

Characterizing Bird Distribution, Abundance, and Diversity within The Land Between: Summary of Key Findings

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In this report, we assess the utility of bird distribution and abundance data from the recently published *Atlas of the Breeding Birds of Ontario, 2001-2005* (Cadman *et al.*, 2007) for characterizing the ecological nature of The Land Between. The following attributes are described in brief below: 1) species richness at the southern Ontario scale, 2) bird populations and conservation responsibility, and 3) abundance transition patterns within The Land Between.

Broad scale species richness

At the very broadest of scales, total species richness is instructive for highlighting “hotspots” of biological diversity across southern Ontario. Figure 1 illustrates that The Land Between harbours among the highest diversity of bird species in the province, along with other well known areas such as the Niagara Escarpment, the Oak Ridges Moraine, and Long Point. These results from the second Ontario Atlas mimic those from the first Atlas which, twenty years ago, identified The Land Between as a key biodiversity cluster in southern Ontario (Cadman *et al.*, 1987).

Bird populations and conservation responsibility

Abundance maps from the Ontario Atlas can be used to quantify the degree to which the populations of bird species are concentrated within The Land Between. Phrased differently, this information indicates the ‘responsibility’ that The Land Between bears for the conservation of a given species. Bird responsibility estimates can, therefore, serve to unify and focus planning and conservation efforts across the multiple jurisdictions and decision making entities that make up the region, ultimately resulting in improved land management policies and actions. Results indicate that the area contains 79% of the Ontario population of Golden-winged Warblers (Figure 4), 61% of Yellow-throated Vireos (Figure 5), 56% of Eastern Towhees, 49% of White-breasted Nuthatches, and 47% of Great-crested Flycatchers (all figures approximate). Table 1 shows results for the entire suite of species for which relative abundance data are available.

Abundance transition patterns

Relative abundance maps from the recent Ontario Atlas reveal, for the first time, that the abundance patterns of many bird species change abruptly within The Land Between. Some species are more abundant in the lowlands to the south, and quickly become less abundant at the Canadian Shield. Others are more abundant on the Shield to the north, and become less abundant south to the Shield edge. Still other species show a more gradual transition within The Land Between. Prior to the recent Atlas, scientists did not appreciate the frequency and degree to which this phenomenon was occurring, because maps of breeding presence often do not detect it. Table 2 identifies species that exhibit these characteristics, based on an initial qualitative assessment, while Figures 4 and 5 illustrate some of the more striking examples.

REFERENCES

- Cadman, M.D., D.A. Sutherland, G.G. Beck, D. Lepage, and A.R. Couturier (eds.). 2007. *Atlas of the Breeding Birds of Ontario, 2001-2005*. Bird Studies Canada, Environment Canada, Ontario Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature, Toronto.
- Cadman, M.D., P.F.J. Eagles, and F.M. Helleiner (eds.). 1987. *Atlas of the Breeding Birds of Ontario*. Federation of Ontario Naturalists and Long Point Bird Observatory. Waterloo: University of Waterloo Press.

FIGURES

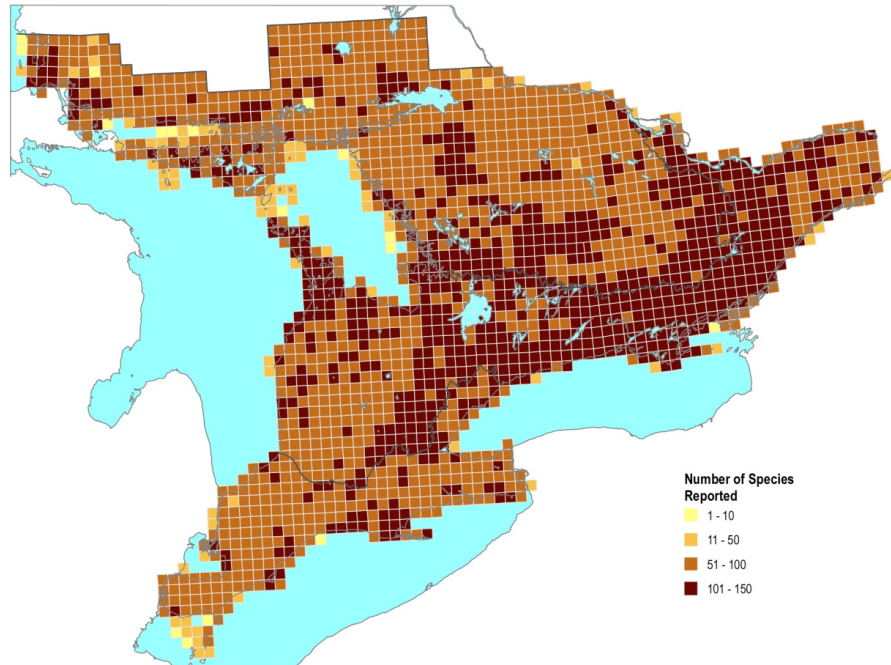


Figure 1 – Total bird species richness within 10-km atlas squares

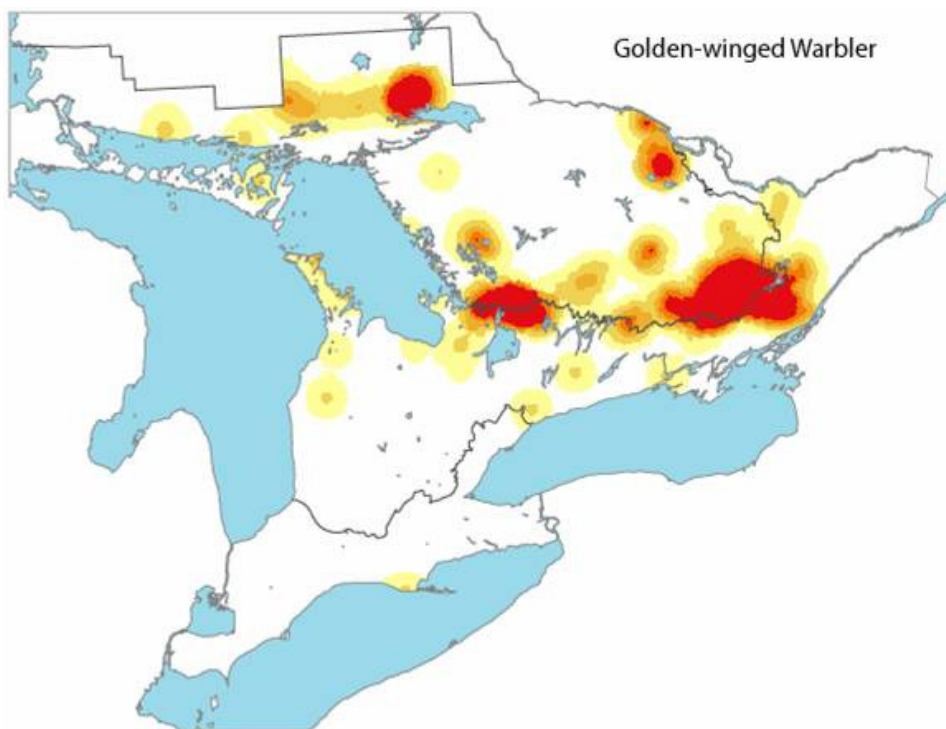


Figure 2 – Golden-winged Warbler relative abundance map for southern Ontario. Darker shades indicate higher abundance – 79% of this species' Ontario population occurs within The Land Between.

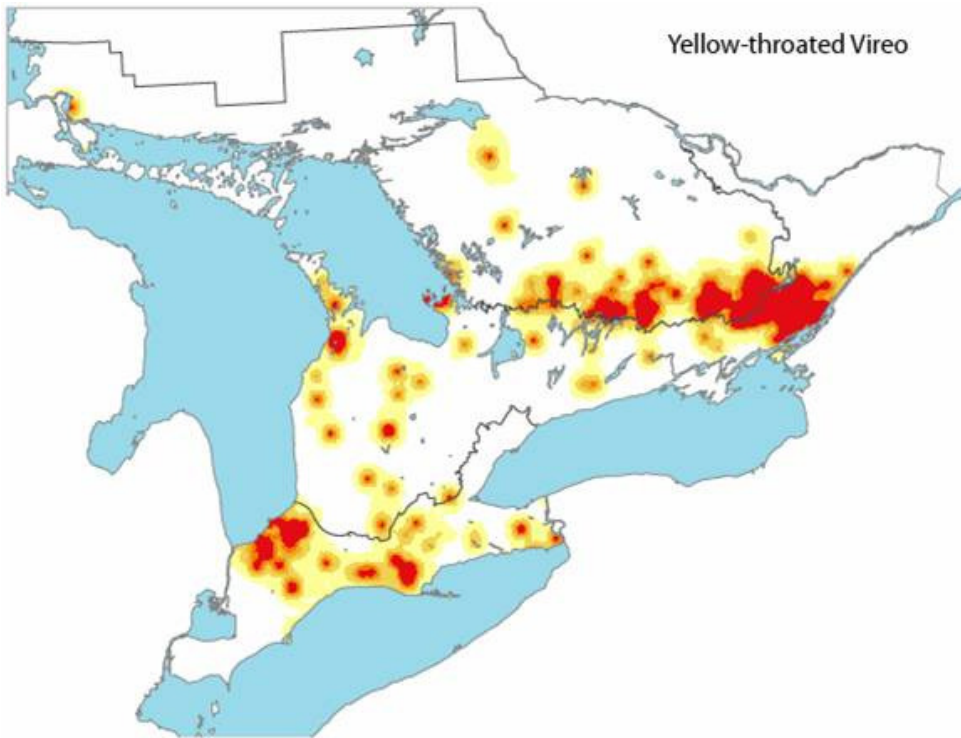


Figure 3 – Yellow-throated Vireo relative abundance map for southern Ontario. Darker shades indicate higher abundance – 61% of this species' Ontario population occurs within The Land Between.

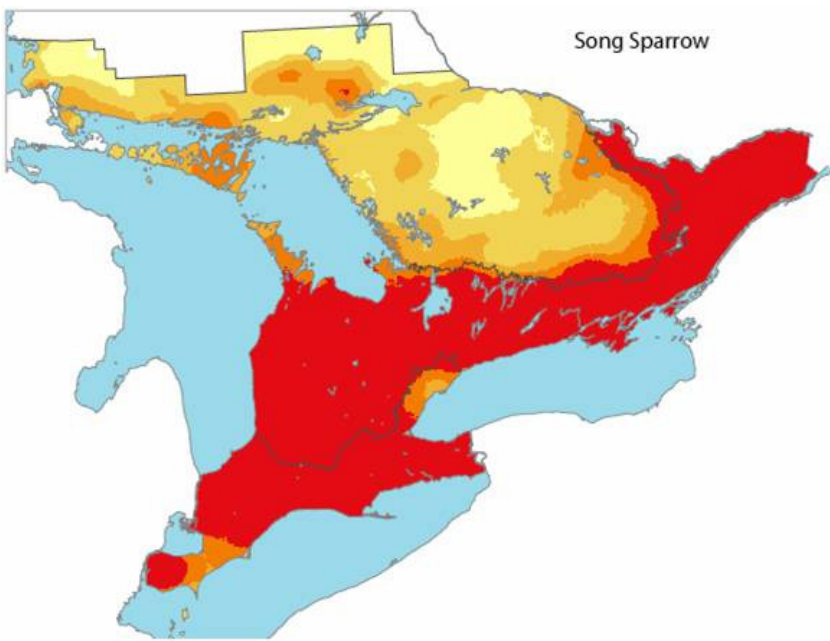


Figure 4 – Song Sparrow relative abundance map for southern Ontario. Darker shades indicate higher abundance – note that this species rapidly becomes less abundant moving northward through The Land Between.

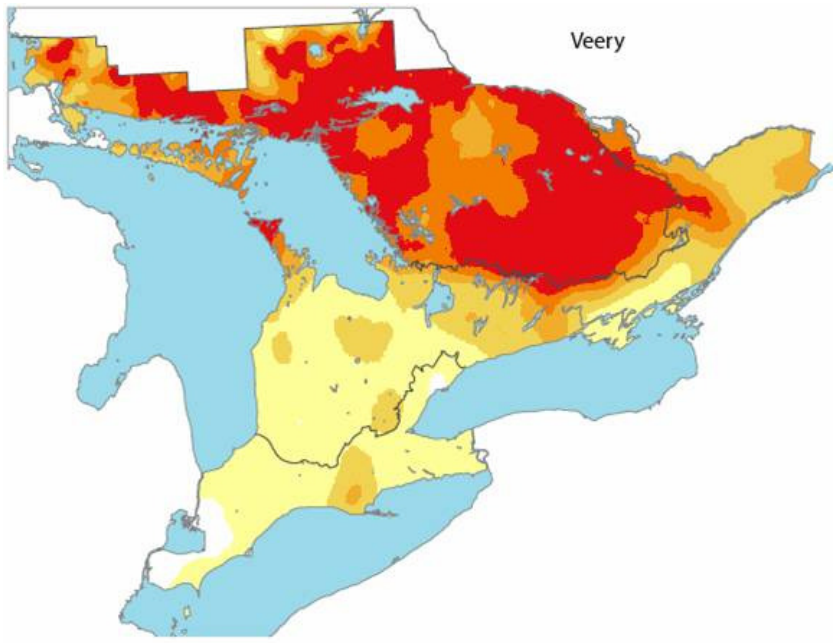


Figure 5 – Veery relative abundance map for southern Ontario. Darker shades indicate higher abundance – note that this species rapidly becomes less abundant moving southward through The Land Between.

TABLES

Table 1. Population estimates for birds¹ within The Land Between provisional area of interest.

English name	Scientific name	TLB population estimate	Ontario population estimate	Percent Ontario population
Golden-winged Warbler	<i>Vermivora chrysoptera</i>	19,247	24,145	79.7%
Yellow-throated Vireo	<i>Vireo flavifrons</i>	15,868	25,908	61.2%
Eastern Towhee	<i>Pipilo erythrophthalmus</i>	24,256	43,052	56.3%
White-breasted Nuthatch	<i>Sitta carolinensis</i>	148,484	304,296	48.8%
Great Crested Flycatcher	<i>Myiarchus crinitus</i>	188,047	402,902	46.7%
Eastern Phoebe	<i>Sayornis phoebe</i>	113,386	254,118	44.6%
Pine Warbler	<i>Dendroica pinus</i>	123,876	291,054	42.6%
Field Sparrow	<i>Spizella pusilla</i>	14,001	35,702	39.2%
Brown Thrasher	<i>Toxostoma rufum</i>	36,682	95,922	38.2%
Scarlet Tanager	<i>Piranga olivacea</i>	54,283	144,781	37.5%
Wood Thrush	<i>Hylocichla mustelina</i>	63,110	179,743	35.1%
Upland Sandpiper	<i>Bartramia longicauda</i>	2,960	8,675	34.1%
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>	139,890	434,253	32.2%
Ruby-throated Hummingbird	<i>Archilochus colubris</i>	158,827	515,946	30.8%
Eastern Wood-Pewee	<i>Contopus virens</i>	89,982	301,618	29.8%
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	14,562	49,063	29.7%
Warbling Vireo	<i>Vireo gilvus</i>	81,884	279,621	29.3%
Eastern Meadowlark	<i>Sturnella magna</i>	40,918	142,044	28.8%
Indigo Bunting	<i>Passerina cyanea</i>	80,956	291,547	27.8%
Marsh Wren	<i>Cistothorus palustris</i>	29,425	108,910	27.0%
Eastern Kingbird	<i>Tyrannus tyrannus</i>	75,261	279,109	27.0%
Blue Jay	<i>Cyanocitta cristata</i>	167,477	655,882	25.5%
Gray Catbird	<i>Dumetella carolinensis</i>	171,997	677,488	25.4%
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>	10,494	42,400	24.8%
Eastern Screech-Owl	<i>Megascops asio</i>	1,075,934	4,356,654	24.7%
Baltimore Oriole	<i>Icterus galbula</i>	64,530	291,914	22.1%
House Wren	<i>Troglodytes aedon</i>	57,041	267,876	21.3%
Veery	<i>Catharus fuscescens</i>	449,972	2,132,182	21.1%
American Goldfinch	<i>Carduelis tristis</i>	847,274	4,273,850	19.8%
Black-capped Chickadee	<i>Poecile atricapillus</i>	945,923	4,915,121	19.2%
Bobolink	<i>Dolichonyx oryzivorus</i>	145,646	783,484	18.6%
Eastern Bluebird	<i>Sialia sialis</i>	7,883	43,740	18.0%
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	628,504	3,554,164	17.7%
Black-throated Blue Warbler	<i>Dendroica caerulescens</i>	247,767	1,446,417	17.1%
Song Sparrow	<i>Melospiza melodia</i>	484,747	2,881,339	16.8%
Turkey Vulture	<i>Cathartes aura</i>	2,808	17,638	15.9%
Black-throated Green Warbler	<i>Dendroica virens</i>	389,974	2,484,591	15.7%
American Crow	<i>Corvus brachyrhynchos</i>	169,643	1,087,609	15.6%

¹Of the 130 species considered in this analysis (i.e., those with relative abundance surfaces), the table above shows the 38 species with at least 15% of their Ontario population within The Land Between provisional area of interest (for brevity, 92 species are not shown). As The Land Between comprises approximately 5% of the total area of the province, the species above are three times more abundant within the region than one would expect based on catchment area alone.

Table 2. Qualitative assessment of abundance transitions occurring within or near The Land Between.

English name	Direction of abundance transition (high to low)	English name	Direction of abundance transition (high to low)
Alder Flycatcher		House Wren	South-to-North
American Crow	South-to-North	Indigo Bunting	South-to-North
American Goldfinch	South-to-North	Killdeer	South-to-North
American Redstart	North-to-South	Least Flycatcher	North-to-South
American Robin	South-to-North	Lincoln's Sparrow	
Baltimore Oriole	South-to-North	Magnolia Warbler	North-to-South
Bank Swallow	South-to-North	Marsh Wren	
Barn Swallow	South-to-North	Mourning Dove	South-to-North
Bay-breasted Warbler		Mourning Warbler	
Belted Kingfisher		Nashville Warbler	North-to-South
Black-and-white Warbler	North-to-South	Northern Cardinal	South-to-North
Black-backed Woodpecker		Northern Flicker	
Black-billed Cuckoo		Northern Harrier	
Blackburnian Warbler	North-to-South	Northern Mockingbird	
Black-capped Chickadee		Northern Parula	
Blackpoll Warbler		Northern Rough-winged Swallow	South-to-North
Black-throated Blue Warbler	North-to-South	Northern Waterthrush	
Black-throated Green Warbler	North-to-South	Olive-sided Flycatcher	North-to-South
Blue Jay		Orange-crowned Warbler	
Blue-gray Gnatcatcher		Ovenbird	North-to-South
Blue-headed Vireo	North-to-South	Palm Warbler	
Bobolink	South-to-North	Philadelphia Vireo	
Boreal Chickadee		Pileated Woodpecker	North-to-South
Broad-winged Hawk	North-to-South	Pine Siskin	
Brown Creeper		Pine Warbler	
Brown Thrasher	South-to-North	Purple Finch	North-to-South
Brown-headed Cowbird	South-to-North	Purple Martin	South-to-North
Canada Warbler	North-to-South	Red-bellied Woodpecker	
Cape May Warbler		Red-breasted Nuthatch	North-to-South
Carolina Wren		Red-eyed Vireo	North-to-South
Cedar Waxwing		Red-tailed Hawk	South-to-North
Chestnut-sided Warbler	North-to-South	Red-winged Blackbird	South-to-North
Chimney Swift		Rock Pigeon	South-to-North
Chipping Sparrow	South-to-North	Rose-breasted Grosbeak	
Cliff Swallow	South-to-North	Ruby-crowned Kinglet	North-to-South
Common Grackle	South-to-North	Ruby-throated Hummingbird	North-to-South
Common Loon	North-to-South	Ruffed Grouse	North-to-South
Common Raven	North-to-South	Rusty Blackbird	
Common Yellowthroat		Sandhill Crane	
Connecticut Warbler		Savannah Sparrow	South-to-North
Dark-eyed Junco	North-to-South	Scarlet Tanager	
Downy Woodpecker		Song Sparrow	South-to-North
Eastern Bluebird	South-to-North	Swainson's Thrush	North-to-South
Eastern Kingbird	South-to-North	Swamp Sparrow	
Eastern Meadowlark	South-to-North	Tennessee Warbler	
Eastern Phoebe		Tree Swallow	South-to-North
Eastern Screech-Owl		Turkey Vulture	
Eastern Towhee		Upland Sandpiper	South-to-North
Eastern Wood-Pewee	South-to-North	Veery	North-to-South
European Starling	South-to-North	Vesper Sparrow	South-to-North

Table 2. Qualitative assessment of abundance transitions occurring within or near The Land Between.

English name	Direction of abundance transition (high to low)	English name	Direction of abundance transition (high to low)
Evening Grosbeak	North-to-South	Warbling Vireo	South-to-North
Field Sparrow	South-to-North	White-breasted Nuthatch	
Fox Sparrow		White-crowned Sparrow	
Golden-crowned Kinglet	North-to-South	White-throated Sparrow	North-to-South
Golden-winged Warbler		White-winged Crossbill	
Grasshopper Sparrow	South-to-North	Willow Flycatcher	South-to-North
Gray Catbird	South-to-North	Wilson's Snipe	
Gray Jay		Wilson's Warbler	
Great Crested Flycatcher		Winter Wren	North-to-South
Greater Yellowlegs		Wood Thrush	
Hairy Woodpecker	North-to-South	Yellow Warbler	South-to-North
Hermit Thrush	North-to-South	Yellow-bellied Flycatcher	
Horned Lark	South-to-North	Yellow-bellied Sapsucker	North-to-South
House Finch	South-to-North	Yellow-rumped Warbler	North-to-South
House Sparrow	South-to-North	Yellow-throated Vireo	