



2013

Wildlife Monitoring Report



What we do on the land is mirrored in the water

Working In Partnership:



Report No.: 2014-01MR

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EXECUTIVE SUMMARY

In 2013, the wildlife monitoring program was completed successfully. Annual commitments, such as the Forest Bird Monitoring Program at Long Sault and Heber Down C.A.s, and the Bobolink Surveys at Cranberry West Tract, were met. The annual monitoring of birds and amphibians at Rogers Tract, one component of the management agreement for that property, was completed as well. The results of these surveys support the premise that the habitats in these areas continue to function as they have in the past. The bird species observed and recorded at Heber Down and Long Sault Conservation Areas was not notably different from previous monitoring results, implying that forest habitat and function in these Conservation Areas is stable.

As scheduled, bird surveys were undertaken in the Enniskillen Conservation Area in 2013, as well as throughout the Black/Harmony/Farewell Creek Watershed. Several Species at Risk were identified in these areas and numerous sensitive forest species were recorded, confirming the presence of high quality forest habitats. Amphibian surveys were conducted for the first time in the Black/Harmony/Farewell Creek Watershed, and the data from those surveys revealed a wealth of significant amphibian breeding habitat present in the mixed swamps of the Iroquois Beach. A number of species at risk were recorded through the 2013 monitoring efforts.

A winter Muskrat Monitoring pilot project was carried out in 2013 for the second year at 12 of CLOCA's coastal wetlands. Muskrats are an important indicator of wetland health as they are sensitive to wetland water depth conditions and though their diet of cattails, they help support and maintain a more diverse and complex hemi-marsh type environment.



Snapping turtle at Lynde Shores C.A.

1.0 INTRODUCTION

Knowledge about watershed health, and the impacts that development may have on watershed health, is the backbone of all sound planning decisions. In order to facilitate such decisions, the Central Lake Ontario Conservation Authority (CLOCA) conducts long-term monitoring for aquatic and terrestrial conditions, as well as water quality and quantity. The information gathered through these programs enables CLOCA to better understand the existing conditions within a watershed, determine ecological trends over time, and provide guidance to planning agencies to assist them in making informed land-use decisions.

1.1 Background

The CLOCA jurisdiction is approximately 638 km² and its boundaries are defined by the 24 watersheds that drain this area into Lake Ontario. 7 of these watersheds are large, originating on the Oak Ridges Moraine. They are grouped into 4 planning watersheds which are:

- Lynde Creek
- Oshawa Creek
- Black/Harmony/Farewell Creek
- Bowmanville/Soper Creek

These watersheds, as they have been grouped, define the monitoring areas for watershed management and planning. The remaining watersheds are relatively small, and for monitoring purposes are generally grouped together and labeled “small watersheds”. This grouping, from west to east, includes:

- Warbler
- Cranberry
- Whitby Shores
- Pringle Creek
- Heydenshore
- Corbett Creek
- Goldpoint /Pumphouse
- McLaughlin Bay
- Robinson Creek
- Burk
- Tooley Creek
- Osborne
- Darlington Creek
- St. Marys
- Westside Creek
- Bennett Creek
- Rickard

Seven municipalities are located in whole or in part within the CLOCA jurisdiction. They are the Cities of Oshawa and Pickering, the Towns of Ajax and Whitby, the Municipality of Clarington, and the Townships of Scugog and Uxbridge. CLOCA is entirely located within the Regional Municipality of Durham. The Authority works in partnership with each of these municipalities to provide information on the terrestrial and aquatic conditions within their boundaries, and assists them in making planning decisions that are consistent with the natural heritage values set out in the Provincial Policy Statement.

Figure 1 depicts the CLOCA jurisdiction, its watersheds, and the lower tier municipalities within its boundaries.



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Figure 1: CLOCA jurisdiction.

1.2 Monitoring Wildlife

Wildlife occupy virtually every niche and habitat type in the CLOCA jurisdiction: some species are specialized to one habitat type and others can thrive in almost any habitat, but the presence or absence of any given species can offer some insight into the overall health of an ecosystem. This is the importance of monitoring wildlife in the CLOCA jurisdiction.

Birds and amphibians are the most commonly monitored wildlife because they attract mates using songs, and consequently can be readily counted and identified. Furthermore, both of these wildlife groups contain some individuals that are more sensitive to habitat change or degradation, and others that are more tolerant. The identification of certain species in a monitoring location, therefore, can be used to assess the overall quality of that habitat.

Knowing where high quality habitats exist in a watershed is important not only for assessing the overall health of each watershed, but also improving land management and guiding development. Without this knowledge, sensitive habitat and the wildlife that depend on them are at risk of being lost.

2.0 BIRD MONITORING

2.1 Conservation Area Management

CLOCA's Conservation Area bird monitoring program is generally set up to coincide with the development of Conservation Area and Watershed Management Plans so that current data can be incorporated into these documents.

As Table 1 outlines, Lynde Shores, Bowmanville-Westside Marshes, Heber Down, Long Sault, and the Enniskillen Conservation Areas were targeted for bird monitoring in 2013.

Table 1: Bird monitoring efforts within CLOCA's Conservation Areas

CONSERVATION AREA	2013 BIRD MONITORING (PROGRAM*)
Audley Road Woods Valleylands	No
Bowmanville-Westside Marshes	Yes (MMP)
Cane Tract	No
Crow's Pass	No
Enniskillen	Yes
Hampton Pond	No
Heber Down	Yes (FBMP)
Long Sault	Yes (FBMP)
Lynde Shores	Yes (MMP/Cranberry West Tract – Special Project)
Purple Woods	No
Rahmani Tract	No
Rogers Tract	Yes (Special Project)
Stephen's Gulch	No

*MMP (Marsh Monitoring Program); FBMP (Forest Bird Monitoring Program);

The rationale for this monitoring schedule is as follows:

- The Lynde Creek and Cranberry Marshes, part of Lynde Shores C.A., and the Bowmanville and Westside Marshes, part of the Bowmanville-Westside Marshes C.A., are coastal wetlands; therefore, they are monitored annually as part of the Durham Coastal Wetland Monitoring Project (DRCWMP).
- Some terrestrial components of the Lynde Shores C.A, namely the lands west of Halls Rd (Cranberry West Tract) were monitored specifically for Bobolink in 2013.
- Heber Down and Long Sault C.A.s are monitored annually as part of Environment Canada's Forest Bird Monitoring Program (FBMP).
- Rogers Tract is monitored annually as part of the management agreement for this property.
- Enniskillen was monitored in 2013 as part of the outlined watershed rotation.

2.1.1 Durham Region Coastal Wetland Monitoring Project

Wildlife data collected through DRCWMP is published periodically by Environment Canada. Please refer to CLOCA's website and/or Environment Canada's website for publications relating to this project.

2.1.2 Forest Bird Monitoring Program

Every year, CLOCA participates in the Ontario Forest Bird Monitoring Program, which is run by Environment Canada – Canadian Wildlife Service (CWS). Two of CLOCA's Conservation Areas, Heber Down and Long Sault, are included in the program, and have been monitored annually since 2005 (see Figures 2 and 3). Data collected at these sites is used by CWS to assess population trends and habitat associations of forest interior breeding birds across the province.

2.1.2.1 Heber Down Conservation Area

The results of the 2013 forest bird surveys at Heber Down (see Table 2) are typical of previous surveys, which is good as it indicates that forest function is being maintained. Forest birds make up the majority of the observations, as is expected in this habitat, and the presence of forest interior birds, such as Ovenbird, confirms that conditions within the forest are functioning as forest interior. A decline in forest interior species could be a red flag for forest decline.

The presence of nesting species with specialized swamp habitat needs, such as Northern Waterthrush, indicates that the forest block, which is largely mixed swamp, is retaining its swamp characteristics in some areas. The habitat conditions at Station F for example (see photo below) are ideal for Northern Waterthrush, and because the species has been recorded at this site for several years, it can be concluded that the swamp habitat in this area has not degraded or converted to a drier forest type. From this, it can be further concluded that no significant changes to the local hydrology have occurred.

The presence of species at risk does not tell us anything specific about the health of the forest in Heber Down, but it is good to know that this forest is supporting such species by providing habitat for them. Over time, these species may indicate declines in habitat function at Heber Down if their abundances drop; however, it should be noted that some species at risk are at risk because of factors that are outside of habitat loss, so changes in SAR abundance at Heber Down over time may be the result of external influences that are not related to forest health. In 2013, Wood Thrush and Eastern Wood-pewee, both listed federally, were the only SAR identified.

What is Forest Interior?

'Forest Interior' describes an area within a forest that displays particular habitat conditions. These include reduced nest predation and parasitism, and protection from the elements, e.g., wind and sun. As a general rule, forest interior is the area of forest that is at least 100 m from any forest edge: this means that only forests of a certain size and shape will provide such conditions.

Why is Forest Interior important?

Some birds will only inhabit a forest if forest interior conditions exist. As forest blocks are fragmented or made smaller by development, forest interior is lost and the species that occupy the interior are lost as well, resulting in reduced biodiversity in an area.



Photo of swamp habitat at Forest Bird Monitoring Station F (Heber Down)

Table 2: Forest Bird Monitoring Program results for Heber Down C.A. (2013)

Common Name	Scientific Name	COSEWIC	COSSARO	NHIC
Station A				
American Goldfinch	<i>Carduelis tristis</i>			
American Redstart*	<i>Setophaga ruticilla</i>			
American Robin	<i>Turdus migratorius</i>			
Black-capped Chickadee	<i>Poecile atricapillus</i>			
Black-throated Green Warbler*	<i>Dendroica virens</i>			
Blue Jay	<i>Cyanocitta cristata</i>			
Eastern Wood-pewee	<i>Contopus virens</i>	S		
Northern Cardinal	<i>Cardinalis cardinalis</i>			
Red-eyed Vireo	<i>Vireo olivaceus</i>			
Veery	<i>Catharus fuscescens</i>			
Wood Thrush	<i>Hylocichla mustelina</i>	T		
Station B				
American Goldfinch	<i>Carduelis tristis</i>			
American Robin	<i>Turdus migratorius</i>			
Black-capped Chickadee	<i>Poecile atricapillus</i>			
Blue Jay	<i>Cyanocitta cristata</i>			
Eastern Wood-pewee	<i>Contopus virens</i>	S		
Great Crested Flycatcher	<i>Myiarchus crinitus</i>			
Ovenbird*	<i>Seiurus aurocapillus</i>			
Red-eyed Vireo	<i>Vireo olivaceus</i>			
Station C				
American Goldfinch	<i>Carduelis tristis</i>			
American Robin	<i>Turdus migratorius</i>			
Black-capped Chickadee	<i>Poecile atricapillus</i>			

Common Name	Scientific Name	COSEWIC	COSSARO	NHIC
Black-throated Green Warbler*	<i>Dendroica virens</i>			
Blue Jay	<i>Cyanocitta cristata</i>			
Brown Creeper*	<i>Certhia americana</i>			
Eastern Wood-pewee	<i>Contopus virens</i>	S		
Great Crested Flycatcher	<i>Myiarchus crinitus</i>			
Northern Waterthrush*	<i>Seiurus noveboracensis</i>			
Ovenbird*	<i>Seiurus aurocapillus</i>			
Red-eyed Vireo	<i>Vireo olivaceus</i>			
Scarlet Tanager*	<i>Piranga olivacea</i>			
Station D				
American Robin	<i>Turdus migratorius</i>			
Black-capped Chickadee	<i>Poecile atricapillus</i>			
Black-throated Green Warbler*	<i>Dendroica virens</i>			
Cedar Waxwing	<i>Bombycilla cedrorum</i>			
Great Crested Flycatcher	<i>Myiarchus crinitus</i>			
Northern Waterthrush*	<i>Seiurus noveboracensis</i>			
Ovenbird*	<i>Seiurus aurocapillus</i>			
Pileated Woodpecker*	<i>Dryocopus pileatus</i>			
Red-eyed Vireo	<i>Vireo olivaceus</i>			
Veery	<i>Catharus fuscescens</i>			
Station E				
American Goldfinch	<i>Carduelis tristis</i>			
American Robin	<i>Turdus migratorius</i>			
Black-capped Chickadee	<i>Poecile atricapillus</i>			
Black-throated Green Warbler*	<i>Dendroica virens</i>			
Blue Jay	<i>Cyanocitta cristata</i>			
Brown Creeper*	<i>Certhia americana</i>			
Common Grackle	<i>Quiscalus quiscula</i>			
Eastern Wood-pewee	<i>Contopus virens</i>	S		
Great Crested Flycatcher	<i>Myiarchus crinitus</i>			
Ovenbird*	<i>Seiurus aurocapillus</i>			
Red-eyed Vireo	<i>Vireo olivaceus</i>			
Station F				
American Goldfinch	<i>Carduelis tristis</i>			
American Woodcock	<i>Scolopax minor</i>			
Black-capped Chickadee	<i>Poecile atricapillus</i>			
Cedar Waxwing	<i>Bombycilla cedrorum</i>			
Eastern Wood-pewee	<i>Contopus virens</i>	S		
Great Crested Flycatcher	<i>Myiarchus crinitus</i>			
Northern Waterthrush*	<i>Seiurus noveboracensis</i>			
Red-eyed Vireo	<i>Vireo olivaceus</i>			
Veery	<i>Catharus fuscescens</i>			
Winter Wren*	<i>Troglodytes troglodytes</i>			
Wood Thrush	<i>Hylocichla mustelina</i>	T		

*Species that are Area Sensitive/Forest Interior; Species in bold are considered *Probable Breeders*

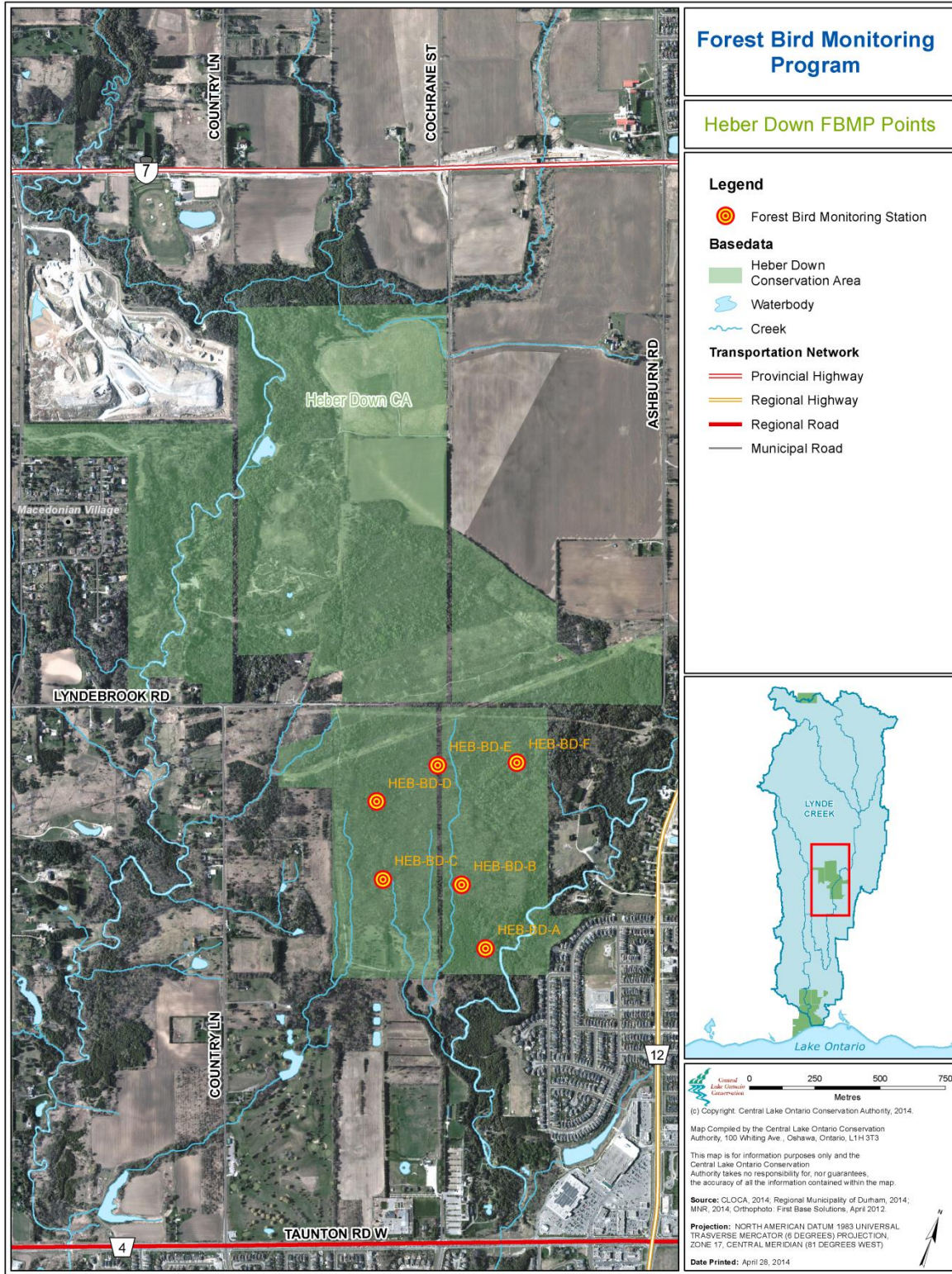


Figure 2: Forest Bird Monitoring Program point count locations at Heber Down C.A.

2.1.2.2 Long Sault Conservation Area

The species list generated through the forest bird monitoring program at Long Sault in 2013 (Table 3) is not notably different from the lists generated in past years and, as was noted in the previous section, this may lead to the conclusion that the forest is stable in its function as well.

Long Sault continues to provide forest interior habitat for nesting species such as Black-throated Green Warbler and Ovenbird. Area-sensitive species, such as Red-breasted Nuthatch, also continue to be observed at Long Sault as a result of its large size.

Table 3: Forest Bird Monitoring Program results for Long Sault C.A. (2013)

Common Name	Scientific Name	COSEWIC	COSSARO	NHIC
Station A				
Black-throated Green Warbler*	<i>Dendroica virens</i>			
Blue Jay	<i>Cyanocitta cristata</i>			
Brown Creeper*	<i>Certhia americana</i>			
Eastern Wood-pewee	<i>Contopus virens</i>	S		
Ovenbird*	<i>Seiurus aurocapillus</i>			
Red-eyed Vireo	<i>Vireo olivaceus</i>			
Veery*	<i>Catharus fuscescens</i>			
Station B				
Black-throated Blue Warbler*	<i>Dendroica caerulescens</i>			
Black-throated Green Warbler*	<i>Dendroica virens</i>			
Eastern Wood-pewee	<i>Contopus virens</i>	S		
Great Crested Flycatcher	<i>Myiarchus crinitus</i>			
Hairy Woodpecker*	<i>Picoides villosus</i>			
Northern Parula*	<i>Parula americana</i>			
Ovenbird*	<i>Seiurus aurocapillus</i>			
Pine Warbler*	<i>Dendroica pinus</i>			
Red-eyed Vireo	<i>Vireo olivaceus</i>			
Wood Thrush	<i>Hylocichla mustelina</i>	T		
Station C				
American Goldfinch	<i>Carduelis tristis</i>			
Black-throated Green Warbler*	<i>Dendroica virens</i>			
Blue Jay	<i>Cyanocitta cristata</i>			
Brown Creeper*	<i>Certhia americana</i>			
Great Crested Flycatcher	<i>Myiarchus crinitus</i>			
Hairy Woodpecker*	<i>Picoides villosus</i>			
Ovenbird*	<i>Seiurus aurocapillus</i>			
Pine Warbler*	<i>Dendroica pinus</i>			
Red-eyed Vireo	<i>Vireo olivaceus</i>			
Veery*	<i>Catharus fuscescens</i>			
Station D				
American Goldfinch	<i>Carduelis tristis</i>			
American Robin	<i>Turdus migratorius</i>			
Baltimore Oriole	<i>Icterus galbula</i>			
Black-throated Green Warbler*	<i>Dendroica virens</i>			
Blue Jay	<i>Cyanocitta cristata</i>			

Common Name	Scientific Name	COSEWIC	COSSARO	NHIC
Eastern Wood-pewee	<i>Contopus virens</i>	S		
Great Crested Flycatcher	<i>Myiarchus crinitus</i>			
Mourning Dove	<i>Zenaida macroura</i>			
Ovenbird*	<i>Seiurus aurocapillus</i>			
Red-eyed Vireo	<i>Vireo olivaceus</i>			
Station E				
American Crow	<i>Corvus brachyrhynchos</i>			
American Robin	<i>Turdus migratorius</i>			
Blue Jay	<i>Cyanocitta cristata</i>			
Eastern Wood-pewee	<i>Contopus virens</i>	S		
Great Crested Flycatcher	<i>Myiarchus crinitus</i>			
Ovenbird*	<i>Seiurus aurocapillus</i>			
Red-breasted Nuthatch*	<i>Sitta canadensis</i>			
Red-eyed Vireo	<i>Vireo olivaceus</i>			
Scarlet Tanager*	<i>Piranga olivacea</i>			
Wood Thrush	<i>Hylocichla mustelina</i>	T		
Station F				
American Crow	<i>Corvus brachyrhynchos</i>			
American Goldfinch	<i>Carduelis tristis</i>			
Blue Jay	<i>Cyanocitta cristata</i>			
Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>			
Eastern Wood-pewee	<i>Contopus virens</i>	S		
Great Crested Flycatcher	<i>Myiarchus crinitus</i>			
Indigo Bunting	<i>Passerina cyanea</i>			
Northern Waterthrush*	<i>Seiurus noveboracensis</i>			
Ovenbird*	<i>Seiurus aurocapillus</i>			
Pileated Woodpecker*	<i>Dryocopus pileatus</i>			
Red-breasted Nuthatch*	<i>Sitta canadensis</i>			
Red-eyed Vireo	<i>Vireo olivaceus</i>			
Veery*	<i>Catharus fuscescens</i>			
Wood Thrush	<i>Hylocichla mustelina</i>	T		

*Species that are Area Sensitive/Forest Interior; Species in bold are considered *Probable Breeders*

Long Sault is an upland forest, so the species that occupy it differ in some ways from Heber Down. Despite their habitat differences however, they both provide habitat for all species at some points in time. For example, Northern Waterthrush is listed in both Table 2 and 3: this seems odd at first because Long Sault, and in particular Station F, does not have the wetland habitat suitable for Northern Waterthrush whereas Heber Down does. What is noteworthy in Table 2 is that Northern Waterthrush was recorded more than once, indicating possible nesting, whereas at Long Sault it was observed only once, indicating that it did not stay at that location to nest. Generally, species recorded in suitable nesting habitat on both visits can be considered Probable Breeders (bold in Tables 2 and 3), and in many ways this label is a more important indicator of forest function than just the presence of a species. The presence of any species once is not insignificant though – it reveals the role that a forest plays in supporting species as they migrate to the habitats in which they ultimately choose to nest, which is a very important function.

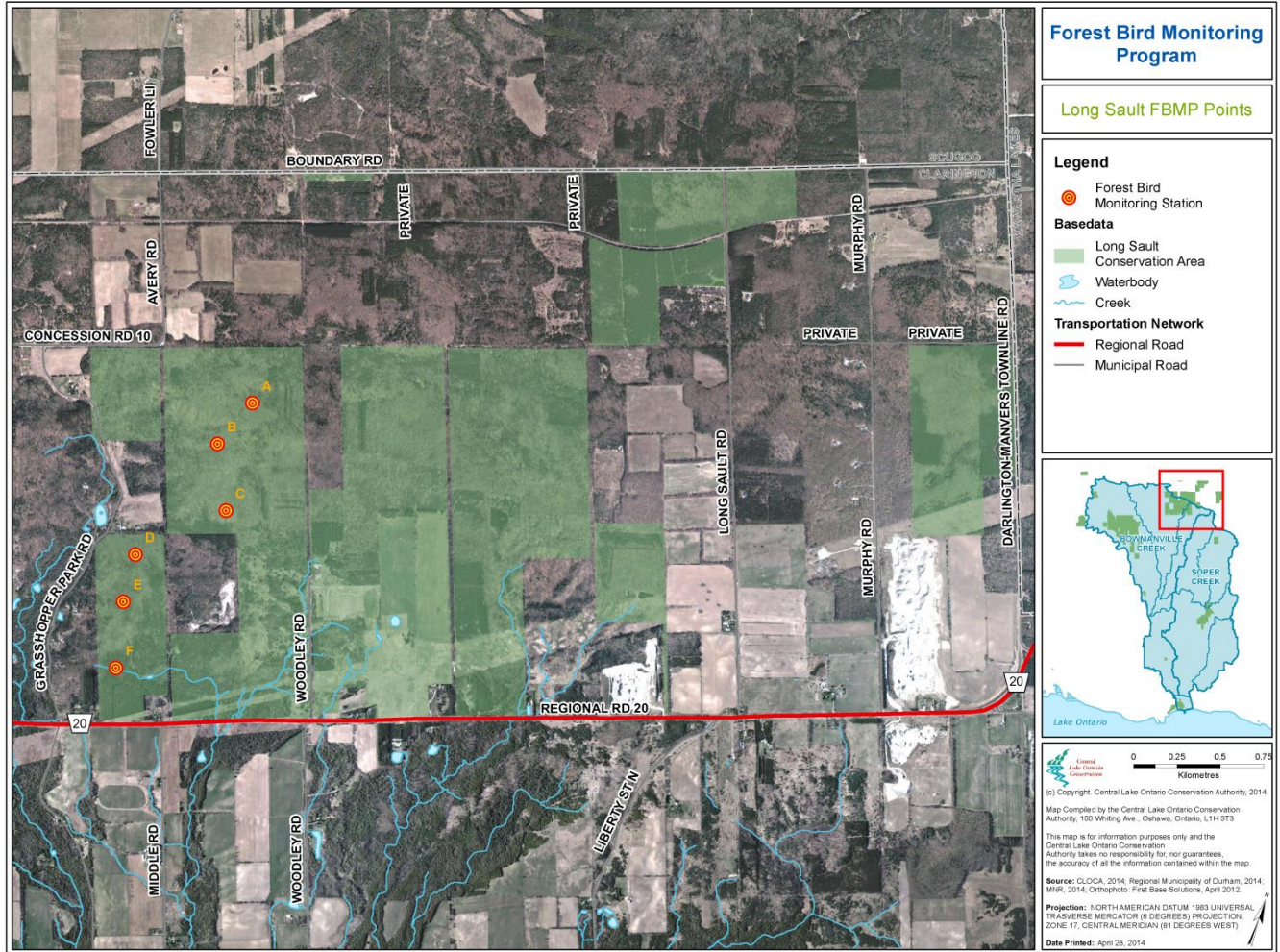


Figure 3: Forest Bird Monitoring Program point count locations at Long Sault C.A.

2.1.3 Conservation Area Management Planning

2.1.3.1 Lynde Shores Conservation Area – Cranberry West Tract Bobolink Surveys

Bobolink surveys in the western portion of Lynde Shores C.A. were conducted for a second year in 2013 as part of a landuse management agreement with the Ontario Ministry of Natural Resources. Two transects were surveyed, as Figure 4 demonstrates, in the fields west of Halls Rd.

As in 2012, several Bobolink were observed within the study area, particularly in the north half of the property. As part of the management agreement, the habitat in the north section of the study area is actively maintained as meadow so that it may continue to act as Bobolink habitat.

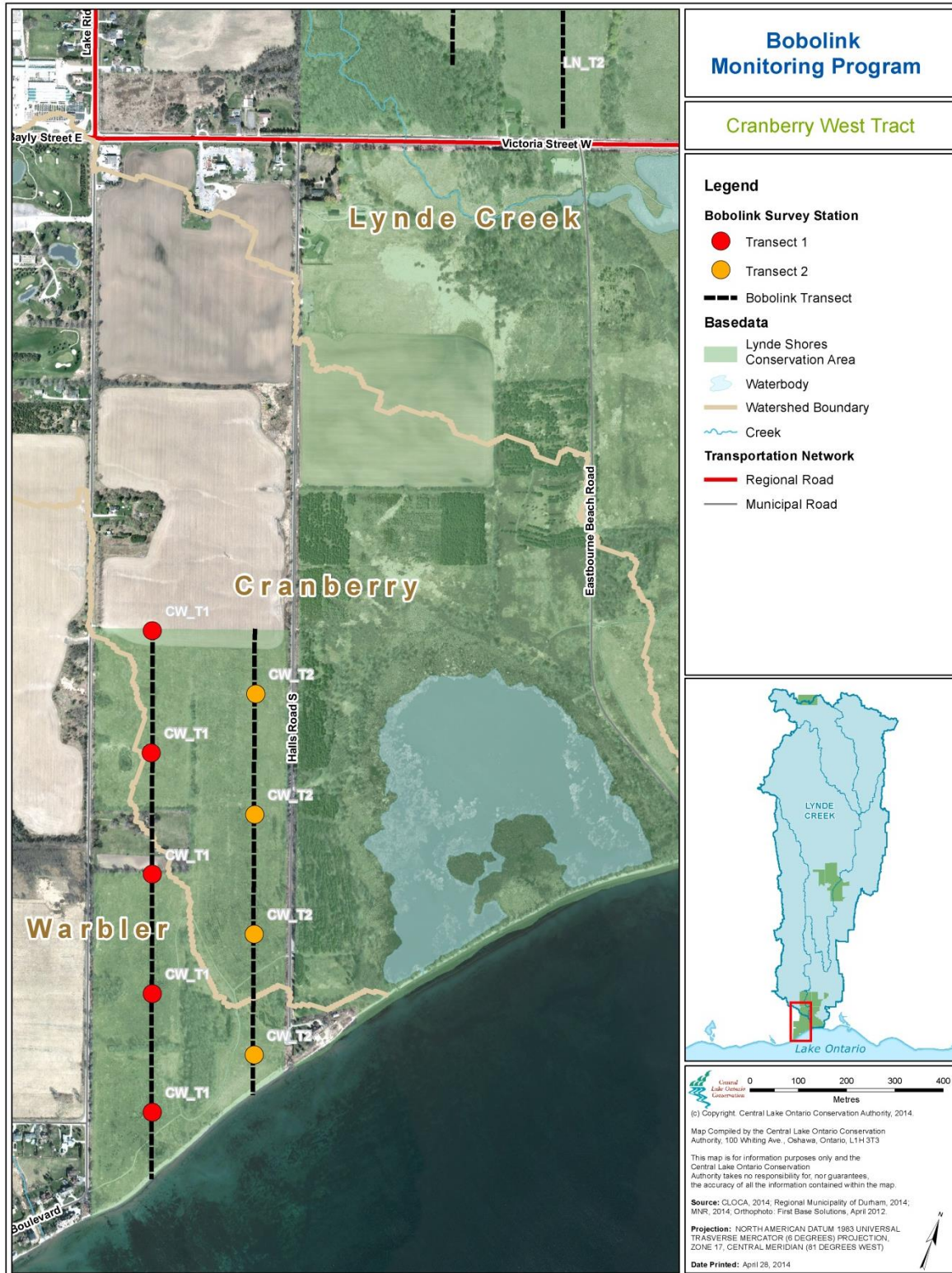


Figure 4: Bobolink monitoring stations at Lynde Shores C.A. – Cranberry West Tract.

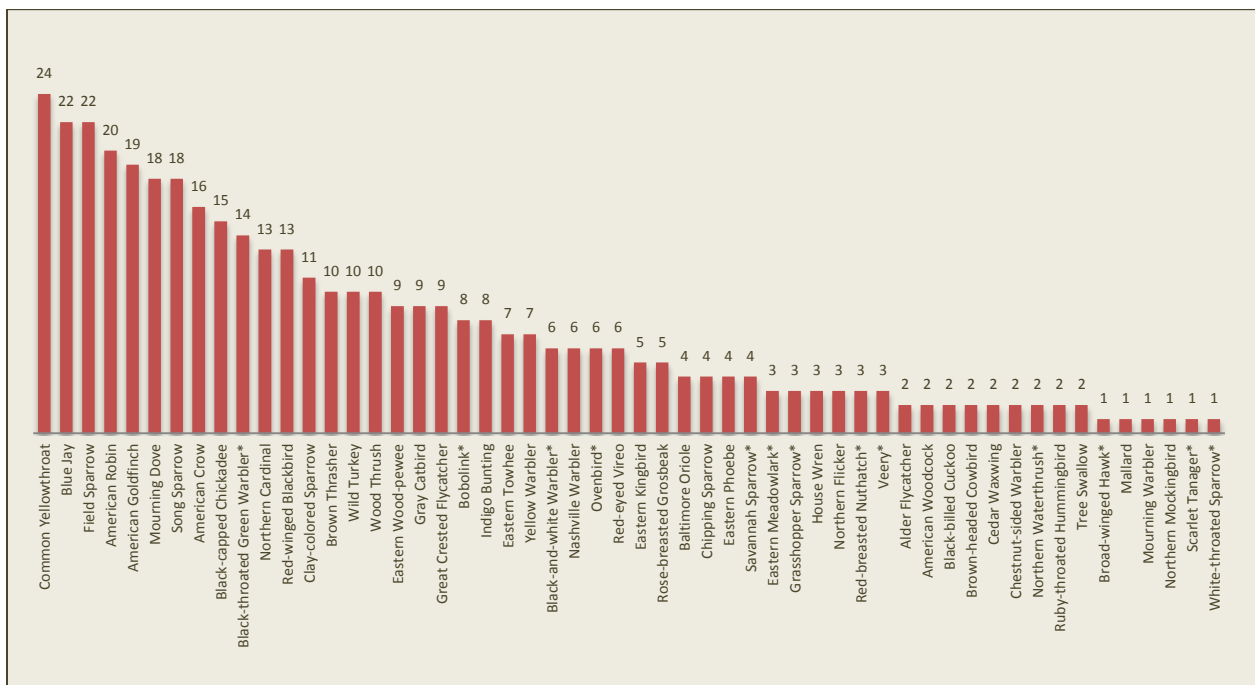
2.1.3.2 Enniskillen Conservation Area

The Enniskillen Conservation Area is extensive in size; accordingly, it has 4 monitoring routes: A-D. Table 4 contains the data for all of the routes. The species list includes species with a wide range of habitat preferences, and this is because there are many habitat types within the Conservation Area.

The most commonly recorded species was Common Yellowthroat – seen at 24 of 27 stations (Figure 5). This species inhabits thick, tangled vegetation, often near a wet area, in habitats ranging from wetlands to prairies to pine forests. Given the habitat diversity in the Enniskillen Conservation Area, and the abundance of water in the valley, it is not surprising that this species is so widely distributed. The next most frequently observed species tended to be habitat generalists, such as Field Sparrow, American Robin, and Song Sparrow. These species can occupy many different habitats and are successful in disturbed habitats; even urban areas. Enniskillen contains a Hydro corridor, which is maintained, and much of the property was recently used for agriculture, so the distribution of generalist species reflects the presence of these disturbed habitats.

The second most commonly observed bird was Blue Jay, which is a forest species (though it is more of an edge species than an interior species). This positively reflects the presence of forest habitat in the Enniskillen CA. The most frequently recorded forest habitat specialist was Black-throated Green Warbler, which was at about half the stations (14). The presence of this forest interior species suggests that there are a good number of forest blocks within the Conservation Area and that at least half of them have conditions that can support nesting forest interior species.

Figure 5: Number of Stations at which bird species were recorded at Enniskillen CA (2013)



Bobolink was recorded at 8 stations, and was considered a probable breeder at 2 locations. This species, along with Savannah Sparrow, Grasshopper Sparrow, and Eastern Meadowlark, is a grassland habitat specialist; the presence of these species indicates that there are numerous functional grassland habitats within the Conservation Area.

Several species at risk were recorded during the surveys including Bobolink, Eastern Meadowlark, Wood Thrush, Eastern Wood-pewee, and Grasshopper Sparrow.



Song Sparrow Nest in a shrub (Enniskillen CA)

Table 4: Bird monitoring results for Enniskillen CA

Common Name	Scientific Name	COSEWIC	COSSARO	NHIC
Station A1				
American Crow	<i>Corvus brachyrhynchos</i>			
American Goldfinch	<i>Carduelis tristis</i>			
American Robin	<i>Turdus migratorius</i>			
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>			

Common Name	Scientific Name	COSEWIC	COSSARO	NHIC
Blue Jay	<i>Cyanocitta cristata</i>			
Bobolink*	<i>Dolichonyx oryzivorus</i>	T	T	Yes
Chipping Sparrow	<i>Spizella passerina</i>			
Clay-colored Sparrow	<i>Spizella pallida</i>			
Common Yellowthroat	<i>Geothlypis trichas</i>			
Eastern Meadowlark*	<i>Sturnella magna</i>	T	T	Yes
Eastern Phoebe	<i>Sayornis phoebe</i>			
Field Sparrow	<i>Spizella pusilla</i>			
Gray Catbird	<i>Dumetella carolinensis</i>			
Indigo Bunting	<i>Passerina cyanea</i>			
Mourning Dove	<i>Zenaida macroura</i>			
Northern Cardinal	<i>Cardinalis cardinalis</i>			
Red-winged Blackbird	<i>Agelaius phoeniceus</i>			
Savannah Sparrow*	<i>Passerculus sandwichensis</i>			
Song Sparrow	<i>Melospiza melodia</i>			
Wild Turkey	<i>Meleagris gallopavo</i>			
Station A2				
American Crow	<i>Corvus brachyrhynchos</i>			
Blue Jay	<i>Cyanocitta cristata</i>			
Bobolink*	<i>Dolichonyx oryzivorus</i>	T	T	Yes
Clay-colored Sparrow	<i>Spizella pallida</i>			
Common Yellowthroat	<i>Geothlypis trichas</i>			
Eastern Kingbird	<i>Tyrannus tyrannus</i>			
Field Sparrow	<i>Spizella pusilla</i>			
Mourning Dove	<i>Zenaida macroura</i>			
Red-winged Blackbird	<i>Agelaius phoeniceus</i>			
Song Sparrow	<i>Melospiza melodia</i>			
Wild Turkey	<i>Meleagris gallopavo</i>			
Station A3				
American Goldfinch	<i>Carduelis tristis</i>			
Baltimore Oriole	<i>Icterus galbula</i>			
Blue Jay	<i>Cyanocitta cristata</i>			
Bobolink*	<i>Dolichonyx oryzivorus</i>	T	T	Yes
Brown Thrasher	<i>Toxostoma rufum</i>			
Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>			
Clay-colored Sparrow	<i>Spizella pallida</i>			
Eastern Kingbird	<i>Tyrannus tyrannus</i>			
Eastern Towhee	<i>Pipilo erythrophthalmus</i>			
Field Sparrow	<i>Spizella pusilla</i>			
Gray Catbird	<i>Dumetella carolinensis</i>			
Northern Cardinal	<i>Cardinalis cardinalis</i>			
Red-winged Blackbird	<i>Agelaius phoeniceus</i>			
Song Sparrow	<i>Melospiza melodia</i>			
Wild Turkey	<i>Meleagris gallopavo</i>			
Yellow Warbler	<i>Dendroica petechia</i>			
Station A4				
American Goldfinch	<i>Carduelis tristis</i>			
American Robin	<i>Turdus migratorius</i>			

Common Name	Scientific Name	COSEWIC	COSSARO	NHIC
Baltimore Oriole	<i>Icterus galbula</i>			
Black-capped Chickadee	<i>Poecile atricapillus</i>			
Black-throated Green Warbler*	<i>Dendroica virens</i>			
Blue Jay	<i>Cyanocitta cristata</i>			
Brown Thrasher	<i>Toxostoma rufum</i>			
Brown-headed Cowbird	<i>Molothrus ater</i>			
Clay-colored Sparrow	<i>Spizella pallida</i>			
Common Yellowthroat	<i>Geothlypis trichas</i>			
Field Sparrow	<i>Spizella pusilla</i>			
Gray Catbird	<i>Dumetella carolinensis</i>			
Great Crested Flycatcher	<i>Myiarchus crinitus</i>			
Mourning Dove	<i>Zenaida macroura</i>			
Northern Cardinal	<i>Cardinalis cardinalis</i>			
Red-winged Blackbird	<i>Agelaius phoeniceus</i>			
Song Sparrow	<i>Melospiza melodia</i>			
Wood Thrush	<i>Hylocichla mustelina</i>	T		
Yellow Warbler	<i>Dendroica petechia</i>			
Station A5				
American Goldfinch	<i>Carduelis tristis</i>			
American Robin	<i>Turdus migratorius</i>			
Black-capped Chickadee	<i>Poecile atricapillus</i>			
Black-throated Green Warbler*	<i>Dendroica virens</i>			
Blue Jay	<i>Cyanocitta cristata</i>			
Brown-headed Cowbird	<i>Molothrus ater</i>			
Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>			
Clay-colored Sparrow	<i>Spizella pallida</i>			
Common Yellowthroat	<i>Geothlypis trichas</i>			
Field Sparrow	<i>Spizella pusilla</i>			
Gray Catbird	<i>Dumetella carolinensis</i>			
Great Crested Flycatcher	<i>Myiarchus crinitus</i>			
Indigo Bunting	<i>Passerina cyanea</i>			
Mourning Dove	<i>Zenaida macroura</i>			
Red-winged Blackbird	<i>Agelaius phoeniceus</i>			
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>			
Song Sparrow	<i>Melospiza melodia</i>			
Yellow Warbler	<i>Dendroica petechia</i>			
Station A6				
American Crow	<i>Corvus brachyrhynchos</i>			
American Goldfinch	<i>Carduelis tristis</i>			
American Robin	<i>Turdus migratorius</i>			
Black-capped Chickadee	<i>Poecile atricapillus</i>			
Blue Jay	<i>Cyanocitta cristata</i>			
Bobolink*	<i>Dolichonyx oryzivorus</i>	T	T	Yes
Brown Thrasher	<i>Toxostoma rufum</i>			
Clay-colored Sparrow	<i>Spizella pallida</i>			
Common Yellowthroat	<i>Geothlypis trichas</i>			
Eastern Phoebe	<i>Sayornis phoebe</i>			
Eastern Towhee	<i>Pipilo erythrophthalmus</i>			

Common Name	Scientific Name	COSEWIC	COSSARO	NHIC
Field Sparrow	<i>Spizella pusilla</i>			
Great Crested Flycatcher	<i>Myiarchus crinitus</i>			
House Wren	<i>Troglodytes aedon</i>			
Mourning Dove	<i>Zenaida macroura</i>			
Northern Cardinal	<i>Cardinalis cardinalis</i>			
Red-winged Blackbird	<i>Agelaius phoeniceus</i>			
Song Sparrow	<i>Melospiza melodia</i>			
Wild Turkey	<i>Meleagris gallopavo</i>			
Wood Thrush	<i>Hylocichla mustelina</i>	T		
Station A7				
American Crow	<i>Corvus brachyrhynchos</i>			
American Goldfinch	<i>Carduelis tristis</i>			
American Robin	<i>Turdus migratorius</i>			
Black-capped Chickadee	<i>Poecile atricapillus</i>			
Bobolink*	<i>Dolichonyx oryzivorus</i>	T	T	Yes
Common Yellowthroat	<i>Geothlypis trichas</i>			
Eastern Phoebe	<i>Sayornis phoebe</i>			
Field Sparrow	<i>Spizella pusilla</i>			
House Wren	<i>Troglodytes aedon</i>			
Mourning Dove	<i>Zenaida macroura</i>			
Northern Flicker	<i>Colaptes auratus</i>			
Red-winged Blackbird	<i>Agelaius phoeniceus</i>			
Song Sparrow	<i>Melospiza melodia</i>			
Wild Turkey	<i>Meleagris gallopavo</i>			
Station B1				
American Goldfinch	<i>Carduelis tristis</i>			
American Robin	<i>Turdus migratorius</i>			
Black-capped Chickadee	<i>Poecile atricapillus</i>			
Black-throated Green Warbler*	<i>Dendroica virens</i>			
Blue Jay	<i>Cyanocitta cristata</i>			
Brown Thrasher	<i>Toxostoma rufum</i>			
Clay-colored Sparrow	<i>Spizella pallida</i>			
Common Yellowthroat	<i>Geothlypis trichas</i>			
Eastern Kingbird	<i>Tyrannus tyrannus</i>			
Eastern Towhee	<i>Pipilo erythrophthalmus</i>			
Eastern Wood-pewee	<i>Contopus virens</i>	S		
Field Sparrow	<i>Spizella pusilla</i>			
Great Crested Flycatcher	<i>Myiarchus crinitus</i>			
Mourning Dove	<i>Zenaida macroura</i>			
Northern Cardinal	<i>Cardinalis cardinalis</i>			
Ovenbird*	<i>Seiurus aurocapillus</i>			
Red-breasted Nuthatch*	<i>Sitta canadensis</i>			
Red-winged Blackbird	<i>Agelaius phoeniceus</i>			
Song Sparrow	<i>Melospiza melodia</i>			
Station B2				
American Crow	<i>Corvus brachyrhynchos</i>			
American Goldfinch	<i>Carduelis tristis</i>			
American Robin	<i>Turdus migratorius</i>			

Common Name	Scientific Name	COSEWIC	COSSARO	NHIC
Black-capped Chickadee	<i>Poecile atricapillus</i>			
Black-throated Green Warbler*	<i>Dendroica virens</i>			
Blue Jay	<i>Cyanocitta cristata</i>			
Bobolink*	<i>Dolichonyx oryzivorus</i>	T	T	Yes
Brown Thrasher	<i>Toxostoma rufum</i>			
Common Yellowthroat	<i>Geothlypis trichas</i>			
Eastern Phoebe	<i>Sayornis phoebe</i>			
Eastern Wood-pewee	<i>Contopus virens</i>	S		
Field Sparrow	<i>Spizella pusilla</i>			
Gray Catbird	<i>Dumetella carolinensis</i>			
Mourning Dove	<i>Zenaida macroura</i>			
Mourning Warbler	<i>Oporornis philadelphia</i>			
Northern Cardinal	<i>Cardinalis cardinalis</i>			
Red-winged Blackbird	<i>Agelaius phoeniceus</i>			
Song Sparrow	<i>Melospiza melodia</i>			
Wood Thrush	<i>Hylocichla mustelina</i>	T		
Station B3				
American Goldfinch	<i>Carduelis tristis</i>			
American Robin	<i>Turdus migratorius</i>			
Black-capped Chickadee	<i>Poecile atricapillus</i>			
Black-throated Green Warbler*	<i>Dendroica virens</i>			
Blue Jay	<i>Cyanocitta cristata</i>			
Common Yellowthroat	<i>Geothlypis trichas</i>			
Eastern Wood-pewee	<i>Contopus virens</i>	S		
Great Crested Flycatcher	<i>Myiarchus crinitus</i>			
Northern Waterthrush*	<i>Seiurus noveboracensis</i>			
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>			
Veery*	<i>Catharus fuscescens</i>			
Wood Thrush	<i>Hylocichla mustelina</i>	T		
Station B4				
Alder Flycatcher	<i>Empidonax alnorum</i>			
American Crow	<i>Corvus brachyrhynchos</i>			
American Goldfinch	<i>Carduelis tristis</i>			
American Robin	<i>Turdus migratorius</i>			
Black-capped Chickadee	<i>Poecile atricapillus</i>			
Black-throated Green Warbler*	<i>Dendroica virens</i>			
Blue Jay	<i>Cyanocitta cristata</i>			
Brown Thrasher	<i>Toxostoma rufum</i>			
Clay-colored Sparrow	<i>Spizella pallida</i>			
Common Yellowthroat	<i>Geothlypis trichas</i>			
Field Sparrow	<i>Spizella pusilla</i>			
Mourning Dove	<i>Zenaida macroura</i>			
Red-breasted Nuthatch*	<i>Sitta canadensis</i>			
Song Sparrow	<i>Melospiza melodia</i>			
Wood Thrush	<i>Hylocichla mustelina</i>	T		
Yellow Warbler	<i>Dendroica petechia</i>			
Station B5				
American Crow	<i>Corvus brachyrhynchos</i>			

Common Name	Scientific Name	COSEWIC	COSSARO	NHIC
Black-throated Green Warbler*	<i>Dendroica virens</i>			
Blue Jay	<i>Cyanocitta cristata</i>			
Common Yellowthroat	<i>Geothlypis trichas</i>			
Eastern Wood-pewee	<i>Contopus virens</i>	S		
Indigo Bunting	<i>Passerina cyanea</i>			
Nashville Warbler	<i>Vermivora ruficapilla</i>			
Ovenbird*	<i>Seiurus aurocapillus</i>			
Red-eyed Vireo	<i>Vireo olivaceus</i>			
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>			
Station B6				
American Crow	<i>Corvus brachyrhynchos</i>			
American Goldfinch	<i>Carduelis tristis</i>			
American Robin	<i>Turdus migratorius</i>			
Black-capped Chickadee	<i>Poecile atricapillus</i>			
Black-throated Green Warbler*	<i>Dendroica virens</i>			
Blue Jay	<i>Cyanocitta cristata</i>			
Common Yellowthroat	<i>Geothlypis trichas</i>			
Eastern Wood-pewee	<i>Contopus virens</i>	S		
Indigo Bunting	<i>Passerina cyanea</i>			
Northern Cardinal	<i>Cardinalis cardinalis</i>			
Ovenbird*	<i>Seiurus aurocapillus</i>			
Red-eyed Vireo	<i>Vireo olivaceus</i>			
Wood Thrush	<i>Hylocichla mustelina</i>	T		
Station B7				
American Crow	<i>Corvus brachyrhynchos</i>			
American Goldfinch	<i>Carduelis tristis</i>			
American Robin	<i>Turdus migratorius</i>			
Black-and-white Warbler*	<i>Mniotilta varia</i>			
Black-throated Green Warbler*	<i>Dendroica virens</i>			
Blue Jay	<i>Cyanocitta cristata</i>			
Bobolink*	<i>Dolichonyx oryzivorus</i>	T	T	Yes
Brown Thrasher	<i>Toxostoma rufum</i>			
Clay-colored Sparrow	<i>Spizella pallida</i>			
Common Yellowthroat	<i>Geothlypis trichas</i>			
Eastern Kingbird	<i>Tyrannus tyrannus</i>			
Field Sparrow	<i>Spizella pusilla</i>			
Great Crested Flycatcher	<i>Myiarchus crinitus</i>			
Nashville Warbler	<i>Vermivora ruficapilla</i>			
Northern Cardinal	<i>Cardinalis cardinalis</i>			
Song Sparrow	<i>Melospiza melodia</i>			
Tree Swallow	<i>Tachycineta bicolor</i>			
Station B8				
American Goldfinch	<i>Carduelis tristis</i>			
American Robin	<i>Turdus migratorius</i>			
American Woodcock	<i>Scolopax minor</i>			
Black-and-white Warbler*	<i>Mniotilta varia</i>			
Black-throated Green Warbler*	<i>Dendroica virens</i>			
Blue Jay	<i>Cyanocitta cristata</i>			

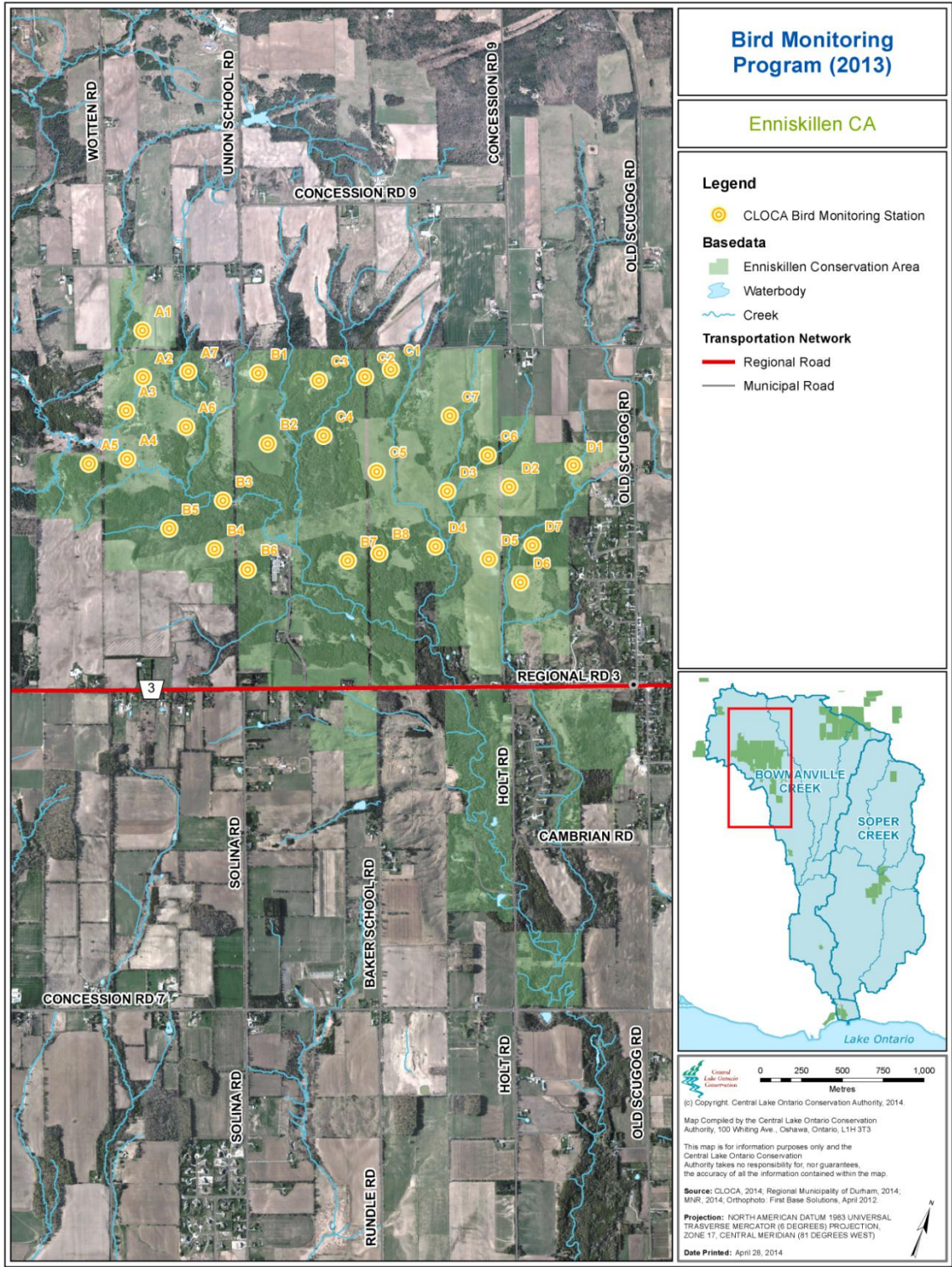
Common Name	Scientific Name	COSEWIC	COSSARO	NHIC
Brown Thrasher	<i>Toxostoma rufum</i>			
Common Yellowthroat	<i>Geothlypis trichas</i>			
Eastern Towhee	<i>Pipilo erythrophthalmus</i>			
Field Sparrow	<i>Spizella pusilla</i>			
Mourning Dove	<i>Zenaida macroura</i>			
Northern Cardinal	<i>Cardinalis cardinalis</i>			
Red-breasted Nuthatch*	<i>Sitta canadensis</i>			
Veery*	<i>Catharus fuscescens</i>			
Wood Thrush	<i>Hylocichla mustelina</i>	T		
Station C1				
American Goldfinch	<i>Carduelis tristis</i>			
Black-and-white Warbler*	<i>Mniotilta varia</i>			
Black-capped Chickadee	<i>Poecile atricapillus</i>			
Blue Jay	<i>Cyanocitta cristata</i>			
Brown Thrasher	<i>Toxostoma rufum</i>			
Clay-colored Sparrow	<i>Spizella pallida</i>			
Common Yellowthroat	<i>Geothlypis trichas</i>			
Eastern Towhee	<i>Pipilo erythrophthalmus</i>			
Field Sparrow	<i>Spizella pusilla</i>			
House Wren	<i>Troglodytes aedon</i>			
Indigo Bunting	<i>Passerina cyanea</i>			
Mourning Dove	<i>Zenaida macroura</i>			
Nashville Warbler	<i>Vermivora ruficapilla</i>			
Northern Flicker	<i>Colaptes auratus</i>			
Red-eyed Vireo	<i>Vireo olivaceus</i>			
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>			
Ruby-throated Hummingbird	<i>Archilochus colubris</i>			
Song Sparrow	<i>Melospiza melodia</i>			
Wild Turkey	<i>Meleagris gallopavo</i>			
Wood Thrush	<i>Hylocichla mustelina</i>	T		
Yellow Warbler	<i>Dendroica petechia</i>			
Station C2				
American Crow	<i>Corvus brachyrhynchos</i>			
American Robin	<i>Turdus migratorius</i>			
Black-and-white Warbler*	<i>Mniotilta varia</i>			
Black-capped Chickadee	<i>Poecile atricapillus</i>			
Black-throated Green Warbler*	<i>Dendroica virens</i>			
Blue Jay	<i>Cyanocitta cristata</i>			
Field Sparrow	<i>Spizella pusilla</i>			
Great Crested Flycatcher	<i>Myiarchus crinitus</i>			
Indigo Bunting	<i>Passerina cyanea</i>			
Mourning Dove	<i>Zenaida macroura</i>			
Nashville Warbler	<i>Vermivora ruficapilla</i>			
Ovenbird*	<i>Seiurus aurocapillus</i>			
Red-eyed Vireo	<i>Vireo olivaceus</i>			
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>			
Scarlet Tanager*	<i>Piranga olivacea</i>			
Wild Turkey	<i>Meleagris gallopavo</i>			

Common Name	Scientific Name	COSEWIC	COSSARO	NHIC
Winter Wren*	<i>Troglodytes troglodytes</i>			
Wood Thrush	<i>Hylocichla mustelina</i>	T		
Station C3				
American Crow	<i>Corvus brachyrhynchos</i>			
American Goldfinch	<i>Carduelis tristis</i>			
American Robin	<i>Turdus migratorius</i>			
Black-throated Green Warbler*	<i>Dendroica virens</i>			
Blue Jay	<i>Cyanocitta cristata</i>			
Cedar Waxwing	<i>Bombycilla cedrorum</i>			
Field Sparrow	<i>Spizella pusilla</i>			
Great Crested Flycatcher	<i>Myiarchus crinitus</i>			
Mourning Dove	<i>Zenaida macroura</i>			
Nashville Warbler	<i>Vermivora ruficapilla</i>			
Wild Turkey	<i>Meleagris gallopavo</i>			
Station C4				
American Crow	<i>Corvus brachyrhynchos</i>			
American Robin	<i>Turdus migratorius</i>			
American Woodcock	<i>Scolopax minor</i>			
Black-and-white Warbler*	<i>Mniotilta varia</i>			
Black-capped Chickadee	<i>Poecile atricapillus</i>			
Black-throated Green Warbler*	<i>Dendroica virens</i>			
Blue Jay	<i>Cyanocitta cristata</i>			
Common Yellowthroat	<i>Geothlypis trichas</i>			
Northern Flicker	<i>Colaptes auratus</i>			
Northern Waterthrush*	<i>Seiurus noveboracensis</i>			
Ovenbird*	<i>Seiurus aurocapillus</i>			
Red-eyed Vireo	<i>Vireo olivaceus</i>			
Veery*	<i>Catharus fuscescens</i>			
White-throated Sparrow*	<i>Zonotrichia albicollis</i>			
Station C5				
American Crow	<i>Corvus brachyrhynchos</i>			
American Goldfinch	<i>Carduelis tristis</i>			
American Robin	<i>Turdus migratorius</i>			
Black-capped Chickadee	<i>Poecile atricapillus</i>			
Bobolink*	<i>Dolichonyx oryzivorus</i>	T	T	Yes
Brown Thrasher	<i>Toxostoma rufum</i>			
Common Yellowthroat	<i>Geothlypis trichas</i>			
Eastern Towhee	<i>Pipilo erythrophthalmus</i>			
Eastern Wood-pewee	<i>Contopus virens</i>	S		
Field Sparrow	<i>Spizella pusilla</i>			
Grasshopper Sparrow*	<i>Ammodramus savannarum</i>	S		
Gray Catbird	<i>Dumetella carolinensis</i>			
Mourning Dove	<i>Zenaida macroura</i>			
Northern Cardinal	<i>Cardinalis cardinalis</i>			
Red-winged Blackbird	<i>Agelaius phoeniceus</i>			
Savannah Sparrow*	<i>Passerculus sandwichensis</i>			
Song Sparrow	<i>Melospiza melodia</i>			
Station C6				

Common Name	Scientific Name	COSEWIC	COSSARO	NHIC
Black-throated Green Warbler*	<i>Dendroica virens</i>			
Common Yellowthroat	<i>Geothlypis trichas</i>			
Eastern Towhee	<i>Pipilo erythrophthalmus</i>			
Northern Cardinal	<i>Cardinalis cardinalis</i>			
Red-eyed Vireo	<i>Vireo olivaceus</i>			
Song Sparrow	<i>Melospiza melodia</i>			
Station D1				
Alder Flycatcher	<i>Empidonax alnorum</i>			
American Crow	<i>Corvus brachyrhynchos</i>			
American Robin	<i>Turdus migratorius</i>			
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>			
Cedar Waxwing	<i>Bombycilla cedrorum</i>			
Common Yellowthroat	<i>Geothlypis trichas</i>			
Eastern Meadowlark*	<i>Sturnella magna</i>	T	T	Yes
Eastern Wood-pewee	<i>Contopus virens</i>	S		
Field Sparrow	<i>Spizella pusilla</i>			
Gray Catbird	<i>Dumetella carolinensis</i>			
Mourning Dove	<i>Zenaida macroura</i>			
Northern Mockingbird	<i>Mimus polyglottos</i>			
Red-winged Blackbird	<i>Agelaius phoeniceus</i>			
Song Sparrow	<i>Melospiza melodia</i>			
Yellow Warbler	<i>Dendroica petechia</i>			
Station D2				
American Goldfinch	<i>Carduelis tristis</i>			
American Robin	<i>Turdus migratorius</i>			
Baltimore Oriole	<i>Icterus galbula</i>			
Blue Jay	<i>Cyanocitta cristata</i>			
Clay-colored Sparrow	<i>Spizella pallida</i>			
Common Yellowthroat	<i>Geothlypis trichas</i>			
Eastern Meadowlark*	<i>Sturnella magna</i>	T	T	Yes
Field Sparrow	<i>Spizella pusilla</i>			
Grasshopper Sparrow*	<i>Ammodramus savannarum</i>	S		
Gray Catbird	<i>Dumetella carolinensis</i>			
Mourning Dove	<i>Zenaida macroura</i>			
Ruby-throated Hummingbird	<i>Archilochus colubris</i>			
Savannah Sparrow*	<i>Passerculus sandwichensis</i>			
Song Sparrow	<i>Melospiza melodia</i>			
Yellow Warbler	<i>Dendroica petechia</i>			
Station D4				
American Crow	<i>Corvus brachyrhynchos</i>			
American Goldfinch	<i>Carduelis tristis</i>			
Black-capped Chickadee	<i>Poecile atricapillus</i>			
Common Yellowthroat	<i>Geothlypis trichas</i>			
Eastern Wood-pewee	<i>Contopus virens</i>	S		
Field Sparrow	<i>Spizella pusilla</i>			
Great Crested Flycatcher	<i>Myiarchus crinitus</i>			
Mourning Dove	<i>Zenaida macroura</i>			
Nashville Warbler	<i>Vermivora ruficapilla</i>			

Common Name	Scientific Name	COSEWIC	COSSARO	NHIC
Northern Cardinal	<i>Cardinalis cardinalis</i>			
Ovenbird*	<i>Seiurus aurocapillus</i>			
Station D5				
American Crow	<i>Corvus brachyrhynchos</i>			
American Robin	<i>Turdus migratorius</i>			
Blue Jay	<i>Cyanocitta cristata</i>			
Chipping Sparrow	<i>Spizella passerina</i>			
Common Yellowthroat	<i>Geothlypis trichas</i>			
Eastern Wood-pewee	<i>Contopus virens</i>	S		
Field Sparrow	<i>Spizella pusilla</i>			
Indigo Bunting	<i>Passerina cyanea</i>			
Mallard	<i>Anas platyrhynchos</i>			
Red-winged Blackbird	<i>Agelaius phoeniceus</i>			
Savannah Sparrow*	<i>Passerculus sandwichensis</i>			
Song Sparrow	<i>Melospiza melodia</i>			
Tree Swallow	<i>Tachycineta bicolor</i>			
Wild Turkey	<i>Meleagris gallopavo</i>			
Wood Thrush	<i>Hylocichla mustelina</i>	T		
Station D6				
American Goldfinch	<i>Carduelis tristis</i>			
Baltimore Oriole	<i>Icterus galbula</i>			
Blue Jay	<i>Cyanocitta cristata</i>			
Chipping Sparrow	<i>Spizella passerina</i>			
Common Yellowthroat	<i>Geothlypis trichas</i>			
Eastern Kingbird	<i>Tyrannus tyrannus</i>			
Field Sparrow	<i>Spizella pusilla</i>			
Grasshopper Sparrow*	<i>Ammodramus savannarum</i>	S		
Gray Catbird	<i>Dumetella carolinensis</i>			
Red-winged Blackbird	<i>Agelaius phoeniceus</i>			
Song Sparrow	<i>Melospiza melodia</i>			
Wild Turkey	<i>Meleagris gallopavo</i>			
Station D7				
American Robin	<i>Turdus migratorius</i>			
Black-and-white Warbler*	<i>Mniotilta varia</i>			
Black-capped Chickadee	<i>Poecile atricapillus</i>			
Blue Jay	<i>Cyanocitta cristata</i>			
Broad-winged Hawk*	<i>Buteo platypterus</i>			
Chipping Sparrow	<i>Spizella passerina</i>			
Common Yellowthroat	<i>Geothlypis trichas</i>			
Field Sparrow	<i>Spizella pusilla</i>			
Indigo Bunting	<i>Passerina cyanea</i>			
Mourning Dove	<i>Zenaida macroura</i>			
Northern Cardinal	<i>Cardinalis cardinalis</i>			

*Species that are Area Sensitive/Forest Interior; Species in bold are considered *Probable Breeders*



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Figure 6: Bird monitoring stations at Enniskillen CA

2.2 Watershed Management

In 2013, watershed-wide bird monitoring was undertaken in the Black/Harmony/Farewell Creek Watershed. Bird surveys, which are road-based, include monitoring for nocturnal owls as well as breeding birds (Figure 7). Incidental observations of amphibians and mammals were also recorded during the surveys, and this information has been included in Table 5 along with the birds identified during the surveys.

Roadside amphibian surveys were conducted in the watershed as well: the species list (Table 6) and details about the results of these surveys are discussed in Section 3.1.2.

2.2.1 Nocturnal Owl Surveys

Recordings of Eastern Screech-owl and Boreal/Barred Owl calls were played at several sites across the watershed with no positive responses or observations.

2.2.2 Roadside Bird Surveys

A total of 56 bird species were recorded in the Black/Harmony/Farewell Creek Watershed. These included the most common species in the CLOCA jurisdiction, such as American Goldfinch and Red-winged Blackbird, as well as some less commonly recorded species, such as Horned Lark. The abundance and frequency of birds observed in the watershed is displayed in Figures 8 and 9, and discussed further in the following pages.

Several Species at Risk in Ontario were identified during the surveys. These included Barn Swallow (Threatened – 6 stations), Bobolink (Threatened – 1 station), and Chimney Swift (Threatened – 4 stations). Eastern Wood-pewee and Wood Thrush, both listed federally but not provincially, were observed as well (Table 5). Eastern Wood-pewee was recorded at 13 stations, while Wood Thrush was only noted at 2.

Table 5: Wildlife observed in the Black/Harmony/Farewell Creek Watershed in 2013.

Common Name	Scientific Name	COSEWIC	COSSARO	NHIC
Amphibians				
American Toad	<i>Bufo americanus</i>			
Green Frog	<i>Rana clamitans</i>			
Northern Leopard Frog	<i>Rana pipiens</i>			
Birds				
Alder Flycatcher	<i>Empidonax alnorum</i>			
American Crow	<i>Corvus brachyrhynchos</i>			
American Goldfinch	<i>Carduelis tristis</i>			
American Redstart*	<i>Setophaga ruticilla</i>			
American Robin	<i>Turdus migratorius</i>			
American Woodcock	<i>Scolopax minor</i>			
Baltimore Oriole	<i>Icterus galbula</i>			
Barn Swallow	<i>Hirundo rustica</i>	T	T	Yes
Black-and-white Warbler*	<i>Mniotilta varia</i>			

Common Name	Scientific Name	COSEWIC	COSSARO	NHIC
Black-capped Chickadee	<i>Poecile atricapillus</i>			
Black-throated Green Warbler*	<i>Dendroica virens</i>			
Blue Jay	<i>Cyanocitta cristata</i>			
Bobolink*	<i>Dolichonyx oryzivorus</i>	T	T	Yes
Brown-headed Cowbird	<i>Molothrus ater</i>			
Cedar Waxwing	<i>Bombycilla cedrorum</i>			
Chimney Swift	<i>Chaetura pelagica</i>	T	T	Yes
Chipping Sparrow	<i>Spizella passerina</i>			
Common Grackle	<i>Quiscalus quiscula</i>			
Common Loon	<i>Gavia immer</i>			
Common Yellowthroat	<i>Geothlypis trichas</i>			
Cooper's Hawk*	<i>Accipiter cooperii</i>			
Eastern Kingbird	<i>Tyrannus tyrannus</i>			
Eastern Phoebe	<i>Sayornis phoebe</i>			
Eastern Wood-pewee	<i>Contopus virens</i>	S		
European Starling	<i>Sturnus vulgaris</i>			
Gray Catbird	<i>Dumetella carolinensis</i>			
Great Blue Heron	<i>Ardea herodias</i>			
Great Crested Flycatcher	<i>Myiarchus crinitus</i>			
Hairy Woodpecker*	<i>Picoides villosus</i>			
Horned Lark	<i>Eremophila alpestris</i>			
House Sparrow	<i>Passer domesticus</i>			
House Wren	<i>Troglodytes aedon</i>			
Indigo Bunting	<i>Passerina cyanea</i>			
Killdeer	<i>Charadrius vociferus</i>			
Mink	<i>Mustela vison</i>			
Mourning Dove	<i>Zenaida macroura</i>			
Mourning Warbler	<i>Oporornis philadelphia</i>			
Northern Cardinal	<i>Cardinalis cardinalis</i>			
Northern Flicker	<i>Colaptes auratus</i>			
Northern Waterthrush*	<i>Seiurus noveboracensis</i>			
Ovenbird*	<i>Seiurus aurocapillus</i>			
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>			
Red-eyed Vireo	<i>Vireo olivaceus</i>			
Red-winged Blackbird	<i>Agelaius phoeniceus</i>			
Ring-billed Gull	<i>Larus delawarensis</i>			
Rock Dove	<i>Columba livia</i>			
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>			
Savannah Sparrow*	<i>Passerculus sandwichensis</i>			
Song Sparrow	<i>Melospiza melodia</i>			
Tree Swallow	<i>Tachycineta bicolor</i>			
Turkey Vulture	<i>Cathartes aura</i>			
Veery*	<i>Catharus fuscescens</i>			
Warbling Vireo	<i>Vireo gilvus</i>			
White-breasted Nuthatch*	<i>Sitta carolinensis</i>			

Common Name	Scientific Name	COSEWIC	COSSARO	NHIC
Willow Flycatcher	<i>Empidonax traillii</i>			
Wood Thrush	<i>Hylocichla mustelina</i>	T		
Yellow Warbler	<i>Dendroica petechia</i>			
Mammals				
Coyote	<i>Canis latrans</i>			
Eastern Chipmunk	<i>Tamias striatus</i>			
Eastern Cottontail	<i>Sylvilagus floridanus</i>			
Grey Squirrel	<i>Sciurus carolinensis</i>			
Red Squirrel	<i>Tamiasciurus hudsonicus</i>			

*Species that are Area Sensitive and/or Forest Interior
 Bird species in bold are considered *Probable Breeders*



*Juvenile Barn Swallows
 (Colonel Sam Dr. @
 Oshawa Second Marsh)*

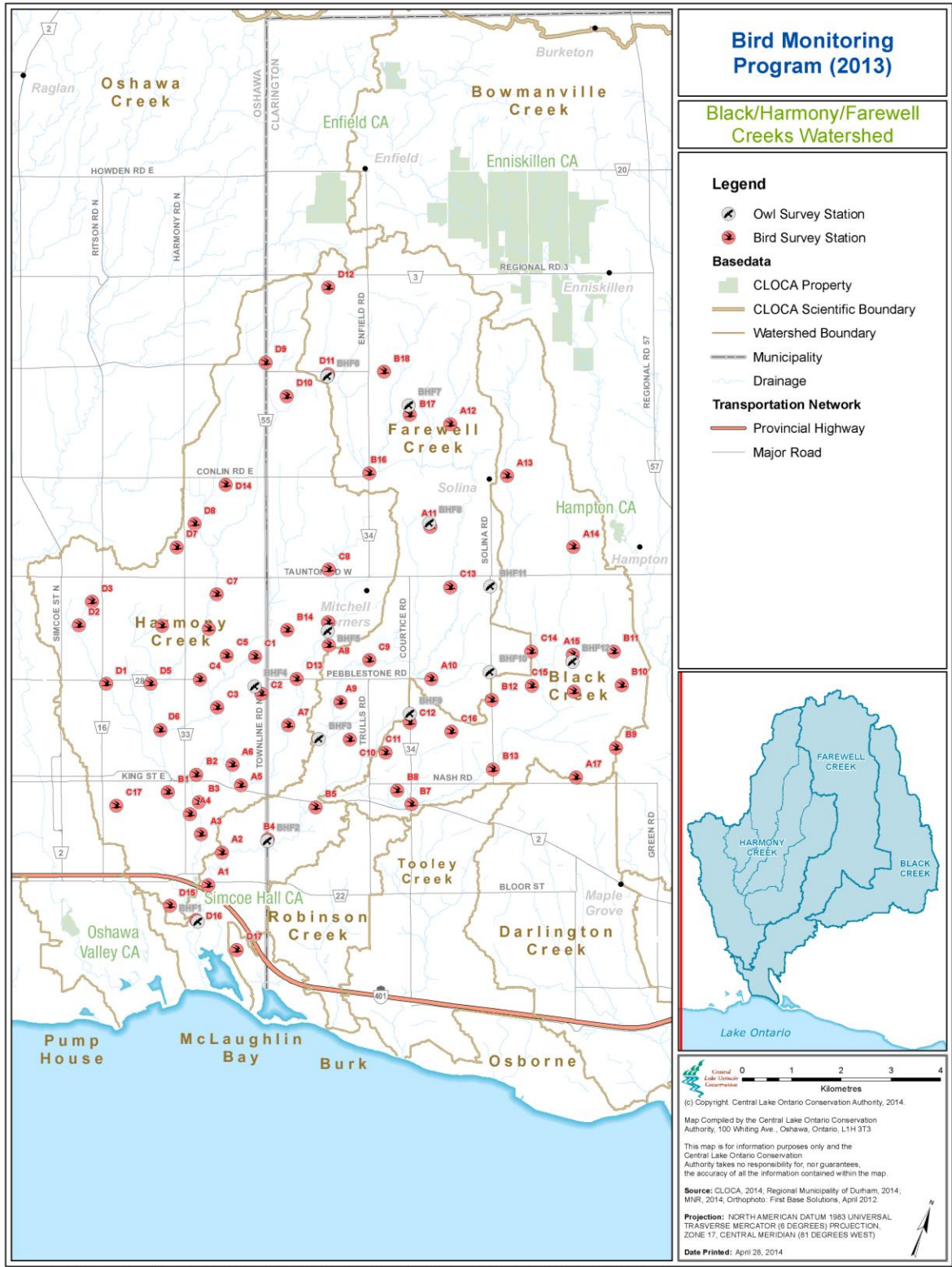
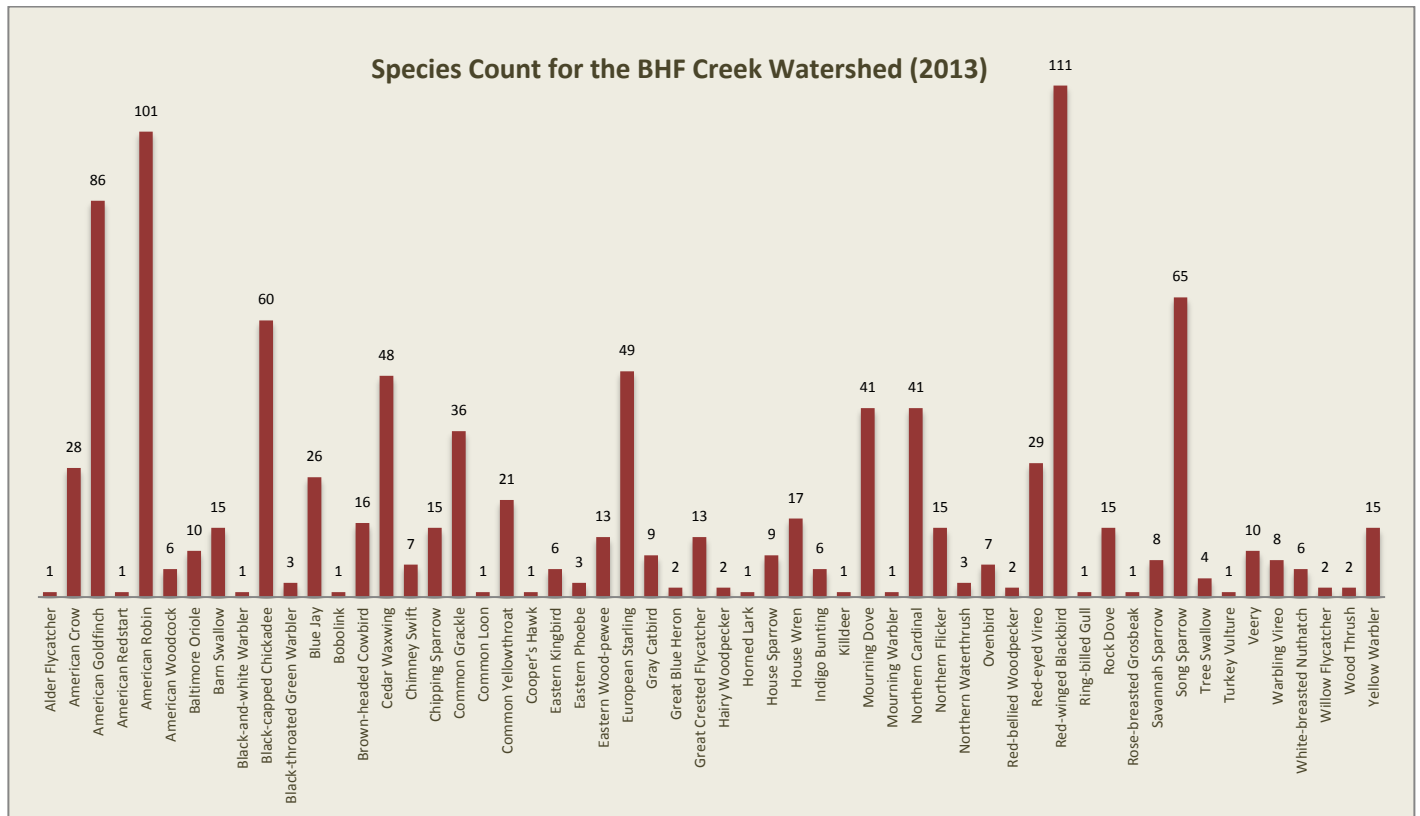


Figure 7: Bird survey stations in the Black/Harmony/Farewell Creek Watershed.

Of all of the birds observed throughout the watershed, Red-winged Blackbird was the most abundantly recorded, followed by American Robin, American Goldfinch, Song Sparrow, and Black-capped Chickadee (Figure 8). These birds are generalists and are able to occupy and exploit a wide variety of habitats, which reflects the large areas of urban and agricultural landuses in the watershed.

Figure 8: Graph showing abundance of bird species observed.



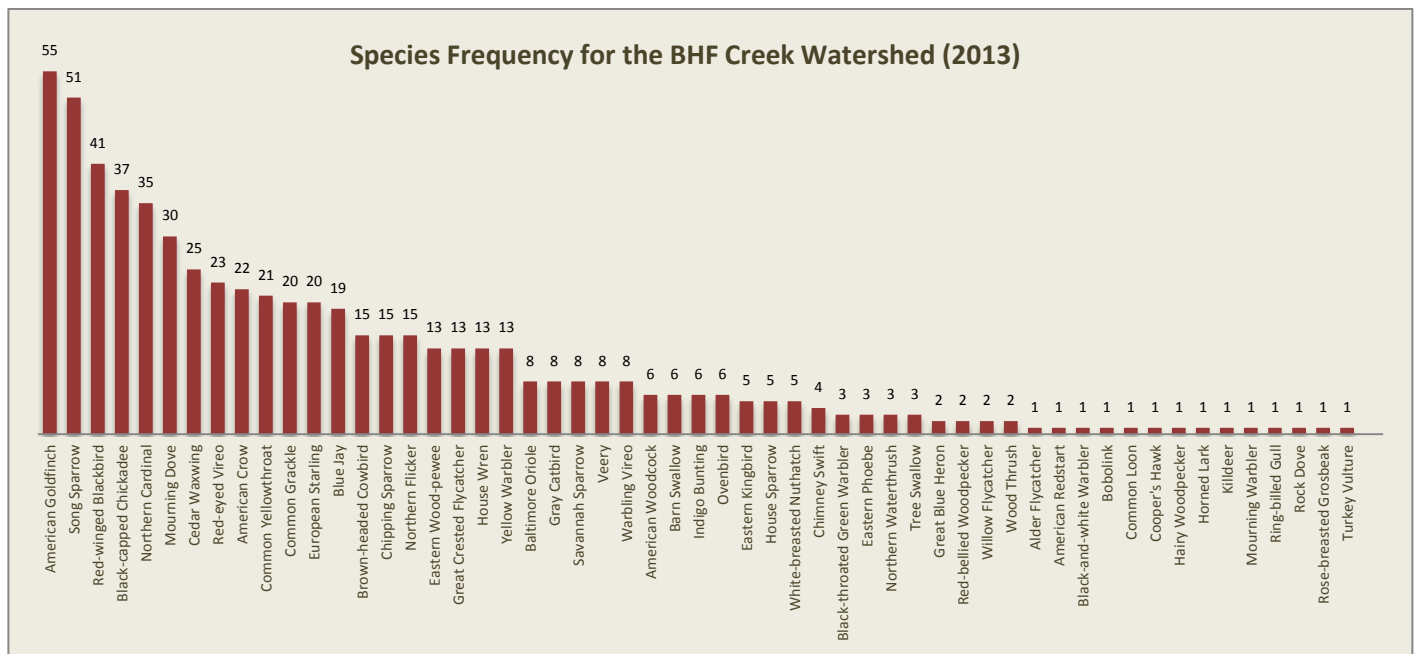
Forest interior species, such as Black-and-white Warbler and White-breasted Nuthatch are less abundant in the watershed, according to the results of the surveys. This may be representative of the landuse in the watershed, but may also be a result of the fact that the surveys are, for the most part, road-based, and the chance of detecting forest interior species from the edge of a forest block is reduced; not to mention that on busier roads the background noise of passing cars inhibits one's ability to hear birds singing at a distance. In some of the more rural areas of the watershed however, where traffic noise is reduced, forest interior birds with louder calls, such as Veery or Ovenbird, can be detected despite the distance of the road to the interior.

The frequency with which these bird were observed, i.e., the number of stations at which each species was recorded, speaks to the distribution of habitats in the watershed. The list of the most frequently recorded species is similar to the list of the most abundant species, with American Goldfinch, Song Sparrow, Red-winged Blackbird, Black-capped Chickadee, and Northern Cardinal making up the top 5 (Figure 9). The presence of Song Sparrow, American Goldfinch, and Red-winged Blackbird on both lists

indicates a watershed with a large number of well-distributed generalist habitats. It also suggests that while there are a few habitats that support forest specialists, they are concentrated in specific areas of the watershed, such as in the core habitats along the Iroquois Beach.

While the bird surveys undertaken at CLOCA’s Conservation Areas are conducted twice, the roadside bird surveys are only conducted once. This is important because the data gathered from one-time surveys is sufficient for understanding the presence and distribution of species in an area, but is not as helpful in understanding habitat function, as no breeding potential can be inferred (unless a nest is observed). Because some birds use habitats for migration or foraging that they might not use for nesting, it is difficult to know if an observation of a habitat specialist, like Veery, suggests the presence of forest interior suitable for nesting, or if it means that the habitat is being used in-transit. If a habitat is only being used temporarily, it does not mean that it is less valuable on the landscape, but it does mean that conclusions cannot be made about the true function of that habitat.

Figure 9: Graph showing observation frequency for each bird species.



3.0 AMPHIBIAN MONITORING

3.1 Frogs & Toads

3.1.1 Durham Region Coastal Wetland Monitoring Project

Amphibian data for all of the coastal wetlands in the CLOCA jurisdiction is collected annually through DRCWMP, and is published periodically by Environment Canada. Please refer to CLOCA’s website and/or Environment Canada’s website for publications relating to this project.

3.1.2 Roadside Amphibian Surveys

Amphibian surveys throughout the Black/Harmony/Farewell Creek Watershed were conducted in 2013, and many of the habitats surveyed proved to be highly productive; in particular, within the wetlands in the Iroquois Beach physiographic region (Figure 10).

Spring Peeper and Gray Treefrog were identified at almost every site surveyed, and Wood Frog was recorded at just under half (Table 6). Full choruses of Spring Peeper were noted at 30 of the 36 stations, and Wood Frog full choruses were observed at 12. The abundance of these two species, which tend to be sensitive to habitat degradation, reflects positively on the quality of the wetland habitats in the Black/Harmony/Farewell Creek Watershed.



Spring Peeper (Rundle Rd., BHF Watershed)

Overall, Spring Peeper and Gray Treefrog were heard most frequently, followed by American Toad and Wood Frog. Green Frog and Northern Leopard Frog were recorded at relatively few stations.

Table 6: Roadside amphibian results for BHF Creek Watershed (2013).

Common Name	Scientific Name	COSSARO	COSEWIC	NHIC	No. Stations Recorded
American Toad	<i>Bufo americanus</i>				28
Gray Treefrog	<i>Hyla versicolor</i>				32
Green Frog	<i>Rana clamitans</i>				7
Northern Leopard Frog	<i>Rana pipiens</i>				4
Spring Peeper	<i>Pseudacris crucifer</i>				34
Wood Frog	<i>Rana sylvatica</i>				15

Note: Species in bold recorded calling counts of 3 at one or more stations.

In Figure 10, the locations of the roadside amphibian survey stations are displayed. Adjacent habitats that are highlighted in purple identify the locations where a full chorus of at least one species was recorded. For the purposes of this report, these habitats have been designated as Significant Amphibian Breeding Habitat in the Black/Harmony/Farewell Creek Watershed.

As Figure 10 demonstrates, the distribution of significant amphibian breeding habitat in the watershed is largely confined to the Iroquois Beach, which contains numerous swamps. These wetlands form much of the Provincially Significant Harmony-Farewell Iroquois Beach Wetland Complex. Swamps, which are treed wetlands, are ideal habitat for amphibians such as Wood Frog, Spring Peeper, and Gray Treefrog, as they require wet areas for breeding, e.g., vernal pools, but inhabit and overwinter in forest habitats. The abundance of sensitive woodland species in this wetland complex confirms that the wetland habitats have persisted over time and that they have remained high quality habitats; however, Figure 10 also displays the high degree of fragmentation that has occurred within the Iroquois Beach habitat area from urban and agricultural settlement. For amphibians, fragmentation can be detrimental, particularly if a breeding habitat is separated from a foraging/overwintering habitat by a road. In particular, Solina Road and Rundle Road, which run north-south through the wetland complex, are areas of high road mortality on warm rainy nights in the spring.

These important amphibian breeding habitats will also be bisected in the future by the 407 East Link (Figure 10). The Environmental Assessment for this stretch of highway proposes to incorporate wildlife passage structures beneath it to enable wildlife to move between the habitats on either side of the highway, and prevent them from having to cross the highway.

Other pockets of significant amphibian breeding habitat are scattered through the Black/Harmony/Farewell Creek Watershed, including within the Solina Wetland Complex, but the vast majority are in the middle of the watershed. Very few habitats exist within the Harmony Creek Watershed, which is not surprising, as it is the most heavily urbanized and little wetland habitat remains. The contrast between this watershed and the Farewell and Black Creek Watersheds to the east is noteworthy though, particularly since the soils of the Iroquois Beach are continuous between them; it should serve as an important reminder of how sensitive these features are to urban development and how easily the wildlife that rely on them can be lost.

3.2 Salamanders

No salamanders were found at either Lynde Shores or Heber Down in 2013.

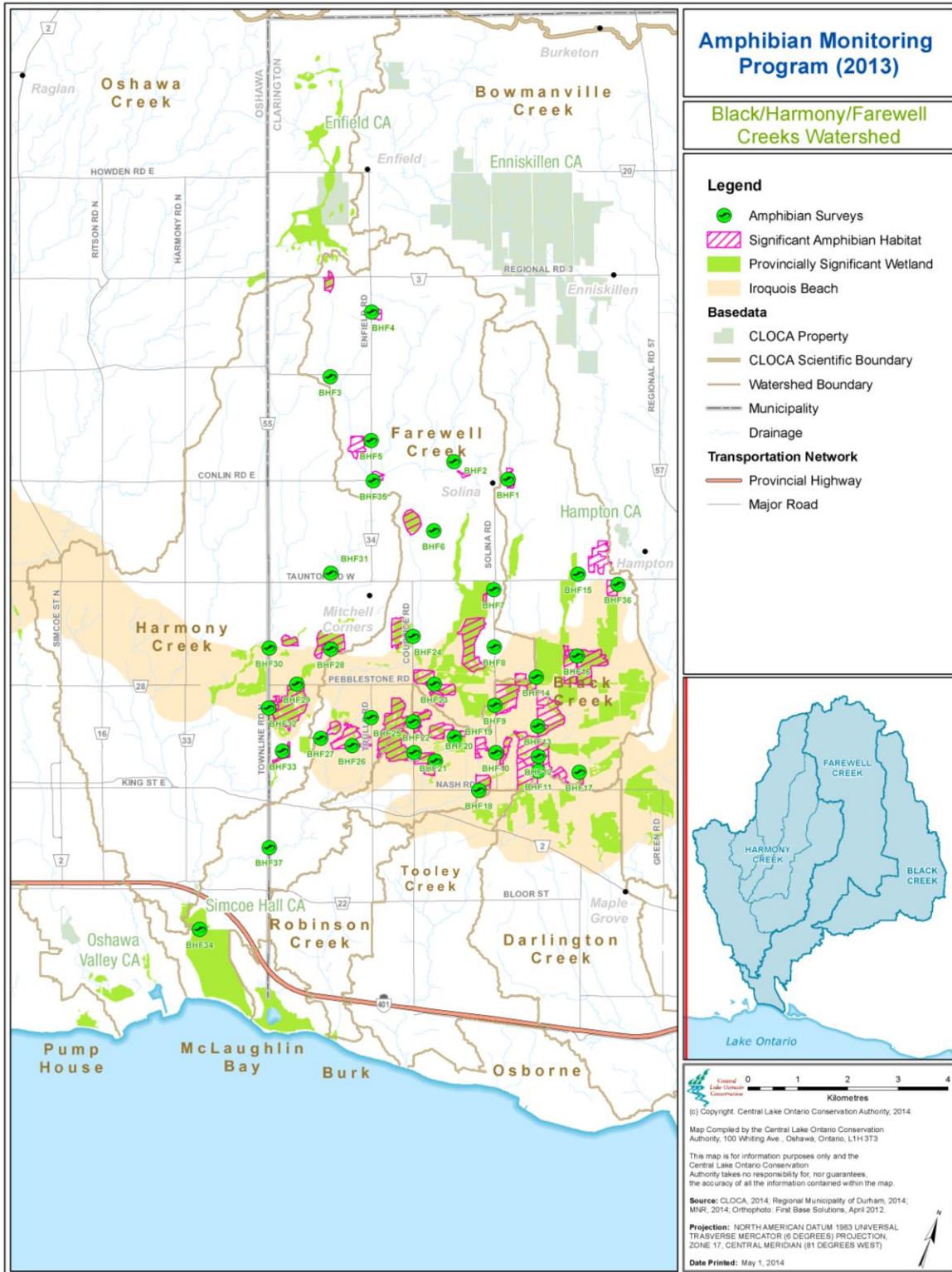


Figure 10: Amphibian survey stations and significant amphibian breeding habitat in the Black/Harmony/Farewell Creek Watershed.

4.0 SPECIAL PROJECTS

4.1 Rogers Tract

Bird and amphibian monitoring was undertaken again in 2013 at Rogers Tract. This monitoring program is scheduled to occur annually as part of the property management agreement.

Wildlife habitat within Rogers Tract is diverse; consequently, the list of bird species is also diverse. Birds that were identified as probable breeders include Chestnut-sided Warbler, Veery, Red-breasted Nuthatch, and Red-Eyed Vireo (bold in Table 7). Area-sensitive and/or forest interior birds, such as Northern Waterthrush, and Winter Wren (shown with an asterisk in Table 7), were also identified on the property, and generally indicate the presence of large, higher-quality habitats.

Bobolink, which is listed as Threatened in Ontario, was recorded in 2012, but not in 2013. Eastern Meadowlark – another provincially-listed species at risk – was recorded however. Three federally-listed Species at Risk, Eastern Meadowlark, Eastern Wood-pewee, and Wood Thrush, were also recorded. Table 7 identifies their respective at risk categories.

Table 7: Bird monitoring data from Rogers Tract in 2013.

Common Name	Scientific Name	COSEWIC	COSSARO	NHIC
Station B1				
American Crow	<i>Corvus brachyrhynchos</i>			
American Goldfinch	<i>Carduelis tristis</i>			
American Robin	<i>Turdus migratorius</i>			
Black-and-white Warbler*	<i>Mniotilta varia</i>			
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>			
Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>			
Chipping Sparrow	<i>Spizella passerina</i>			
Eastern Phoebe	<i>Sayornis phoebe</i>			
Eastern Towhee	<i>Pipilo erythrophthalmus</i>			
Field Sparrow	<i>Spizella pusilla</i>			
Great Crested Flycatcher	<i>Myiarchus crinitus</i>			
Indigo Bunting	<i>Passerina cyanea</i>			
Nashville Warbler	<i>Vermivora ruficapilla</i>			
Ovenbird*	<i>Seiurus aurocapillus</i>			
Red-breasted Nuthatch*	<i>Sitta canadensis</i>			
Song Sparrow	<i>Melospiza melodia</i>			
Veery*	<i>Catharus fuscescens</i>			
Wild Turkey	<i>Meleagris gallopavo</i>			
Station B2				
American Crow	<i>Corvus brachyrhynchos</i>			
American Goldfinch	<i>Carduelis tristis</i>			
Brown Thrasher	<i>Toxostoma rufum</i>			
Canada Goose	<i>Branta canadensis</i>			

Common Name	Scientific Name	COSEWIC	COSSARO	NHIC
Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>			
Common Grackle	<i>Quiscalus quiscula</i>			
Common Yellowthroat	<i>Geothlypis trichas</i>			
Eastern Meadowlark*	<i>Sturnella magna</i>	T	T	Yes
Great Crested Flycatcher	<i>Myiarchus crinitus</i>			
Mallard	<i>Anas platyrhynchos</i>			
Mourning Warbler	<i>Oporornis philadelphia</i>			
Northern Cardinal	<i>Cardinalis cardinalis</i>			
Northern Flicker	<i>Colaptes auratus</i>			
Red-breasted Nuthatch*	<i>Sitta canadensis</i>			
Red-winged Blackbird	<i>Agelaius phoeniceus</i>			
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>			
Song Sparrow	<i>Melospiza melodia</i>			
Swamp Sparrow	<i>Melospiza georgiana</i>			
Station B3				
American Goldfinch	<i>Carduelis tristis</i>			
American Robin	<i>Turdus migratorius</i>			
Black-capped Chickadee	<i>Poecile atricapillus</i>			
Blue Jay	<i>Cyanocitta cristata</i>			
Canada Goose	<i>Branta canadensis</i>			
Chipping Sparrow	<i>Spizella passerina</i>			
Eastern Wood-pewee	<i>Contopus virens</i>	S		
Great Crested Flycatcher	<i>Myiarchus crinitus</i>			
Ovenbird*	<i>Seiurus aurocapillus</i>			
Red-eyed Vireo	<i>Vireo olivaceus</i>			
Red-winged Blackbird	<i>Agelaius phoeniceus</i>			
Station B4				
American Crow	<i>Corvus brachyrhynchos</i>			
American Robin	<i>Turdus migratorius</i>			
Blackburnian Warbler*	<i>Dendroica fusca</i>			
Black-throated Green Warbler*	<i>Dendroica virens</i>			
Blue Jay	<i>Cyanocitta cristata</i>			
Eastern Wood-pewee	<i>Contopus virens</i>	S		
Great Crested Flycatcher	<i>Myiarchus crinitus</i>			
Nashville Warbler	<i>Vermivora ruficapilla</i>			
Northern Waterthrush*	<i>Seiurus noveboracensis</i>			
Red-eyed Vireo	<i>Vireo olivaceus</i>			
Scarlet Tanager*	<i>Piranga olivacea</i>			
Swamp Sparrow	<i>Melospiza georgiana</i>			
Veery*	<i>Catharus fuscescens</i>			
Yellow Warbler	<i>Dendroica petechia</i>			
Station B5				
American Crow	<i>Corvus brachyrhynchos</i>			
American Goldfinch	<i>Carduelis tristis</i>			
Black-and-white Warbler*	<i>Mniotilta varia</i>			
Blue Jay	<i>Cyanocitta cristata</i>			
Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>			
Eastern Wood-pewee	<i>Contopus virens</i>	S		

Common Name	Scientific Name	COSEWIC	COSSARO	NHIC
Ovenbird*	<i>Seiurus aurocapillus</i>			
Pine Warbler*	<i>Dendroica pinus</i>			
Red-eyed Vireo	<i>Vireo olivaceus</i>			
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>			
Veery*	<i>Catharus fuscescens</i>			
Yellow Warbler	<i>Dendroica petechia</i>			
Station B6				
American Crow	<i>Corvus brachyrhynchos</i>			
Black-capped Chickadee	<i>Poecile atricapillus</i>			
Black-throated Green Warbler*	<i>Dendroica virens</i>			
Blue Jay	<i>Cyanocitta cristata</i>			
Great Crested Flycatcher	<i>Myiarchus crinitus</i>			
Ovenbird*	<i>Seiurus aurocapillus</i>			
Red-breasted Nuthatch*	<i>Sitta canadensis</i>			
Red-eyed Vireo	<i>Vireo olivaceus</i>			
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>			
Winter Wren*	<i>Troglodytes troglodytes</i>			
Wood Thrush	<i>Hylocichla mustelina</i>	T		
Yellow Warbler	<i>Dendroica petechia</i>			
Station B7				
Black-capped Chickadee	<i>Poecile atricapillus</i>			
Black-throated Green Warbler*	<i>Dendroica virens</i>			
Blue Jay	<i>Cyanocitta cristata</i>			
Eastern Wood-pewee	<i>Contopus virens</i>	S		
Northern Cardinal	<i>Cardinalis cardinalis</i>			
Ovenbird*	<i>Seiurus aurocapillus</i>			
Red-eyed Vireo	<i>Vireo olivaceus</i>			

*Species that are Area Sensitive/Forest Interior; Species in bold are considered *Probable Breeders*

In 2013, the same amphibian species diversity was observed on the property as in 2012. Sites Aa, Ab, and Ae were the most productive habitats for breeding amphibians, while Ac showed no activity.

American Toad was the most abundantly recorded species, followed by Spring Peeper. American Toad readily occupies wet habitats and is the least sensitive species to deterioration in habitat quality. Spring Peeper is more sensitive, but its counterparts, Wood Frog and Gray Treefrog were hardly present, with only 1 individual from each species recorded. This may reflect a lack of the seasonal ephemeral pools that these species prefer on the property, or it may indicate that the existing habitats are degraded in some way or lacking in other resources.

Table 8: Amphibian monitoring data from Rogers Tract in 2013.

Common Name	Scientific Name	Full Chorus Recorded	Station(s)
American Toad	<i>Bufo americanus</i>	Yes	Aa, Ab, Ad, Ae
Gray Treefrog	<i>Hyla versicolor</i>		Ae
Northern Leopard Frog	<i>Rana pipiens</i>		Aa, Ae
Spring Peeper	<i>Pseudacris crucifer</i>	Yes	Aa, Ab, Ae
Wood Frog	<i>Rana sylvatica</i>		Aa



Figure 11: Wildlife monitoring stations at Rogers Tract.

4.2 Muskrat Surveys

In 2014 CLOCA was contracted by the Ministry of Natural Resources to conduct Muskrat House Surveys in 8 Durham Region Coastal Wetlands. This was the second year of data collection for this project. Muskrats have the unique ability to manipulate ecosystems and promote wetland diversity, through influences associated with their foraging, house construction, and transportation systems. Muskrats are sensitive to environmental conditions, particularly wetland water depth conditions. The objectives of this survey were to assess the muskrat populations and their relationship to water levels in selected wetlands. Muskrat populations were assessed through counts of muskrat structures. Muskrats build houses which are conical structures made with roots and aquatic vegetation, in which they live and breed in the winter months. They also build smaller “push-ups” of vegetation above the ice which they use as feeding platforms.

Muskrat surveys were completed for the following wetlands in January and February 2014, when ice conditions were safe for work (according to MNR Working on Ice Policy) and snow depth did not limit the detection of muskrat houses:

- Cranberry Marsh
- Lynde Creek Marsh
- Corbett Creek Marsh
- Pumphouse Marsh
- Oshawa Second Marsh
- McLaughlin Bay Marsh
- Westside Marsh
- Bowmanville Marsh

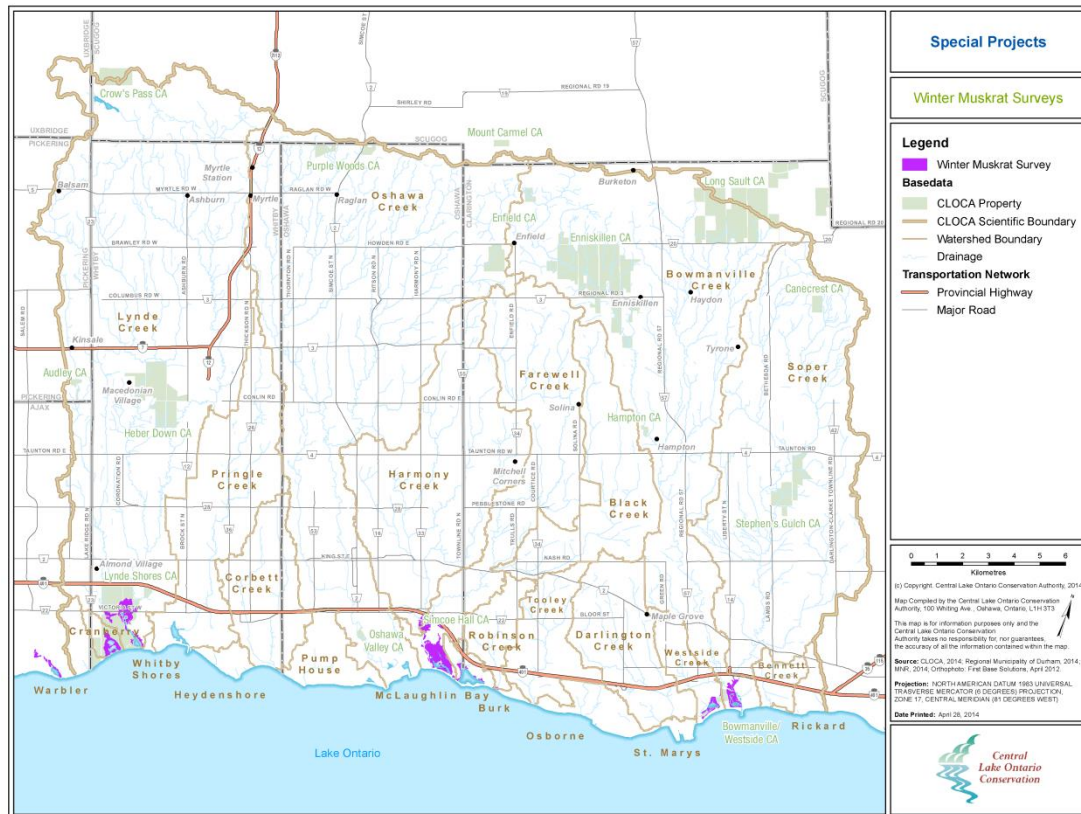


Figure 12: Winter Muskrat Survey Sites

4.2.1 Survey Cell Selection

Each wetland had a grid overlaid using 100m x 100m cells. Grids were overlaid using an XY coordinate system and the XY coordinates of the southwest corner of each cell were recorded to orient searches in the field. Cells were pre-screened for suitability as muskrat habitat. Criteria to meet suitability included cell must intersect with open water, cell must be > or = 25% shallow marsh and < 75% open water or hard land. From the cells identified as suitable, 10 random cells for each wetland were selected to be surveyed. Where 10 or fewer cells met the suitability criteria for a wetland, the entire wetland was surveyed.

4.2.2 Surveys

A complete inventory of muskrat structures within the pre-determined 10 randomly selected cells was conducted within each wetland. Within each cell habitat characteristics were assessed, including the % cattail meadow, % cattail marsh, % open water, % land, and any evidence of muskrat activity. The entire wetland was surveyed in locations where there were 10 or fewer cells that met the suitability criteria, or where the number of houses was low and time permitted.

For each muskrat structure identified the UTM coordinates were recorded using a hand held GPS unit. A number of characteristics were recorded for each structure.

These characteristics include:

- Height
- Length and Width
- Distance to open water
- Muskrat presence or activity
- Dominant construction material
- Predation

Muskrat structure characteristics were then used to evaluate its occupancy status (“active”, “inactive” or “unsure”) and the type of structure (“house”, feeding “push-up” or “unknown”). Activity information for each structure was estimated based on water levels and evidence of predation. Without seeing inside the structure it was difficult to definitively say whether it is active or not and most structures were classified as “unsure”. Muskrat structures were not opened to assess characteristics and verify occupancy to prevent invasion by predators. The size of the structure was used to assess whether the structure was a “house” or a “push-up”. Many intermediate sized structures were classified as “unknown”.

4.2.3 Results

The following table summarizes the muskrat structure counts in the 10 random cells sampled in each wetland in 2014.

Table 9: Muskrat Structure Counts (2014)

Wetland	Wetland Type	Houses	Push-ups	Unknowns	Total Number of Structures
Bowmanville Marsh	DR	1	0	0	1
Corbett Creek Marsh	DR	2	0	0	2
Cranberry Marsh	BB	24	6	23	53
Lynde Creek Marsh	DR	0	0	0	0
McLaughlin Bay Marsh	BB	7	1	4	12
Oshawa Second Marsh	BB	3	1	2	6
Pumphouse Marsh	BB	6	2	2	10
Westside Marsh	BB	12	2	2	16

* DR = drowned river-mouth; BB = barrier beach lagoon

4.2.4 Findings

Overall muskrat structures were found primarily in barrier beach wetlands that are periodically or permanently disconnected from, and therefore perched above, Lake Ontario. In these cases water levels were high enough to support muskrat movement under the ice. The drowned river-mouth marshes had hard cattail edges on dry land and little to no muskrat structures. These areas are unlikely to be suitable habitat for muskrat houses even in high water level years, but may be more suited to bank dens when under water access to banks is available.

The wetlands in general had low water levels in January and February of 2014, much the same as in 2013, and many marsh areas were not conducive to muskrat structures this season. From the surveys it was evident that higher winter water levels are necessary to support muskrat populations.

No muskrat tracks were observed in 2014, and only a few sets of predator (mink) tracks were observed. Colder temperatures and better snow cover in 2014 compared to 2013 may have better protected the structures from predation.

Musk rats play an important ecological role in coastal wetlands through the control of cattail growth through herbivory. In this way they create and maintain habitat complexity by creating more open water areas and maintaining more of a hemi-marsh environment. This environment is beneficial for a variety of wildlife including birds, fish, invertebrates and other vegetation species. Musk rats are also food for a variety of predators including mink, coyote, fox, owls, hawks, river otter, snapping turtle, and northern pike.

The results of this study highlight the importance of maintaining higher winter water levels to support muskrat populations. This information can be used to inform future management decisions regarding Lake Ontario water levels.

5.0 SPECIES AT RISK

Several species at risk were identified in the CLOCA jurisdiction this year: Grasshopper Sparrow, Bobolink, Eastern Meadowlark, Eastern Wood-pewee, Snapping turtle, Barn Swallow, Chimney Swift and Wood Thrush. Eastern Meadowlark was the most commonly observed SAR, and is still relatively common in the CLOCA jurisdiction in forest habitats.

6.0 SUMMARY

The wildlife monitoring program was completed successfully in 2013, and valuable data on the resources in several of the conservation areas, as well as in the Black/Hamony/Farewell Creek Watershed, was gathered. In particular, important insights were gained regarding the abundance and distribution of amphibian breeding habitat in the Black/Harmony/Farewell Creek Watershed, specifically within the Iroquois Beach, as 2013 was the first year for the roadside amphibian monitoring program there.

Special projects were undertaken in 2013 that provided insight into the state of wildlife resources in targeted areas, such as at Cranberry West and Rogers Tract, and helped staff to understand the status of muskrat populations in the Coastal Wetlands. In addition, numerous species at risk were observed throughout the jurisdiction.

The data collected through the CLOCA wildlife monitoring program, as well as through its various special projects, is key to the successful management of CLOCA's natural heritage resources overall. It is used to ensure that CLOCA's conservation areas continue to be managed responsibly, and it is a critical tool for CLOCA's municipal planning partners to use to help them make informed landuse decisions within their watersheds. As such, it is important to continue monitoring wildlife in the jurisdiction.

7.0 RESOURCES

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