

Forest Birds at Risk in the Carolinian Forest of Southwestern Ontario

2014 Report including 4-year Summary



Photo: Acadian Flycatcher, Mike Burrell

March 2015

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PREAMBLE

This report summarizes the 2014 results of the Forest Birds at Risk project, initiated by Bird Studies Canada (BSC) in 2011. The report also provides summaries of the previous three years of the project. The project focused initially on the Norfolk Sand Plain in 2011 and 2012, but expanded to include targeted locations elsewhere in the Carolinian forest of southwestern Ontario in 2013 and 2014. The final year of this initiative is scheduled for 2015. Thus, we conclude with recommendations for further work based on knowledge acquired and lessons learned over the past four years.

The report contains sensitive information on species at risk (SAR) locations and this version of the report is not for general distribution. A modified version will be made available on BSC's website www.birdscanada.org. For further information contact Jody Allair at jallair@birdscanada.org.

PROJECT GOALS

The project focuses on filling key knowledge gaps, as well as identifying threats, for four high conservation priority bird species that occur in Ontario's Carolinian Forest: Acadian Flycatcher (ACFL), Louisiana Waterthrush (LOWA), Cerulean Warbler (CERW) and Prothonotary Warbler (PROW). Our primary goal is to document these species' distributions and occupancy patterns in southwestern Ontario, and relate these to productivity, habitat, past occupancy and forest management practices, as well as to identify threats in key areas of occupancy. The results of the project are intended to inform conservation and stewardship efforts and, ultimately, improve conservation status of the four target species in southwestern Ontario.

OBJECTIVES

1. Collect current data on site occupancy (presence/absence/productivity of target species), in all known and potential sites in the Norfolk Sand Plain and in other areas in southwestern Ontario.
2. Improve the understanding of ACFL habitat preferences, assess sites currently identified as critical habitat, and identify new sites to recommend as critical habitat.
3. Increase key audiences' awareness and understanding of forest SAR and their stewardship needs and to engage public and private landowners in taking stewardship action for SAR.

METHODS

Target species were searched for in forest tracts that encompassed known and potential breeding habitat for one or more of the four target species: ACFL, CERW, LOWA, and PROW. Canada Warbler (CAWA), Eastern Wood-Pewee (EAWP), Red-headed Woodpecker (RHWO), Wood Thrush (WOTH), and any other bird species at risk (SAR) were also recorded when encountered, but no targeted efforts were made to survey for these species.

SURVEY EFFORT

Surveys were completed at 58 sites from April 24 to August 19, 2014 throughout southwestern Ontario's Carolinian Forest, primarily the Norfolk Sand Plain (Figure 1). Effort was placed on visiting all sites listed as critical habitat in the ACFL Recovery Plan, including Rondeau Provincial Park and areas in Middlesex and Lambton Counties. Sites were chosen based on whether they were known sites (occupied by target species within the last 10 years; 43 sites), historic sites (occupied by target species over 10 years ago; 12 sites), or new sites (sites with potential habitat that had not been previously surveyed or had been surveyed, but, with no target species detected; 3 sites). Of the 43 known sites, 22 of which 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 and ACFLs nest from June to August). Survey effort totalled 303 survey hours, (747 person-hours) spread over 192 site visits (Table 1). BSC staff surveyed each site with area searches, recorded target

species occupancy and assessed habitat quality on an index scale. Further, for ACFL, Ecological Land Classifications (ELCs) were conducted at 10 known and historic ACFL nesting locations (see attached report, Appendix A). All identifiable threats (e.g., active logging, ATV use) were noted during site visits.

Whenever pairs of target species 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 OMNRF Natural Heritage Information Centre and Environment Canada. Data from private sites has, or will be, provided to the respective landowners.

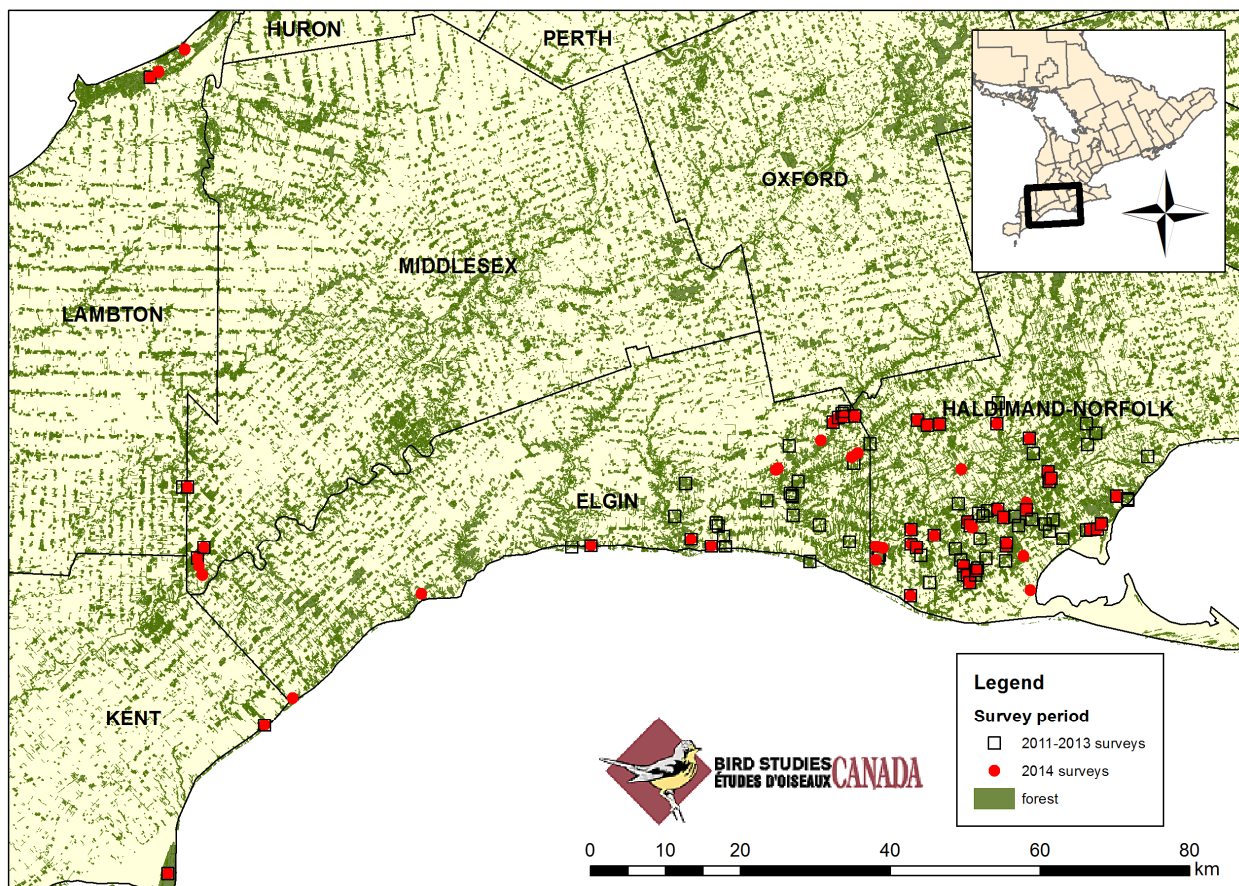


Figure 1. Map of study area showing sites surveyed only during 2011-2013 (empty squares), sites surveyed during 2011-2014 (red squares), and sites surveyed only during 2014 (red circles). County boundaries and forest cover are also shown.

Table 1. Summary of 2014 survey effort by site. Site names in bold are sites currently identified as critical habitat for Acadian Flycatcher.

Site ID	Site Name	Land Ownership	Visits (#)	Time (hours)	Effort (person-hours)
HN1-b	Backus Woods North Tract	NCC	12	30.5	68.5
HN1-c	Backus Woods South Tract	NCC	15	46.25	117.5
HN112-b	South Coast Gardens Property	Private	9	10	31
HN114-z	Jackson Gunn	LPBLT	1	0.5	1
HN12-d	St. Williams Forest - Southwest	Provincial Government	1	0.25	0.5
HN12-g	St. Williams Forest - Northeast	Provincial Government	5	9	27
HN14-z	Spooky Hollow	Multiple	2	4	8
HN16-m	Long Point Eco Adventures	Private	1	2.5	7.5
HN16-z	Turkey Point SW Bluff & Ravines	Provincial Government	7	7.5	18.5
HN19-b	Jackson Tract	LPRCA	2	2	3
HN20-z	Bird Studies Canada Headquarters	BSC	11	2.75	2.75
HN21-c	Smith Tract (Walsh Forest SW)	LPRCA	1	0.5	0.5
HN21-b	Earl Danylevitch Tract (Walsh Forest NE)	LPRCA	1	1	1
HN21-a	Swick-King Tract (Walsh Forest SE)	LPRCA	2	3.25	5
HN26-g	Fair North Forest	Private	1	1	5
HN26-f	Jonckheere Forest	Private	1	0.75	3.75
HN27-a	South Walsingham-Wilson Tract	LPRCA	7	11	35
HN27-c	South Walsingham-Coppens Tract	LPRCA	21	23	60.5
HN27-d	South Walsingham-Armstrong Tract	LPRCA	2	3	12
HN27-g	South Walsingham-Rowanwood	NGO	7	9.5	21
HN3-c	Big Creek Valley Schafer Rd. S. Croton	Private	2	3.5	6.5
HN30-z	Shoppe's Creek	Private	5	7.75	20
HN30-a	Shoppe's Creek-Saul	Private	4	2.7	6
HN37-a	Abbott-Townsend Tract	LPRCA	1	1	1
HN37-b	Anderson Tract	LPRCA	1	1.5	4.5
HN37-z	Courtland/Middleton Wetlands	LPRCA	1	1	1
HN4-a	Harris-Harris Floyd (Cultus Woods)	LPRCA	1	0.17	0.68
HN4-d	Burwell Tract (Cultus Woods)	LPRCA	1	1	4
HN5-a	Hepburn Tract (Deer Creek Valley)	LPRCA	3	2.25	5.5
HN5-b	Woolley Tract (Deer Creek Valley)	NCC	1	1	2
HN5-c	Casier (Deer Creek Valley)	NCC	3	4	9
HN52-a	Trout Creek	Regional Government	4	4	6
HN69-z	Eerenberg Forest	Private	3	3.75	8.5
HN8-a	De Vos Tract	LPRCA	1	.75	1.5
HN81-a	Arthur Langford Nature Reserve	LPBLT	9	17.25	34.50
EL3-z	Bachan Bush	Private	1	1.75	3.5
EL20-z	Hawk Cliff	Private	2	7.5	15

Site ID	Site Name	Land Ownership	Visits (#)	Time (hours)	Effort (person-hours)
EL27-z	Rush Creek	Private	4	5	10
EL34-z	John E. Pearce Provincial Park	Ontario Parks	1	0.5	1
EL45-b	Rugienis Tract	LPRCA & MNR	1	0.5	1.5
EL45-z	Carson Line Ravine	Private	10	18.25	42.25
EL46-b	Talbot Line Ravine-Gagnon	Private	5	5.75	14.5
EL46-c	Talbot Line Ravine-Gagnon South	Private	3	4.75	12.25
EL49-z	Bossuyt-Fick (Copenhagen Woods)	Private	1	1.5	3
EL52-z	Stewart Ravine	Private	1	3	6
EL53-a	Richmond Forest-Walker	Private	1	2	4
EL53-b	Richmond Forest- Rochus	Private	1	0.5	1
EL54-c	Little Otter Creek- Howey	Private	1	3.25	6.5
EL54-d	Little Otter Creek- Wood	Private	1	2	4
KE2-z	Rondeau Provincial Park	Ontario Parks	1	10.5	21
LA2-z	Lambton County Forest (Port Franks IBA)	Multiple	1	4.75	23.75
LA5-z	Pinery Provincial Park (Port Franks IBA)	Ontario Parks	1	3.5	17.5
LA9-z	Karner Blue Trail	Public	1	1	3
MI6-z	County Line Woods East	Multiple	1	1	2
MI33-b	Skunks Misery NE-Leech/North Hurdle	Middlesex County	1	1	3
MI34-a	Skunks Misery NC-Jane Bowles Trail	Middlesex County	1	1	3
MI36-z	Skunks Misery Middle Central	LPRCA	1	2	6
MI37-z	Skunks Misery South Central	Private	1	0.25	0.75

Notes: NCC= Nature Conservancy of Canada; LPBLT= Long Point Basin Land Trust; LPRCA= Long Point Region Conservation Authority; NGO= Non Government Organization; MNR= Ministry of Natural Resources.

COLOUR BANDING

A colour banding program initiated for LOWA in 2011 and conducted every year since, was continued in 2014 to learn about site fidelity and return rates for this species.

STEWARDSHIP

All landowners were contacted to obtain permission to survey private lands for ACFL and LOWA in particular. Similar to past years, landowners new to the program were given a copy of the *Forest Bird Species at Risk Factsheet* and interviewed about their forest use. Landowners who participated in an interview in 2013 were asked to participate in a follow up interview in 2014. The follow-up interview involved discussing any changes in their perspectives of forests or forest birds, changes to their forests, and what new information BSC could provide them regarding any changes to their forest or their management approach to forest birds at risk.

RESULTS AND DISCUSSION

One or more of the four target species were detected at 30 of the 58 sites surveyed in 2014, with ACFL, LOWA, CERW and PROW detected at 18, 11, 8 and 2 sites, respectively (Figure 2). Table 2 details the number of pairs, individuals and nests found for each target species at each of the 58 sites surveyed in 2014. Other species at risk (CAWA, EAWP, WOTH) were recorded at

12 of the 58 sites surveyed.

All target species appeared to occupy a relatively similar number and percentage of sites in all years (Table 3), although the sites occupied varied from year to year, with some sites occupied consistently from 2011 to 2014, and some not (Figures 3 – 6).

Between 2011 and 2014, 54 sites were surveyed in at least 2 or more years (Table 4). Table 4 shows sites ranked in order of “conservation importance”, which was calculated by summing the proportion of years that each target species was detected out of the total number of years surveyed. Thirty-six sites have had target species present in at least half of the years surveyed (Rank > 0.5) and, of these, 22 have had at least one target species present in all years surveyed (Rank = 1.0). Twelve sites have supported multiple target species in multiple years. This method of ranking the conservation importance of sites might be improved with the addition of abundance in the calculations, which is an area for future work.

Below we discuss these results and their potential conservation implications separately for each species.

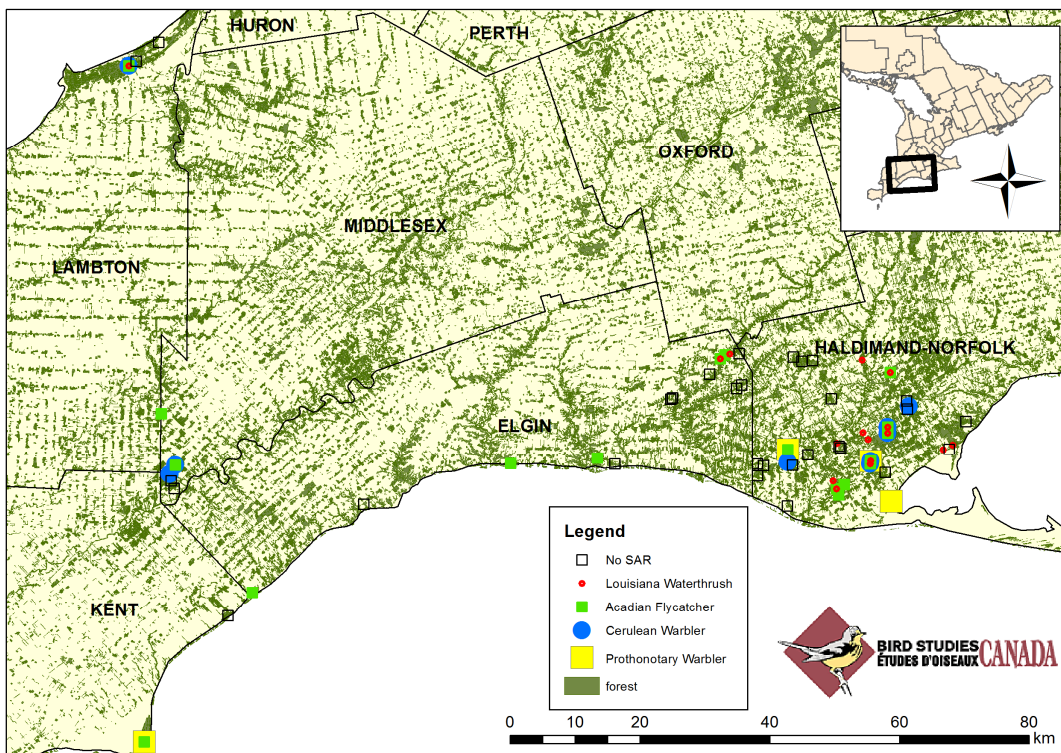


Figure 2. Map showing sites surveyed in 2014 that were occupied (or not occupied) by target species at risk including Louisiana Waterthrush, Acadian Flycatcher, Cerulean Warbler, and Prothonotary Warbler. County boundaries and forest cover are also shown.

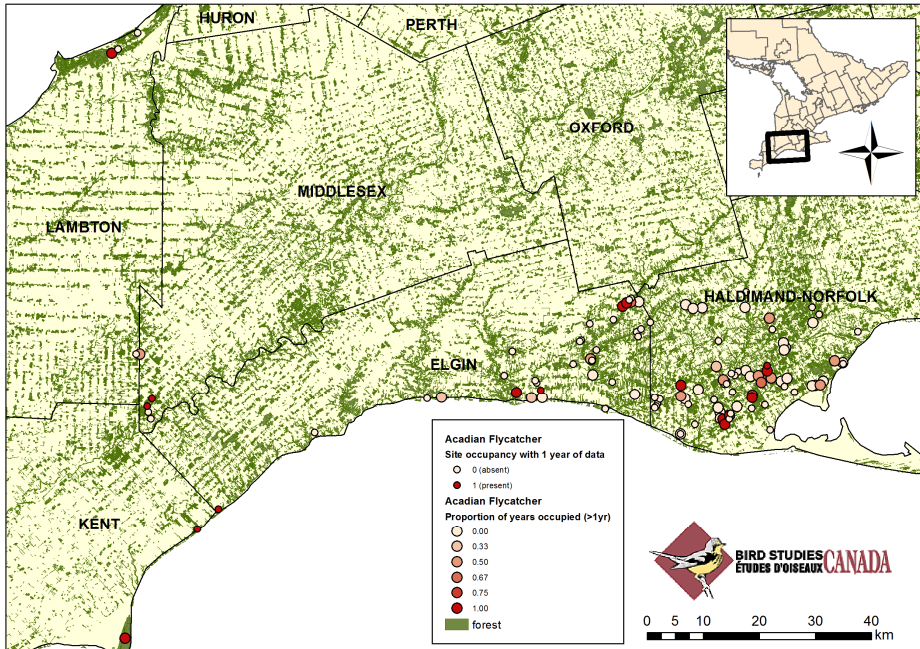


Figure 3. Map showing the site occupancy of Acadian Flycatcher across the study area between 2011 and 2014. Small circles represent sites surveyed only once during 2011-2014 and whether they were occupied (red-filled) or not (open). Larger circles represent sites with two to four years of surveys and colour intensity represents the proportion of years that the species was present at the site.

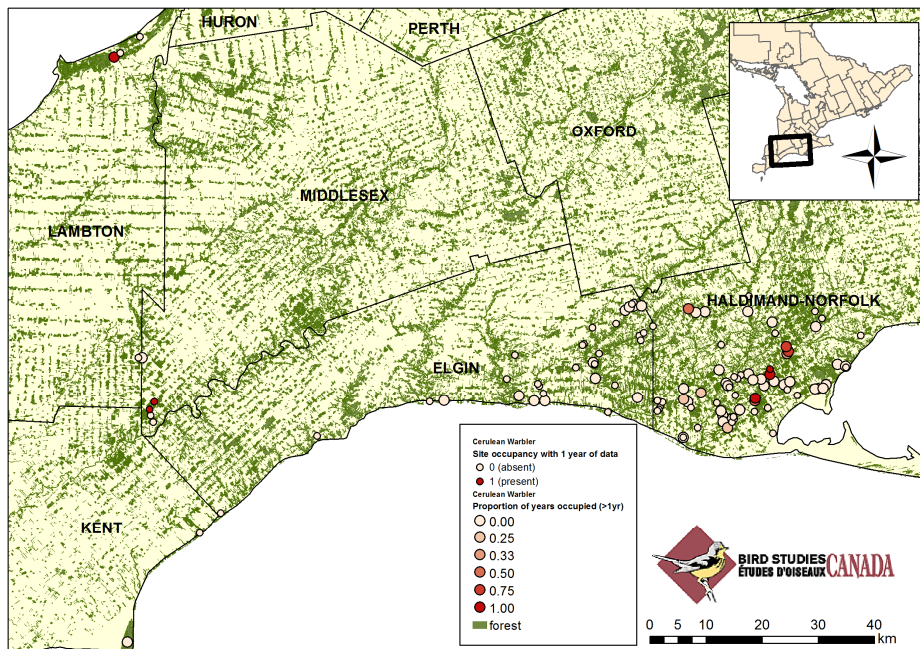


Figure 4. Map showing the site occupancy of Cerulean Warbler across the study area between 2011 and 2014. See Figure 3 for legend details.

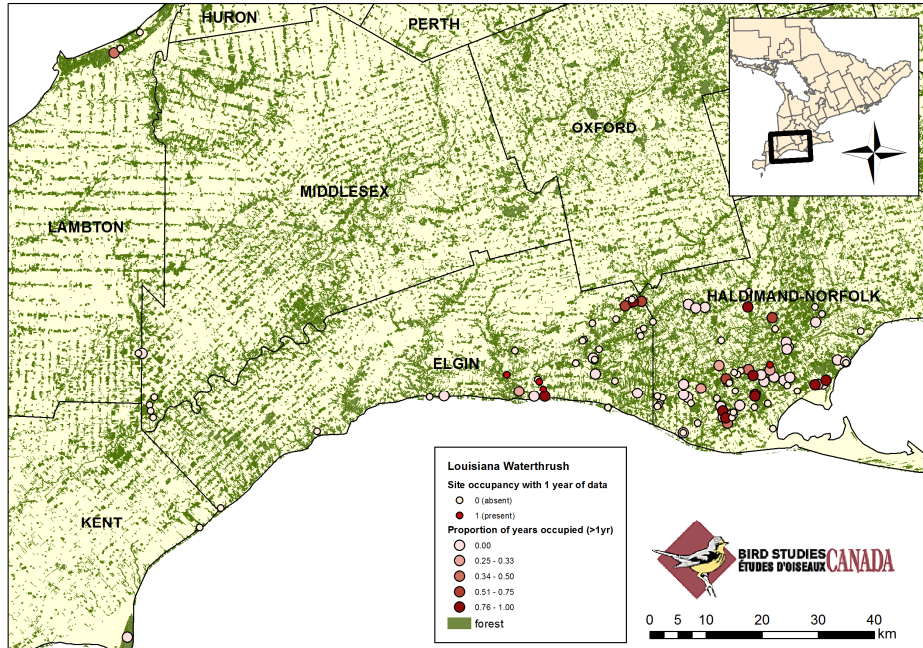


Figure 5. Map showing the site occupancy of Louisiana Waterthrush across the study area between 2011 and 2014. Figure 3 for legend details.

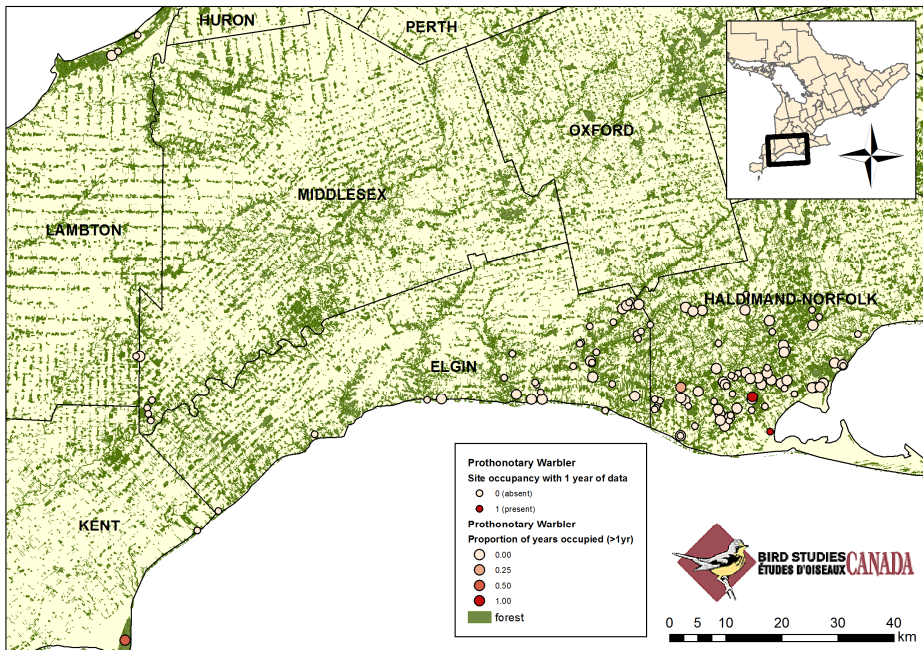


Figure 6. Map showing the site occupancy of Prothonotary Warbler across the study area between 2011 and 2014. Figure 3 for legend details.

Table 2. Forest birds at risk found in 2014 in southwestern Ontario by site. Sites in ***bold italics*** are identified as critical habitat for Acadian Flycatcher.

Site ID	Site Name	ACFL			LOWA			CERW		PROW		CAWA		EAWP	WOTH
		P	S	N	P	S	N	M	F	P	S	P	S	N	N
HN1-b	<i>Backus Woods North Tract</i>				1	1	2	3		5			1		2
HN1-c	<i>Backus Woods South Tract</i>	1	2	2	2		1	1							2
HN112-b	South Coast Gardens Property				1		1								
HN114 - z	Jackson Gunn														
HN12-d	St. Williams Forest - Southwest														
HN12-g	St. Williams Forest - Northeast		1					4	1				1		1
HN14-z	<i>Spooky Hollow</i>											1	1		
HN16-m	Long Point Eco Adventures														
HN16-z	<i>Turkey Point SW Bluff & Ravines</i>				1	1	1								1
HN19-b	Jackson Tract														
HN20-z	Bird Studies Canada Headquarters									1					
HN21-c	Smith Tract-Walsh Forest														
HN21-b	Earl Danylevitch Tract (Walsh Forest NE)														
HN21- a	Swick-King Tract (Walsh Forest SE)							4							
HN26-f	Jonckheere Forest														
HN26-g	Fair North Forest														
HN27-a	<i>South Walsingham - Wilson Tract</i>				1		2								1
HN27-c	<i>South Walsingham SW - Coppens Tract</i>	2		3	2		2								3
HN27-d	<i>South Walsingham SW - Armstrong Tract</i>		1												
HN27-g	<i>South Walsingham- Rowanwood</i>	1		2											
HN3-c	Big Creek Valley Schafer Rd. S. Croton														
HN30-z	Shoppe's Creek				1		1								
HN30-a	Shoppe's Creek-Saul														
HN37-a	Abbott-Townsend Tract														
HN37-b	Anderson Tract														
HN37-z	Courtland/Middleton Wetlands														
HN4-a	Harris-Harris Floyd (Cultus Woods)														
HN4-d	<i>Burwell Tract (Cultus Woods)</i>							1							
HN5-a	<i>Hepburn Tract (Deer Creek)</i>														1

Site ID	Site Name	ACFL			LOWA			CERW		PROW		CAWA		EAWP	WOTH
		P	S	N	P	S	N	M	F	P	S	P	S	N	N
	<i>Valley)</i>														
HN5-b	Woolley Tract (Deer Creek Valley)														
HN5-c	Casier (Deer Creek Valley)														
HN52-a	Trout Creek		1			1									
HN67-z	Long Forest														
HN69-z	Eerenberg Forest*	1		2	1	1		2					1		
HN8-a	De Vos Tract														
HN81-a	Arthur Langford Nature Reserve	3		4							1				
EL3z	Bachan Bush*	1		1											
EL20z	Hawk Cliff	2	2	2											
EL27z	Rush Creek	2		3											
EL34z	John E. Pearce Provincial Park														
EL45b	Rugienis Tract														
EL45z	Carson Line Ravine	2		3	1		1								
EL46b	Talbot Line Ravine-Gagnon				1		1								
EL46c	Talbot Line Ravine-Gagnon South		1												
EL49z	Bossuyt-Fick (Copenhagen Woods)														
EL52z	Stewart Ravine														
EL53a	Richmond Forest-Walker														1
EL53b	Richmond Forest- Rochus														
EL54c	Little Otter Creek- Howey														
EL54d	Little Otter Creek- Wood														
KE2z	Rondeau Provincial Park	3		3							1			1	
LA2z	Lambton County Forest (Port Franks IBA)	6		6	1			2							
LA5z	Pinery Provincial Park (Port Franks IBA)													1	
LA9z	Karner Blue Trail														
MI6z	County Line Woods East	1	1	1											
MI33b	Skunks Misery NE-Leech/North Hurdle	1	1	1				1							
MI34a	Skunks Misery NC-Jane Bowles Trail							2							
MI36z	Skunks Misery Middle Central		1												
MI37z	Skunks Misery South Central														
TOTALS		26	11	33	13	4	12	20	1	5	2	4	1	2	12

Notes: ACFL= Acadian Flycatcher, LOWA = Louisiana Waterthrush, CERW = Cerulean Warbler, PROW =

Prothonotary Warbler, CAWA = Canada Warbler, EAWP = Eastern Wood-Pewee, WOTH = Wood Thrush; P = Number of pairs, S = Single (unpaired individuals), N = number of nests found, M = males, F = female.
* = new sites where ACFL has not previously been detected.

Table 3. Summary of forest bird at risk data collected in southwestern Ontario between 2011 and 2014. Note that for some species, such as Cerulean Warbler, little effort was made to determine the number of pairs or the number of nests. When this is the case the total appears in brackets.

Species	Year	# Sites	% Sites occupied ¹	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
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	-	-
	2014	8	0.14	(1)	20	1	(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
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	2	0.03	6	5	6	7	31	4.43	0.00	0
Hooded Warbler ²	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

Table 4. Sites surveyed more than once between 2011 and 2014, with the proportion of years each target species was detected out of the number of years surveyed. Sites in ***bold italics*** are identified as critical habitat for Acadian Flycatcher.

¹ Total number of sites surveyed in 2011: 37; in 2012: 61; in 2013: 54, and; in 2014: 58.

² Hooded Warbler is included because the species was a focus of the study initially in 2011 and 2012. It is 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.

Site ID	Site name	Ownership	Years surveyed	Proportion of years detected				Ranking (sum)
				CERW	ACFL	PROW	LOWA	
HN1-b	Backus Woods North Tract	NCC	4	1.0	0.8	1.0	1.0	3.8
HN1-c	Backus Woods South Tract	NCC	4	0.5	1.0	0.0	1.0	2.5
LA2-z	Lambton County Forest (Port Franks IBA)	Multiple	2	1.0	1.0	0.0	0.5	2.5
HN12-g	St. Williams Forest - Northeast	Provincial Government	4	1.0	1.0	0.0	0.3	2.3
HN27-c	South Walsingham SW - Coppens Tract	LPRCA	4	0.0	1.0	0.0	1.0	2.0
HN27-d	South Walsingham SW - Armstrong Tract	LPRCA	4	0.3	1.0	0.0	0.5	1.8
EL45-z	Carson Line Ravine	Private	3	0.0	1.0	0.0	0.7	1.7
EL46-b	Talbot Line Ravine - Gagnon	Private	3	0.0	0.7	0.0	1.0	1.7
KE2-z	Rondeau Provincial Park	Provincial Government	2	0.0	1.0	0.5	0.0	1.5
EL27-z	Rush Creek	Private	3	0.0	1.0	0.0	0.3	1.3
HN5-a	Hepburn Tract (Deer Creek Valley)	LPRCA	4	0.0	0.5	0.0	0.8	1.3
HN52-a	Trout Creek	Regional Government	4	0.0	0.5	0.0	0.8	1.3
HN81-z	Arthur Langford Nature Reserve	LPBLT	4	0.0	1.0	0.3	0.0	1.3
HN16-b	Turkey Point SW Bluff & Ravines	Provincial Government	4	0.0	0.0	0.0	1.0	1.0
HN27-a	Wilson Tract	LPRCA	4	0.0	0.0	0.0	1.0	1.0
HN27-g	South Walsingham Rowanwood	NGO	4	0.0	1.0	0.0	0.0	1.0
HN112-c	Ravine west of South Coast Gardens Property	Private	3	0.0	0.0	0.0	1.0	1.0
HN3-c	Big Creek Valley Schafer Road South Croton	Private	3	0.0	0.0	0.0	1.0	1.0
EL14-z	Passmore Farm-Silver Creek	Private	2	0.0	0.0	0.0	1.0	1.0
EL46-c	Talbot Line Ravine-Gagnon South	Private	2	0.0	1.0	0.0	0.0	1.0
HN30-z	Shoppe's Creek	Private	2	0.0	0.0	0.0	1.0	1.0
HN21-a	Swick-King Tracts (Walsh Forest SE)	LPRCA	4	0.8	0.0	0.0	0.0	0.8
HN21-b	Hanson Earl Danylevitch Tracts (Walsh Forest NE)	LPRCA	4	0.8	0.0	0.0	0.0	0.8
HN4-d	Burwell Tract (Cultus Woods)	LPRCA	4	0.3	0.5	0.0	0.0	0.8
EL51-z	Rugienis Tract All	LPRCA	3	0.0	0.0	0.0	0.7	0.7
HN12-d	St. Williams Forest - Southwest	Provincial Government	3	0.0	0.7	0.0	0.0	0.7
HN5-z	Deer Creek Valley	Multiple	3	0.0	0.3	0.0	0.3	0.7
HN14-z	Spooky Hollow	Multiple	4	0.0	0.5	0.0	0.0	0.5
HN19-b	Jackson Tract	LPRCA	4	0.3	0.0	0.0	0.3	0.5
HN37-a	Abbott-Townsend Tract	LPRCA	4	0.5	0.0	0.0	0.0	0.5
EL43-a	Calton Swamp – SE	Provincial Government	2	0.0	0.5	0.0	0.0	0.5
HN12-e	St. Williams Forest - Southeast	Provincial Government	2	0.0	0.5	0.0	0.0	0.5
HN12-f	St. Williams Forest - Northwest	Provincial Government	2	0.0	0.5	0.0	0.0	0.5
HN16-m	Long Point Eco Adventures	Public	2	0.0	0.5	0.0	0.0	0.5

Site ID	Site name	Ownership	Years surveyed	Proportion of years detected				Ranking (sum)
				CERW	ACFL	PROW	LOWA	
HN30-a	Shoppe's Creek-Saul	Private	2	0.0	0.0	0.0	0.5	0.5
MI6-z	County Line Woods East	Multiple	2	0.0	0.5	0.0	0.0	0.5
EL20-z	Hawk Cliff	Private	3	0.0	0.3	0.0	0.0	0.3
EL49-z	Bossuyt-Fick (Copenhagen Woods)	Private	3	0.0	0.3	0.0	0.0	0.3
HN112-b	South Coast Gardens Property	Private	3	0.0	0.0	0.0	0.3	0.3
HN21-c	Smith Tract (Walsh Forest SW)	LPRCA	3	0.3	0.0	0.0	0.0	0.3
HN5-b	Woolley Tract (Deer Creek Valley)	NCC	3	0.0	0.0	0.0	0.3	0.3
HN31-z	Fishers Glen	LPRCA	3	0.0	0.0	0.0	0.0	0.0
HN37-z	Courtland/Middleton Wetlands	LPRCA	3	0.0	0.0	0.0	0.0	0.0
HN4-a	Harris Harris Floyd Tract (Cultus Woods)	LPRCA	3	0.0	0.0	0.0	0.0	0.0
EL28-z	Grigg (South Otter)	Private	2	0.0	0.0	0.0	0.0	0.0
EL50-a	Dennis Property	Private	2	0.0	0.0	0.0	0.0	0.0
HN113-a	Miles Property (NCC Office Ravine)	NCC	2	0.0	0.0	0.0	0.0	0.0
HN114-z	Jackson Gunn	LPBLT	2	0.0	0.0	0.0	0.0	0.0
HN17-a	McKay-Kyte-Laforge Tract (Ungers Corners)	LPCRA	2	0.0	0.0	0.0	0.0	0.0
HN17-b	Vandervyere-Lipsit-Penner (Ungers Corners)	LPCRA	2	0.0	0.0	0.0	0.0	0.0
HN27-j	South Walsingham Pterophylla	Private	2	0.0	0.0	0.0	0.0	0.0
HN37-b	Anderson Tract	LPBLT	2	0.0	0.0	0.0	0.0	0.0
HN7-z	Monroe Landon's Woods	NCC	2	0.0	0.0	0.0	0.0	0.0
HN96-a	Lake Erie Farms	NCC	2	0.0	0.0	0.0	0.0	0.0

ACADIAN FLYCATCHER

2014 Surveys

Twenty-six pairs and 11 single male ACFLs were detected in 18 sites (Table 3). Of these, 15 were known sites (11 of are listed as critical habitat in the ACFL Recovery Strategy), 1 was historic, and 2 were new sites (Erenberg Forest and Bachan Bush).

In total, 33 nests were found and monitored until the end of the breeding season, of which 12 were successful, 8 failed and 13 had unknown outcomes. At least 28 young fledged from the successful nests. Most pairs that failed on their first nesting attempt built another nest which succeeded, with the exception of one pair in Carson Line Ravine, which disappeared from the site after one nesting attempt. No ACFL nests were parasitized by Brown-headed Cowbirds in 2014 (Table 3).

The number of pairs recorded in 2014 was nearly double that from previous years, but this is likely related to the increased number of sites surveyed outside of the Norfolk Sand Plain in 2014 (e.g., Rondeau Provincial Park had 6 pairs). The percentage of sites occupied, relative to sites surveyed was similar between years (ranging between 22 and 32% of sites) but it should be noted that these numbers do not account for variation in effort or sites surveyed between years.

Some sites, such as Lambton County Forest (Port Franks IBA) and Rondeau Provincial Park, were surveyed only once, and nests found at these sites were not monitored. This accounts for the large number of unknown ACFL nest outcomes ($n = 13$) in 2014. However, ACFL fledged young to nest ratios (Table 3) suggest that ACFL productivity may be lower than other targeted species at risk. This likely merits additional investigation.

Interestingly, one female ACFL, in Backus South, was observed twittering as she picked her nest location. To our knowledge, this behaviour has never been observed in females.

Between-year occupancy

ACFL consistently occupied sites throughout the study area. About 48% (26 of 54) of sites with multi-year surveys detected ACFL in at least one year and about 43% (11 of 26) of these sites were occupied by ACFL every year. About 23% 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 County, where the species consistently occupied several areas each year (e.g. sections of South Walsingham Forest). However, many other sites, such as Spooky Hollow were infrequently occupied.

CERULEAN WARBLER

2014 Surveys

Twenty male CERW were recorded at nine sites (Table 2). Of these, four were known sites, three were historic and two were new (Burwell Tract and Eerenberg Forest). In the St. Williams Conservation Reserve a female was located between 2 male territories, but a nest site was never found. This represents the highest number of Cerulean Warblers detected through the

SAR surveys conducted since 2011. However, as noted above, the results do not account for variation in effort or sites surveyed between years.

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), Port Franks IBA and the Walsh Forest complex (Long Point Region Conservation Authority). Twenty percent (11 of 54) 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 in our study area do not appear to support many CERWs. One private land parcel connected to SWCR was occupied by a CERW in 2014. However, since CERWs and CERW habitat have not consistently received the same survey focus from year to year, additional effort is needed to better determine CERW distribution, abundance and breeding success in the Norfolk region..

PROTHONOTARY WARBLER

2014 Surveys

Five PROW pairs (5 females and 4 males) were reported nesting in the same boxes as previous years at the consistently-occupied Backus Woods North site along with one new nest box. Thirty-one chicks fledged successfully from Backus this year, and one successful double brood was observed. Also, a Tree Swallow (TRES) nest was found with one PROW egg inside the same box. The TRES adults were successful in raising the PROW young as well as their own. The TRES nest box was located between two active PROW nest boxes, so it was unclear which female laid the egg.

In addition to the nesting activity at Backus North two new sites were occupied by PROW. A pair of PROW was found foraging in a pond at the BSC Headquarters property. A nest box was placed in the pond immediately after observing them, and the pair nested successfully, fledging two young. In addition, a single male PROW was detected at a buttonbush pond for the first time in the Arthur Langford Reserve. No female was observed, and the male apparently left the site before the completion of the breeding season.

Between-year occupancy

PROW was very rare in our study area. It is consistently found at Backus Woods, but other less frequently occupied sites include Rondeau Provincial Park, Arthur Langford Nature Reserve, and BSC Headquarters. PROW was not observed on surveyed private lands.

LOUISIANA WATERTHRUSH

2014 Surveys

Thirteen pairs, 12 nests, and 4 single male birds were detected in 12 sites (10 known, one historic, one new) across southwestern Ontario (Table 2). Of the 12 nests monitored, 6 nests were successful in fledging a total of 25 chicks, and 5 nests were parasitized by Brown-headed Cowbirds (Table 3).

Between-year occupancy

LOWA consistently occupied sites in Norfolk and East Elgin Counties. About 43% (23 of 54) of sites with multi-year surveys were occupied by LOWA in at least one year and about 43% (10 of 23) of these sites are occupied by LOWA every year. Interestingly, about 40% 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.

2014 Banding data

Since 2011, we have banded 100 LOWAs, including 72 chicks, 14 males and 14 females (Table 4). Of these banded birds, only 11 individuals returned to breed, consisting of: six females, banded as adults; four males, banded as adults; and one male banded as a nestling (Table 4).

All re-sighted birds that were banded as adults showed high site fidelity and returned to the same site to breed every year (Table 5). Banded birds were re-sighted in later years in the following sites: Backus North, Backus South, Turkey Point, South Coast Gardens, Wilson Tract, and Coppens Tract. In Backus North, one female banded in 2011 returned in 2012 and mated with a different male. A new pair bred in Backus North in 2013, and the male returned in 2014 to breed with a new female. In Backus South, a male bird that was banded in 2011 returned to the same forest every year until 2014, mating with the same female in 2013 and 2014, but with a different female in 2012. In Turkey Point, the male that was banded in 2011 returned every year until 2014, mating with one female in both 2011 and 2012, and a different female in 2013 and 2014. In South Coast Gardens, the male banded in 2012 did not return in 2013, but did return in 2014, mating with a new female. In Wilson Tract the same female returned in 2012, 2013, and 2014, mating with a different male every year. Lastly, in Coppens Tract, the same female banded in 2011 returned in 2012, 2013 and 2014, mating with a new male every year.

A complete list of re-sighted LOWA pairs can be viewed in Table 6, with some individuals pairing with different mates during subsequent years. The only nestling that returned to breed did so in a different forest site than its natal site, and was not re-sighted in consecutive years. Larger sample sizes of LOWAs are needed to learn more about site fidelity and differences between male and female mating choices.

Table 4. Total Louisiana Waterthrush banded from 2011-2014, including return rates.

Total Nestlings Banded	Total Females Banded	Total Males Banded	Number of Adult Banded Females Returned to Breed	Number of Adult Banded Males Returned to Breed	Rate of Return of Birds Banded as Nestlings
72	14	14	6	4	1

Table 5. A comparison of sites where Louisiana Waterthrush were banded and re-sighted from 2011 to 2014. The year each bird was banded and re-sighted as well as the age and sex of the bird when it was initially banded is indicated. Individual Louisiana Waterthrush are differentiated based on unique band number.

Re-sighted LOWAs					
Band Number	Age/Sex Banded	Year Banded	Year(s) Re-sighted	Site Banded	Site Re-sighted
2401-80812	Adult/Female	2011	2012	Backus North	Backus North
2401-80867	Adult/Male	2013	2014	Backus North	Backus North
2401-80840	Adult/Male	2012	2013, 2014	Backus South	Backus South (x2)
2401-80871	Adult/Female	2013	2014	Backus South	Backus South
2401-80876	Adult/Female	2013	2014	Turkey Point	Turkey Point
2401-80801	Adult/Female	2011	2012	Turkey Point	Turkey Point
2401-80802	Adult/Male	2011	2012, 2013, 2014	Turkey Point	Turkey Point (x3)
2401-80826	Adult/Male	2012	2014	South Coast Gardens	South Coast Gardens
2401-80820	Adult/Female	2012	2013, 2014	Wilson Tract	Wilson Tract (x2)
2401-80805	Adult/Female	2011	2012, 2013, 2014	Coppens Tract	Coppens Tract (x3)
2401-80816	Chick/Male	2011	2012	Coppens Tract	Backus North

Table 6. Pairing of each colour banded Louisiana Waterthrush that was re-sighted after the year it was banded. Each individual Louisiana Waterthrush is differentiated by its unique band number.

Mating Choices of Returned Birds				
Band Number	Year Banded	Mate in Year Banded	Year Re-sighted	Mate when re-sighted
2401-80812	2011	2401-80813	2012	2401-80816
2401-80867	2013	2401-80866	2014	2401-80900
2401-80840	2012	2401-80839	2013	2401-80871
			2014	2401-80871
2401-80871	2013	2401-80840	2014	2401-80840
2401-80876	2013	2401-80802	2014	2401-80802
2401-80801	2011	2401-80802	2012	2401-80802

Mating Choices of Returned Birds				
Band Number	Year Banded	Mate in Year Banded	Year Re-sighted	Mate when re-sighted
2401-80802	2011	2401-80801	2012	2401-80801
			2013	2401-80876
			2014	2401-80876
2401-80826	2012	2401-80827	2014	2401-80889
2401-80820	2012	2401-80819	2013	*unbanded*
			2014	2401-80895
2401-80805	2011	2401-80818	2012	*unbanded*
			2013	*unbanded*
			2014	2401-80886
2401-80816	2011	*chick*	2012	2401-80812

OTHER SPECIES AT RISK

One male CAWA was heard at St. Williams NE, one was on territory in Eerenberg Forest, single males were heard singing on a single occasion in Backus North and a Big Creek Valley site, and a family group was located at Spooky Hollow. No CAWA nests were located. One pair of RHWO was seen in Jackson Gunn Forest and another pair was seen in Pinery Provincial Park, but these were not confirmed to be nesting. Effort was made to record nest locations of EAWP and WOTH. However nest searches for these species were incidental, and therefore the number of nests was underestimated. .

THREATS NOTED

Threats noted at the study sites included: logging, tree disease (e.g., beech bark disease), erosion, invasive species (e.g., Emerald Ash Borer), ATV use, and garbage dumping. Additional work is needed to prioritize threats to help target stewardship and conservation effort for the area. However, it is likely that habitat degradation and destruction from logging is the primary threat for the target SAR which depend on mature forest.

LANDOWNER STEWARDSHIP

We contacted two new landowners, whose land was previously un-surveyed and who were made newly aware of the species at risk present on their properties.

Eight of nine landowners previously interviewed in 2013 participated in follow-up interviews. The interview consisted of three questions (Table 7). The two private landowners new to the program in 2014 were also interviewed. Interview results are summarized in Table 8. Overall, both new and previous landowners appeared to be pleased to have BSC on their property and were happy to learn more about forest birds at risk.

In 2014, a new interpretive factsheet, entitled *Carolinian Birds of Ontario* (Figure 7), was designed to be used during landowner stewardship in addition to the *Forest Bird Species at Risk*

Factsheet. The *Carolinian Birds of Ontario* factsheet included a photo of each target species as well as CAWA and RHWO, and described the importance of the Carolinian forest for these species. BSC will continue to use this factsheet during stewardship outreach in the future.

Table 7. Summary of responses from questions asked in 2014 follow up interviews.

<u>Questions</u>	#1-Do you have a greater appreciation for forests and forest birds?	#2-Have there been any changes to your forest? Are there any plans to change your forest?	#3-Is there any other information you would like to receive from BSC?
<u>Answers</u>	3/8 stated that the factsheet did help their appreciation, while 5/8 stated they already had a high appreciation for birds/forests	5/8 stated no new changes to the forest; 1 landowner is conducting an ongoing restoration project; 1 is building a new deer stand; 1 landowner logs dead trees every winter	All landowners wish to receive more information on both birds and the forest. Some wish to receive information via mail or email, while others prefer talking to BSC staff

Table 8: Summary of responses from questions asked in 2014 interviews with new landowners.

<u>Questions</u>	#1- How do you feel about having BSC or SAR on your property?	#2-Do you have a forest management plan?	#3- How do you use your forest?	#4- Did you find the FBAR fact sheet useful?	#5- Are you interested in learning more about FBAR and forest management?	#6- What information would you like to receive? Is there a more effective method of receiving information?
<u>Answers</u>	Both landowners are happy to have both SAR and BSC staff conducting surveys on their property	Landowner 1= forest harvested every 20 years; Landowner 2= logs the forest every few years	Landowner 1= recreational (walks); Landowner 2= logging	Both liked reading the fact-sheet and found it very useful	Both said yes; Landowner 2= wishes to know more about forest management for SAR to prevent damaging their habitat when logging	Landowner 1= wishes to know about other birds, such as Bluebirds, via email. Landowner 2= anything



Figure 7. Two-sided “fact sheet” designed to introduce landowners to forest birds at risk.

SUMMARY AND CONCLUSIONS

Key findings and implications

Following 4 years of surveys in southwestern Ontario’s Carolinian forest, we have taken steps to rank the sites surveyed according to their conservation significance for the project’s four target species. Several had more than one target species detected in multiple years and these results have implications for further conservation planning and stewardship efforts. Examples include:

- Acadian Flycatcher was detected consistently at sites not identified as ‘critical habitat’, indicating that some sites should potentially be identified as ‘critical habitat’ and listed in Appendix 2 of the species Recovery Strategy.
- A substantial percentage of Acadian Flycatchers and Louisiana Waterthrush occur on private lands and/or lands potentially subject to timber harvesting. Additional effort should be made in the short-term to prioritize consistently occupied areas for additional stewardship and outreach efforts.
- Sites consistently occupied by Cerulean Warbler can be used in drafting the species Recovery Strategy as locations suitable for designation as critical habitat. In addition, greater effort should be made to survey and monitor Cerulean Warbler in the Norfolk Sand Plain to help identify additional areas as ‘critical habitat’, as well as to better

understand the population dynamics of Ontario's southernmost Cerulean Warbler population.

Next steps

By the end of 2015, following five years of surveys, we will have gathered a comprehensive dataset including detailed distribution and occurrence information for the four targeted species at risk dependent on the Carolinian Forest. New areas of 'critical habitat' for Acadian Flycatcher will be identified, as will habitat characteristics, and all known historical records will be verified and updated. In addition, key threats and the current level of stewardship for these species at risk will be determined. However, most important is how we use this information to further conservation efforts for the four target species at risk.

While we took the first steps in this report to rank the conservation significance of different sites, there are many more steps, including combining the results presented here with our understanding of species abundance at the sites, as well as our understanding of the severity of threats at different sites. This information will help with conservation planning and, ultimately, with targeting conservation and stewardship efforts in the area. Another important next step will be identifying potential factors, such as productivity and habitat, that are influencing the patterns of occupancy reported here.

Lastly, over the course of the next year, we will identify ongoing gaps in knowledge and/or conservation efforts for the region and for the target species. We will evaluate what research is needed to address those gaps and/or what level of monitoring may be required to track species recovery. This will ultimately help determine "what's next" for BSC's Forest Birds at Risk Program and will help us to identify a program strategy that works towards outcomes with greatest positive impact for Carolinian forest birds at risk.

ACKNOWLEDGEMENTS

Thank you to all of the public and private landowners who helped make this project possible, particularly to the Long Point Region Conservation Authority, Nature Conservancy of Canada, Norfolk County and the St. Williams Conservation Reserve Community Council.

Thank you to BSC field staff, Sarah Dobney and Heather xxx from 2014, who collected all of the data for this report, as well as helped prepare the report and produce the Carolinian Birds of Ontario fact sheet. Thank you to Catherine Jardine who manages the Forest Birds at Risk database and helped produce various summaries, and to many other BSC staff who provided input and commentary for this report.

Finally, this endeavour would not have been possible without the continued financial support of:

Environment Canada – Canadian Wildlife Service;
Government of Canada’s Habitat Stewardship Program for Species at Risk;
Ontario Ministry of Natural Resources and Forestry’s Species at Risk Stewardship Fund.