

Forest Birds at Risk in the Carolinian Forest of Southwestern Ontario

2016 Report



Acadian Flycatcher, photo by Christian Artuso

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BIRD STUDIES
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PREAMBLE

This report summarizes results of the sixth season of the Southern Ontario Forest Birds at Risk monitoring and stewardship program, initiated by Bird Studies Canada (BSC) in 2011. In 2016, this project was undertaken with the support of Environment and Climate Change Canada (ECCC), as well as ECCC's Habitat Stewardship Program for Species at Risk, the Ontario Ministry of Natural Resources (OMNRF) Species at Risk Stewardship Fund, and the United States Fish and Wildlife Service.

The report contains information on species at risk (SAR) locations as well as private landholdings and thus, is not for general distribution. A second, condensed report is available distribution. For further information contact Jody Allair at jallair@birdscanada.org.

ACKNOWLEDGEMENTS

Thank you to the public and private landowners who make this project possible, and especially to those landowners taking action to support SAR and SAR habitat on their properties.

Thank you to BSC field staff who collected the data for this report, as well as helped prepare summary reports and materials provided to landowners. Thank you to Catherine Jardine, who manages the Forest Birds at Risk database and produced various data summaries, as well as to the many other BSC staff who provided input and commentary for this report.

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CITATION

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PROJECT GOALS AND OBJECTIVES

The project goal is to improve the conservation status of four high priority forest birds at risk, Acadian Flycatcher (ACFL; Endangered)¹, Louisiana Waterthrush (LOWA; Threatened), Cerulean Warbler (CERW; Endangered), and Prothonotary Warbler (PROW; Endangered), in southwestern Ontario's Carolinian Forest.

Our primary objectives are to:

1. Determine and monitor site occupancy for four target species-at-risk (SAR) in the Norfolk Sand Plain and elsewhere throughout the Carolinian Region (e.g., federally-identified Critical Habitat);
2. Identify and mitigate threats, or potential threats, to the target SAR birds in the Norfolk Sand Plain and elsewhere throughout the Carolinian Region;
3. Increase key audiences' awareness and understanding of forest SAR and SAR conservation needs and to engage landowners and land managers in stewardship action for SAR.

Additional objective(s) are to:

1. Determine level of site fidelity for LOWA as part of a mark-resighting study of a colour-marked LOWA population started in 2011 (colour-banding done between 2011 and 2015);
2. Determine active breeding sites of PROW across south-western Ontario, including several sites outside our Carolinian Forest study area. This PROW "blitz" is undertaken approximately every 4 to 8 years.

Project results are intended to direct conservation and stewardship efforts over both the short- and long-term.

In addition to the above program activities, in 2016, we piloted a new monitoring program to broadly monitor the abundance of forest bird communities in the Norfolk Sand Plain. We have reported on the activities of this project in a separate report (see Falconer 2017 unpublished report), but some aspects of this project are included in this report (e.g., landowner stewardship). For simplicity and clarity, we refer to this project as the 'point count survey' or the sites used in this project as 'point count locations'.

¹ Status from assessments by Committee on the Status of Endangered Wildlife In Canada (COSEWIC).

METHODS

Primary target species were searched for in forest tracts that encompassed known and potential breeding habitat for one or more of the four target species: PROW, LOWA, ACFL and CERW. Secondary target SAR were also recorded. Some of which include very rare breeding SAR in the Norfolk Sand Plain such as Canada Warbler and Red-headed Woodpecker, while others, such as Eastern Wood-Pewee and Wood Thrush, commonly breed in the area.

Site Occupancy Surveys

Surveys were completed at 50 sites, from April 16, 2016 to August 9, 2016, throughout southwestern Ontario's Carolinian Forest, primarily the Norfolk Sand Plain (Figure 1). An additional 41 sites were also surveyed through point counts. Sites were chosen for occupancy surveys based on whether they were known sites (occupied by target species within the last 10 years; 44 sites), historic sites (occupied by target species over 10 years ago; 1 site), or new sites (sites with potential habitat that had not been previously surveyed or had been surveyed, but, with no target species detected; 5 sites). Of the 50 sites surveyed, 9 are designated as critical habitat for ACFL. Individual site details, including landowner and survey effort are shown in Table 1. All sites were surveyed at least once during the breeding season for each target species. Many were surveyed multiple times throughout the season to account for differences in the timing of breeding among the target species (e.g., LOWAs nest from May to mid-June, ACFLs nest from June to August). Survey effort totaled 235.5 survey hours (439.25 person hours) spread over 200 site visits (Table 1).

BSC staff surveyed each site with area searches, recorded target species occupancy and assessed habitat quality on an index scale. For all observations the highest breeding evidence observed (e.g., male singing in potential breeding habitat) was recorded. Whenever pairs were observed, nests were searched for, and, if found, monitored to determine nest fate. Nest data were recorded on Ontario Nest Record Scheme cards, and were entered into the Project NestWatch database. All data gathered were entered into the Forest Birds at Risk database, maintained by BSC, as well as submitted to the Ontario Ministry of Natural Resources and Forestry's Natural Heritage Information Centre and Environment and Climate Change Canada.

Prothonotary Warbler "Blitz"

In 2016, additional efforts were made to visit all current and recently occupied PROW territories in Southern Ontario. This is the first comprehensive blitz for this species in Ontario in 8 years. Occupancy surveys, as described above, were conducted at each of these sites by BSC staff or volunteers. The goal was to gain a better understanding of the size of the Ontario (and Canadian) population as well as to identify and support additional stewardship opportunities. The number of nesting and territorial birds, and productivity were documented.

Louisiana Waterthrush – Site fidelity study

A colour banding program was initiated for LOWA in 2011. All adults and nestlings were banded every year up to and including 2015, to determine site fidelity and return rates. Although banding did not continue in 2016, all sightings of colour banded birds were recorded.

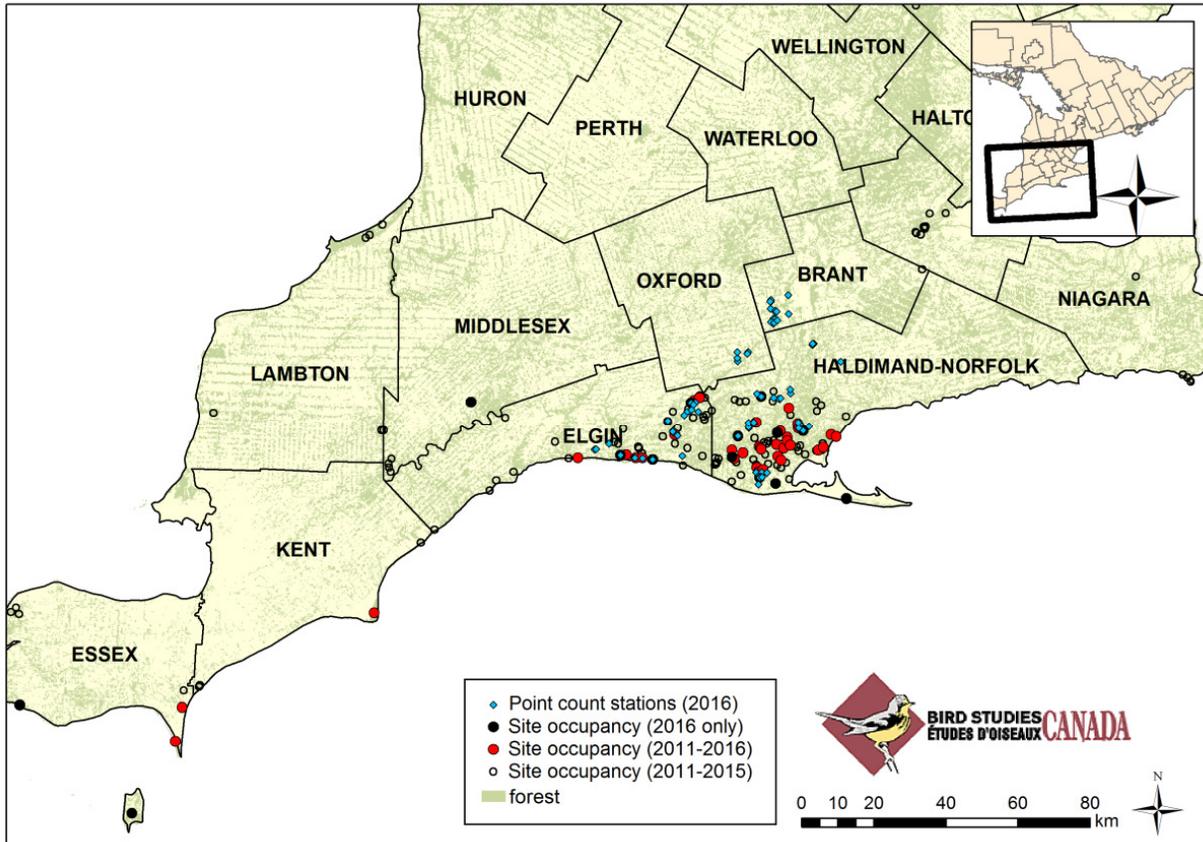


Figure 1. Study area showing sites surveyed since 2011, including point counts and site occupancy surveys. Sites surveyed for the first time in 2016 are denoted by either blue diamonds (point counts) or black circles (occupancy surveys), while sites surveyed previously between 2011-2015 as well as in 2016 are denoted by red circles. Sites surveyed previously (2011-2015), but not in 2016 are also shown (open circles). Shaded green areas represent forest cover.

Table 1. Summary of 2016 survey effort by BSC staff by site including 50 sites targeted for occupancy surveys as well as sites where point count or special Prothonotary Warbler “blitzes” were completed. The latter two are indicated by site identification codes beginning with PC (point count) or PR (Prothonotary Warbler). Site names in **bold** are sites identified as critical habitat for Acadian Flycatcher in the species’ federal recovery strategy. Starred sites (*) are those newly surveyed in 2016. All other sites have been previously surveyed between 2011 and 2015.

Site ID	Site Name (Site complex)	Land Ownership	Number of Visits	Time (hr)	Effort (person-hours)
BR49z	Concession Rd. 3 Swamp	Unknown	1	1	1
PR	Concession Rd A.	Unknown	1	2	2
ES20	Holiday Beach Conservation Area	ERCA ¹	1	0.5	0.5
KE2	Rondeau Provincial Park	Ontario Parks	1	1	1
PR	Chippewa of the Thames First Nation Reserve	Thames First Nation	1	1.5	3
EL20z	Hawk Cliff	TTLT	1	6.75	13.5
EL27z	Rush Creek	Private	2	5	10
EL29b	James Road Woodlots	Private	1	0.5	1
EL29d	James Road Woodlots	Private	2	1.5	3
EL29z	James Road Woodlots	Private	2	3	6
EL45z	Carson Line Ravine	Private	6	14.75	29.5
EL46b	Talbot Line Ravine-Gagnon	Private	2	6	12
ES2z	Point Pelee National Park	Parks Canada	1	4	4
PR	Pelee Island-Fish Point Nature Reserve	Ontario Parks	1	1	1
HN1b	Backus North	NCC	17	21.25	29.75
HN1c	Backus South	NCC	7	13.5	27
HN4	Harris Harris Floyd Tract	LPRCA	1	0.75	1.5
HN112b	South Coast Gardens Property	Private	1	1.25	2.5
HN12d	St. Williams-SW	Provincial Government	1	0.5	1
HN12d	St. Williams-SE	Provincial Government	1	3.5	7
HN12g	St. Williams-NE	Provincial Government	2	3.75	7.5
HN14z	Spooky Hollow	NGO	2	3.75	4.75
HN16b	Turkey Point SW Bluff & Ravines	Provincial Government	5	10.75	21.5
HN19b	Jackson Tract	LPRCA	1	1.75	1.75
HN21a	Swick-King	LPRCA	2	1.75	5.25
HN27a	South Walsingham Wilson Tract	LPRCA	3	5.25	10.5
HN27c	South Walsingham Coppens Tract	LPRCA	9	11	22
HN27d	South Walsingham Armstrong Tract	LPRCA	5	7	14
HN27g	South Walsingham Rowanwood Tract	NGO	3	3.5	7
HN30z	Shoppe's Creek	Private	7	8.75	17.5
HN31a	Fisher's Glen-South	LPBLT	1	1	1
HN4d	Burwell Tract	LPRCA	2	4	8
HN5a	Hepburn Tract	LPRCA	1	0.75	0.75

Site ID	Site Name (Site complex)	Land Ownership	Number of Visits	Time (hr)	Effort (person-hours)
HN5b	Woolley Tract	NCC	2	3.5	7
HN5c	Casier Tract	NCC	1	2	2
HN52a	Trout Creek	Regional Government	2	1.25	3.75
HN54	*Silver Hill Ravine	Private	1	0.5	1
HN59	Golden Leaf Ravine	Private	1	0.5	1
HN69z	Eerenberg Forest	Private	1	1.25	2.5
HN81z	Arthur Langford	LPBLT	4	6	6
PC	*AA Woods	Private	2	1	2
PC	*Blackberry Fields	Private	2	2.5	5
EL49z	Bossuyt-Fick	Private	2	1	2
PC	*Bracadale Woods	Private	2	2.25	4.5
BR80z	Brant Tract	LPRCA	2	1.5	2.5
EL57z	Carolinian Woods	Private	2	.75	1.5
PC	*Cherry Place	Private	2	1	2
PC	*Cliffed Marsh	Private	2	1	2
PC	*Conrad Grebel Forest	Private	2	.75	1.5
PC	*Croton Tract	LPRCA	2	.75	1.5
HN8b	Langton Forest	Norfolk County	2	1	2
PC	*Poole Tract	LPRCA	2	1	1.5
HN21b	Hanson Earl Danylvitch Tract	LPRCA	2	2	4
PC	*Family Forest	Private	2	.75	1.5
PC	*Famous Forest	Private	2	.75	1.5
PC	*Fishing Forest	Private	2	.75	1.5
PC	*Green Stables	Private	2	.5	1
BR81z	Hatchley Swamp	LPRCA	2	8	16
PC	*Hemlock Crossing	Private	2	1.25	2.5
PC	*Indigo Ridge	Private	2	1	2
EL58z	Lakeside Woods	Private	2	1	2
PC	*Lawton's Woods	Private	2	1	2
PC	*Manitoba Mountain	Private	2	1	2
PC	*Moorewood	Private	2	.25	.5
PC	*Motorized Ravine	Private	2	1.75	3.5
PC	Moulton	Private	2	1	2
PC	*North Walsingham 3	Norfolk County	2	.5	.75
PC	*North Walsingham 4	Norfolk County	2	1.75	2.75
PC	*Nursery Woods	Private	2	7.5	15
PC	*Olive-Meadows	Private	2	1	2
EL56z	Painted Ravine	Private	2	1.75	3.5
EL14z	Passmore Farm-Silver Creek	Private	2	1.25	2.5

Site ID	Site Name (Site complex)	Land Ownership	Number of Visits	Time (hr)	Effort (person-hours)
HN99z	Rhino Woods	Private	2	1.25	2.5
PC	*Richwood	Private	2	1	2
HN161z	River Crossing	Private	2	3.5	7
PC	*Runaway Woods	Private	2	1.75	3.5
PC	*Sassafrassling Woods	Private	2	1.25	2.5
PC	*Savannah Woods	Private	2	1.25	2.5
HN160z	Serenity Woods	Private	2	1.25	2.5
PC	*Sidney Back	LPRCA	2	1	2
PC	*Sidney Front	Private	2	1.25	2.5
HN21c	Smith Tract	LPRCA	2	.75	1.5
PC	*Smokey Coyote Woods	Private	2	1.25	2.5
HN271	South Walsingham South Tract	Norfolk County	2	4.5	9
PC	*Sun River	Private	2	1.5	3
PC	*Travelled Woods	Private	2	.5	.75

¹ Acronyms used: ERCA= Essex Region Conservation Authority, LPBLT= Long Point Basin Land Trust, LPRCA= Long Point Region Conservation Authority; NCC= Nature Conservancy of Canada; NGO= Non Government Organization; TTLT= Thames Talbot Land Trust; PR=Prothonotary Warbler Survey Location; PC=Point Count Site.

Landowner Engagement, Threat Surveys, and Stewardship

All landowners were contacted prior to conducting surveys on their property to gain permission to access their land. Landowners were encouraged to join BSC staff during surveys, and they were informed of SAR that occurred on their property. All newly identified landowners with SAR on their properties were provided *Forest Bird Species at Risk* factsheets (produced in previous years). Landowner engagement efforts were tracked, including specific details of discussions and landowner interest (e.g., landowner prefers crew to visit before accessing the property and immediately afterwards to discuss observations), to maintain strong relationships and consistent communications from year-to-year. Because of the additional point count surveys conducted in 2016, an additional 48 landowners were contacted, either through an in-person visit, or, left a hand-written note and formal letter in their mailbox, to gain permission to access their land. Of these, 34 granted BSC permission.

Threat surveys were completed at all sites with target SAR and/or with suitable habitat for one or more of the four target species. All current and potential threats were recorded (e.g., all-terrain vehicle use, garbage dumping, inappropriate harvest activities) and were discussed with landowners. Wherever possible, BSC worked directly with landowners to mitigate threats (e.g., created an alternate ATV route, removed garbage, discussed alternative harvesting practices). The results of these mitigation efforts were also recorded.

RESULTS AND DISCUSSION

One or more of the four target species were detected at 35 of the 91 sites surveyed in 2016 (Figure 3), with ACFL, LOWA, CERW and PROW detected at 9, 11, 10 and 8 sites, respectively. Of the 35 occupied sites, 5 supported more than one of the targeted SAR. Table 2 details the number of pairs, individuals and nests found for each target species at each of the 91 sites surveyed. All target species appeared to occupy a relatively similar number and percentage of sites between years, although sites occupied varied from year to year (Figures 4 – 7). Below we discuss these results and their potential conservation implications separately for each species.

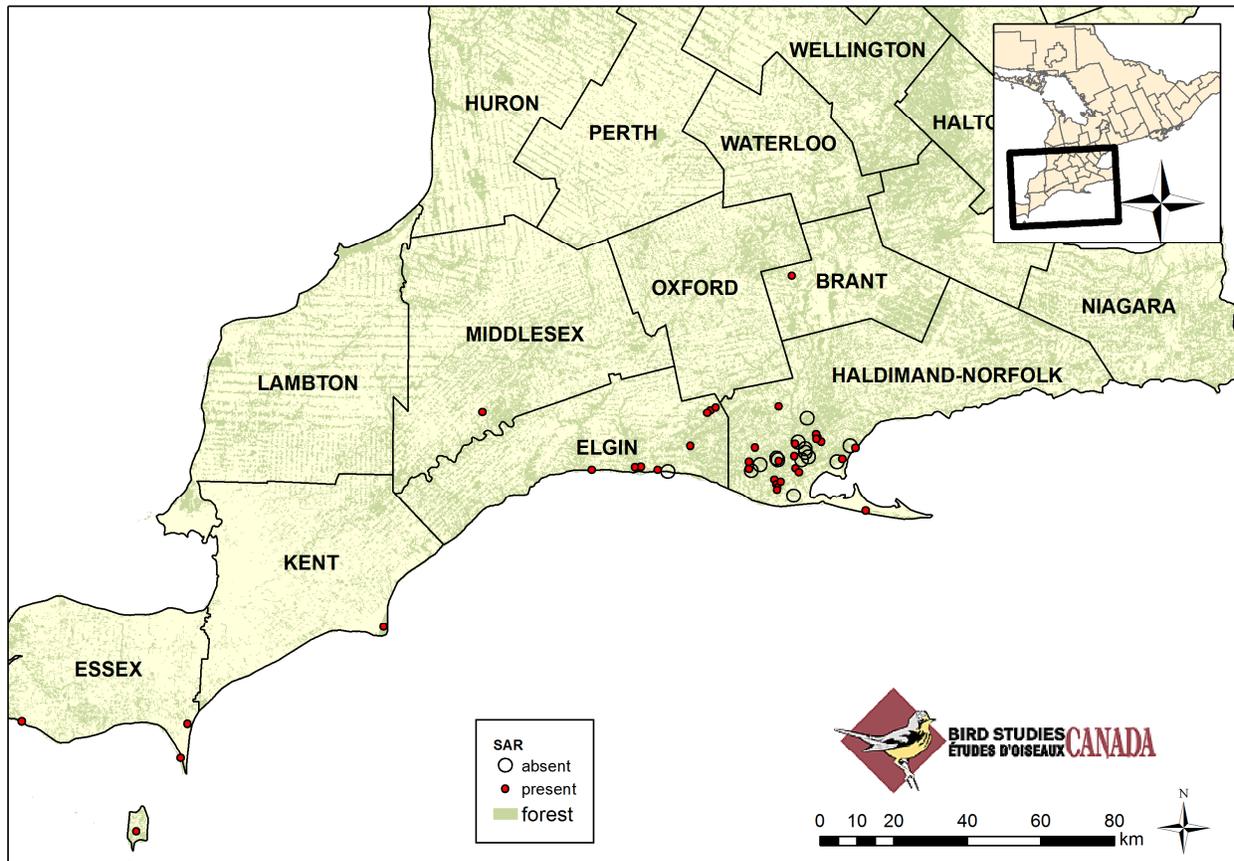


Figure 3. Sites occupied by primary target species at risk in 2016 (red circles). Surveyed but unoccupied sites are also shown (open circles).

Table 2. Forest birds at risk with evidence of breeding found in 2016 in southwestern Ontario by site. Sites in ***bold italics*** are identified as Critical Habitat for Acadian Flycatcher. Underlined sites are identified as Critical Habitat for Prothonotary Warbler. The second-to-last column indicates if any of the targeted species at risk have been previously recorded at the site between 2011 and 2016.

Site ID	Site Name (Site complex)	LOWA			ACFL			PROW			CERW		Previously recorded
		P	S	N	P	S	N	P	S	N	P	S	
BR49z	Concession Rd. 3 Swamp							1		1			Y
PR	Concession Rd A.												Y
PR	<u>Holiday Beach Conservation Area</u>							1		1			Y
KE2	<u>Rondeau Provincial Park</u>							1		1			Y
PR	Thames First Nation Reserve								2				Y
<i>EL20z</i>	<i>Hawk Cliff</i>				1		1						Y
<i>EL27z</i>	<i>Rush Creek</i>		1		1	1							Y
EL29b	James Road Woodlots												Y
EL29d	James Road Woodlots												Y
<i>EL29z</i>	<i>James Road Woodlots</i>										1		Y
EL45z	Carson Line Ravine	1			1		1						Y
EL46b	Talbot Line Ravine-Gagnon	1		1									Y
ES2z	Point Pelee National Park							1		1			Y
PR	Pelee Island-Fish Point Nature Reserve												Y
PR	<u>Hahn Unit Big Creek NWA</u>												Y
PR	Hillman Marsh							1					Y
PR	Squires Ridge - Long Point NWA								1				Y
PR	<u>PROW Woods Big Creek NWA</u>												Y
<i>HN1b</i>	<i>Backus North</i>	1	2	1				5	1	5		2	Y
<i>HN1c</i>	<i>Backus South</i>	1		1		2							Y
HN4	Harris Harris Floyd Tract												Y
HN112b	South Coast Gardens Property												Y
HN12d	St. Williams-SW												Y
HN12d	St. Williams-SE												Y
HN12g	St. Williams-NE												Y
HN14z	<i>Spooky Hollow</i>												Y
<i>HN16b</i>	<i>Turkey Point SW Bluff & Ravines</i>		1										Y
HN19b	Jackson Tract												Y
<i>HN27a</i>	<i>South Walsingham Wilson Tract</i>	1											Y
<i>HN27c</i>	<i>South Walsingham Coppens Tract</i>		1		2	1	2					1	Y
<i>HN27d</i>	<i>South Walsingham Armstrong Tract</i>				1		1						Y
HN27g	South Walsingham Rowanwood Tract					2							Y
HN30z	Shoppe's Creek	2		2									Y

Site ID	Site Name (Site complex)	LOWA			ACFL			PROW			CERW		Previously recorded
		P	S	N	P	S	N	P	S	N	P	S	
HN31a	Fisher's Glen-South					1							Y
<i>HN4d</i>	<i>Burwell Tract</i>				1		1						Y
HN5a	Hepburn Tract												Y
HN5b	Woolley Tract												Y
HN5c	Casier Tract		1										Y
HN52a	Trout Creek												Y
HN54	Silver Hill Ravine		1										N
HN59	Golden Leaf Ravine												Y
HN69z	Eerenberg Forest												Y
HN81z	Arthur Langford				2		4						Y
PC	AA Woods												N
PC	Blackberry Fields												N
EL49z	Bossuyt-Fick												Y
PC	Bracadale Woods												N
BR80z	Brant Tract												Y
EL57z - PC	Carolinian Woods										1		N
PC	Cherry Place												N
PC	Cliffed Marsh												N
PC	Conrad Grebel Forest												N
PC	Croton Tract												N
HN8b	Langton Forest												N
PC	Durham Tract												N
HN21b	Hanson Earl Danylitch Tract										1		Y
PC	Family Forest												N
PC	Famous Forest												N
PC	Fishing Forest												N
PC	Green Stables												N
BR81z	Hatchley Swamp												Y
PC	Hemlock Crossing												N
PC	Indigo Ridge												N
EL58z	Lakeside Woods												Y
PC	Lawton's Woods												N
PC	Manitoba Mountain												N
PC	Moorewood												N
PC	Motorized Ravine												N
PC	Moulton												Y
PC	North Walsingham 3												N
PC	North Walsingham 4												N
PC	Nursery Woods												N

Site ID	Site Name (Site complex)	LOWA			ACFL			PROW			CERW		Previously recorded
		P	S	N	P	S	N	P	S	N	P	S	
PC	Olive-Meadows												N
EL56z - PC	Painted Ravine	1			2								N
EL14z	Passmore Farm-Silver Creek				1								Y
HN99z - PC	Rhino Woods										1		N
PC	Richwood												N
HN161z	River Crossing				1								N
PC	Runaway Woods												N
PC	Sassafrasling Woods												N
PC	Savannah Woods												N
HN160z	Serenity Woods										1		N
PC	Sidney Back												N
PC	Sidney Front												N
HN21c	Smith Tract										1		Y
PC	Smokey Coyote Woods												N
HN27I - PC	South Walsingham South Tract										1		N
PC	Sun River												N
HN21a	Swick-King Tract										1		Y
PC	Travelled Woods												N
TOTALS		8	7	5	9	12	10	10	4	9	0	11	

P=Pair; S=Single singing male; N=Nest; PR=Prothonotary Warbler Survey Location; PC=Point Count Site.

Occupancy Surveys

Acadian Flycatcher

2016 Surveys

Nine pairs and 11 single male ACFLs were detected in 13 sites (Table 3). Of these, 12 were known sites (6 of are listed as Critical Habitat), and 1 was a new site (EL56z).

In total, 10 nests were found and monitored until the end of the breeding season, of which 3 were successful, 4 failed and 3 had unknown outcomes. At least 4 young fledged from the successful nests. Zero ACFL nests were parasitized by Brown-headed Cowbirds (BHCO) in 2016 (Table 3).

Between-year occupancy

ACFL consistently occupied sites throughout the study area (Figure 4). About 47% (34 of 72) of sites with multi-year surveys detected ACFL in at least one year and about 29% (10 of 34) of these sites were occupied by ACFL every year. About 26% of the sites occupied at least once by ACFL included private lands. In general, ACFL was relatively widely distributed in the study area, but especially within Norfolk and east Elgin County, where the species consistently occupies

several localities each year (e.g. sections of South Walsingham Forest). However, many other sites, such as Spooky Hollow were infrequently occupied.

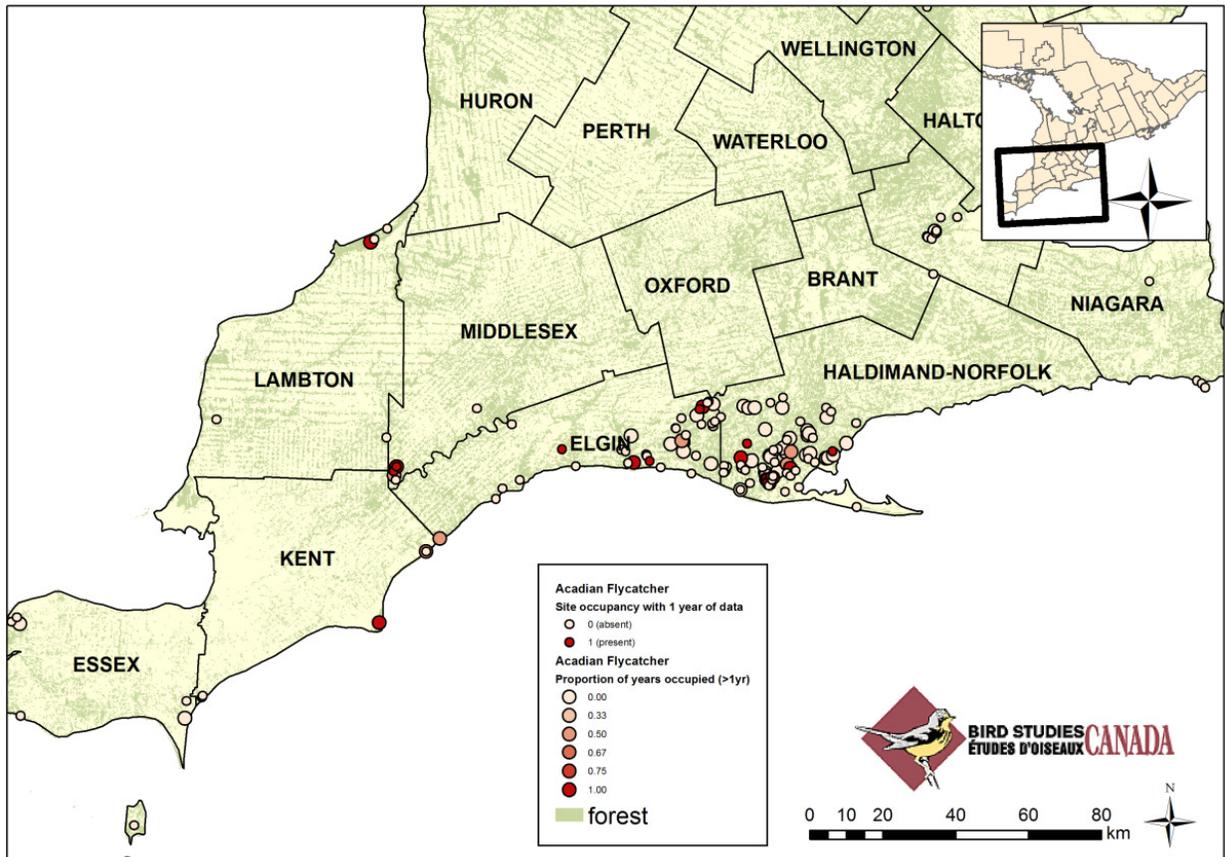


Figure 4. Site occupancy of Acadian Flycatcher across the study area between 2011 and 2016. Small circles represent sites surveyed only once during 2011-2016 and whether they were occupied (red-filled) or not (open). Larger circles represent sites with two to six years of surveys and colour intensity represents the proportion of years that the species was present at the site.

Louisiana Waterthrush

2016 surveys

Surveys for LOWA were completed between April 16 2016 to June 9 2016. In total, 22 sites were surveyed (18 known sites, 2 new sites, and 2 historic sites). Twenty-three LOWA were found at 9 known sites, as well as at 2 new sites. Of these individuals, 7 were single males and the rest were paired. In addition, during point counts, 2 pairs of LOWA were observed; 1 pair on a new site and the other on a known site. The new site where LOWA was observed is on the same ravine system, and approximately 800 m away from the Carson Line Ravine site (EL45z) which was also occupied in 2016. Although the distance between these sightings could indicate that two pairs were occupying the ravine, this could not be confirmed.

Table 3. Summary of forest birds at risk data collected in southwestern Ontario between 2011 and 2016.

Species	Year	# Sites	% Sites Occupied	Pairs	Males	Females	Nests	Host Young Fledged	Host Young Fledged/Nest	Nest Parasitism Rate	Cowbird Young Fledged
Acadian Flycatcher	2011	12	0.32	11	18	12	18	15	0.83	0.00	0
	2012	17	0.28	13	20	13	16	15	0.94	0.06	0
	2013	12	0.22	10	17	10	16	23	1.44	0.00	0
	2014	18	0.31	26	37	26	33	28+	0.85	0.00	0
	2015	17	0.27	19	31	19	23	25+	1.09	0.00	0
	2016	9	0.20	9	12	9	10	4	.4	0.00	0
Cerulean Warbler	2011	6	0.16	1	16	(1)	(0)	-	-	-	-
	2012	5	0.08	2	13	(2)	(0)	-	-	-	-
	2013	5	0.09	1	15	(1)	(1)	2+	2.00	0.00	0
	2014	8	0.14	1	20	(1)	(0)	-	-	-	-
	2015	6	0.10	2	15	(2)	(0)	-	-	-	-
	2016	10	0.22	0	11	0	0	-	-	-	-
Louisiana Waterthrush	2011	11	0.30	7	13	7	7	16	2.29	0.14	1
	2012	17	0.28	17	24	17	8	31	3.88	0.00	0
	2013	13	0.24	11	17	12	10	26+	2.60	0.30	3+
	2014	11	0.19	13	15	12	11	25	2.27	0.42	2
	2015	15	0.23	9	22	10	10	14*	1.40	0.30	4
	2016	11	0.24	8	7	8	5	1	.2	0.00	0
Prothonotary Warbler	2011	1	0.03	1	2	1	1	5	5.00	0.00	0
	2012	1	0.02	4	3	4	5	25	5.00	0.00	0
	2013	1	0.02	4	4	4	4	20	5.00	0.00	0
	2014	3	0.05	6	6	6	7	31	4.43	0.00	0
	2015	2	0.03	8	6	8	9	33	4.13	0.00	0
	2016	3	0.06	10	13	10	9	34+	3.78	0.00	0
Hooded Warbler	2011	20	0.54	41	71	41	29	41	1.41	0.24	3
	2012	30	0.49	31	63	31	22	40	1.82	0.27	2

1. Total number of sites surveyed in 2011: 37; 2012: 61; 2013: 54; 2014: 58; 2015: 62; and 2016: 87.

2. Nest parasitism rate was calculated by dividing the number of parasitized nests by the total number of nests for each host species.

3. Hooded Warbler is included because the species was a focus of the study initially in 2011 and 2012. In 2013 it was no longer included as a target species and no additional effort has been made to record Hood Warbler presence since that time because it is now relatively common, widespread, and presumably continues to increase in numbers and distribution.

Five LOWA nests were found and monitored until completion. Of these, 1 nest (at Shoppe’s Creek) successfully hatched, and fledged, one of five eggs. None of the other nests successfully fledged young. A nest at Backus South and a second nest at Shoppe’s Creek appeared to be predated and two additional nests (at Backus North and at Talbot Line Ravine) were parasitized by BHCO and failed. Note that BHCO parasitism does not typically result in nest failure in LOWA, and thus the failure may have been related to other factors as well (e.g., weather). For the nest at Talbot Line Ravine, 6 of 6 eggs did not hatch (4 LOWA and 2 BHCO), likely due to the cold weather experienced early in the season.

Between-year occupancy

LOWA consistently occupied sites in Norfolk and east Elgin Counties (Figure 5). About 36% (26 of 72) of sites with multi-year surveys were occupied by LOWA in at least one year and about 35% (9 of 26) of these sites are occupied by LOWA every year. About 35% of the sites occupied at least once by LOWA included private lands in Norfolk and Elgin County. This highlights a special need for stewardship and conservation of this species on private lands.

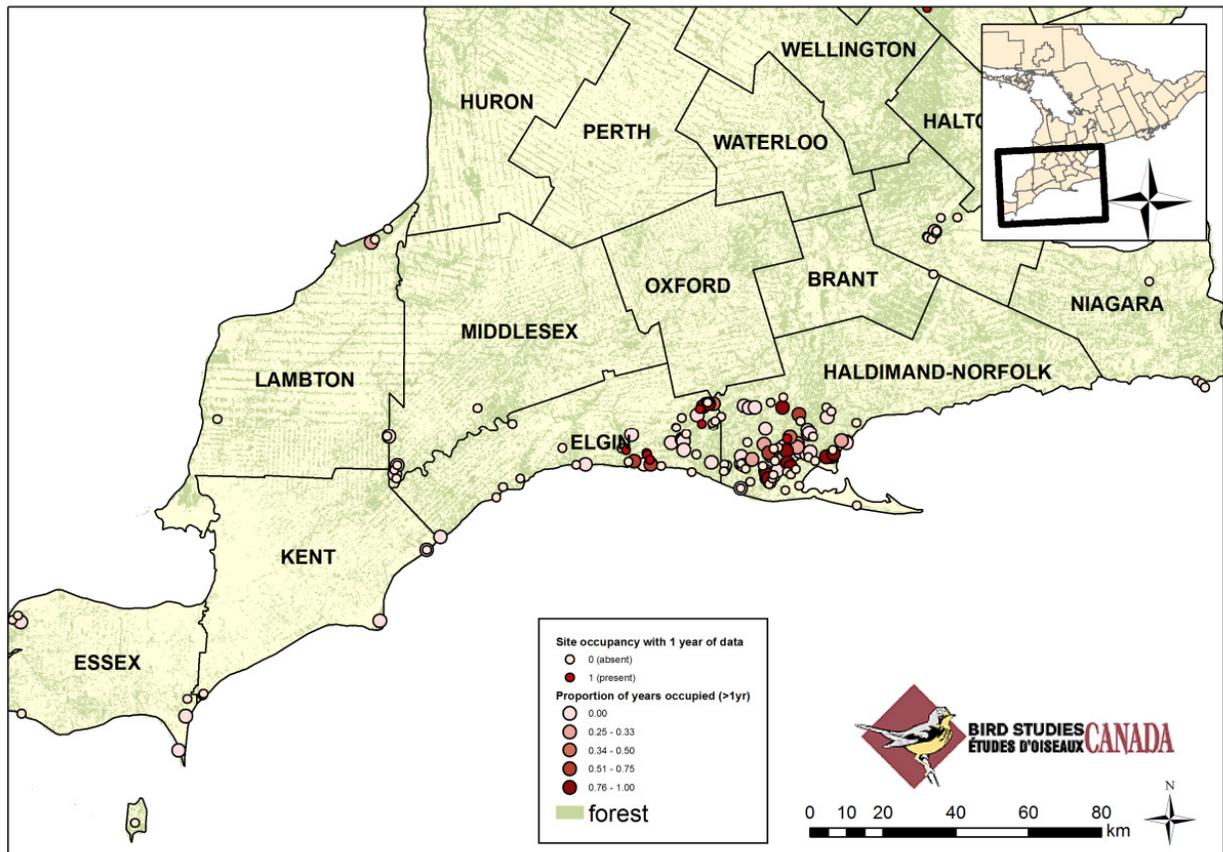


Figure 5. Site occupancy of Louisiana Waterthrush across the study area between 2011 and 2016. Small circles represent sites surveyed only once during 2011-2016 and whether they were occupied (red-filled)

or not (open). Larger circles represent sites with two to six years of surveys and colour intensity represents the proportion of years that the species was present at the site.

Site Fidelity

The return rate in 2016 was unusually low; only four banded individuals, two males and two females, were re-sighted (Table 4). One re-sighted female bred in the same forest where she was originally banded in 2015. However, she bred with an un-banded (i.e., different) male than in 2015. The other re-sighted female was originally banded as a chick, and returned to same forest where she banded in 2014. Her mate was also banded, originally in 2013 in the same forest and has returned to this forest to breed in 2014 and 2016. The pair may have been related, since the male raised this female in 2014. The second re-sighted male returned to the same forest where he was originally banded in 2015, but did not appear to be paired.

The weather conditions of this season may have negatively impacted the productivity and survival of adult and young LOWAs. The season was unusually dry, and known breeding sites for LOWA pairs were dry very early in the season. Although the drought conditions cannot currently be connected to the low return rates of the adult LOWAs, it may be an important factor to consider.

Table 4. Re-sighted adult LOWAs, band number, sex and location of the re-sight in 2016. Each individual LOWA has a unique band number.

Band Number	Sex	Site Re-sighted
2401-80896	Female	Backus North
2401-80867	Male	Backus North
2521-79111	Male	Coppens Tract
2521-79114	Female	Shoppe's Creek

Cerulean Warbler

2016 Surveys

Eleven male CERW were recorded at 10 sites (Table 2), or 9% of sites surveyed. Of these, 6 were known sites, and 4 were new.

Between-year occupancy

CERW was only found consistently at a handful of sites (or site complexes) in the study area, including Backus Woods, St. Williams Conservation Reserve (SWCR), and the Walsh Forest complex (Long Point Region Conservation Authority; Figure 6). Twenty-one percent (15 of 72) of sites with multi-year surveys were occupied by CERW. However, several of these records include potential transient males singing in late May and subsequent visits later in the breeding season failed to detect the species (e.g., Jackson Tract, Abbott Townsend Tract). Private lands

accounted for 13% of sites with CERW. Interestingly though, point count surveys recorded 4 new locations for CERW in 2016. This may indicate a need to survey additional areas, beyond sites previously identified and surveyed between 2011 and 2015 to better determine Cerulean Warbler distribution and occupancy for the region.

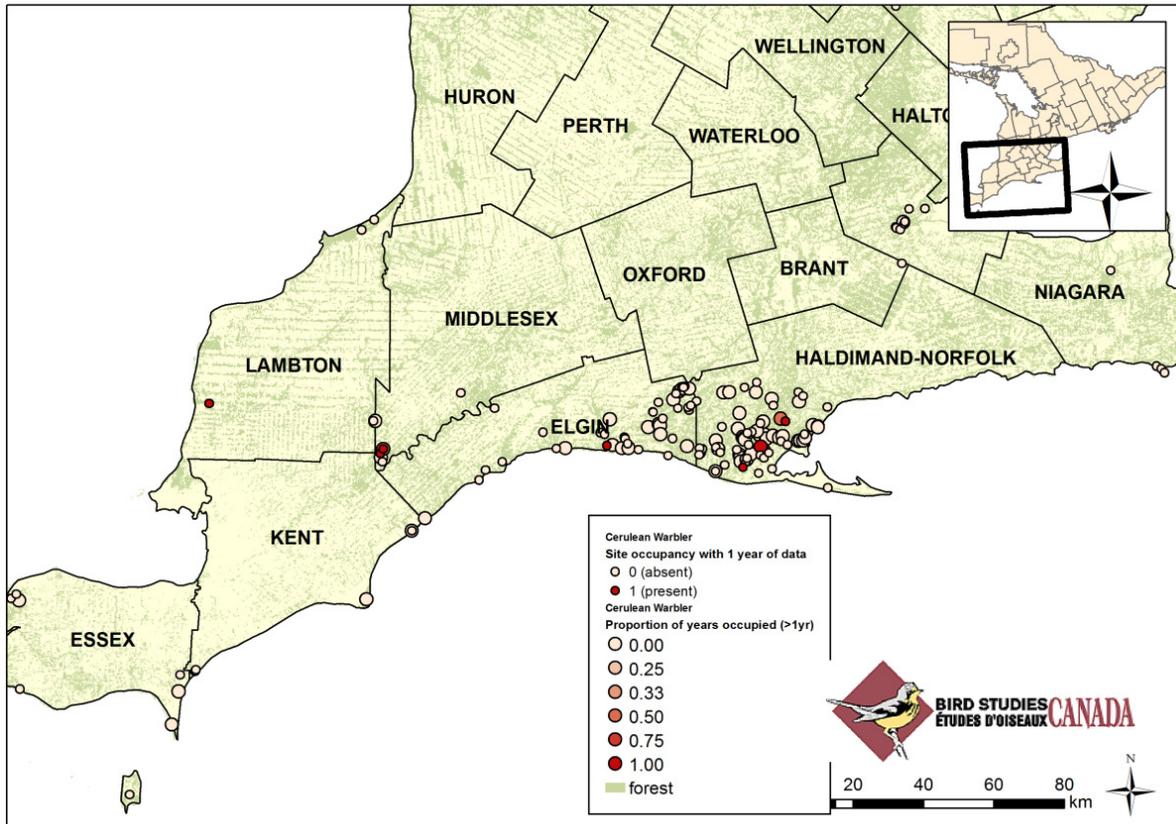


Figure 6. Site occupancy of Cerulean Warbler across the study area between 2011 and 2016. Small circles represent sites surveyed only once during 2011-2016 and whether they were occupied (red-filled) or not (open). Larger circles represent sites with two to six years of surveys and colour intensity represents the proportion of years that the species was present at the site.

Prothonotary Warbler

2016 Surveys

A total of 19 sites were surveyed for PROW. We found and monitored 10 nesting pairs at 6 sites and detected an additional 4 territorial males at 3 sites (Figure 7). No House Wrens (a nest site competitor) were documented in any of the active territories. Eight pairs used nest boxes and two pairs nested in natural cavity nests (Point Pelee and Holiday Beach). The numbers of PROW detected in 2016 are higher than in previous years, primarily because of the additional effort placed on detecting the species.

Between-year occupancy

PROW remain a rare breeder in the area. Only the Backus Wood North site has been consistently occupied for all years surveyed. In addition, there are a handful of other sites in the Norfolk Sand Plain and elsewhere (e.g., Essex County) that PROW has occupied somewhat consistently (> 1 year).

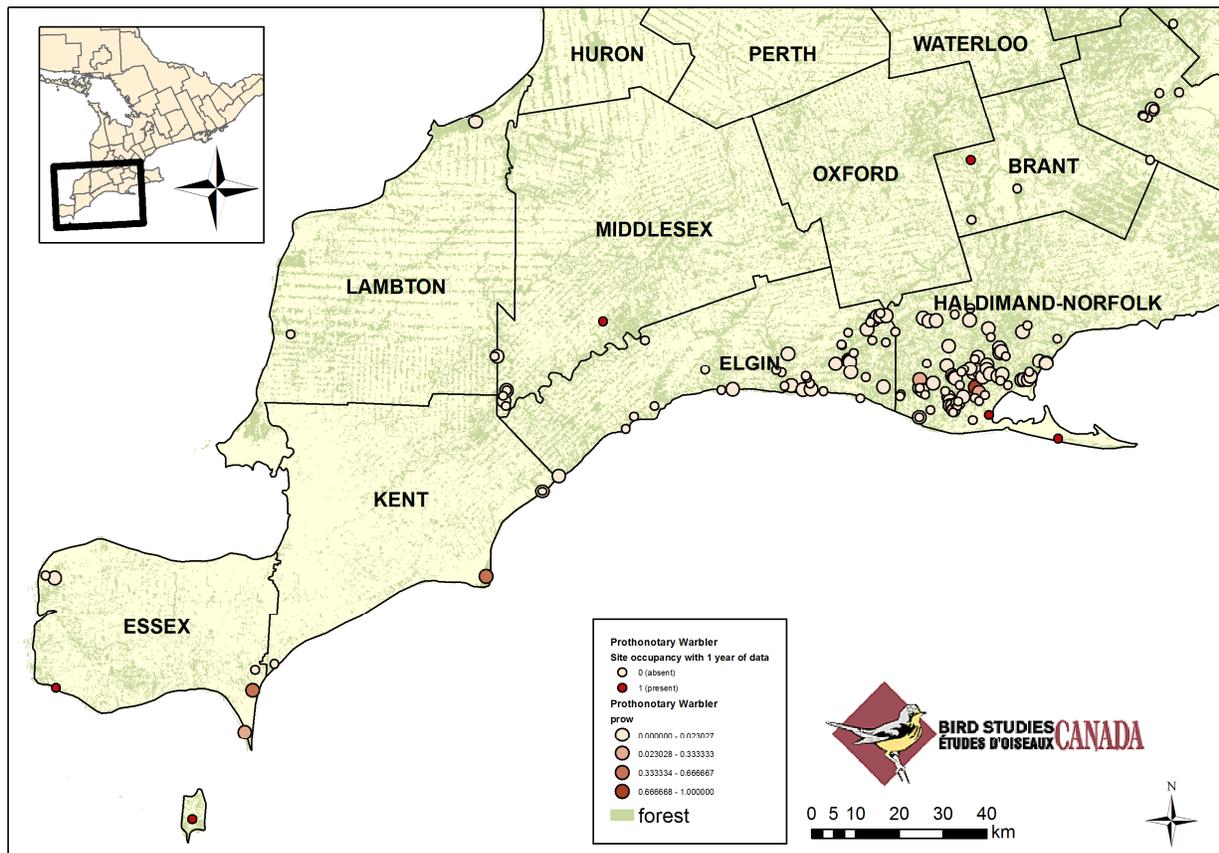


Figure 7. Site occupancy of Prothonotary Warbler across the study area between 2011 and 2016. Small circles represent sites surveyed only once during 2011-2016 and whether they were occupied (red-filled) or not (open). Larger circles represent sites with two to six years of surveys and colour intensity represents the proportion of years that the species was present at the site.

Landowner Engagement, Threats and Stewardship

Landowner Engagement

Occupancy survey sites

Twenty-seven landowners (22 private and 5 public) are engaged through occupancy and threat surveys. We continue to build and maintain strong relationships with these landowners who own high priority SAR sites, monitored annually during the last 6 years. **Of these, 17 of 27 landowners maintained 33 properties for target SAR in 2016 and are planning to maintain these properties for SAR.** The remaining 10 landowners continue to allow BSC to survey their properties and are interested in conserving SAR and SAR habitat to varying degrees.

It is important to note that landowners, particularly those with active woodlots, face competing priorities in managing their properties. For example, despite a good relationship with the landowner, one site, which had CERW and ACFL in 2014 and 2015, was heavily logged during the winter of 2015/2016. No SAR were detected during follow-up surveys in 2016.

Currently, private landowners protecting ACFL habitat or habitat for the other 3 target SAR, do not yet qualify for the OMNRF's Conservation Land Tax Incentive Program (CLTIP). This program provides 100% property tax exemption for land that has important natural heritage features, including endangered species habitat where CLTIP guidelines have been developed. These guidelines have not yet been developed for recently-listed bird species at risk. We believe that including these forest birds in the CLTIP program would increase the number of property owners actively conserving forest habitat for SAR in southwestern Ontario. Currently, private landowners are eligible for the Managed Forest Tax Incentive Program (MFTIP), which offers a 75% tax exemption for properties that qualify as "Managed Forest" (see www.ontario.ca/page/managed-forest-tax-incentive-program for additional details).

Point count survey sites

Approximately 70% (34 of 48) of newly identified landowners contacted, to seek permission to conduct point counts on their properties, granted permission. Landowners who were contacted in person were more likely to grant BSC permission to survey (80%; 30 of 37) than those who were contacted by letter (20%; 2 of 11). Three of the landowners who did not grant BSC permission were concerned that a rare species would be found on their property and that there would be legal ramifications.

Additional notable results:

- Of the 34 newly contacted landowners (point count surveys), 32 asked for follow-up information about the species detected on their properties. *Forest Birds at Risk Fact Sheets* were also provided.
- 6 of 34 landowners have target SAR on their properties
- 2 landowners joined BSC on site visits; 2 additional landowners expressed interest in joining BSC in future years
- 2 newly engaged landowners were provided with information related to the Managed Forest Tax Incentive Program (MFTIP)
- 1 landowner with resident ACFL, applied to MFTIP and used BSC data in support of the application

- LPRCA, which has several SAR on their properties, including ACFL Critical Habitat, regularly incorporates SAR data from BSC into their management planning, and did so in 2016, and participates in the MFTIP.
- Met with Cliff Evanski, General Manager of LPRCA, to discuss greater integration of SAR and habitat needs into LPRCA planning and activities; subsequently invited to present to 20 plus staff; discussions with LPRCA are ongoing

Threat Mitigation

In 2016, threats were observed at 9 sites (4 occupancy survey sites and 5 point count locations), i.e., approximately 10% of sites surveyed and 4 of which were occupied by target SAR (Table 5). Threats included: beech bark disease (2 sites), all-terrain vehicle use (5 sites) and logging (3 sites). In addition to threats presented in the table, Emerald ash borer negatively impacted most point count locations, wherever ash was present (87% of ash trees). Note that no woolly adelgid (potential threat to ACFL and LOWA habitat) was observed in 2016.

Attempts to mitigate threats were made at 4 sites (e.g., threats were reported to landowner and recommendations made to mitigate threats). Threats were successfully mitigated at 1 site, and threats are being tracked and some may be mitigated in the spring of 2017. At all other sites, no threats were observed, but the commitment to mitigate threats, if they arise, varies between landowners.

CONCLUSIONS AND FUTURE DIRECTIONS

Ontario's southwestern region supports Canada's entire population of ACFL and PROW. It also supports a substantial proportion of Canada's LOWA population and a small but significant population of CERW. Since 2011, BSC has surveyed over 135 sites and identified over 50 key sites for these 4 target SAR. From these efforts we have developed detailed snapshots of each species distribution and occupancy, as well as identified and mitigated threats to these species and their habitats. Survey results have been used to immediately direct on-the-ground conservation action, through landowner stewardship, as well as to track ACFL Critical Habitat, to update COSEWIC status assessments for CERW and LOWA, and to identify new areas of ACFL occupancy for Critical Habitat designation. The landowner engagement program has been particularly successful with 17 landowners committed to conserving SAR and SAR habitat on 33 properties, and over 30 landowners newly engaged as a result of point count surveys in 2016.

Table 5. Threats observed at surveyed sites in 2016.

Site ID	Site Name	Occupancy	Threat observed	Action taken	Threat Mitigated	Follow-up required
<u>HN1b</u>	Backus Woods North Property	PROW, LOWA, CERW	Beech bark disease	NCC has been notified of this occurrence	N	Will recheck this location in 2017.
<u>BR80z</u>	Brant Tract	Historically a SAR location for HOWA	Moderate recent logging, large destructive ATV trails, and several deer stands were present	N	N	Follow-up with landowners in 2017.
<u>PC Site</u>	Indigo Ridge	No SAR	Recent heavy logging and widespread ATV use	N	N	Follow-up with landowners
<u>HN27d</u>	Armstrong Tract	ACFL, LOWA	Localized heavy ATV use off-trails	LPRCA was informed of this activity	N	Will follow up with LPRCA spring 2017
<u>HN 27c</u>	Coppen's Tract	ACFL, LOWA	Localized heavy ATV use off-trails	LPRCA was informed of this activity	N	Will follow up with LPRCA spring 2017
<u>PC Site</u>	Motorized Ravine	No SAR Detected	Many heavily used ATV trails running through the ravine that appeared to be ideal LOWA habitat	N	N	Follow up survey and landowner consultation in 2017
<u>PC Site</u>	Richwood	No SAR Detected	Will be logged in fall of 2016	Discussed with landowners	N	Follow up surveys in 2017
<u>ES2z</u>	Point Pelee National Park	Occupied by nesting pair of PROW	Plans are underway to add nestboxes near the natural cavity nest in Point Pelee as the host tree was rotten and will most likely not stay standing through the winter.	New boxes to be erected in May 2017. Several older boxes will be removed/ plugged to reduce competition from Tree Swallows	Y	Follow up in 2017
<u>PC Site</u>	Bracadale Woods	NO SAR Detected	Signs of beech bark disease.	Landowner was consulted.	N	Follow up in 2017.

Overall, it appears that the proportion of sites occupied by SAR, between 2011 and 2016, has been relatively similar, although the specific sites occupied have varied between years (this is not unexpected as ACFL, for example, are known to “blip” on and off at sites). However, during that time, habitat changes have occurred at several sites, including that many sites have been logged, and the amount of habitat available to SAR has been reduced. In addition, several threats, such as logging and all-terrain vehicle use, are ongoing. Given that there is very little mature Carolinian forest left in the region, and because a large proportion of SAR occupy sites on private land, it is absolutely critical that we continue to encourage and to support landowners in their efforts to conserve SAR and SAR habitat. In addition, in 2017, BSC will determine the number of hectares occupied by SAR in the Carolinian Region, to better track and evaluate conservation efforts.

Between 2011 and 2015, the Forest Birds at Risk Program was most focused on gaining a clear snapshot of SAR distribution and occupancy across the region, to direct further monitoring and conservation efforts. Having achieved this, our focus has shifted to conducting annual surveys to track population trends and threats and, to direct immediate, on-the-ground conservation efforts for high priority SAR. Continued surveys at occupied, recently occupied, and additional sites with suitable habitat, are key to mitigating threats, to supporting ongoing stewardship efforts and to maintaining and tracking available SAR habitat. This information will also be important to informing soon-to-be-developed federal Recovery Strategies for CERW and LOWA; particularly for identifying Critical Habitat. As well, in 2017, we will evaluate and refine occupancy survey methodology to improve our ability to make scientific inferences related to occupancy and population trends from these data.

The point count surveys conducted in 2016 (randomly selected points in forest habitat; see separate report, Falconer 2017), were, in part, a pilot to assess whether this sampling strategy was appropriate to track the target SAR relative abundance. However, target SAR were detected in such low numbers, that it appears that this approach is limited for tracking the target SAR. However, point counts did provide four new sites for CERW. Unlike the other 3 target SAR, which often occupy similar habitat (e.g., closed canopy forest near ponds, swamps or waterways), CERW have slightly different habitat preferences (e.g., often associated with canopy gaps). In 2017, we will evaluate our sampling strategy for CERW, as it is likely important that we expand our search efforts for CERW to ensure that we are adequately tracking CERW distribution and occupancy in the region.

As well, in 2017, additional efforts will be made to understand CERW habitat preferences in southwestern Ontario. CERW habitat preferences (e.g., preferred stand basal area and canopy closure) can vary greatly by region. Current information available, is primarily from BSC’s and

others' research in the Frontenac Region, where the forest occupied by CERW differs from that in southern Ontario. To our knowledge, there is no information available on CERW habitat preferences for southern Ontario. However, region-specific information would be valuable to woodlot owners and forest practitioners wishing to manage their woodlots for CERW. We are currently working to develop an appropriate sampling strategy to measure habitat preferences for CERW in southwestern Ontario.

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