0.00	0.000
2016	Marsh Wren	Control	0.00	0.00	0.000

Year	Common Name	Station Type	Distribution	Abundance	Density
2016	Merlin	Control	1.10	0.01	0.000
2016	Mourning Dove	Control	2.10	0.02	0.000
2016	Mourning Warbler	Control	11.60	0.17	0.030
2016	Nashville Warbler	Control	83.20	1.48	0.422
2016	Northern Flicker	Control	20.00	0.23	0.027
2016	Northern Harrier	Control	1.10	0.02	0.000
2016	Northern Parula	Control	15.80	0.23	0.064
2016	Northern Rough-winged Swallow	Control	0.00	0.00	0.000
2016	Northern Waterthrush	Control	4.20	0.05	0.010
2016	Olive-sided Flycatcher	Control	2.10	0.02	0.003
2016	Orange-crowned Warbler	Control	0.00	0.00	0.000
2016	Ovenbird	Control	76.80	1.32	0.278
2016	Palm Warbler	Control	6.30	0.08	0.027
2016	Philadelphia Vireo	Control	0.00	0.00	0.000
2016	Pied-billed Grebe	Control	0.00	0.00	0.000
2016	Pileated Woodpecker	Control	5.30	0.05	0.007
2016	Pine Siskin	Control	3.20	0.08	0.017
2016	Pine Warbler	Control	0.00	0.00	0.000
2016	Purple Finch	Control	0.00	0.00	0.000
2016	Red-breasted Nuthatch	Control	0.00	0.29	0.070
2016	Red Crossbill	Control	25.30	0.00	0.000
2016	Red-eyed Vireo	Control	76.80	1.11	0.261
2016	Red-headed Woodpecker	Control	0.00	0.00	0.000
2016	Red-shouldered Hawk	Control	0.00	0.00	0.000
2016	Red-tailed Hawk	Control	2.10	0.02	0.003
2016	Red-winged Blackbird	Control	15.80	0.18	0.020
2016	Ring-billed Gull	Control	0.00	0.00	0.000
2016	Ring-necked Duck	Control	0.00	0.00	0.000
2016	Rock Pigeon	Control	0.00	0.00	0.000
2016	Rose-breasted Grosbeak	Control	32.60	0.40	0.084
2016	Ruby-crowned Kinglet	Control	12.60	0.14	0.027
2016	Ruby-throated Hummingbird	Control	2.10	0.02	0.007
2016	Ruffed Grouse	Control	32.60	0.36	0.044
2016	Rusty Blackbird	Control	0.00	0.00	0.000
2016	Sandhill Crane	Control	20.00	0.31	0.000
2016	Savannah Sparrow	Control	8.40	0.12	0.027
2016	Scarlet Tanager	Control	3.20	0.04	0.013
2016	Sedge Wren	Control	7.40	0.11	0.027
2016	Sharp-shinned Hawk	Control	0.00	0.00	0.000
2016	Sharp-tailed Grouse	Control	0.00	0.00	0.000
2016	Song Sparrow	Control	24.20	0.40	0.087

Year	Common Name	Station Type	Distribution	Abundance	Density
2016	Sora	Control	2.10	0.02	0.000
2016	Spotted Sandpiper	Control	0.00	0.00	0.000
2016	Spruce Grouse	Control	0.00		0.000
2016	Swainson's Thrush	Control	1.10	0.01	0.000
2016	Swamp Sparrow	Control	13.70	0.19	0.037
2016	Tennessee Warbler	Control	6.30	0.14	0.023
2016	Tree Swallow	Control	4.20	0.04	0.000
2016	Trumpeter Swan	Control	4.20	0.05	0.007
2016	Turkey Vulture	Control	2.10	0.02	0.000
2016	Veery	Control	43.20	0.56	0.107
2016	Vesper Sparrow	Control	0.00	0.00	0.000
2016	Virginia Rail	Control	0.00	0.00	0.000
2016	Warbling Vireo	Control	0.00	0.00	0.000
2016	Western Meadowlark	Control	0.00	0.00	0.000
2016	White-breasted Nuthatch	Control	1.10	0.01	0.003
2016	White-throated Sparrow	Control	80.00	1.66	0.308
2016	White-winged Crossbill	Control	1.10	0.01	0.000
2016	Wilson's Snipe	Control	24.20	0.27	0.030
2016	Wilson's Warbler	Control	0.00	0.00	0.000
2016	Winter Wren	Control	16.80	0.17	0.034
2016	Wood Duck	Control	1.10	0.01	0.003
2016	Wood Thrush	Control	21.10	0.24	0.020
2016	Yellow Warbler	Control	9.50	0.13	0.027
2016	Yellow-bellied Flycatcher	Control	6.30	0.12	0.034
2016	Yellow-bellied Sapsucker	Control	11.60	0.13	0.017
2016	Yellow-rumped Warbler	Control	21.10	0.27	0.080
2015	Alder Flycatcher	Impact	44.40	0.65	0.172
2015	American Bittern	Impact	1.60	0.02	0.000
2015	American Crow	Impact	33.30	0.43	0.040
2015	American Goldfinch	Impact	22.20	0.35	0.101
2015	American Kestrel	Impact	3.20	0.03	0.010
2015	American Pipit	Impact	0.00	0.00	0.000
2015	American Redstart	Impact	9.50	0.13	0.040
2015	American Robin	Impact	55.60	0.78	0.192
2015	American Tree Sparrow	Impact	0.00	0.00	0.000
2015	American White Pelican	Impact	4.80	0.06	0.000
2015	American Woodcock	Impact	0.00	0.00	0.000
2015	Bald Eagle	Impact	3.20	0.03	0.005
2015	Baltimore Oriole	Impact	3.20	0.03	0.005
2015	Barn Swallow	Impact	12.70	0.40	0.025
2015	Barred Owl	Impact	0.00	0.00	0.000

Year	Common Name	Station Type	Distribution	Abundance	Density
2015	Bay-breasted Warbler	Impact	0.00	0.00	0.000
2015	Belted Kingfisher	Impact	0.00	0.00	0.000
2015	Black-and-white Warbler	Impact	38.10	0.38	0.106
2015	Black-backed Woodpecker	Impact	0.00	0.00	0.000
2015	Black-billed Cuckoo	Impact	19.00	0.21	0.020
2015	Black-billed Magpie	Impact	22.20	0.40	0.081
2015	Blackburnian Warbler	Impact	3.20	0.03	0.005
2015	Black-capped Chickadee	Impact	4.80	0.06	0.020
2015	Blackpoll Warbler	Impact	0.00	0.00	0.000
2015	Black-throated Blue Warbler	Impact	0.00	0.00	0.000
2015	Black-throated Green Warbler	Impact	3.20	0.03	0.010
2015	Blue Jay	Impact	50.80	0.70	0.141
2015	Blue-headed Vireo	Impact	14.30	0.14	0.040
2015	Bobolink	Impact	49.20	1.05	0.217
2015	Boreal Chickadee	Impact	0.00	0.00	0.000
2015	Brewer's Blackbird	Impact	0.00	0.00	0.000
2015	Broad-winged Hawk	Impact	3.20	0.03	0.010
2015	Brown Creeper	Impact	0.00	0.00	0.000
2015	Brown Thrasher	Impact	0.00	0.00	0.000
2015	Brown-headed Cowbird	Impact	9.50	0.14	0.025
2015	Canada Goose	Impact	12.70	3.44	0.000
2015	Canada Warbler	Impact	0.00	0.00	0.000
2015	Cape May Warbler	Impact	0.00	0.00	0.000
2015	Cedar Waxwing	Impact	14.30	0.27	0.051
2015	Chestnut-sided Warbler	Impact	11.10	0.14	0.035
2015	Chipping Sparrow	Impact	6.30	0.06	0.010
2015	Clay-colored Sparrow	Impact	47.60	0.76	0.222
2015	Cliff Swallow	Impact	1.60	0.05	0.000
2015	Common Goldeneye	Impact	0.00	0.00	0.000
2015	Common Grackle	Impact	3.20	0.03	0.010
2015	Common Loon	Impact	0.00	0.00	0.000
2015	Common Merganser	Impact	0.00	0.00	0.000
2015	Common Nighthawk	Impact	1.60	0.02	0.005
2015	Common Raven	Impact	12.70	0.13	0.010
2015	Common Tern	Impact	0.00	0.00	0.000
2015	Common Yellowthroat	Impact	55.60	1.10	0.278
2015	Connecticut Warbler	Impact	0.00	0.00	0.000
2015	Dark-eyed Junco	Impact	4.80	0.05	0.005
2015	Dickcissel	Impact	0.00	0.00	0.000
2015	Double-crested Cormorant	Impact	0.00	0.00	0.000
2015	Downy Woodpecker	Impact	1.60	0.02	0.005

Year	Common Name	Station Type	Distribution	Abundance	Density
2015	Eastern Bluebird	Impact	0.00	0.00	0.000
2015	Eastern Kingbird	Impact	14.30	0.17	0.045
2015	Eastern Phoebe	Impact	6.30	0.06	0.010
2015	Eastern Towhee	Impact	0.00	0.00	0.000
2015	Eastern Whip-poor-will	Impact	1.60	0.02	0.000
2015	Eastern Wood-Pewee	Impact	4.80	0.05	0.005
2015	European Starling	Impact	1.60	0.24	0.000
2015	Evening Grosbeak	Impact	0.00	0.00	0.000
2015	Golden-crowned Kinglet	Impact	0.00	0.00	0.000
2015	Golden-winged Warbler	Impact	9.50	0.16	0.040
2015	Gray Catbird	Impact	3.20	0.03	0.010
2015	Gray Jay	Impact	0.00	0.00	0.000
2015	Great Blue Heron	Impact	0.00	0.00	0.000
2015	Great Crested Flycatcher	Impact	1.60	0.03	0.000
2015	Great Gray Owl	Impact	0.00	0.00	0.000
2015	Green Heron	Impact	1.60	0.02	0.000
2015	Hairy Woodpecker	Impact	7.90	0.10	0.015
2015	Hermit Thrush	Impact	23.80	0.25	0.020
2015	Herring Gull	Impact	0.00	0.00	0.000
2015	Hooded Merganser	Impact	0.00	0.00	0.000
2015	House Wren	Impact	6.30	0.08	0.015
2015	Indigo Bunting	Impact	1.60	0.03	0.010
2015	Killdeer	Impact	7.90	0.08	0.010
2015	Least Flycatcher	Impact	28.60	0.51	0.116
2015	LeConte's Sparrow	Impact	34.90	0.46	0.147
2015	Lincoln's Sparrow	Impact	3.20	0.03	0.005
2015	Long-eared Owl	Impact	0.00	0.00	0.000
2015	Magnolia Warbler	Impact	20.60	0.21	0.045
2015	Mallard	Impact	0.00	0.00	0.000
2015	Marbled Godwit	Impact	0.00	0.00	0.000
2015	Marsh Wren	Impact	1.60	0.02	0.005
2015	Merlin	Impact	0.00	0.00	0.000
2015	Mourning Dove	Impact	3.20	0.03	0.010
2015	Mourning Warbler	Impact	3.20	0.03	0.010
2015	Nashville Warbler	Impact	69.80	1.00	0.243
2015	Northern Flicker	Impact	22.20	0.29	0.045
2015	Northern Harrier	Impact	0.00	0.00	0.000
2015	Northern Parula	Impact	1.60	0.02	0.005
2015	Northern Rough-winged Swallow	Impact	0.00	0.00	0.000
2015	Northern Waterthrush	Impact	3.20	0.03	0.010
2015	Olive-sided Flycatcher	Impact	1.60	0.02	0.000

Year	Common Name	Station Type	Distribution	Abundance	Density
2015	Orange-crowned Warbler	Impact	0.00	0.00	0.000
2015	Ovenbird	Impact	74.60	1.29	0.177
2015	Palm Warbler	Impact	0.00	0.00	0.000
2015	Philadelphia Vireo	Impact	0.00	0.00	0.000
2015	Pied-billed Grebe	Impact	0.00	0.00	0.000
2015	Pileated Woodpecker	Impact	9.50	0.10	0.005
2015	Pine Siskin	Impact	0.00	0.00	0.000
2015	Pine Warbler	Impact	0.00	0.00	0.000
2015	Purple Finch	Impact	1.60	0.02	0.005
2015	Red-breasted Nuthatch	Impact	0.00	0.13	0.015
2015	Red Crossbill	Impact	12.70	0.00	0.000
2015	Red-eyed Vireo	Impact	77.80	1.27	0.263
2015	Red-headed Woodpecker	Impact	0.00	0.00	0.000
2015	Red-shouldered Hawk	Impact	0.00	0.00	0.000
2015	Red-tailed Hawk	Impact	3.20	0.03	0.005
2015	Red-winged Blackbird	Impact	23.80	0.54	0.086
2015	Ring-billed Gull	Impact	0.00	0.00	0.000
2015	Ring-necked Duck	Impact	0.00	0.00	0.000
2015	Rock Pigeon	Impact	0.00	0.00	0.000
2015	Rose-breasted Grosbeak	Impact	14.30	0.19	0.051
2015	Ruby-crowned Kinglet	Impact	15.90	0.19	0.015
2015	Ruby-throated Hummingbird	Impact	4.80	0.05	0.010
2015	Ruffed Grouse	Impact	6.30	0.08	0.005
2015	Rusty Blackbird	Impact	1.60	0.06	0.000
2015	Sandhill Crane	Impact	23.80	0.41	0.061
2015	Savannah Sparrow	Impact	38.10	0.68	0.192
2015	Scarlet Tanager	Impact	0.00	0.00	0.000
2015	Sedge Wren	Impact	31.70	0.67	0.202
2015	Sharp-shinned Hawk	Impact	0.00	0.00	0.000
2015	Sharp-tailed Grouse	Impact	11.10	0.14	0.030
2015	Song Sparrow	Impact	66.70	1.05	0.253
2015	Sora	Impact	1.60	0.02	0.000
2015	Spotted Sandpiper	Impact	0.00	0.00	0.000
2015	Spruce Grouse	Impact	0.00		0.000
2015	Swainson's Thrush	Impact	0.00	0.00	0.000
2015	Swamp Sparrow	Impact	14.30	0.22	0.061
2015	Tennessee Warbler	Impact	11.10	0.11	0.030
2015	Tree Swallow	Impact	0.00	0.00	0.000
2015	Trumpeter Swan	Impact	1.60	0.02	0.000
2015	Turkey Vulture	Impact	1.60	0.02	0.000
2015	Veery	Impact	47.60	0.70	0.086

Year	Common Name	Station Type	Distribution	Abundance	Density
2015	Vesper Sparrow	Impact	0.00	0.00	0.000
2015	Virginia Rail	Impact	1.60	0.02	0.005
2015	Warbling Vireo	Impact	0.00	0.00	0.000
2015	Western Meadowlark	Impact	1.60	0.02	0.000
2015	White-breasted Nuthatch	Impact	0.00	0.00	0.000
2015	White-throated Sparrow	Impact	74.60	1.27	0.136
2015	White-winged Crossbill	Impact	0.00	0.00	0.000
2015	Wilson's Snipe	Impact	47.60	0.65	0.096
2015	Wilson's Warbler	Impact	1.60	0.03	0.000
2015	Winter Wren	Impact	1.60	0.02	0.005
2015	Wood Duck	Impact	0.00	0.00	0.000
2015	Wood Thrush	Impact	0.00	0.00	0.000
2015	Yellow Warbler	Impact	23.80	0.30	0.076
2015	Yellow-bellied Flycatcher	Impact	6.30	0.06	0.015
2015	Yellow-bellied Sapsucker	Impact	11.10	0.13	0.020
2015	Yellow-rumped Warbler	Impact	20.60	0.24	0.045
2015	Alder Flycatcher	Control	22.40	0.38	0.090
2015	American Bittern	Control	2.40	0.02	0.000
2015	American Crow	Control	15.30	0.26	0.037
2015	American Goldfinch	Control	23.50	0.36	0.101
2015	American Kestrel	Control	0.00	0.00	0.000
2015	American Pipit	Control	0.00	0.00	0.000
2015	American Redstart	Control	9.40	0.09	0.030
2015	American Robin	Control	41.20	0.53	0.120
2015	American Tree Sparrow	Control	0.00	0.00	0.000
2015	American White Pelican	Control	0.00	0.00	0.000
2015	American Woodcock	Control	0.00	0.00	0.000
2015	Bald Eagle	Control	1.20	0.01	0.004
2015	Baltimore Oriole	Control	2.40	0.02	0.004
2015	Barn Swallow	Control	1.20	0.05	0.000
2015	Barred Owl	Control	0.00	0.00	0.000
2015	Bay-breasted Warbler	Control	0.00	0.00	0.000
2015	Belted Kingfisher	Control	3.50	0.04	0.004
2015	Black-and-white Warbler	Control	29.40	0.36	0.101
2015	Black-backed Woodpecker	Control	1.20	0.01	0.004
2015	Black-billed Cuckoo	Control	7.10	0.12	0.004
2015	Black-billed Magpie	Control	2.40	0.02	0.007
2015	Blackburnian Warbler	Control	11.80	0.12	0.037
2015	Black-capped Chickadee	Control	12.90	0.16	0.045
2015	Blackpoll Warbler	Control	4.70	0.05	0.015
2015	Black-throated Blue Warbler	Control	0.00	0.00	0.000

Year	Common Name	Station Type	Distribution	Abundance	Density
2015	Black-throated Green Warbler	Control	21.20	0.22	0.060
2015	Blue Jay	Control	44.70	0.52	0.094
2015	Blue-headed Vireo	Control	9.40	0.09	0.026
2015	Bobolink	Control	10.60	0.26	0.034
2015	Boreal Chickadee	Control	0.00	0.00	0.000
2015	Brewer's Blackbird	Control	0.00	0.00	0.000
2015	Broad-winged Hawk	Control	4.70	0.06	0.007
2015	Brown Creeper	Control	0.00	0.00	0.000
2015	Brown Thrasher	Control	0.00	0.00	0.000
2015	Brown-headed Cowbird	Control	1.20	0.01	0.004
2015	Canada Goose	Control	5.90	0.16	0.015
2015	Canada Warbler	Control	3.50	0.05	0.015
2015	Cape May Warbler	Control	1.20	0.01	0.004
2015	Cedar Waxwing	Control	22.40	0.27	0.056
2015	Chestnut-sided Warbler	Control	30.60	0.42	0.120
2015	Chipping Sparrow	Control	3.50	0.04	0.004
2015	Clay-colored Sparrow	Control	10.60	0.15	0.030
2015	Cliff Swallow	Control	0.00	0.00	0.000
2015	Common Goldeneye	Control	0.00	0.00	0.000
2015	Common Grackle	Control	3.50	0.08	0.022
2015	Common Loon	Control	4.70	0.07	0.011
2015	Common Merganser	Control	0.00	0.00	0.000
2015	Common Nighthawk	Control	0.00	0.00	0.000
2015	Common Raven	Control	23.50	0.31	0.049
2015	Common Tern	Control	0.00	0.00	0.000
2015	Common Yellowthroat	Control	43.50	0.61	0.146
2015	Connecticut Warbler	Control	5.90	0.09	0.026
2015	Dark-eyed Junco	Control	8.20	0.09	0.022
2015	Dickcissel	Control	0.00	0.00	0.000
2015	Double-crested Cormorant	Control	0.00	0.00	0.000
2015	Downy Woodpecker	Control	3.50	0.04	0.011
2015	Eastern Bluebird	Control	0.00	0.00	0.000
2015	Eastern Kingbird	Control	7.10	0.08	0.015
2015	Eastern Phoebe	Control	10.60	0.11	0.019
2015	Eastern Towhee	Control	2.40	0.02	0.004
2015	Eastern Whip-poor-will	Control	1.20	0.01	0.000
2015	Eastern Wood-Pewee	Control	14.10	0.16	0.037
2015	European Starling	Control	5.90	0.44	0.026
2015	Evening Grosbeak	Control	0.00	0.00	0.000
2015	Golden-crowned Kinglet	Control	8.20	0.12	0.037
2015	Golden-winged Warbler	Control	10.60	0.12	0.037

Year	Common Name	Station Type	Distribution	Abundance	Density
2015	Gray Catbird	Control	0.00	0.00	0.000
2015	Gray Jay	Control	8.20	0.09	0.030
2015	Great Blue Heron	Control	0.00	0.00	0.000
2015	Great Crested Flycatcher	Control	2.40	0.02	0.007
2015	Great Gray Owl	Control	0.00	0.00	0.000
2015	Green Heron	Control	0.00	0.00	0.000
2015	Hairy Woodpecker	Control	1.20	0.02	0.007
2015	Hermit Thrush	Control	43.50	0.60	0.097
2015	Herring Gull	Control	0.00	0.00	0.000
2015	Hooded Merganser	Control	0.00	0.00	0.000
2015	House Wren	Control	2.40	0.02	0.004
2015	Indigo Bunting	Control	0.00	0.00	0.000
2015	Killdeer	Control	1.20	0.01	0.000
2015	Least Flycatcher	Control	25.90	0.32	0.097
2015	LeConte's Sparrow	Control	3.50	0.04	0.011
2015	Lincoln's Sparrow	Control	10.60	0.13	0.030
2015	Long-eared Owl	Control	1.20	0.01	0.000
2015	Magnolia Warbler	Control	23.50	0.27	0.071
2015	Mallard	Control	0.00	0.00	0.000
2015	Marbled Godwit	Control	0.00	0.00	0.000
2015	Marsh Wren	Control	1.20	0.04	0.011
2015	Merlin	Control	0.00	0.00	0.000
2015	Mourning Dove	Control	0.00	0.00	0.000
2015	Mourning Warbler	Control	12.90	0.13	0.022
2015	Nashville Warbler	Control	75.30	1.32	0.352
2015	Northern Flicker	Control	24.70	0.29	0.034
2015	Northern Harrier	Control	1.20	0.01	0.000
2015	Northern Parula	Control	15.30	0.20	0.041
2015	Northern Rough-winged Swallow	Control	0.00	0.00	0.000
2015	Northern Waterthrush	Control	2.40	0.02	0.004
2015	Olive-sided Flycatcher	Control	0.00	0.00	0.000
2015	Orange-crowned Warbler	Control	1.20	0.01	0.004
2015	Ovenbird	Control	72.90	1.38	0.292
2015	Palm Warbler	Control	17.60	0.27	0.071
2015	Philadelphia Vireo	Control	2.40	0.04	0.011
2015	Pied-billed Grebe	Control	0.00	0.00	0.000
2015	Pileated Woodpecker	Control	8.20	0.08	0.015
2015	Pine Siskin	Control	0.00	0.00	0.000
2015	Pine Warbler	Control	2.40	0.02	0.004
2015	Purple Finch	Control	2.40	0.02	0.007
2015	Red-breasted Nuthatch	Control	0.00	0.27	0.071

Year	Common Name	Station Type	Distribution	Abundance	Density
2015	Red Crossbill	Control	23.50	0.00	0.000
2015	Red-eyed Vireo	Control	76.50	1.28	0.333
2015	Red-headed Woodpecker	Control	0.00	0.00	0.000
2015	Red-shouldered Hawk	Control	2.40	0.02	0.007
2015	Red-tailed Hawk	Control	3.50	0.06	0.000
2015	Red-winged Blackbird	Control	10.60	0.20	0.034
2015	Ring-billed Gull	Control	0.00	0.00	0.000
2015	Ring-necked Duck	Control	1.20	0.01	0.000
2015	Rock Pigeon	Control	0.00	0.00	0.000
2015	Rose-breasted Grosbeak	Control	25.90	0.31	0.060
2015	Ruby-crowned Kinglet	Control	9.40	0.11	0.030
2015	Ruby-throated Hummingbird	Control	1.20	0.01	0.004
2015	Ruffed Grouse	Control	14.10	0.19	0.034
2015	Rusty Blackbird	Control	0.00	0.00	0.000
2015	Sandhill Crane	Control	11.80	0.15	0.000
2015	Savannah Sparrow	Control	5.90	0.11	0.030
2015	Scarlet Tanager	Control	2.40	0.02	0.004
2015	Sedge Wren	Control	7.10	0.09	0.026
2015	Sharp-shinned Hawk	Control	0.00	0.00	0.000
2015	Sharp-tailed Grouse	Control	0.00	0.00	0.000
2015	Song Sparrow	Control	34.10	0.64	0.161
2015	Sora	Control	1.20	0.01	0.004
2015	Spotted Sandpiper	Control	0.00	0.00	0.000
2015	Spruce Grouse	Control	0.00	0.00	0.000
2015	Swainson's Thrush	Control	7.10	0.07	0.015
2015	Swamp Sparrow	Control	20.00	0.26	0.064
2015	Tennessee Warbler	Control	7.10	0.09	0.026
2015	Tree Swallow	Control	0.00	0.00	0.000
2015	Trumpeter Swan	Control	0.00	0.00	0.000
2015	Turkey Vulture	Control	3.50	0.04	0.004
2015	Veery	Control	37.60	0.54	0.097
2015	Vesper Sparrow	Control	0.00	0.00	0.000
2015	Virginia Rail	Control	0.00	0.00	0.000
2015	Warbling Vireo	Control	1.20	0.01	0.000
2015	Western Meadowlark	Control	0.00	0.00	0.000
2015	White-breasted Nuthatch	Control	1.20	0.01	0.004
2015	White-throated Sparrow	Control	71.80	1.24	0.172
2015	White-winged Crossbill	Control	0.00	0.00	0.000
2015	Wilson's Snipe	Control	17.60	0.21	0.026
2015	Wilson's Warbler	Control	0.00	0.00	0.000
2015	Winter Wren	Control	16.50	0.16	0.022

Year	Common Name	Station Type	Distribution	Abundance	Density
2015	Wood Duck	Control	0.00	0.00	0.000
2015	Wood Thrush	Control	7.10	0.08	0.019
2015	Yellow Warbler	Control	21.20	0.28	0.079
2015	Yellow-bellied Flycatcher	Control	16.50	0.20	0.064
2015	Yellow-bellied Sapsucker	Control	20.00	0.22	0.041
2015	Yellow-rumped Warbler	Control	24.70	0.27	0.079
2014	Alder Flycatcher	Impact	34.40	0.41	0.053
2014	American Bittern	Impact	3.10	0.03	0.000
2014	American Crow	Impact	18.80	0.19	0.003
2014	American Goldfinch	Impact	31.30	0.47	0.030
2014	American Kestrel	Impact	0.00	0.00	0.000
2014	American Pipit	Impact	0.00	0.00	0.000
2014	American Redstart	Impact	25.00	0.34	0.042
2014	American Robin	Impact	37.50	0.50	0.058
2014	American Tree Sparrow	Impact	0.00	0.00	0.000
2014	American White Pelican	Impact	0.00	0.00	0.019
2014	American Woodcock	Impact	0.00	0.00	0.000
2014	Bald Eagle	Impact	0.00	0.00	0.000
2014	Baltimore Oriole	Impact	0.00	0.00	0.000
2014	Barn Swallow	Impact	0.00	0.00	0.000
2014	Barred Owl	Impact	0.00	0.00	0.000
2014	Bay-breasted Warbler	Impact	0.00	0.00	0.000
2014	Belted Kingfisher	Impact	3.10	0.03	0.003
2014	Black-and-white Warbler	Impact	31.30	0.41	0.080
2014	Black-backed Woodpecker	Impact	0.00	0.00	0.000
2014	Black-billed Cuckoo	Impact	53.10	0.69	0.022
2014	Black-billed Magpie	Impact	6.30	0.06	0.003
2014	Blackburnian Warbler	Impact	0.00	0.00	0.006
2014	Black-capped Chickadee	Impact	3.10	0.03	0.008
2014	Blackpoll Warbler	Impact	0.00	0.00	0.000
2014	Black-throated Blue Warbler	Impact	0.00	0.00	0.000
2014	Black-throated Green Warbler	Impact	12.50	0.13	0.028
2014	Blue Jay	Impact	37.50	0.50	0.061
2014	Blue-headed Vireo	Impact	3.10	0.03	0.008
2014	Bobolink	Impact	21.90	0.53	0.028
2014	Boreal Chickadee	Impact	0.00	0.00	0.003
2014	Brewer's Blackbird	Impact	6.30	0.19	0.014
2014	Broad-winged Hawk	Impact	0.00	0.00	0.011
2014	Brown Creeper	Impact	6.30	0.06	0.006
2014	Brown Thrasher	Impact	0.00	0.00	0.000
2014	Brown-headed Cowbird	Impact	25.00	0.38	0.022

Year	Common Name	Station Type	Distribution	Abundance	Density
2014	Canada Goose	Impact	0.00	0.00	0.003
2014	Canada Warbler	Impact	3.10	0.03	0.014
2014	Cape May Warbler	Impact	0.00	0.00	0.000
2014	Cedar Waxwing	Impact	25.00	0.41	0.042
2014	Chestnut-sided Warbler	Impact	50.00	0.78	0.116
2014	Chipping Sparrow	Impact	15.60	0.16	0.019
2014	Clay-colored Sparrow	Impact	25.00	0.50	0.025
2014	Cliff Swallow	Impact	0.00	0.00	0.000
2014	Common Goldeneye	Impact	0.00	0.00	0.000
2014	Common Grackle	Impact	0.00	0.00	0.000
2014	Common Loon	Impact	0.00	0.00	0.000
2014	Common Merganser	Impact	0.00	0.00	0.000
2014	Common Nighthawk	Impact	0.00	0.00	0.000
2014	Common Raven	Impact	21.90	0.28	0.000
2014	Common Tern	Impact	0.00	0.00	0.000
2014	Common Yellowthroat	Impact	62.50	1.06	0.089
2014	Connecticut Warbler	Impact	3.10	0.06	0.011
2014	Dark-eyed Junco	Impact	0.00	0.00	0.008
2014	Dickcissel	Impact	0.00	0.00	0.000
2014	Double-crested Cormorant	Impact	0.00	0.00	0.000
2014	Downy Woodpecker	Impact	6.30	0.06	0.006
2014	Eastern Bluebird	Impact	0.00	0.00	0.000
2014	Eastern Kingbird	Impact	3.10	0.06	0.008
2014	Eastern Phoebe	Impact	3.10	0.03	0.000
2014	Eastern Towhee	Impact	0.00	0.00	0.000
2014	Eastern Whip-poor-will	Impact	0.00	0.00	0.000
2014	Eastern Wood-Pewee	Impact	9.40	0.09	0.006
2014	European Starling	Impact	0.00	0.00	0.000
2014	Evening Grosbeak	Impact	0.00	0.00	0.000
2014	Golden-crowned Kinglet	Impact	0.00	0.00	0.008
2014	Golden-winged Warbler	Impact	9.40	0.09	0.006
2014	Gray Catbird	Impact	6.30	0.06	0.006
2014	Gray Jay	Impact	3.10	0.03	0.011
2014	Great Blue Heron	Impact	3.10	0.03	0.000
2014	Great Crested Flycatcher	Impact	9.40	0.09	0.008
2014	Great Gray Owl	Impact	0.00	0.00	0.000
2014	Green Heron	Impact	0.00	0.00	0.000
2014	Hairy Woodpecker	Impact	6.30	0.06	0.011
2014	Hermit Thrush	Impact	37.50	0.50	0.080
2014	Herring Gull	Impact	0.00	0.00	0.000
2014	Hooded Merganser	Impact	0.00	0.00	0.000

Year	Common Name	Station Type	Distribution	Abundance	Density
2014	House Wren	Impact	3.10	0.03	0.003
2014	Indigo Bunting	Impact	9.40	0.09	0.006
2014	Killdeer	Impact	0.00	0.00	0.000
2014	Least Flycatcher	Impact	28.10	0.34	0.039
2014	LeConte's Sparrow	Impact	9.40	0.13	0.006
2014	Lincoln's Sparrow	Impact	0.00		0.000
2014	Long-eared Owl	Impact	0.00	0.00	0.000
2014	Magnolia Warbler	Impact	6.30	0.06	0.017
2014	Mallard	Impact	0.00	0.00	0.000
2014	Marbled Godwit	Impact	0.00	0.00	0.000
2014	Marsh Wren	Impact	0.00	0.00	0.000
2014	Merlin	Impact	0.00	0.00	0.000
2014	Mourning Dove	Impact	0.00	0.00	0.000
2014	Mourning Warbler	Impact	25.00	0.31	0.072
2014	Nashville Warbler	Impact	68.80	1.31	0.208
2014	Northern Flicker	Impact	12.50	0.22	0.033
2014	Northern Harrier	Impact	0.00	0.00	0.000
2014	Northern Parula	Impact	6.30	0.09	0.008
2014	Northern Rough-winged Swallow	Impact	0.00	0.00	0.000
2014	Northern Waterthrush	Impact	0.00	0.00	0.000
2014	Olive-sided Flycatcher	Impact	0.00	0.00	0.000
2014	Orange-crowned Warbler	Impact	0.00	0.00	0.000
2014	Ovenbird	Impact	68.80	1.31	0.138
2014	Palm Warbler	Impact	0.00	0.00	0.008
2014	Philadelphia Vireo	Impact	6.30	0.06	0.008
2014	Pied-billed Grebe	Impact	0.00	0.00	0.000
2014	Pileated Woodpecker	Impact	3.10	0.06	0.000
2014	Pine Siskin	Impact	0.00	0.00	0.003
2014	Pine Warbler	Impact	0.00	0.00	0.000
2014	Purple Finch	Impact	0.00	0.00	0.000
2014	Red-breasted Nuthatch	Impact	0.00	0.03	0.019
2014	Red Crossbill	Impact	3.10	0.00	0.000
2014	Red-eyed Vireo	Impact	71.90	1.38	0.113
2014	Red-headed Woodpecker	Impact	0.00	0.00	0.000
2014	Red-shouldered Hawk	Impact	0.00	0.00	0.000
2014	Red-tailed Hawk	Impact	0.00	0.00	0.000
2014	Red-winged Blackbird	Impact	15.60	0.22	0.025
2014	Ring-billed Gull	Impact	0.00	0.00	0.000
2014	Ring-necked Duck	Impact	0.00	0.00	0.000
2014	Rock Pigeon	Impact	0.00	0.00	0.000
2014	Rose-breasted Grosbeak	Impact	25.00	0.31	0.036

Year	Common Name	Station Type	Distribution	Abundance	Density
2014	Ruby-crowned Kinglet	Impact	0.00	0.00	0.000
2014	Ruby-throated Hummingbird	Impact	3.10	0.03	0.003
2014	Ruffed Grouse	Impact	18.80	0.19	0.019
2014	Rusty Blackbird	Impact	0.00	0.00	0.000
2014	Sandhill Crane	Impact	18.80	0.38	0.000
2014	Savannah Sparrow	Impact	21.90	0.69	0.044
2014	Scarlet Tanager	Impact	6.30	0.09	0.003
2014	Sedge Wren	Impact	18.80	0.38	0.033
2014	Sharp-shinned Hawk	Impact	0.00	0.00	0.000
2014	Sharp-tailed Grouse	Impact	0.00	0.00	0.000
2014	Song Sparrow	Impact	56.30	1.03	0.061
2014	Sora	Impact	3.10	0.03	0.003
2014	Spotted Sandpiper	Impact	0.00	0.00	0.000
2014	Spruce Grouse	Impact	0.00		0.000
2014	Swainson's Thrush	Impact	3.10	0.03	0.006
2014	Swamp Sparrow	Impact	15.60	0.31	0.028
2014	Tennessee Warbler	Impact	6.30	0.06	0.003
2014	Tree Swallow	Impact	0.00	0.00	0.000
2014	Trumpeter Swan	Impact	0.00	0.00	0.000
2014	Turkey Vulture	Impact	3.10	0.03	0.000
2014	Veery	Impact	56.30	1.06	0.058
2014	Vesper Sparrow	Impact	0.00	0.00	0.000
2014	Virginia Rail	Impact	0.00	0.00	0.000
2014	Warbling Vireo	Impact	6.30	0.06	0.006
2014	Western Meadowlark	Impact	0.00	0.00	0.000
2014	White-breasted Nuthatch	Impact	0.00	0.00	0.000
2014	White-throated Sparrow	Impact	59.40	1.69	0.227
2014	White-winged Crossbill	Impact	0.00	0.00	0.000
2014	Wilson's Snipe	Impact	31.30	0.31	0.025
2014	Wilson's Warbler	Impact	0.00	0.00	0.000
2014	Winter Wren	Impact	9.40	0.13	0.030
2014	Wood Duck	Impact	0.00	0.00	0.000
2014	Wood Thrush	Impact	6.30	0.06	0.006
2014	Yellow Warbler	Impact	18.80	0.19	0.028
2014	Yellow-bellied Flycatcher	Impact	0.00	0.00	0.006
2014	Yellow-bellied Sapsucker	Impact	9.40	0.09	0.019
2014	Yellow-rumped Warbler	Impact	9.40	0.13	0.033
2014	Alder Flycatcher	Control	16.70	0.27	0.042
2014	American Bittern	Control	1.40	0.01	0.003
2014	American Crow	Control	6.90	0.08	0.008
2014	American Goldfinch	Control	18.10	0.19	0.033

Year	Common Name	Station Type	Distribution	Abundance	Density
2014	American Kestrel	Control	0.00	0.00	0.000
2014	American Pipit	Control	0.00	0.00	0.000
2014	American Redstart	Control	6.90	0.07	0.011
2014	American Robin	Control	34.70	0.51	0.055
2014	American Tree Sparrow	Control	1.40	0.01	0.000
2014	American White Pelican	Control	1.40	0.03	0.006
2014	American Woodcock	Control	0.00	0.00	0.000
2014	Bald Eagle	Control	0.00	0.00	0.000
2014	Baltimore Oriole	Control	0.00	0.00	0.000
2014	Barn Swallow	Control	1.40	0.01	0.003
2014	Barred Owl	Control	0.00	0.00	0.000
2014	Bay-breasted Warbler	Control	0.00	0.00	0.000
2014	Belted Kingfisher	Control	0.00	0.00	0.000
2014	Black-and-white Warbler	Control	34.70	0.39	0.055
2014	Black-backed Woodpecker	Control	0.00	0.00	0.000
2014	Black-billed Cuckoo	Control	9.70	0.11	0.000
2014	Black-billed Magpie	Control	1.40	0.01	0.003
2014	Blackburnian Warbler	Control	6.90	0.09	0.019
2014	Black-capped Chickadee	Control	12.50	0.15	0.028
2014	Blackpoll Warbler	Control	0.00	0.00	0.000
2014	Black-throated Blue Warbler	Control	1.40	0.03	0.000
2014	Black-throated Green Warbler	Control	15.30	0.20	0.025
2014	Blue Jay	Control	31.90	0.35	0.053
2014	Blue-headed Vireo	Control	5.60	0.05	0.011
2014	Bobolink	Control	5.60	0.08	0.011
2014	Boreal Chickadee	Control	1.40	0.01	0.003
2014	Brewer's Blackbird	Control	1.40	0.01	0.003
2014	Broad-winged Hawk	Control	0.00	0.00	0.000
2014	Brown Creeper	Control	2.80	0.03	0.006
2014	Brown Thrasher	Control	0.00	0.00	0.000
2014	Brown-headed Cowbird	Control	6.90	0.07	0.011
2014	Canada Goose	Control	1.40	0.34	0.000
2014	Canada Warbler	Control	0.00	0.00	0.000
2014	Cape May Warbler	Control	0.00	0.00	0.000
2014	Cedar Waxwing	Control	22.20	0.31	0.039
2014	Chestnut-sided Warbler	Control	37.50	0.57	0.089
2014	Chipping Sparrow	Control	12.50	0.14	0.022
2014	Clay-colored Sparrow	Control	8.30	0.15	0.011
2014	Cliff Swallow	Control	0.00	0.00	0.000
2014	Common Goldeneye	Control	0.00	0.00	0.000
2014	Common Grackle	Control	0.00	0.00	0.000

Year	Common Name	Station Type	Distribution	Abundance	Density
2014	Common Loon	Control	2.80	0.03	0.000
2014	Common Merganser	Control	0.00	0.00	0.000
2014	Common Nighthawk	Control	0.00	0.00	0.000
2014	Common Raven	Control	12.50	0.15	0.003
2014	Common Tern	Control	0.00	0.00	0.000
2014	Common Yellowthroat	Control	43.10	0.73	0.108
2014	Connecticut Warbler	Control	11.10	0.20	0.033
2014	Dark-eyed Junco	Control	8.30	0.14	0.022
2014	Dickcissel	Control	0.00	0.00	0.000
2014	Double-crested Cormorant	Control	0.00	0.00	0.000
2014	Downy Woodpecker	Control	2.80	0.03	0.006
2014	Eastern Bluebird	Control	0.00	0.00	0.000
2014	Eastern Kingbird	Control	2.80	0.05	0.011
2014	Eastern Phoebe	Control	4.20	0.04	0.008
2014	Eastern Towhee	Control	0.00	0.00	0.000
2014	Eastern Whip-poor-will	Control	2.80	0.03	0.003
2014	Eastern Wood-Pewee	Control	2.80	0.03	0.006
2014	European Starling	Control	0.00	0.00	0.000
2014	Evening Grosbeak	Control	0.00	0.00	0.000
2014	Golden-crowned Kinglet	Control	9.70	0.14	0.025
2014	Golden-winged Warbler	Control	2.80	0.03	0.003
2014	Gray Catbird	Control	1.40	0.01	0.003
2014	Gray Jay	Control	11.10	0.12	0.022
2014	Great Blue Heron	Control	0.00	0.00	0.000
2014	Great Crested Flycatcher	Control	2.80	0.03	0.006
2014	Great Gray Owl	Control	0.00	0.00	0.000
2014	Green Heron	Control	0.00	0.00	0.000
2014	Hairy Woodpecker	Control	1.40	0.03	0.000
2014	Hermit Thrush	Control	47.20	0.86	0.113
2014	Herring Gull	Control	0.00	0.00	0.000
2014	Hooded Merganser	Control	0.00	0.00	0.000
2014	House Wren	Control	0.00	0.00	0.000
2014	Indigo Bunting	Control	0.00	0.00	0.000
2014	Killdeer	Control	0.00	0.00	0.000
2014	Least Flycatcher	Control	16.70	0.19	0.036
2014	LeConte's Sparrow	Control	0.00	0.00	0.000
2014	Lincoln's Sparrow	Control	5.60	0.09	0.017
2014	Long-eared Owl	Control	0.00	0.00	0.000
2014	Magnolia Warbler	Control	13.90	0.15	0.022
2014	Mallard	Control	0.00	0.00	0.000
2014	Marbled Godwit	Control	0.00	0.00	0.000

Year	Common Name	Station Type	Distribution	Abundance	Density
2014	Marsh Wren	Control	0.00	0.00	0.000
2014	Merlin	Control	0.00	0.00	0.000
2014	Mourning Dove	Control	0.00	0.00	0.000
2014	Mourning Warbler	Control	15.30	0.23	0.033
2014	Nashville Warbler	Control	90.30	2.19	0.318
2014	Northern Flicker	Control	18.10	0.26	0.028
2014	Northern Harrier	Control	0.00	0.00	0.000
2014	Northern Parula	Control	9.70	0.12	0.019
2014	Northern Rough-winged Swallow	Control	0.00	0.00	0.000
2014	Northern Waterthrush	Control	2.80	0.04	0.003
2014	Olive-sided Flycatcher	Control	0.00	0.00	0.000
2014	Orange-crowned Warbler	Control	1.40	0.01	0.003
2014	Ovenbird	Control	66.70	1.28	0.158
2014	Palm Warbler	Control	8.30	0.22	0.036
2014	Philadelphia Vireo	Control	0.00	0.00	0.000
2014	Pied-billed Grebe	Control	0.00	0.00	0.000
2014	Pileated Woodpecker	Control	2.80	0.03	0.006
2014	Pine Siskin	Control	0.00	0.00	0.000
2014	Pine Warbler	Control	0.00	0.00	0.000
2014	Purple Finch	Control	2.80	0.03	0.006
2014	Red-breasted Nuthatch	Control	0.00	0.14	0.025
2014	Red Crossbill	Control	12.50	0.00	0.000
2014	Red-eyed Vireo	Control	75.00	1.41	0.147
2014	Red-headed Woodpecker	Control	0.00	0.00	0.000
2014	Red-shouldered Hawk	Control	0.00	0.00	0.000
2014	Red-tailed Hawk	Control	1.40	0.01	0.000
2014	Red-winged Blackbird	Control	5.60	0.05	0.003
2014	Ring-billed Gull	Control	0.00	0.00	0.000
2014	Ring-necked Duck	Control	0.00	0.00	0.000
2014	Rock Pigeon	Control	0.00	0.00	0.000
2014	Rose-breasted Grosbeak	Control	20.80	0.23	0.042
2014	Ruby-crowned Kinglet	Control	2.80	0.03	0.006
2014	Ruby-throated Hummingbird	Control	1.40	0.01	0.003
2014	Ruffed Grouse	Control	4.20	0.04	0.008
2014	Rusty Blackbird	Control	0.00	0.00	0.000
2014	Sandhill Crane	Control	2.80	0.03	0.000
2014	Savannah Sparrow	Control	8.30	0.18	0.030
2014	Scarlet Tanager	Control	2.80	0.03	0.003
2014	Sedge Wren	Control	1.40	0.01	0.003
2014	Sharp-shinned Hawk	Control	0.00	0.00	0.000
2014	Sharp-tailed Grouse	Control	0.00	0.00	0.000

Year	Common Name	Station Type	Distribution	Abundance	Density
2014	Song Sparrow	Control	27.80	0.51	0.069
2014	Sora	Control	1.40	0.01	0.003
2014	Spotted Sandpiper	Control	0.00	0.00	0.000
2014	Spruce Grouse	Control	0.00	0.00	0.000
2014	Swainson's Thrush	Control	1.40	0.03	0.006
2014	Swamp Sparrow	Control	9.70	0.20	0.036
2014	Tennessee Warbler	Control	0.00	0.00	0.000
2014	Tree Swallow	Control	1.40	0.03	0.000
2014	Trumpeter Swan	Control	0.00	0.00	0.000
2014	Turkey Vulture	Control	0.00	0.00	0.000
2014	Veery	Control	40.30	0.61	0.075
2014	Vesper Sparrow	Control	0.00	0.00	0.000
2014	Virginia Rail	Control	0.00	0.00	0.000
2014	Warbling Vireo	Control	0.00	0.00	0.000
2014	Western Meadowlark	Control	0.00	0.00	0.000
2014	White-breasted Nuthatch	Control	0.00	0.00	0.000
2014	White-throated Sparrow	Control	72.20	1.70	0.197
2014	White-winged Crossbill	Control	1.40	0.01	0.003
2014	Wilson's Snipe	Control	11.10	0.12	0.017
2014	Wilson's Warbler	Control	0.00	0.00	0.000
2014	Winter Wren	Control	16.70	0.23	0.028
2014	Wood Duck	Control	0.00	0.00	0.000
2014	Wood Thrush	Control	2.80	0.03	0.006
2014	Yellow Warbler	Control	6.90	0.08	0.017
2014	Yellow-bellied Flycatcher	Control	8.30	0.08	0.017
2014	Yellow-bellied Sapsucker	Control	8.30	0.12	0.014
2014	Yellow-rumped Warbler	Control	11.10	0.11	0.022