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CONSULTING

NATURAL FORCES DEVELOPMENTS LP

Bird Surveys

Benjamins Mill Wind Project - Appendix H

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1.0 Introduction

The Proponent engaged the expertise of Dillon Consulting Ltd. (Dillon) to conduct biophysical surveys for the Benjamins Mill Wind Project (the Project) including bird surveys to identify species that may be present in the area.

1.1 Scope of Work

Based on the recommended ECCC and CWS protocols, and feedback from NSE during the consultation process, the following scope of work was completed as part of the bird and bird habitat surveys for the proposed project. As field work progressed, and as more information became available, the surveys were refined based on the available habitat types and expected species diversity within the Project study area. The scope of work included:

- Background and Desktop Analysis;
- Late-winter Surveys (targeting overwintering birds);
- Spring Surveys (targeting migrating birds using the area as a stopover and breeding nocturnal owls);
- Summer Surveys (targeting breeding birds, including common nighthawk (a species at risk));
- Fall Surveys (targeting migrating birds); and
- Winter surveys (targeting winter resident birds) — to be conducted in winter of 2022 and to be documented as an addendum to this report.

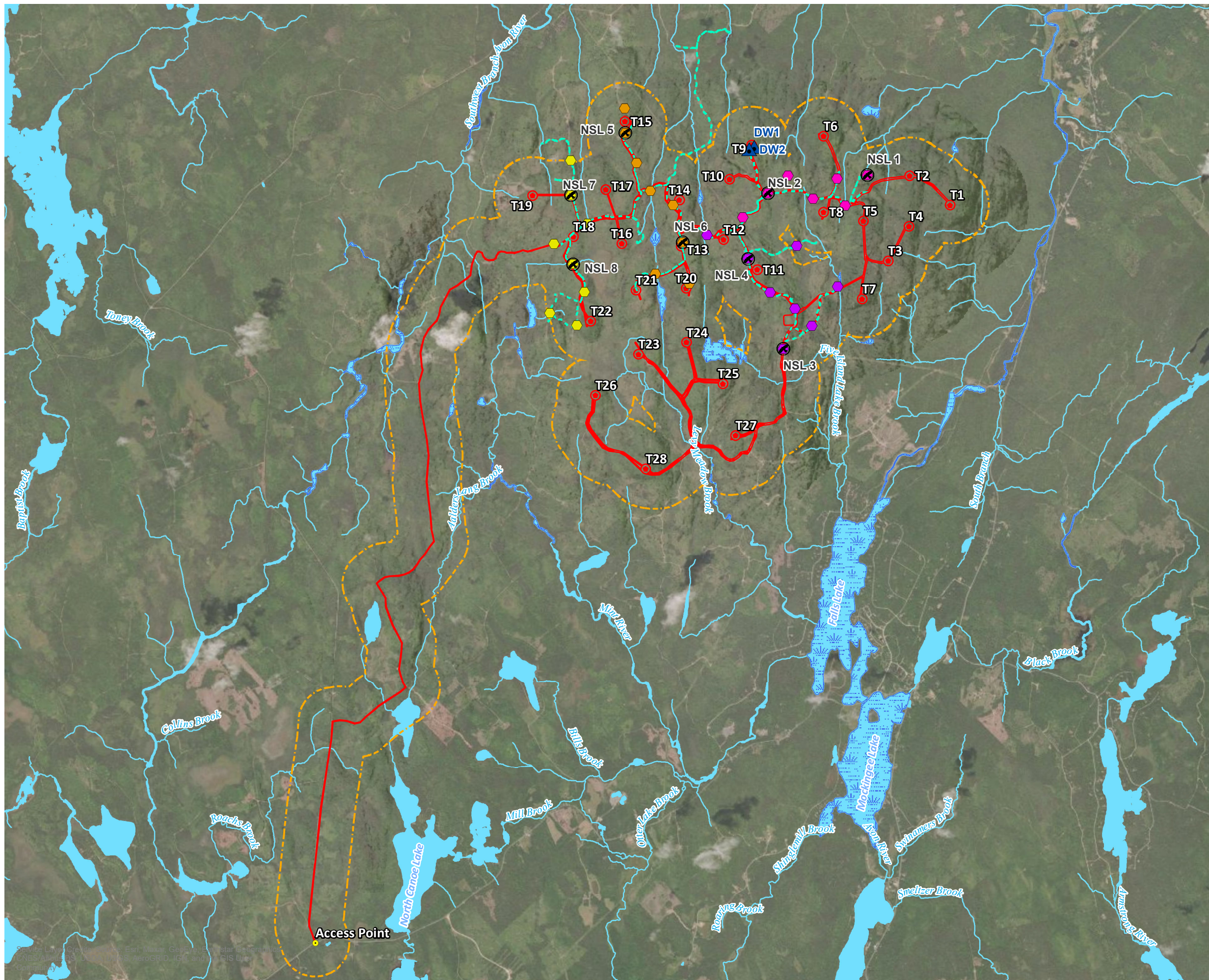
The methodologies used for the scope of the desktop analysis and field surveys listed above are outlined within the following sections.

For the purpose of this assessment, the spatial boundaries for the field surveys (i.e., the local assessment area) have been identified as a 500 m buffer surrounding the project footprint of the proposed turbine locations, substation, connector lines, new roads and road upgrades.

1.2 Methodology

Based on the project risk category for the proposed Project (EC, 2007a), and the findings of the initial literature review, the following approach for the avian surveys was completed with the objective of gaining an estimate of both the number of bird species using the Project area, and their relative abundance.

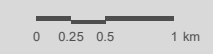
The surveys were performed by experienced bird specialists skilled at identifying birds by song, call and sight. The surveys were scheduled so that observations were made during all seasons to evaluate which species regularly use the area at what times throughout the year. Survey protocols were developed based on professional experience, knowledge of the Project area, and review of recommended techniques from the CWS guidance documents (EC, 2007a; EC, 2007b). The locations of point count transects, and nocturnal bird survey locations are shown on Figure H-1.



BENJAMINS MILL WIND PROJECT

SURVEY LOCATIONS AND LOCAL ASSESSMENT AREA FOR BIRDS
FIGURE H-1

- Proposed Access Point
- Proposed Turbine Location
- Watercourse
- Waterbody
- Wetland
- Project Development Area
- Local Assessment Area
- ▲ Durnal Watch Counts
- ⦿ Nocturnal Survey Location
- Transect 1
- Transect 2
- Transect 3
- Transect 4
- - - Winter Area Search



SCALE 1:55,000



MAP DRAWING INFORMATION:
DATA PROVIDED BY DILLON CONSULTING, GEONB, NATURAL FORCES

MAP CREATED BY: MEC
MAP CHECKED BY: KB
MAP PROJECTION: NAD 1983 UTM ZONE 20N



PROJECT: 21-1329
STATUS: DRAFT
DATE: 2021-12-22

2.0

Field Survey

During the spring and fall migration periods, two different types of survey were employed: Migration Stop-over Counts and Diurnal Watch Counts. The former determines the number and kinds of birds that land in the study area during their period of migration, while the latter examines the number, species, altitude and behaviour of birds flying over the study area during the daytime. During the summer months, a Breeding Bird Survey was conducted to determine the number and species of birds that breed in the study area with particular attention paid to their habitat requirements and habitat availability in the study area. This survey was also supplemented by nocturnal surveys for bird species that may breed in the area, but that are typically only detectable at night, or during twilight hours, such as many owls and the common nighthawk. Lastly, during the late winter months a Winter Resident Survey was completed to assess and determine which species are resident in the area and can be anticipated to occur in the project area year-round. Surveys were conducted when weather conditions were appropriate for viewing and listening for birds (i.e., on days or nights with minimal forecasted fog and precipitation).

Migration Stop-over Counts were conducted along four pre-determined transects throughout the study area using an existing network of logging roads. The transect routes were selected to maximize site coverage, as well as to target habitats similar to where wind turbine generators or other infrastructure will be located. Eight point counts were conducted along each transect at pre-determined locations so they can be repeated consistently across the seasons. The locations were determined following a preliminary desktop assessment of the habitat types present within the study area. Point counts were 10 minutes in length during which all birds seen or heard overhead were recorded. During the spring migration period, each transect was surveyed five times between April 27 and May 29, 2021. During the fall migration, each transect was also surveyed five times between August 24 and October 18, 2021. Migration Stop-over counts typically began 30-60 minutes after sunrise, as many birds become active later in the morning in response to the colder dawn temperatures during these seasons.

Diurnal Watch Counts were conducted during both spring and fall migration at pre-determined, repeatable observation points within the study area. The choice of the observation points was made based on the extent to which they provided as close as possible to an extended 360 degree view of the air space over the study area and proximity to proposed site for the placement of wind turbines. These counts were often conducted following the completion of Migration Stop-over counts and typically occur during the mid-morning into the early afternoon.

Diurnal Watch counts were recorded in 1/2 hour blocks of observations, whereby all birds seen or heard were recorded according to their species, location and altitude relative to the observer (not to the point over which they were flying), flight direction, and number of individuals.

A Breeding Bird Survey was conducted during the summer months following the same four transects established for spring and fall Migration Stop-over Counts. As with the spring and fall surveys, point counts were also completed at the same pre-determined locations, were 10 minutes in length and all birds seen or heard were recorded. During the peak summer breeding period, each transect was surveyed twice – once during the early peak period and once during the late peak period – between June 2 and June 29, 2021.

Targeted playback surveys, using recordings of bird breeding calls, were used occasionally during the Breeding Bird Survey to elicit a response from SAR or SOCC, to either confirm a possible detection (when there is uncertainty) or to simply detect a particular species when surveying appropriate habitat. The detrimental impact of playback recordings on breeding birds is noted and, as such, use of playback recordings is limited and employed sparingly to avoid prolonged disturbance to breeding males.

Additionally, two nocturnal surveys were conducted for breeding bird species not readily detectable during daylight hours, namely a Breeding Nocturnal Owl Survey and a Breeding Common Nighthawk Survey. These surveys were conducted from pre-determined locations within the study area and were based on well established, standardized field protocols. The breeding nocturnal owl survey methodology was based on the 'Guidelines for Nocturnal Owl Monitoring in North America' (Takats et al. 2001), as well as the 'Nova Scotia Nocturnal Owl Survey: Guide for Volunteers (BC 2019)'. The breeding Common Nighthawk survey methodology was based on the 'Canadian Nightjar Survey Protocol' (BSC 2019).

A Late Winter Resident Survey was also completed for the study area and consisted of five general area searches in which the birds in a specific area were counted. These general area searches took place on April 7-9 and April 13-14, 2021.

3.0 Results

3.1 Late Winter Program

A total of 288 individual birds comprised of 29 species were recorded during the Winter Survey programs, which consisted solely of the Winter Resident Survey. Based on the available habitat regional characteristics of the LAA, as well as the specific life histories of the bird species observed, seven of the 29 detected species were considered likely to be early migrants and not to be resident species for the LAA.

Table H-1: Bird Species Detected During the Late Winter Survey Program

Common Name	Scientific Name	SARA	NS ESA	S-rank
Dark-eyed Junco	<i>Junco hyemalis</i>			S4S5
*American Robin	<i>Turdus migratorius</i>			S5B,S3N
Black-capped Chickadee	<i>Poecile atricapillus</i>			S5
Blue Jay	<i>Cyanocitta cristata</i>			S5
Song Sparrow	<i>Melospiza melodia</i>			S5B
*Common Grackle	<i>Quiscalus quiscula</i>			S5B
Common Raven	<i>Corvus corax</i>			S5
American Crow	<i>Corvus brachyrhynchos</i>			S5
American Goldfinch	<i>Spinus tristis</i>			S5
Golden-crowned Kinglet	<i>Regulus satrapa</i>			S5
*Mallard	<i>Anas platyrhynchos</i>			S5
Mourning Dove	<i>Zenaida macroura</i>			S5
Red-breasted Nuthatch	<i>Sitta canadensis</i>			S3
Bald Eagle	<i>Haliaeetus leucocephalus</i>			S5
Canada Jay	<i>Perisoreus canadensis</i>			S3
Hairy Woodpecker	<i>Dryobates villosus</i>			S5
Northern Flicker	<i>Colaptes auratus</i>			S5B
Spruce Grouse	<i>Falcapennis canadensis</i>			S4
White-winged Crossbill	<i>Loxia leucoptera</i>			S4S5

Common Name	Scientific Name	SARA	NS ESA	S-rank
Evening Grosbeak	<i>Coccothraustes vespertinus</i>	SC	v	S3S4B,S3N
Pileated Woodpecker	<i>Dryocopus pileatus</i>			S5
Red-tailed Hawk	<i>Buteo jamaicensis</i>			S5
*American Black Duck	<i>Anas rubripes</i>			S5
Brown Creeper	<i>Certhia americana</i>			S5
*Hermit Thrush	<i>Catharus guttatus</i>			S5B
*Hooded Merganser	<i>Lophodytes cucullatus</i>			S5B
Northern Harrier	<i>Circus hudsonius</i>			S3S4B
Ruffed Grouse	<i>Bonasa umbellus</i>			S5
*Winter Wren	<i>Troglodytes hiemalis</i>			S5B

* indicates a species was considered migratory

3.2 Spring Survey Program

A total of 3,217 individual birds comprised of 83 species were recorded during the Spring Survey programs. The vast majority of these individuals and species, 3,040 and 73 respectively, were detected during point counts conducted for the Spring Migration Stop-over Counts. A further 47 individuals and 4 species were added through incidental detections, nine individuals and two species were added as a result of the Breeding Nocturnal Owl Survey, and lastly an additional 121 individuals and 4 species were detected during diurnal watch count surveys.

Table H-2: Bird Species Detected During the Spring Survey Program

Common Name	Scientific Name	SARA	NS ESA	S-rank
Alder Flycatcher	<i>Empidonax alnorum</i>			S5B
American Black Duck	<i>Anas rubripes</i>			S5
American Crow	<i>Corvus brachyrhynchos</i>			S5
American Goldfinch	<i>Spinus tristis</i>			S5
American Kestrel	<i>Falco sparverius</i>			S3B
American Redstart	<i>Setophaga ruticilla</i>			S4S5B
American Robin	<i>Turdus migratorius</i>			S5B S3N

Common Name	Scientific Name	SARA	NS ESA	S-rank
American Woodcock	<i>Scolopax minor</i>			S5B
Bald Eagle	<i>Haliaeetus leucocephalus</i>	NAR		S5
Bay-breasted Warbler	<i>Setophaga castanea</i>			S3S4B
Belted Kingfisher	<i>Megaceryle alcyon</i>			S5B
Black-and-White Warbler	<i>Mniotilta varia</i>			S5B
Blackburnian Warbler	<i>Setophaga fusca</i>			S4B
Black-capped Chickadee	<i>Poecile atricapillus</i>			S5
Blackpoll Warbler	<i>Setophaga striata</i>			S3S4B
Black-throated Blue Warbler	<i>Setophaga caerulescens</i>			S5B
Black-throated Green Warbler	<i>Setophaga virens</i>			S5B
Blue Jay	<i>Cyanocitta cristata</i>			S5
Blue-headed Vireo	<i>Vireo solitarius</i>			S5B
Boreal Chickadee	<i>Poecile hudsonicus</i>			S3
Broad-winged Hawk	<i>Buteo platypterus</i>			S5B
Brown Creeper	<i>Certhia americana</i>			S5
Canada Goose	<i>Branta canadensis</i>			S4N
Canada Jay	<i>Perisoreus canadensis</i>			S3
Canada Warbler	<i>Cardellina canadensis</i>	T	E	S3B
Cape May Warbler	<i>Setophaga tigrina</i>			S2B
Chestnut-sided Warbler	<i>Setophaga pensylvanica</i>			S5B
Common Grackle	<i>Quiscalus quiscula</i>			S5B
Common Loon	<i>Gavia immer</i>	NAR		S4B S4N
Common Nighthawk	<i>Chordeiles minor</i>	SC	T	S2B
Common Raven	<i>Corvus corax</i>			S5
Common Yellowthroat	<i>Geothlypis trichas</i>			S5B
Dark-eyed Junco	<i>Junco hyemalis</i>			S4S5
Double-crested Cormorant	<i>Phalacrocorax auritus</i>	NAR		S4B
Downy Woodpecker	<i>Dryobates pubescens</i>			S5

Common Name	Scientific Name	SARA	NS ESA	S-rank
Eastern Wood-Pewee	<i>Contopus virens</i>	SC	V	S3S4B
Evening Grosbeak	<i>Coccothraustes vespertinus</i>	SC	V	S3S4B S3N
Golden-crowned Kinglet	<i>Regulus satrapa</i>			S5
Gray Catbird	<i>Dumetella carolinensis</i>			S3B
<u>Great Horned Owl</u>	<u><i>Bubo virginianus</i></u>			S4
Hairy Woodpecker	<i>Dryobates villosus</i>			S5
Hermit Thrush	<i>Catharus guttatus</i>			S5B
Herring Gull	<i>Larus argentatus</i>			S5
Least Flycatcher	<i>Empidonax minimus</i>			S4S5B
Lincoln's Sparrow	<i>Melospiza lincolni</i>			S4B
Magnolia Warbler	<i>Setophaga magnolia</i>			S5B
Mourning Dove	<i>Zenaida macroura</i>			S5
Nashville Warbler	<i>Oreothlypis ruficapilla</i>			S4S5B
Northern Flicker	<i>Colaptes auratus</i>			S5B
Northern Goshawk	<i>Accipiter gentilis</i>			S3S4
Northern Harrier	<i>Circus hudsonius</i>	NAR		S3S4B
Northern Parula	<i>Setophaga americana</i>			S5B
<u>Northern Saw-whet Owl</u>	<u><i>Aegolius acadicus</i></u>			S4B
Northern Waterthrush	<i>Parkesia noveboracensis</i>			S4B
Olive-sided Flycatcher	<i>Contopus cooperi</i>	SC	T	S2B
Osprey	<i>Pandion haliaetus</i>			S4B
Ovenbird	<i>Seiurus aurocapilla</i>			S5B
Palm Warbler	<i>Setophaga palmarum</i>			S5B
Pileated Woodpecker	<i>Dryocopus pileatus</i>			S5
Purple Finch	<i>Haemorhous purpureus</i>			S4S5B S3S4N
Red-breasted Nuthatch	<i>Sitta canadensis</i>			S3
Red Crossbill	<i>Loxia curvirostra</i>			S3S4

Common Name	Scientific Name	SARA	NS ESA	S-rank
Red-eyed Vireo	Vireo olivaceus			S5B
Red-tailed Hawk	Buteo jamaicensis	NAR		S5
Red-winged Blackbird	Agelaius phoeniceus			S4B
Ruby-crowned Kinglet	Regulus calendula			S3S4B
Ruby-throated Hummingbird	Archilochus colubris			S5B
Ruffed Grouse	Bonasa umbellus			S5
Rusty Blackbird	Euphagus carolinus	SC	E	S2B
Sharp-shinned Hawk	Accipiter striatus	NAR		S5
Song Sparrow	Melospiza melodia			S5B
Spruce Grouse	Falcapennis canadensis			S4
Swamp Sparrow	Melospiza georgiana			S5B
Tree Swallow	Tachycineta bicolor			S4B
Veery	Catharus fuscescens			S3S4B
White-throated Sparrow	Zonotrichia albicollis			S5B
White-winged Crossbill	Loxia leucoptera			S4S5
Winter Wren	Troglodytes hiemalis			S5B
Wood Duck	Aix sponsa			S5B
Yellow Warbler	Setophaga petechia			S5B
Yellow-bellied Flycatcher	Empidonax flaviventris			S3S4B
Yellow-bellied Sapsucker	Sphyrapicus varius			S4S5B
Yellow-rumped Warbler	Setophaga coronata			S5B

Alphabetical (Bold indicates species only identified incidentally, Bold and Underlined indicates species identified during the Breeding Nocturnal Owl Survey).

3.2.1 Spring Migration Stop-over Surveys

A total of 3,040 individual birds comprised of 73 species were recorded during the Spring Migration Stop-over Counts. These data are used to assess abundance of each species, as well as to briefly examine the seasonality of bird diversity migrating through the study area. A summary of the birds observed during the Spring Diurnal Watch Counts is presented in Table H-3. Figure H-3 illustrates a general trend of rising bird diversity throughout the Spring migratory period.

Table H-3: Spring Diurnal Watch Count Results

Date	Survey Time	Total survey time	Common name	Scientific Name	S-Rank	# Detected	Seen	Heard	Est. Distance	Est. Bearing	Pass Height (m)	Pass Direction	Comments
4-May-21	9:20	0	Northern Harrier	Circus hudsonius	S3S4B	1	local		100		<50		wind changing
4-May-21			American Kestrel	Falco sparverius	S3B	1	passing		100	S	50-100	SW	
4-May-21			Evening Grosbeak	Coccothraustes vespertinus	S3S4B S3N	2	passing		50	S	100-250	NW	
4-May-21			warbler spp.	-	-	1	passing		100	SE	<50	N	
4-May-21	9:50	30	blackbird spp.	-	-	1	passing		0	W	100-250	E	
4-May-21			Red-tailed Hawk	Buteo jamaicensis	S5	1	circling		1000	E			
4-May-21	10:20	60	Red-tailed Hawk	Buteo jamaicensis	S5	1	passing		2000	S W	50-100	N	
4-May-21	10:50	90	buteo spp.	-	-	2	circling		2000	SE	100-250	S	Riding thermals 100-300 m high. slowly made way south
4-May-21			American Kestrel	Falco sparverius	S3B	1	passing		0	S	50-100	N	
4-May-21	11:20	120	Bald Eagle	Haliaeetus leucocephalus	S5	1	circling		3000	NE	100-250	NW	circling, slowly making way nw
4-May-21	11:50	150	Bald Eagle	Haliaeetus leucocephalus	S5	1	circling		2000	NE	100-250	E	
4-May-21	12:20	180	Belted Kingfisher	Megaceryle alcyon	S5B	1	local	calling					
4-May-21			Common Raven	Corvus corax	S5	2	circling		500	S	100-250	N	circling high, slowly making way north

Date	Survey Time	Total survey time	Common name	Scientific Name	S-Rank	# Detected	Seen	Heard	Est. Distance	Est. Bearing	Pass Height (m)	Pass Direction	Comments
4-May-21	12:50	210	Northern Goshawk	Accipiter gentilis	S3S4	1	circling		1000	NE	100-250	E	riding thermals 100-500 m high, slowly making way east
4-May-21			Bald Eagle	Haliaeetus leucocephalus	S5	1	circling		2000	N	100-250		
	13:20	240	SURVEY END										
7-May-21	6:15	0	Evening Grosbeak	Coccothraustes vespertinus	S3S4B S3N	7	passing		0	E	100-250	NW	
7-May-21			Red-breasted Nuthatch	Sitta canadensis	S3	1	calling						
7-May-21			Yellow-rumped Warbler	Setophaga coronata	S5B	1	passing		0	S	50-100	NE	
7-May-21			Canada Goose	Branta canadensis	S4N	2	passing		500	N W	50-100	SE	
7-May-21	6:45	30	American Kestrel	Falco sparverius	S3B	2	local	calling	250	E			pair in tree
7-May-21			Red-winged Blackbird	Agelaius phoeniceus	S4B	1	passing		100	S	50-100	N	
7-May-21	7:15	60	American Goldfinch	Spinus tristis	S5	1	passing		0	W	50-100	SE	
7-May-21			Double-crested Cormorant	Phalacrocorax auritus	S4B	8	passing		2000	SE	100-250	N	flying towards basin, looked close to t6
7-May-21			Canada Jay	Perisoreus canadensis	S3	1	calling						

Date	Survey Time	Total survey time	Common name	Scientific Name	S-Rank	# Detected	Seen	Heard	Est. Distance	Est. Bearing	Pass Height (m)	Pass Direction	Comments
7-May-21	7:45	90	Red-winged Blackbird	Agelaius phoeniceus	S4B	1	passing		0	S	50-100	N	
7-May-21			American Kestrel	Falco sparverius	S3B	2	local	calling	100	NE			pair calling from large tree in cut
7-May-21	8:15	120	Common Grackle	Quiscalus quiscula	S5B	1	passing		1000	S W	50-100	NW	
7-May-21			Northern Harrier	Circus hudsonius	S3S4B	1	passing		2000	SE	100-250	W	male
7-May-21			Bald Eagle	Haliaeetus leucocephalus	S5	1	circling		2000	SE	100-250		
7-May-21			Common Raven	Corvus corax	S5	1	passing		2000	SE	250+	NE	
7-May-21	8:45	150	Purple Finch	Haemorhous purpureus	S4S5B, S3S4N	1	passing		0	NE	50-100	SW	
7-May-21			passerine spp.	-	-	2	passing		250	S W	50-100	E	
7-May-21	9:15	180	Common Raven	Corvus corax	S5	1	passing		2000	W	250+	S	
7-May-21			Bald Eagle	Haliaeetus leucocephalus	S5	2	circling		2000	SE	100-250	N	flew close to t6
7-May-21			Bald Eagle	Haliaeetus leucocephalus	S5	1	circling		3000	SE	250+	stationary	different bird, circling high above other 2
7-May-21			Common Raven	Corvus corax	S5	1	circling		3000	SE	250+	stationary	harassing eagle
7-May-21	9:45	210	passerine spp.	-	-	1	passing		500	SE	50-100	N	

Date	Survey Time	Total survey time	Common name	Scientific Name	S-Rank	# Detected	Seen	Heard	Est. Distance	Est. Bearing	Pass Height (m)	Pass Direction	Comments
7-May-21			Purple Finch	Haemorhous purpureus	S4S5B, S3S4N	1	passing		40	S W	100-250	N	
7-May-21			Bald Eagle	Haliaeetus leucocephalus	S5	2	passing		1000	SE	100-250		
7-May-21	10:15	240	Red-tailed Hawk	Buteo jamaicensis	S5	1	circling		2000	S W	100-250	stationary	
7-May-21			Common Raven	Corvus corax	S5	1	passing		1000	E	100-250	N	
7-May-21			American Kestrel	Falco sparverius	S3B	2	local	calling					pair still present
7-May-21			Red-tailed Hawk	Buteo jamaicensis	S5	1	passing		1000	E	50-100	N	carrying snake or stick for nesting
7-May-21	10:45	270	Red Crossbill	Loxia curvirostra	S3S4	2	passing		0	N	50-100	SW	
7-May-21			Bald Eagle	Haliaeetus leucocephalus	S5	6	circling		2000	NE	100-250	stationary	
7-May-21			Bald Eagle	Haliaeetus leucocephalus	S5	2	circling		2000	SE	100-250	stationary	different birds
7-May-21			Bald Eagle	Haliaeetus leucocephalus	S5	1	circling		3000	N	100-250	stationary	different birds
7-May-21	11:15	300	Herring Gull	Larus argentatus	S5	?	local	calling	500	SE	?	N?	heard only, sounded high, potentially moving north
7-May-21			Red-tailed Hawk	Buteo jamaicensis	S5	1	circling		2000	NE	50-100	stationary	circling low over valley

Date	Survey Time	Total survey time	Common name	Scientific Name	S-Rank	# Detected	Seen	Heard	Est. Distance	Est. Bearing	Pass Height (m)	Pass Direction	Comments
7-May-21			American Kestrel	Falco sparverius	S3B	1	local	calling	250	N			pair still present, calling from partially dead hardwoods
7-May-21			American Goldfinch	Spinus tristis	S5	1	passing		0	N W	50-100	SE	
7-May-21	11:45	330	raptor spp.	-	-	1	passing		3000	SE	250+	N	carried by updraft > 1000 m high, slowly made way north
7-May-21			Bald Eagle	Haliaeetus leucocephalus	S5	2	circling		1000	S W	100-250	E	slowly making way east
7-May-21			Bald Eagle	Haliaeetus leucocephalus	S5	2	circling		1000	E	100-250	stationary	possibly same pair last recorded
7-May-21	12:15	360	Bald Eagle	Haliaeetus leucocephalus	S5	1	passing		3000	E	100-250	N	
7-May-21	12:45	390	Bald Eagle	Haliaeetus leucocephalus	S5	1	circling		3000	SE	100-250	stationary	
7-May-21			Red-tailed Hawk	Buteo jamaicensis	S5	1	hunting		1000	S	50-100	stationary	
7-May-21			raptor spp.	-	-	3	circling		3000	SE	100-250	stationary	3 raptors. One climbed > 1000 m then headed sw, potentially buteos sp.
7-May-21	13:15	420	Bald Eagle	Haliaeetus leucocephalus	S5	1	circling		3000	SE	100-250	stationary	
7-May-21			Bald Eagle	Haliaeetus leucocephalus	S5	2	passing		2000	E	100-250	N	
7-May-21	13:45	450	Bald Eagle	Haliaeetus leucocephalus	S5	1	circling		2000	E	100-250	N	slowly making way north

Date	Survey Time	Total survey time	Common name	Scientific Name	S-Rank	# Detected	Seen	Heard	Est. Distance	Est. Bearing	Pass Height (m)	Pass Direction	Comments
7-May-21			Bald Eagle	Haliaeetus leucocephalus	S5	1	passing		500	S W	100-250	N	
	14:15	480	SURVEY END										
21-May-21	5:45	0	Red-tailed Hawk	Buteo jamaicensis	S5	1	perched		2000	SE			Some fog in morning. Sky hazy most of day, visibility poor.
21-May-21	6:15	30	Red-tailed Hawk	Buteo jamaicensis	S5	1	perched		2000	SE			same bird
21-May-21			warbler spp.	-	-	1	passing		100	E	<50	SE	
21-May-21			warbler spp.	-	-	1	passing		250	E	<50	SE	
21-May-21			American Kestrel	Falco sparverius	S3B	1	local	calling	100	N			
21-May-21	6:45	60	Olive-sided Flycatcher	Contopus cooperi	S2B	1	local	singing	250	S			
21-May-21			Blue Jay	Cyanocitta cristata	S5	1	passing		250	S	<50	W	
21-May-21	7:15	90	Alder Flycatcher	Empidonax alnorum	S5B	1	calling						
21-May-21			American Black Duck	Anas rubripes	S5	1	passing		1000	NE	<50	W	
21-May-21	7:45	120	American Kestrel	Falco sparverius	S3B	2	local	calling	100	NE			pair

Date	Survey Time	Total survey time	Common name	Scientific Name	S-Rank	# Detected	Seen	Heard	Est. Distance	Est. Bearing	Pass Height (m)	Pass Direction	Comments
21-May-21	8:15	150	Common Raven	Corvus corax	S5	1	passing		2000	S W	<50	NW	
21-May-21	8:45	180	Blue Jay	Cyanocitta cristata	S5	1	passing		250	E	<50	S	
21-May-21	9:15	210	Osprey	Pandion haliaetus	S4B	2	circling		2000	S W	100-250		
21-May-21	9:45	240	Olive-sided Flycatcher	Contopus cooperi	S2B	1	local	singing	250	S W			
21-May-21	10:15	270	*no birds detected*	-	-								
21-May-21	10:45	300	Common Raven	Corvus corax	S5	1	passing		1000	SE	50-100	N	
21-May-21	11:15	330	raptor species	-	-	1	passing		2000	S W	50-100	E	
21-May-21	11:45	360	*no birds detected*	-	-								
21-May-21	12:15	390	American Goldfinch	Spinus tristis	S5	1	passing		50	N W	50-100	SE	
21-May-21	12:45	420	Common Grackle	Quiscalus quiscula	S5B	1	passing		500	S	50-100	NW	
21-May-21	13:15	450	Bald Eagle	Haliaeetus leucocephalus	S5	1	circling		2000	W	100-250	NE	slowly making its way ne
21-May-21	13:45	480	American Kestrel	Falco sparverius	S3B	1	local	calling	100	E			

Date	Survey Time	Total survey time	Common name	Scientific Name	S-Rank	# Detected	Seen	Heard	Est. Distance	Est. Bearing	Pass Height (m)	Pass Direction	Comments
21-May-21	14:15	510	Common Grackle	Quiscalus quiscula	S5B	3	passing		1000	SE	50-100	W	
	14:45	540	SURVEY END										
TOTAL:						121							



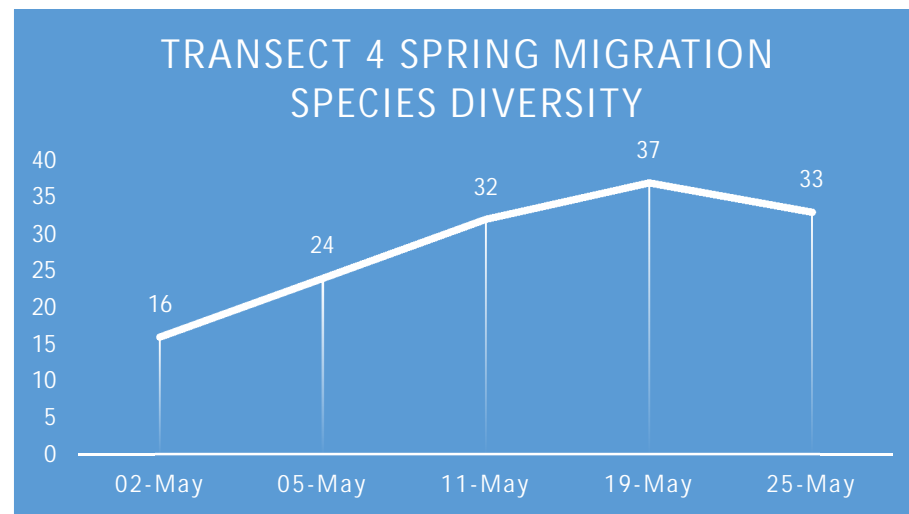
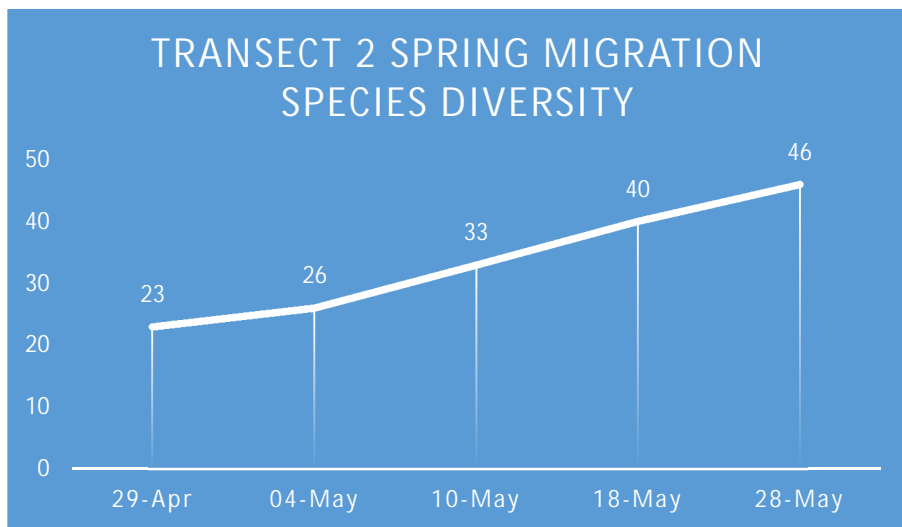
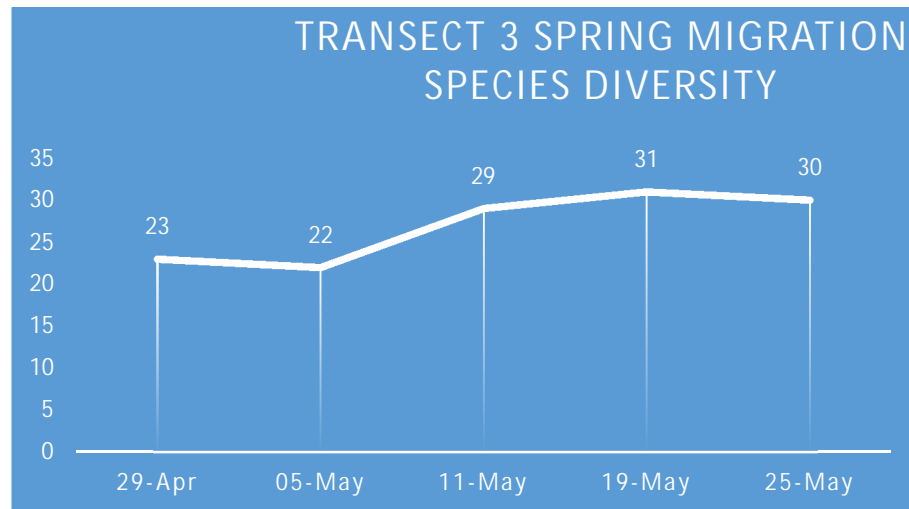
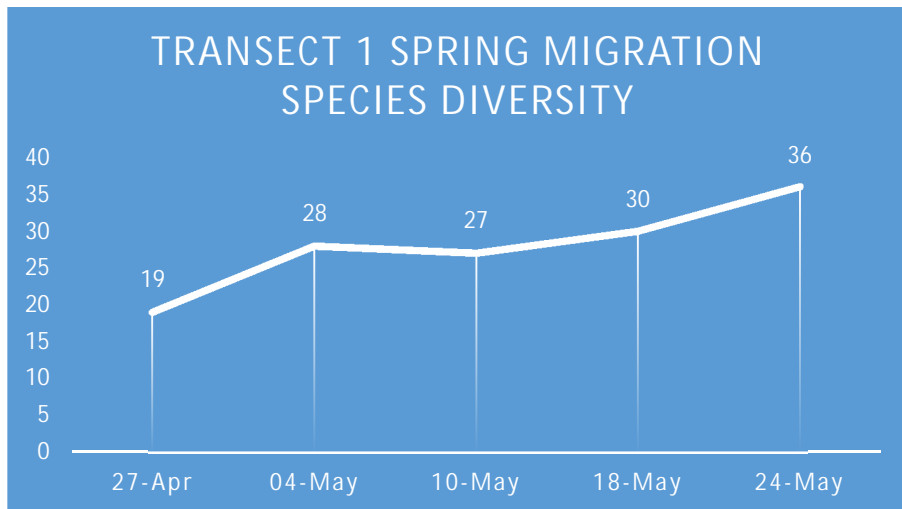


Figure H-2: Number of Bird Species Detected During the 2021 Spring Bird Surveys by Transect at the BMWP Site

Overall, the vast majority of the birds detected within the assessment area during the Spring Migration Stop-over Counts are ranked S4 or S5 by the ACCDC indicating that they are considered 'Apparently Secure' or 'Secure', respectively. A discussion of detected SOCC and SAR is available in Section 6.2.3.

Table H-4: Total Abundance of Birds Detected During the 2021 Spring Migration Stop-Over Counts

Common Name	Scientific Name	SARA	NS ESA	S-rank
White-throated Sparrow	<i>Zonotrichia albicollis</i>			S5B
Hermit Thrush	<i>Catharus guttatus</i>			S5B
Palm Warbler	<i>Setophaga palmarum</i>			S5B
Common Yellowthroat	<i>Geothlypis trichas</i>			S5B
Dark-eyed Junco	<i>Junco hyemalis</i>			S4S5
Yellow-rumped Warbler	<i>Setophaga coronata</i>			S5B
Blue Jay	<i>Cyanocitta cristata</i>			S5
Black-capped Chickadee	<i>Poecile atricapillus</i>			S5
Northern Flicker	<i>Colaptes auratus</i>			S5B
Mourning Dove	<i>Zenaida macroura</i>			S5
Ovenbird	<i>Seiurus aurocapilla</i>			S5B
Black-and-White Warbler	<i>Mniotilta varia</i>			S5B
American Goldfinch	<i>Spinus tristis</i>			S5
Magnolia Warbler	<i>Setophaga magnolia</i>			S5B
Song Sparrow	<i>Melospiza melodia</i>			S5B
American Robin	<i>Turdus migratorius</i>			S5B S3N
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>			S4S5B
Nashville Warbler	<i>Oreothlypis ruficapilla</i>			S4S5B
Ruffed Grouse	<i>Bonasa umbellus</i>			S5
Chestnut-sided Warbler	<i>Setophaga pensylvanica</i>			S5B
Purple Finch	<i>Haemorhous purpureus</i>			S4S5B S3S4N
Common Grackle	<i>Quiscalus quiscula</i>			S5B
Red-breasted Nuthatch	<i>Sitta canadensis</i>			S3
Swamp Sparrow	<i>Melospiza georgiana</i>			S5B
Hairy Woodpecker	<i>Dryobates villosus</i>			S5
Black-throated Green Warbler	<i>Setophaga virens</i>			S5B
Blue-headed Vireo	<i>Vireo solitarius</i>			S5B
American Crow	<i>Corvus brachyrhynchos</i>			S5
Olive-sided Flycatcher	<i>Contopus cooperi</i>	SC	T	S2B

Common Name	Scientific Name	SARA	NS ESA	S-rank
Canada Jay	<i>Perisoreus canadensis</i>			S3
Black-throated Blue Warbler	<i>Setophaga caerulescens</i>			S5B
Golden-crowned Kinglet	<i>Regulus satrapa</i>			S5
Northern Parula	<i>Setophaga americana</i>			S5B
Alder Flycatcher	<i>Empidonax alnorum</i>			S5B
American Redstart	<i>Setophaga ruticilla</i>			S4S5B
Canada Goose	<i>Branta canadensis</i>			S4N
Common Raven	<i>Corvus corax</i>			S5
Downy Woodpecker	<i>Dryobates pubescens</i>			S5
Yellow-bellied Flycatcher	<i>Empidonax flaviventris</i>			S3S4B
Least Flycatcher	<i>Empidonax minimus</i>			S4S5B
Winter Wren	<i>Troglodytes hiemalis</i>			S5B
American Kestrel	<i>Falco sparverius</i>			S3B
Double-crested Cormorant	<i>Phalacrocorax auritus</i>	NAR		S4B
Canada Warbler	<i>Cardellina canadensis</i>	T	Endangered	S3B
Evening Grosbeak	<i>Coccothraustes vespertinus</i>	SC	Vulnerable	S3S4B S3N
Ruby-crowned Kinglet	<i>Regulus calendula</i>			S3S4B
American Black Duck	<i>Anas rubripes</i>			S5
Lincoln's Sparrow	<i>Melospiza lincolni</i>			S4B
Red-eyed Vireo	<i>Vireo olivaceus</i>			S5B
Red-tailed Hawk	<i>Buteo jamaicensis</i>	NAR		S5
Pileated Woodpecker	<i>Dryocopus pileatus</i>			S5
Tree Swallow	<i>Tachycineta bicolor</i>			S4B
Northern Waterthrush	<i>Parkesia noveboracensis</i>			S4B
Red-winged Blackbird	<i>Agelaius phoeniceus</i>			S4B
Bald Eagle	<i>Haliaeetus leucocephalus</i>	NAR		S5
Brown Creeper	<i>Certhia americana</i>			S5
Common Loon	<i>Gavia immer</i>	NAR		S4B S4N
Common Nighthawk	<i>Chordeiles minor</i>	SC	Threatened	S2B
Eastern Wood-Pewee	<i>Contopus virens</i>	SC	Vulnerable	S3S4B
Blackpoll Warbler	<i>Setophaga striata</i>			S3S4B
Gray Catbird	<i>Dumetella carolinensis</i>			S3B
Northern Harrier	<i>Circus hudsonius</i>	NAR		S3S4B

Common Name	Scientific Name	SARA	NS ESA	S-rank
Veery	<i>Catharus fuscescens</i>			S3S4B
American Woodcock	<i>Scolopax minor</i>			S5B
Belted Kingfisher	<i>Megaceryle alcyon</i>			S5B
Blackburnian Warbler	<i>Setophaga fusca</i>			S4B
Broad-winged Hawk	<i>Buteo platypterus</i>			S5B
Ruby-throated Hummingbird	<i>Archilochus colubris</i>			S5B
Sharp-shinned Hawk	<i>Accipiter striatus</i>	NAR		S5
Spruce Grouse	<i>Falcapennis canadensis</i>			S4
White-winged Crossbill	<i>Loxia leucoptera</i>			S4S5
Wood Duck	<i>Aix sponsa</i>			S5B
Yellow Warbler	<i>Setophaga petechia</i>			S5B

3.2.2 Breeding Nocturnal Owl Survey

During the breeding nocturnal owl survey in 2021 two species of nocturnal owl were detected (Great Horned Owl and the Northern Saw-whet Owl). No SAR or SoCC owl species were detected during the 2021 breeding nocturnal owl surveys. The results of the 2021 breeding nocturnal owl surveys are presented in Table H-5.

Table H-5: Results of the 2021 Breeding Nocturnal Owl Survey

Survey Location	Number detected	Common Name	Scientific Name	Estimated Distance (m)	Estimated Direction	S-rank
1	1	American Woodcock	<i>Scolopax minor</i>	n/a	n/a	S5B
2	1	Great Horned Owl	<i>Bubo virginianus</i>	500	S	S4
3	1	Northern Saw-whet Owl	<i>Aegolius acadicus</i>	500	SW	S4B
4	1	Northern Saw-whet Owl	<i>Aegolius acadicus</i>	250	W	S4B
5	1	Northern Saw-whet Owl	<i>Aegolius acadicus</i>	500	SW	S4B
5	1	Great Horned Owl	<i>Bubo virginianus</i>	1000	W	S4
6	1	Northern Saw-whet Owl	<i>Aegolius acadicus</i>	500	N	S4B
7	1	Northern Saw-whet Owl	<i>Aegolius acadicus</i>	100	NNW	S4B
8	1	Northern Saw-whet Owl	<i>Aegolius acadicus</i>	500	SW	S4B

3.3 Summer Survey Program

A total of 1,478 individual birds comprised of 74 species were recorded during the Summer Survey programs. The vast majority of these individuals and species, 1,423 and 66 respectively, were detected during point counts conducted for the Breeding Bird Survey. A further 53 individuals and 8 species were added through incidental detections and, lastly, two individuals were added as a result of the Breeding Common Nighthawk Survey.

Table H-6: Bird Species Detected During the Spring Survey Program

Common Name	Scientific Name	SARA	NS ESA	S-rank
Alder Flycatcher	<i>Empidonax alnorum</i>			S5B
American Crow	<i>Corvus brachyrhynchos</i>			S5
American Goldfinch	<i>Spinus tristis</i>			S5
American Kestrel	<i>Falco sparverius</i>			S3B
American Redstart	<i>Setophaga ruticilla</i>			S4S5B
American Robin	<i>Turdus migratorius</i>			S5B S3N
American Woodcock	<i>Scolopax minor</i>			S5B
Barred Owl	<i>Strix varia</i>			S5
Bay-breasted Warbler	<i>Setophaga castanea</i>			S3S4B

Common Name	Scientific Name	SARA	NS ESA	S-rank
Black-and-White Warbler	<i>Mniotilta varia</i>			S5B
Black-capped Chickadee	<i>Poecile atricapillus</i>			S5
Black-throated Blue Warbler	<i>Setophaga caerulescens</i>			S5B
Black-throated Green Warbler	<i>Setophaga virens</i>			S5B
Blue Jay	<i>Cyanocitta cristata</i>			S5
Blue-headed Vireo	<i>Vireo solitarius</i>			S5B
Boreal Chickadee	<i>Poecile hudsonicus</i>			S3
Broad-winged Hawk	<i>Buteo platypterus</i>			S5B
Brown Creeper	<i>Certhia americana</i>			S5
Canada Jay	<i>Perisoreus canadensis</i>			S3
Canada Warbler	<i>Cardellina canadensis</i>	T	Endangered	S3B
Cape May Warbler	<i>Setophaga tigrina</i>			S2B
Cedar Waxwing	<i>Bombycilla cedrorum</i>			S5B
Chestnut-sided Warbler	<i>Setophaga pensylvanica</i>			S5B
Chimney Swift	<i>Chaetura pelagica</i>	T	Endangered	S2B S1M
Common Grackle	<i>Quiscalus quiscula</i>			S5B
Common Loon	<i>Gavia immer</i>	NAR		S4B S4N
Common Nighthawk	<i>Chordeiles minor</i>	SC	Threatened	S2B
Common Raven	<i>Corvus corax</i>			S5
Common Yellowthroat	<i>Geothlypis trichas</i>			S5B
Dark-eyed Junco	<i>Junco hyemalis</i>			S4S5
Downy Woodpecker	<i>Dryobates pubescens</i>			S5
Eastern Phoebe	<i>Sayornis phoebe</i>			S4B
Evening Grosbeak	<i>Coccothraustes vespertinus</i>	SC	Vulnerable	S3S4B S3N
Golden-crowned Kinglet	<i>Regulus satrapa</i>			S5
Gray Catbird	<i>Dumetella carolinensis</i>			S3B
Hairy Woodpecker	<i>Dryobates villosus</i>			S5
Hermit Thrush	<i>Catharus guttatus</i>			S5B
Least Flycatcher	<i>Empidonax minimus</i>			S4S5B
Lincoln's Sparrow	<i>Melospiza lincolnii</i>			S4B
Magnolia Warbler	<i>Setophaga magnolia</i>			S5B
Mourning Dove	<i>Zenaida macroura</i>			S5
Mourning Warbler	<i>Geothlypis philadelphia</i>			S4B
Nashville Warbler	<i>Oreothlypis ruficapilla</i>			S4S5B
Northern Flicker	<i>Colaptes auratus</i>			S5B

Common Name	Scientific Name	SARA	NS ESA	S-rank
Northern Harrier	<i>Circus hudsonius</i>	NAR		S3S4B
Northern Parula	<i>Setophaga americana</i>			S5B
Northern Waterthrush	<i>Parkesia noveboracensis</i>			S4B
Olive-sided Flycatcher	<i>Contopus cooperi</i>	SC	Threatened	S2B
Ovenbird	<i>Seiurus aurocapilla</i>			S5B
Palm Warbler	<i>Setophaga palmarum</i>			S5B
Pileated Woodpecker	<i>Dryocopus pileatus</i>			S5
Pine Siskin	<i>Spinus pinus</i>			S2S3
Purple Finch	<i>Haemorhous purpureus</i>			S4S5B S3S4N
Red Crossbill	<i>Loxia curvirostra</i>			S3S4
Red-breasted Nuthatch	<i>Sitta canadensis</i>			S3
Red-eyed Vireo	<i>Vireo olivaceus</i>			S5B
Red-tailed Hawk	<i>Buteo jamaicensis</i>	NAR		S5
Ruby-crowned Kinglet	<i>Regulus calendula</i>			S3S4B
Ruby-throated Hummingbird	<i>Archilochus colubris</i>			S5B
Ruffed Grouse	<i>Bonasa umbellus</i>			S5
Song Sparrow	<i>Melospiza melodia</i>			S5B
Spruce Grouse	<i>Falcapennis canadensis</i>			S4
Swainson's Thrush	<i>Catharus ustulatus</i>			S3S4B
Swamp Sparrow	<i>Melospiza georgiana</i>			S5B
Tree Swallow	<i>Tachycineta bicolor</i>			S4B
Veery	<i>Catharus fuscescens</i>			S3S4B
White-throated Sparrow	<i>Zonotrichia albicollis</i>			S5B
White-winged Crossbill	<i>Loxia leucoptera</i>			S4S5
Winter Wren	<i>Troglodytes hiemalis</i>			S5B
Wood Duck	<i>Aix sponsa</i>			S5B
Yellow Warbler	<i>Setophaga petechia</i>			S5B
Yellow-bellied Flycatcher	<i>Empidonax flaviventris</i>			S3S4B
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>			S4S5B
Yellow-rumped Warbler	<i>Setophaga coronata</i>			S5B

Note: Alphabetical (Bold indicates species only identified incidentally)

3.3.1

Breeding Bird Survey

A total of 1,423 individual birds comprised of 66 species were recorded during the summer Breeding Bird Survey. These data are used to assess abundance of each species, as well as to briefly examine the seasonality of bird diversity during the earlier and later portion of the peak breeding period.

Figure H-3 illustrates that bird diversity remained relatively high, averaging more than 37 species across all transects. However, at some transects species diversity rose between early and late visits, while at others species diversity was highest during the early portion of the breeding season. This is an indication of the end of the migration period may extend into early June.

Overall, the vast majority of the birds detected within the assessment area during the Summer Breeding Bird Survey are ranked S4 or S5 by the ACCDC indicating that they are considered 'Apparently Secure' or 'Secure', respectively. A detailed discussion of detected SoCC and SAR is available in Section 6.2.3.

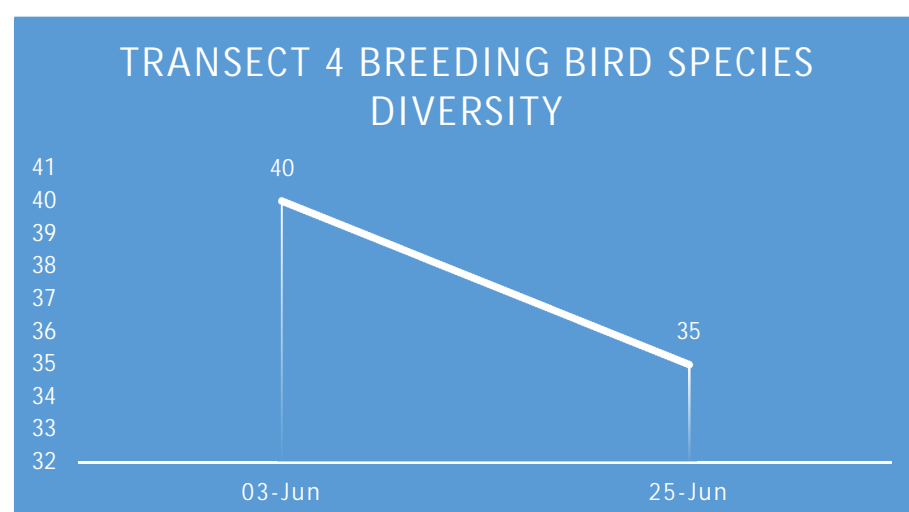
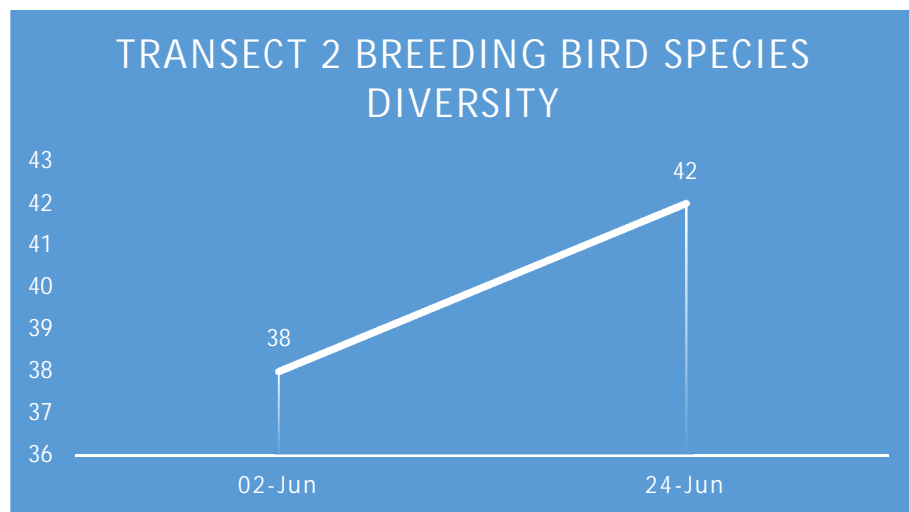
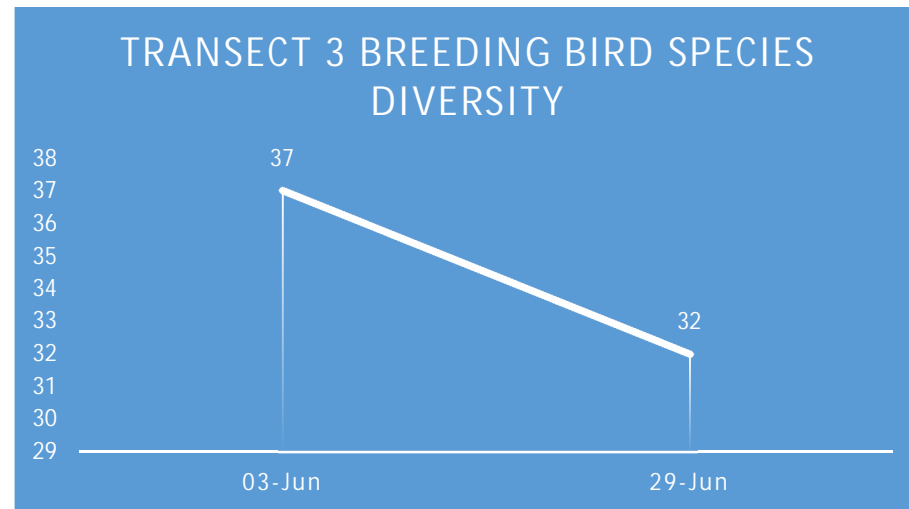
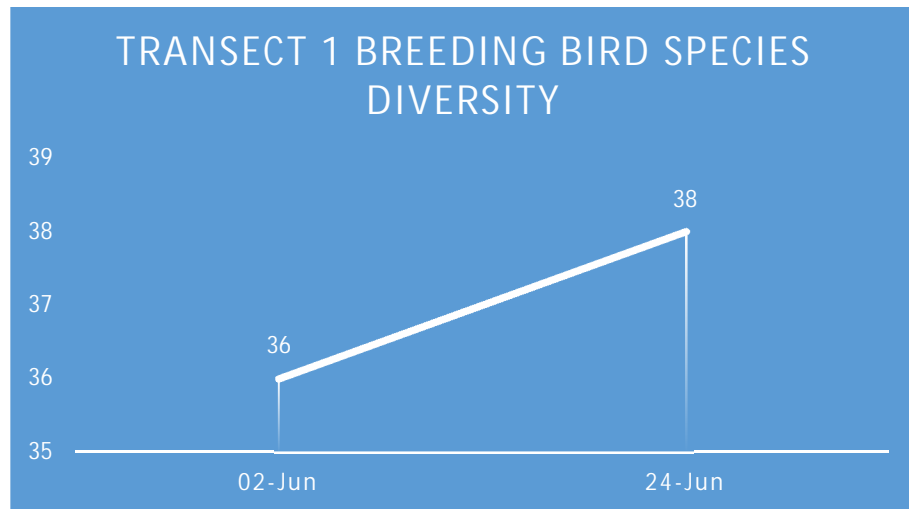


Figure H-3: Number of Bird Species Detected During the 2021 Summer Bird Surveys by Transect at the BMWP Site

Table H-7: Total Abundance of Birds Detected During Summer Breeding Bird Survey

Common Name	Scientific Name	SARA	NS ESA	S-rank
Common Yellowthroat	<i>Geothlypis trichas</i>			S5B
White-throated Sparrow	<i>Zonotrichia albicollis</i>			S5B
Hermit Thrush	<i>Catharus guttatus</i>			S5B
Magnolia Warbler	<i>Setophaga magnolia</i>			S5B
Palm Warbler	<i>Setophaga palmarum</i>			S5B
Ovenbird	<i>Seiurus aurocapilla</i>			S5B
Alder Flycatcher	<i>Empidonax alnorum</i>			S5B
Black-and-White Warbler	<i>Mniotilta varia</i>			S5B
Mourning Dove	<i>Zenaida macroura</i>			S5
Chestnut-sided Warbler	<i>Setophaga pensylvanica</i>			S5B
Dark-eyed Junco	<i>Junco hyemalis</i>			S4S5
Blue Jay	<i>Cyanocitta cristata</i>			S5
American Goldfinch	<i>Spinus tristis</i>			S5
Nashville Warbler	<i>Oreothlypis ruficapilla</i>			S4S5B
Yellow-rumped Warbler	<i>Setophaga coronata</i>			S5B
Olive-sided Flycatcher	<i>Contopus cooperi</i>	SC	T	S2B
Cedar Waxwing	<i>Bombycilla cedrorum</i>			S5B
Yellow-bellied Flycatcher	<i>Empidonax flaviventris</i>			S3S4B
American Redstart	<i>Setophaga ruticilla</i>			S4S5B
Black-capped Chickadee	<i>Poecile atricapillus</i>			S5
Northern Flicker	<i>Colaptes auratus</i>			S5B
Red-eyed Vireo	<i>Vireo olivaceus</i>			S5B
American Robin	<i>Turdus migratorius</i>			S5B S3N
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>			S4S5B
Song Sparrow	<i>Melospiza melodia</i>			S5B
Canada Warbler	<i>Cardellina canadensis</i>	T	E	S3B
Black-throated Green Warbler	<i>Setophaga virens</i>			S5B
Purple Finch	<i>Haemorhous purpureus</i>			S4S5B S3S4N
Black-throated Blue Warbler	<i>Setophaga caerulescens</i>			S5B
Blue-headed Vireo	<i>Vireo solitarius</i>			S5B
Northern Parula	<i>Setophaga americana</i>			S5B
Canada Jay	<i>Perisoreus canadensis</i>			S3

Common Name	Scientific Name	SARA	NS ESA	S-rank
Red Crossbill	<i>Loxia curvirostra</i>			S3S4
Red-breasted Nuthatch	<i>Sitta canadensis</i>			S3
Hairy Woodpecker	<i>Dryobates villosus</i>			S5
Least Flycatcher	<i>Empidonax minimus</i>			S4S5B
Lincoln's Sparrow	<i>Melospiza lincolni</i>			S4B
American Crow	<i>Corvus brachyrhynchos</i>			S5
Common Grackle	<i>Quiscalus quiscula</i>			S5B
Swamp Sparrow	<i>Melospiza georgiana</i>			S5B
Golden-crowned Kinglet	<i>Regulus satrapa</i>			S5
Common Nighthawk	<i>Chordeiles minor</i>	SC	T	S2B
Evening Grosbeak	<i>Coccothraustes vespertinus</i>	SC	V	S3S4B S3N
Ruffed Grouse	<i>Bonasa umbellus</i>			S5
White-winged Crossbill	<i>Loxia leucoptera</i>			S4S5
American Kestrel	<i>Falco sparverius</i>			S3B
Veery	<i>Catharus fuscescens</i>			S3S4B
Common Raven	<i>Corvus corax</i>			S5
Downy Woodpecker	<i>Dryobates pubescens</i>			S5
Ruby-throated Hummingbird	<i>Archilochus colubris</i>			S5B
Winter Wren	<i>Troglodytes hiemalis</i>			S5B
Gray Catbird	<i>Dumetella carolinensis</i>			S3B
Pine Siskin	<i>Spinus pinus</i>			S2S3
Swainson's Thrush	<i>Catharus ustulatus</i>			S3S4B
American Woodcock	<i>Scolopax minor</i>			S5B
Brown Creeper	<i>Certhia americana</i>			S5
Common Loon	<i>Gavia immer</i>	NAR		S4B S4N
Eastern Phoebe	<i>Sayornis phoebe</i>			S4B
Mourning Warbler	<i>Geothlypis philadelphia</i>			S4B
Northern Waterthrush	<i>Parkesia noveboracensis</i>			S4B
Pileated Woodpecker	<i>Dryocopus pileatus</i>			S5
Red-tailed Hawk	<i>Buteo jamaicensis</i>	NAR		S5
Spruce Grouse	<i>Falcipennis canadensis</i>			S4
Tree Swallow	<i>Tachycineta bicolor</i>			S4B
Wood Duck	<i>Aix sponsa</i>			S5B
Yellow Warbler	<i>Setophaga petechia</i>			S5B

3.3.2 Common Nighthawk Survey

Only two (2) Common Nighthawk were detected during the Common Nighthawk Survey which took place in June during the full moon.

Table H-8: Results of the Breeding Nocturnal Owl Survey

Survey Location	Number detected	Common Name	Scientific Name	SAR or SOCC	Estimated Distance (m)	Estimated Direction	SARA Status	NS ESA Status	S-rank
6	1	Common Nighthawk	Chordeiles minor	SAR	500	SW	SC	T	S2B
7	1	Common Nighthawk	Chordeiles minor	SAR	250	E	SC	T	S2B

3.4 Fall Survey Program

3.4.1 Fall Migration Survey

A total of 2,385 individual birds comprised of 66 species were recorded during the Fall Migration Stop-over Counts. These data are used to assess abundance of each species, as well as to briefly examine the seasonality of bird diversity migrating through the study area.

A summary of the birds observed during the Fall Diurnal Watch Counts is presented in Table H-9.

Figure H-4 illustrates a general trend of rising bird diversity throughout the fall migratory period.

Table H-9: Fall Diurnal Watch Count Results

Date	Survey Time	Total survey time (mins)	Common name	Scientific Name	S-Rank	# Detected	Seen	Heard	Est. Distance	Est. Bearing	Pass. Height (m)	Pass Direction	Comments
19-Aug-21	8:00	0	Black-and-White Warbler	<i>Mniotilta varia</i>	S5B	1	local	singing	50	east			
19-Aug-21			Palm Warbler	<i>Setophaga palmarum</i>	S5B	1	local	singing	50	se			
19-Aug-21			Blue Jay	<i>Cyanocitta cristata</i>	S5	2	local	calling	50	east			
19-Aug-21	8:30	30	Red-tailed Hawk	<i>Buteo jamaicensis</i>	S5	1	passing		500	se	50-100	S	gliding above canopy in valley below
19-Aug-21			Cedar Waxwing	<i>Bombycilla cedrorum</i>	S5B	3	passing		100	east	<50	S	
19-Aug-21	9:00	60	American Robin	<i>Turdus migratorius</i>	S5B, S3N	1	passing		50	east	<50	W	
19-Aug-21			Common Yellowthroat	<i>Geothlypis trichas</i>	S5B	1	local	singing	50	se			
19-Aug-21	9:30	90	American Robin	<i>Turdus migratorius</i>	S5B, S3N	2	passing		250	ne	<50	SW	
19-Aug-21	10:00	120	warbler spp.	-	-	1	passing		500	ne	<50	SW	
19-Aug-21	10:30	150	Red-tailed Hawk	<i>Buteo jamaicensis</i>	S5	1	circling		1000	north	250+		gaining altitude
19-Aug-21			American Goldfinch	<i>Spinus tristis</i>	S5	2	passing		150	west	<50	E	
19-Aug-21			Red-tailed Hawk	<i>Buteo jamaicensis</i>	S5	1	passing		500	S	50-100	SE	

Date	Survey Time	Total survey time (mins)	Common name	Scientific Name	S-Rank	# Detected	Seen	Heard	Est. Distance	Est. Bearing	Pass. Height (m)	Pass Direction	Comments
19-Aug-21			Cedar Waxwing	Bombycilla cedrorum	S5B	4	passing		250	NE	50-100	SW	
19-Aug-21	11:00	180	Northern Flicker	Colaptes auratus	S5B	1	passing		500	NE	<50	W	
19-Aug-21			American Goldfinch	Spinus tristis	S5	4	passing		250	E	50-100	SW	
19-Aug-21	11:30	210	Mourning Dove	Zenaida macroura	S5	1	passing		100	N	50-100	W	
19-Aug-21			Red-tailed Hawk	Buteo jamaicensis	S5	1	perched		3000	NE			perched at distance
19-Aug-21			Olive-sided Flycatcher	Contopus cooperi	S2B	1	local	singing	200	W			
19-Aug-21			American Goldfinch	Spinus tristis	S5	1	passing		250	NE	50-100	S	
	12:00	240	SURVEY END										
26-Aug-21	11:05	0	American Robin	Turdus migratorius	S5B, S3N	2	passing		100	E	<50	E	
26-Aug-21			Purple Finch	Haemorhous purpureus	S4S5B S3S4N	1	passing		50	W	50-100	NE	
26-Aug-21			American Goldfinch	Spinus tristis	S5	1	passing		0	W	<50	SE	
26-Aug-21	11:35	30	Olive-sided Flycatcher	Contopus cooperi	S2B	1	passing		250	S			
26-Aug-21			Cedar Waxwing	Bombycilla cedrorum	S5B	1	passing		250	NE	<50	SW	
26-Aug-21	12:05	60	Common Raven	Corvus corax	S5	1	passing		500	S	<50	NE	

Date	Survey Time	Total survey time (mins)	Common name	Scientific Name	S-Rank	# Detected	Seen	Heard	Est. Distance	Est. Bearing	Pass. Height (m)	Pass Direction	Comments
26-Aug-21			Pileated Woodpecker	Dryocopus pileatus	S5	1	local	calling					
26-Aug-21	12:35	90	American Goldfinch	Spinus tristis	S5	1	passing		100	NW	<50	SE	
26-Aug-21			Cedar Waxwing	Bombycilla cedrorum	S5B	1	passing		100	NW	<50	SE	
26-Aug-21			Olive-sided Flycatcher	Contopus cooperi	S2B	1	passing		250	SW			
26-Aug-21	13:05	120	Olive-sided Flycatcher	Contopus cooperi	S2B	1	local		250	NE			young bird foraging
26-Aug-21			warbler spp.	-	-	1	passing		100	SE	<50	S	
26-Aug-21			Chimney Swift	Chaetura pelagica	S2B S1M	3	passing		500	SE	<50	W	
26-Aug-21	13:35	150	Ovenbird	Seiurus aurocapilla	S5B	1	local	singing					singing
26-Aug-21	14:05	180	American Goldfinch	Spinus tristis	S5	1	passing		50	NW	<50	S	
26-Aug-21			American Goldfinch	Spinus tristis	S5	1	passing		0	SE	<50	W	
26-Aug-21	14:35	210	*no birds detected*	-	-								
26-Aug-21	15:05	240	Cedar Waxwing	Bombycilla cedrorum	S5B	2	passing		0	N	<50	SE	
26-Aug-21	15:35	270	Cedar Waxwing	Bombycilla cedrorum	S5B	2	passing		0	N	<50	S	
26-Aug-21	16:05	300	American Kestrel	Falco sparverius	S3B	1	local	calling					

Date	Survey Time	Total survey time (mins)	Common name	Scientific Name	S-Rank	# Detected	Seen	Heard	Est. Distance	Est. Bearing	Pass. Height (m)	Pass Direction	Comments
	16:35	330	SURVEY END										
14-Sep-21	14:25	0	warbler spp.	-	-	1	passing		250	N	<50	W	
14-Sep-21			Red-tailed Hawk	Buteo jamaicensis	S5	1	passing		3000	SE	100-250	SW	
14-Sep-21	14:55	30	Common Raven	Corvus corax	S5	1	passing		500	NW	100-250		
14-Sep-21			raptor spp.	-	-	1	passing		5000	NW	250+	W	
14-Sep-21			Cedar Waxwing	Bombycilla cedrorum	S5B	2	passing		100	NE	<50	NW	
14-Sep-21	15:25	60	Broad-winged Hawk	Buteo platypterus	S5B	1	passing		1000	N	100-250	SW	
14-Sep-21			Red-tailed Hawk	Buteo jamaicensis	S5	1	passing		2000	E	100-250	S	
14-Sep-21	15:55	90	Cape May Warbler	Setophaga tigrina	S2B	1	local	singing	50				
14-Sep-21			Turkey Vulture	Cathartes aura	S2S3B	1	passing		2000	NE	250+	S	
14-Sep-21	16:25	120	Broad-winged Hawk	Buteo platypterus	S5B	1	passing		2000	NE	250+	SE	
14-Sep-21	16:55	150	Hermit Thrush	Catharus guttatus	S5B	1	local	singing	50				
14-Sep-21			Red-breasted Nuthatch	Sitta canadensis	S3	1	local	singing	100				
14-Sep-21			Broad-winged Hawk	Buteo platypterus	S5B	4	passing		2000	E	250+	W	all in one group.

Date	Survey Time	Total survey time (mins)	Common name	Scientific Name	S-Rank	# Detected	Seen	Heard	Est. Distance	Est. Bearing	Pass. Height (m)	Pass Direction	Comments
14-Sep-21	17:25	180	Bald Eagle	<i>Haliaeetus leucocephalus</i>	S5	1	passing		2000	W	250+	W	
14-Sep-21	17:55	210	Herring Gull	<i>Larus argentatus</i>	S5	2	passing		3000	NE	250+	W	
14-Sep-21			Herring Gull	<i>Larus argentatus</i>	S5	6	passing		3000	NE	250+	S	
14-Sep-21	18:25	240	Cedar Waxwing	<i>Bombycilla cedrorum</i>	S5B	2	passing		250	NE	<50	W	
14-Sep-21			Northern Flicker	<i>Colaptes auratus</i>	S5B	1	passing		500	E	<50	W	
14-Sep-21	18:55	270	Cedar Waxwing	<i>Bombycilla cedrorum</i>	S5B	16	passing		500	N	<50	E	
	19:25	300	SURVEY END										
23-Sep-21	10:20	0	Purple Finch	<i>Haemorhous purpureus</i>	S4S5B S3S4N	1	local	singing					
23-Sep-21	10:50	30	Red-tailed Hawk	<i>Buteo jamaicensis</i>	S5	1	circling		1000	N	100-250	circling	
23-Sep-21			Common Grackle	<i>Quiscalus quiscula</i>	S5B	2	passing		500	N	<50	E	
23-Sep-21	11:20	60	Bald Eagle	<i>Haliaeetus leucocephalus</i>	S5	2	passing		2000	SW	100-250	E	
23-Sep-21	11:50	90	American Goldfinch	<i>Spinus tristis</i>	S5	2	passing		0	W	<50	E	
23-Sep-21			raptor spp.	-	-	1	circling		2000	NE	100-250	circling	

Date	Survey Time	Total survey time (mins)	Common name	Scientific Name	S-Rank	# Detected	Seen	Heard	Est. Distance	Est. Bearing	Pass. Height (m)	Pass Direction	Comments
23-Sep-21	12:20	120	Evening Grosbeak	<i>Coccothraustes vespertinus</i>	S3S4B S3N	6	passing		500	E	<50	N	
23-Sep-21			Red-tailed Hawk	<i>Buteo jamaicensis</i>	S5	1	passing		500	w	100-250	W	hunting
23-Sep-21			raptor spp.	-	-	1	passing		3000	W	250+	W	
23-Sep-21			Ruby-crowned Kinglet	<i>Regulus calendula</i>	S3S4B	1	local	singing					
23-Sep-21			Hermit Thrush	<i>Catharus guttatus</i>	S5B	1	local	singing					
23-Sep-21	12:50	150	Bald Eagle	<i>Haliaeetus leucocephalus</i>	S5	4	circling		1000	E	100-250	E	circling, eventually moved east
23-Sep-21	13:20	180	Bald Eagle	<i>Haliaeetus leucocephalus</i>	S5	1	circling		3000	NE	100-250	circling	
23-Sep-21			Common Raven	<i>Corvus corax</i>	S5	1	passing		3000	E	250+	E	
23-Sep-21	13:50	210	Cedar Waxwing	<i>Bombycilla cedrorum</i>	S5B	11	local	feeding					
23-Sep-21			Ruby-crowned Kinglet	<i>Regulus calendula</i>	S3S4B	1	local	singing					
23-Sep-21	14:20	240	Blue-headed Vireo	<i>Vireo solitarius</i>	S5B	1	local	singing					
23-Sep-21			Bald Eagle	<i>Haliaeetus leucocephalus</i>	S5	1	passing		2000	W	100-250	S	
23-Sep-21			Ruby-crowned Kinglet	<i>Regulus calendula</i>	S3S4B	1	local	singing					
	14:50	270	SURVEY END										

Date	Survey Time	Total survey time (mins)	Common name	Scientific Name	S-Rank	# Detected	Seen	Heard	Est. Distance	Est. Bearing	Pass. Height (m)	Pass Direction	Comments
6-Oct-21	10:55	0	Sharp-shinned Hawk	Accipiter striatus	S5	2	passing		0	S	<50	S	
6-Oct-21			Yellow-rumped Warbler	Setophaga coronata	S5B	1	passing		0	N	<50	S	
6-Oct-21	11:25	30	Common Grackle	Quiscalus quiscula	S5B	1	passing		500	S	<50	W	
6-Oct-21			Common Raven	Corvus corax	S5	2	circling		3000	SW	250+	circling	
6-Oct-21	11:55	60	Bald Eagle	Haliaeetus leucocephalus	S5	1	circling		3000	S	250+	circling	circling, looked to be slowly moving east
6-Oct-21			Common Raven	Corvus corax	S5	1	circling		3000	S	250+	circling	
6-Oct-21			Canada Goose	Branta canadensis	S4N	1	passing						
6-Oct-21			raptor spp.	-	-	1	passing		3000	NW	100-250	W	circling above trees, stooped westward into woods
6-Oct-21	12:25	90	Cedar Waxwing	Bombycilla cedrorum	S5B	1	passing		0	S	<50	N	
6-Oct-21			Broad-winged Hawk	Buteo platypterus	S5B	1	passing		1000	NE	100-250	W	
6-Oct-21	12:55	120	Bald Eagle	Haliaeetus leucocephalus	S5	1	circling		1000	N	250+	soaring	

Date	Survey Time	Total survey time (mins)	Common name	Scientific Name	S-Rank	# Detected	Seen	Heard	Est. Distance	Est. Bearing	Pass. Height (m)	Pass Direction	Comments
6-Oct-21			Common Raven	Corvus corax	S5	18	circling		3000	N	100-250	S	circling, slowly made way south
6-Oct-21	13:25	150	Bald Eagle	Haliaeetus leucocephalus	S5	1	circling		3000	SE	100-250	soaring	
6-Oct-21	13:55	180	Red-tailed Hawk	Buteo jamaicensis	S5	1	passing		2000	NE	100-250	hunting	actively hunting, slowly moving se
6-Oct-21			Bald Eagle	Haliaeetus leucocephalus	S5	1	circling		2000	SE	100-250	soaring	
6-Oct-21	14:25	210	raptor spp.	-	-	1	circling		2000	SE	100-250	soaring	
	14:55	240	SURVEY END										

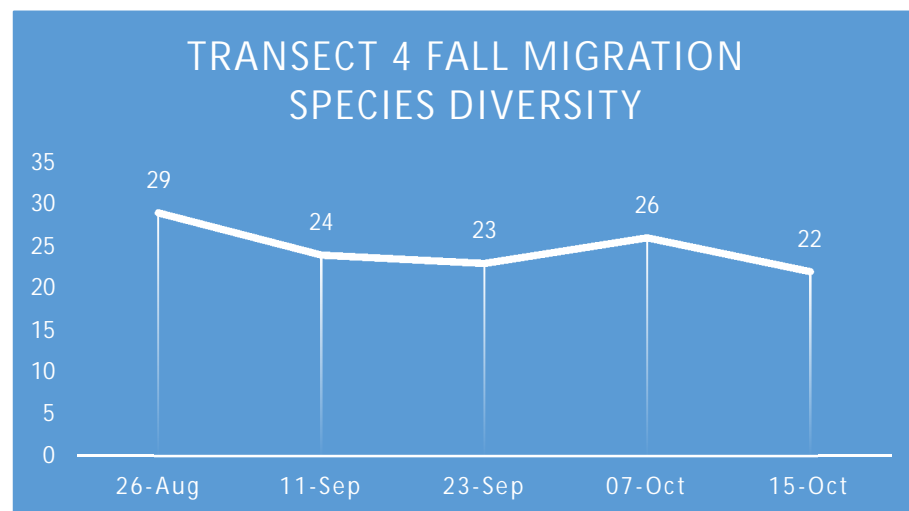
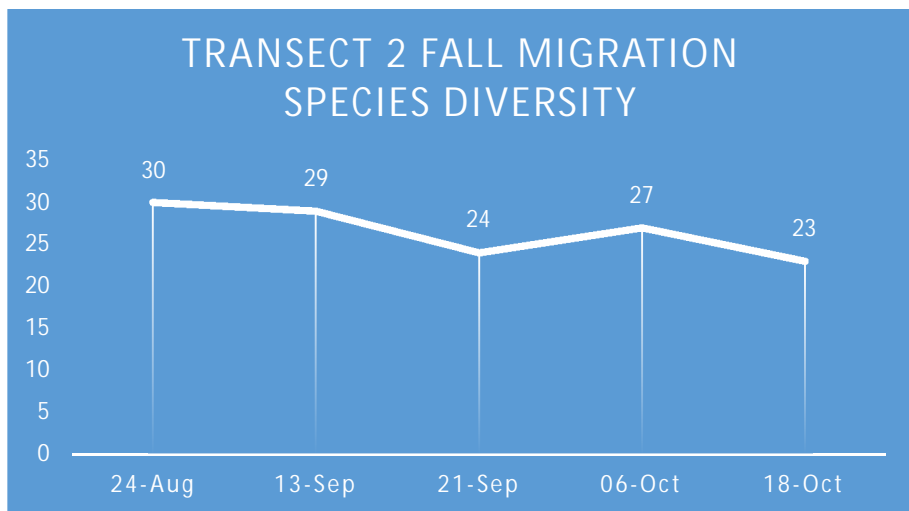
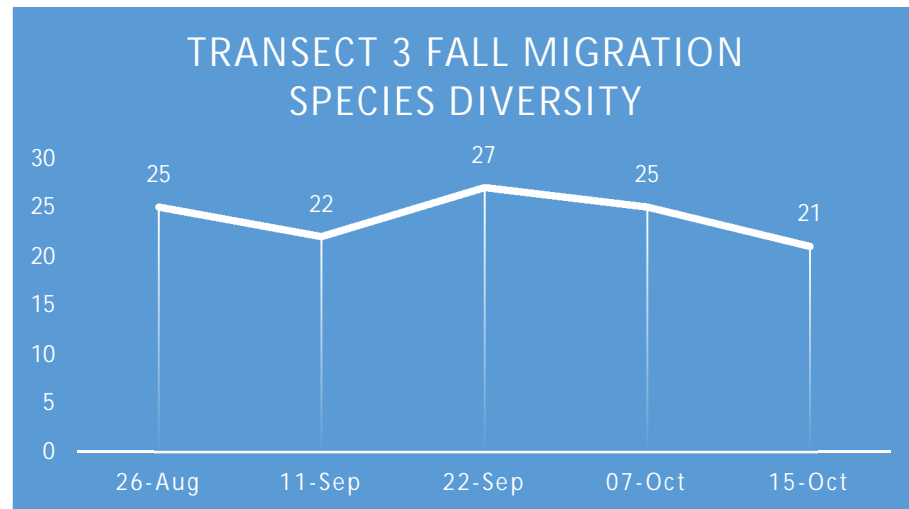
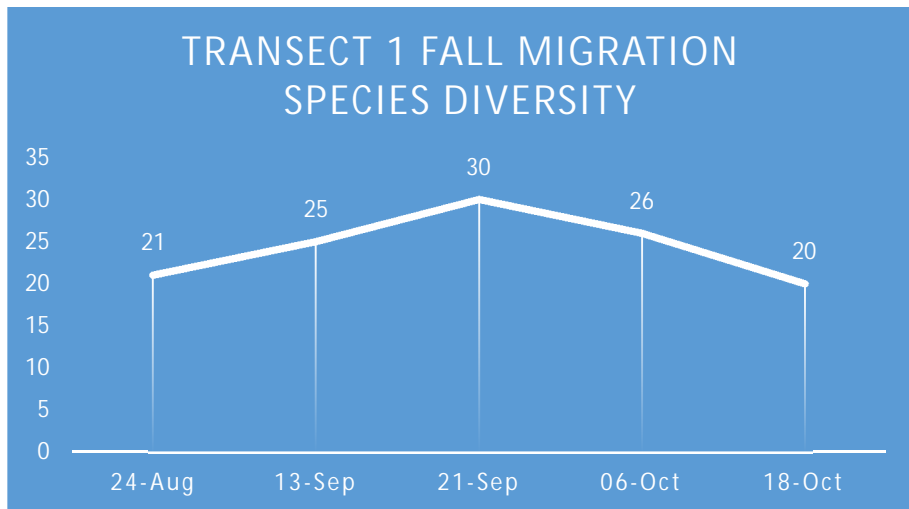


Figure H-4: Number of Bird Species Detected During the 2021 Fall Bird Surveys by Transect at the BMWP Site

Overall, the vast majority of the birds detected within the assessment area during the Fall Migration Stop-over Counts are ranked S4 or S5 by the ACCDC indicating that they are considered 'Apparently Secure' or 'Secure', respectively. A detailed discussion of detected SOCC and SAR is available in Section 6.2.3.

Table H-10: Total Abundance of Birds Detected During Fall Migration Stop-Over Counts

Number Detected	Common Name	Scientific Name	SARA Status	NS ESA Status	S-rank
239	American Goldfinch	<i>Spinus tristis</i>			S5
231	Blue Jay	<i>Cyanocitta cristata</i>			S5
179	Dark-eyed Junco	<i>Junco hyemalis</i>			S4S5
173	Palm Warbler	<i>Setophaga palmarum</i>			S5B
142	Yellow-rumped Warbler	<i>Setophaga coronata</i>			S5B
136	Black-capped Chickadee	<i>Poecile atricapillus</i>			S5
134	American Robin	<i>Turdus migratorius</i>			S5B S3N
112	Purple Finch	<i>Haemorhous purpureus</i>			S4S5B S3S4N
103	Common Yellowthroat	<i>Geothlypis trichas</i>			S5B
100	White-throated Sparrow	<i>Zonotrichia albicollis</i>			S5B
80	Northern Flicker	<i>Colaptes auratus</i>			S5B
59	Golden-crowned Kinglet	<i>Regulus satrapa</i>			S5
53	Canada Jay	<i>Perisoreus canadensis</i>			S3
50	White-winged Crossbill	<i>Loxia leucoptera</i>			S4S5
48	Cedar Waxwing	<i>Bombycilla cedrorum</i>			S5B
46	Hermit Thrush	<i>Catharus guttatus</i>			S5B
41	Red-breasted Nuthatch	<i>Sitta canadensis</i>			S3
38	Common Raven	<i>Corvus corax</i>			S5
35	Swamp Sparrow	<i>Melospiza georgiana</i>			S5B
34	Hairy Woodpecker	<i>Dryobates villosus</i>			S5
28	American Crow	<i>Corvus brachyrhynchos</i>			S5
23	Mourning Dove	<i>Zenaida macroura</i>			S5

Number Detected	Common Name	Scientific Name	SARA Status	NS ESA Status	S-rank
22	Pine Siskin	<i>Spinus pinus</i>			S2S3
22	Red Crossbill	<i>Loxia curvirostra</i>			S3S4
21	Ruby-crowned Kinglet	<i>Regulus calendula</i>			S3S4B
21	Song Sparrow	<i>Melospiza melodia</i>			S5B
20	Downy Woodpecker	<i>Dryobates pubescens</i>			S5
19	Black-throated Green Warbler	<i>Setophaga virens</i>			S5B
19	Pileated Woodpecker	<i>Dryocopus pileatus</i>			S5
14	Black-and-White Warbler	<i>Mniotilta varia</i>			S5B
14	Red-eyed Vireo	<i>Vireo olivaceus</i>			S5B
11	American Kestrel	<i>Falco sparverius</i>			S3B
11	Ruffed Grouse	<i>Bonasa umbellus</i>			S5
10	Blue-headed Vireo	<i>Vireo solitarius</i>			S5B
10	Red-tailed Hawk	<i>Buteo jamaicensis</i>	NAR		S5
8	Blackpoll Warbler	<i>Setophaga striata</i>			S3S4B
8	Evening Grosbeak	<i>Coccothraustes vespertinus</i>	SC	Vulnerable	S3S4B S3N
7	Spruce Grouse	<i>Falcapennis canadensis</i>			S4
6	Magnolia Warbler	<i>Setophaga magnolia</i>			S5B
6	Nashville Warbler	<i>Oreothlypis ruficapilla</i>			S4S5B
5	Chimney Swift	<i>Chaetura pelagica</i>	T	Endangered	S2B S1M
5	Northern Parula	<i>Setophaga americana</i>			S5B
5	Ovenbird	<i>Seiurus aurocapilla</i>			S5B
4	Olive-sided Flycatcher	<i>Contopus cooperi</i>	SC	Threatened	S2B
3	Bald Eagle	<i>Haliaeetus leucocephalus</i>	NAR		S5
3	Broad-winged Hawk	<i>Buteo platypterus</i>			S5B
3	Brown Creeper	<i>Certhia americana</i>			S5
3	Hooded Merganser	<i>Lophodytes cucullatus</i>			S5B

Number Detected	Common Name	Scientific Name	SARA Status	NS ESA Status	S-rank
2	Gray Catbird	<i>Dumetella carolinensis</i>			S3B
2	Lincoln's Sparrow	<i>Melospiza lincolnii</i>			S4B
2	Merlin	<i>Falco columbarius</i>	NAR		S5B
2	Peregrine Falcon - anatum/tundrius	<i>Falco peregrinus</i> pop. 1	NAR	Vulnerable	S1B SNAM
2	Ruby-throated Hummingbird	<i>Archilochus colubris</i>			S5B
2	Sharp-shinned Hawk	<i>Accipiter striatus</i>	NAR		S5
1	American Redstart	<i>Setophaga ruticilla</i>			S4S5B
1	Bay-breasted Warbler	<i>Setophaga castanea</i>			S3S4B
1	Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>			S3B
1	Black-throated Blue Warbler	<i>Setophaga caerulea</i>			S5B
1	Common Grackle	<i>Quiscalus quiscula</i>			S5B
1	Northern Harrier	<i>Circus hudsonius</i>	NAR		S3S4B
1	Savannah Sparrow	<i>Passerculus sandwichensis</i>			S4S5B
1	Swainson's Thrush	<i>Catharus ustulatus</i>			S3S4B
1	Winter Wren	<i>Troglodytes hiemalis</i>			S5B

4.0

Bird Species at Risk

Observation and detections of bird SAR during the 2021 bird surveys at the BMWP site are summarized below in Tables 11 to 18.

Table H-11: Rusty Blackbird Observances

Survey	Total Detections	Incidental
Spring Migration	2	May 5 (2)
Summer Breeding	0	
Fall Migration	0	
Total Detected	2	

Table H-12: Chimney Swift Observances

Survey	Total Detections	PC11	Incidental
Spring Migration	0		
Summer Breeding	1		June 3 (1)
Fall Migration	5	Sept. 24 (5)	
Total Detected	6		

Table H-13: Eastern Wood-Pewee Observances

Survey	Total Detections	PC15	Incidental
Spring Migration	1	May 28 (1)	
Summer Breeding	0		
Fall Migration	0		
Total Detected	1		

Table H-14: Canada Warbler Observances

Survey	Total Detections	PC4	PC5	PC6	PC9	PC20	PC23	PC27	PC28	PC29	PC30	PC32	Incidental
Spring Migration	8				May 28 (1)		May 25 (1)	May 25 (1)		May 19 (1) May 25 (1)		May 25 (1)	May 25 (2)
Summer Breeding	15	June 2 (1) June 24 (1)	June 2 (1)	June 2 (2) June 24 (1)	June 2 (1) June 24 (1)	June 3 (1)	June 3 (1)	June 3 (1)	June 3 (1)	June 3 (1) June 25 (1)		June 3 (1)	
Fall Migration	1												Aug 25 (1)
Total Detected	24												

Table H-15: Common Nighthawk Observances

Survey	Total Detections	PC9	PC16	PC25	Incidental	CONI Survey
Spring Migration	1	May 28 (1)				
Summer Breeding	9		June 24 (2)	June 25 (1)	June 3 (2) June 22 (1) July 21 (1)	June 22 (2)
Fall Migration	2				Aug. 12 (2)	
Total Detected	12					

Table H-16: Evening Grosbeak Observances

Survey	Total Detections	PC1	PC6	PC10	PC16	Incidental
Spring Migration	6		May 18 (2)	May 10 (2) May 28 (2)		May 20 (1)
Summer Breeding	5		June 2 (3)			June 28 (2)
Fall Migration	8	Sept. 21 (6)			Oct. 18 (2)	
Total Detected	19					

Table H-17: Peregrine Falcon Observances

Survey	Total Detections	PC31	Incidental
Spring Migration	0		
Summer Breeding	0		
Fall Migration	2	Sept. 11 (2)	
Total Detected	2		

Table H-18: Olive-sided Flycatcher Observances

Survey	Total Detections	PC1	PC2	PC3	PC4	PC7	PC8	PC10	PC11	PC13	PC14	PC15
Spring Migration	20	May 24 (1)	May 24 (1)	May 18 (1) May 24 (1)	May 24 (1)	May 24 (1)	May 18 (1) May 24 (1)	May 18 (1) May 28 (1)	May 28 (1)		May 18 (1)	May 18 (1)
Summer Breeding	31	June 2 (1)	June 2 (1)		June 2 (1) June 24 (1)	June 2 (1) June 24 (1)	June 2 (1)			June 2 (1)	June 2 (1) June 24 (1)	June 24 (1)
Fall Migration	5	Aug. 24 (1)										
Total Detected	56											

Survey Cont.	PC16	PC17	PC21	PC22	PC24	PC25	PC26	PC28	PC30	PC31	PC32	Incidental
Spring Migration	May 18 (1)					May 19 (1)	May 25 (1)					May 18 (1) May 25 (1) May 28 (2)
Summer Breeding	June 2 (1) June 24 (1)	June 29 (1)	June 29 (1)	June 3 (1)	June 3 (1)	June 3 (1) June 25 (2)	June 3 (1)	June 3 (1)	June 3 (1)		June 3 (1)	June 2 (3) June 3 (2) June 24 (1) July 31 (1)
Fall Migration								Aug. 26 (2)		Aug. 26 (1)		Aug. 24 (1)

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