



Severn Sound

Environmental Association

WETLAND EVALUATION OF NORTH RIVER SWAMP

TOWNSHIP OF SEVERN



DECEMBER 2008

**WETLAND EVALUATION OF
NORTH RIVER SWAMP
TOWNSHIP OF SEVERN, ONTARIO**

December 2008

**Prepared for
THE TOWNSHIP OF SEVERN
and
THE ONTARIO MINISTRY OF NATURAL RESOURCES**

**by
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SEVERN SOUND ENVIRONMENTAL ASSOCIATION**

FOREWORD

This document reports on the major findings of the Wetland Evaluation of North River Swamp, conducted during 2007 by the Severn Sound Environmental Association (SSEA) for the Township of Severn and the Ontario Ministry of Natural Resources.

The evaluation was conducted using the standards set out in the Ontario Wetland Evaluation System, Southern Manual, 3rd edition. The North River Swamp wetland evaluation has been reviewed and accepted by the Ontario Ministry of Natural Resources Midhurst District.

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Front cover Photo Credits: *Deciduous Swamp Community* - SSEA, *Yellow Lady's Slippers* - Bob Bowles, *Fawn Darner* - Bob Bowles, *Fen Community* - SSEA

ACKNOWLEDGEMENTS

I am grateful to Bob Bowles and Margaret Killing for their substantial assistance with this wetland evaluation. Bob's impressive natural history knowledge is very valuable for projects like this. In addition to his direct involvement with field surveys, Bob's checklists of wildlife in Simcoe County were used as the basis for the species lists in this report, and he provided many excellent photographs for use in the report. Margaret contributed significantly to the project as a volunteer. She assisted with field work and data collection, and maintained and updated the plant species list for the project.

Severn Sound Environmental Association staff provided support and professional expertise throughout the project. In particular, the support of Keith Sherman and Lex McPhail was essential to the preparation of this wetland evaluation. Thank you also to Ryan Hamelin, Phil Breault, and Matt Bruce-Sharp for field support and assisting with data collection.

The project team would like to thank Ontario Ministry of Natural Resources (OMNR) staff for their assistance with the evaluation. We received background information, support and expertise from Brad Allan (Biologist), Suzanne Robinson (Species At Risk Biologist), Greg Cull (Fish & Wildlife Technical Specialist), and Paul Jurjans (GIS Officer) at the Midhurst OMNR office.

Special thanks to Township of Severn staff David Scott and Christine Shaw for municipal information and assistance.

We are grateful to Jamie Hunter and John Raynor from Huronia Museum for providing information pertaining to the cultural resources of the North River Swamp area.

Landowner support was important to this project. We would like to thank the private landowners in the North River Swamp area that kindly allowed us to access their properties for the purpose of conducting the wetland evaluation.

All photographs in this report were taken by SSEA staff unless otherwise noted.

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1. INTRODUCTION

1.1 Background

North River Swamp is located in the Township of Severn, northeast of Orillia (Figure 1). The Township of Severn owns approximately 11% of this wetland, and the remainder is under private ownership.

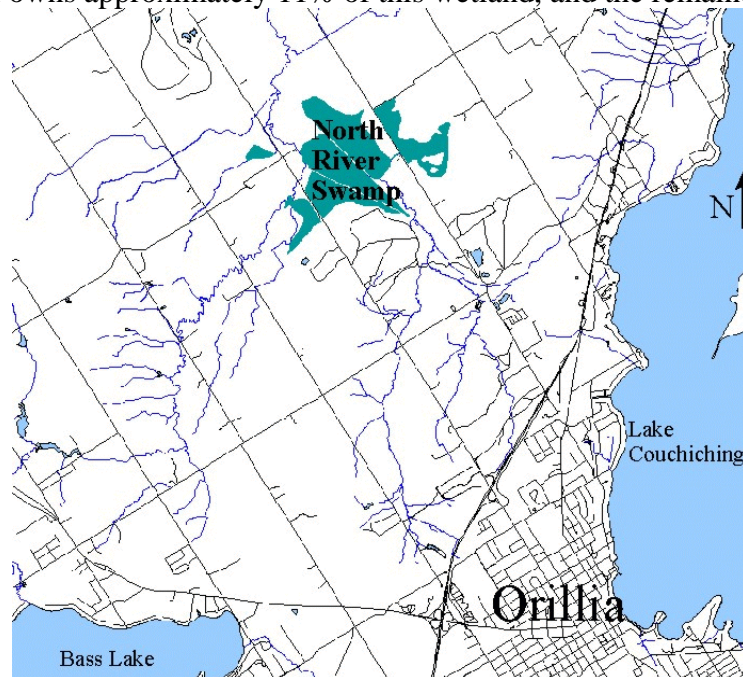


Figure 1: Location of North River Swamp

A wetland evaluation was conducted in 1985 by the Ontario Ministry of Natural Resources (OMNR), and North River Swamp was evaluated as a Class 4 Wetland. In 1993, changes were made to the Southern Ontario Wetland Evaluation System, and in 1994, a desktop revision of North River Swamp to third edition Wetland Evaluation Standards was undertaken by the OMNR. While the upgrade concluded that North River Swamp was a non-provincially significant wetland, the revision was an in-office exercise based on information gathered in 1985. No boundary verification or additional field work was conducted in support of the paper upgrade.

1.2 Purpose

The purpose of this project was to conduct field work, and prepare and submit a revised evaluation and mapping for North River Swamp, upgraded to the 3rd edition standards of the Ontario Wetland Evaluation System.

1.3 Study Team

Severn Sound Environmental Association (SSEA) undertook the wetland evaluation, funded by the Township of Severn, with support from the Ontario Ministry of Natural Resources. The Township of Severn provided assessment data and background information, and OMNR provided direction and technical advice during the project.

The primary investigators for the field component of the evaluation were Michelle Hudolin, SSEA Wetlands & Habitat Biologist, and contractor Bob Bowles. Margaret Killing (volunteer), Ryan Hamelin and Phil Breault (SSEA seasonal staff), Matt Bruce-Sharp (SSEA co-op student), and Suzanne Robinson (OMNR) assisted with field investigations and data collection. SSEA Coordinator Keith Sherman provided guidance, input and assistance throughout the project, and Geographic Information System (GIS) support and mapping was provided by Lex McPhail, SSEA GIS/Applications Specialist.

1.4 Fieldwork and Data Collection

Three seasons of field investigations were undertaken to assess features in North River Swamp, map and describe vegetation communities, and collect information on species utilizing the wetland. Field work was conducted on May 31, June 29, July 17, July 31, August 21, August 28, September 25, October 4, October 12, October 17, and November 1, 2007. During field visits, the field crew compiled a list of plant species observed, and recorded incidental observations of wildlife species; minnows were trapped and identified on July 31, August 28, September 25, and November 1, 2007. Soils were sampled with a hand auger to determine general soil types present in the wetland, to a maximum depth of 120 cm.

Access was not granted to all parcels of land within the study area, therefore some information was not directly obtainable from field observations. In these cases, existing information and aerial photograph interpretation was used to determine the wetland boundary and describe the wetland communities. If an opportunity arises in the future to access these lands, the vegetation communities and wetland evaluation record should be updated accordingly.

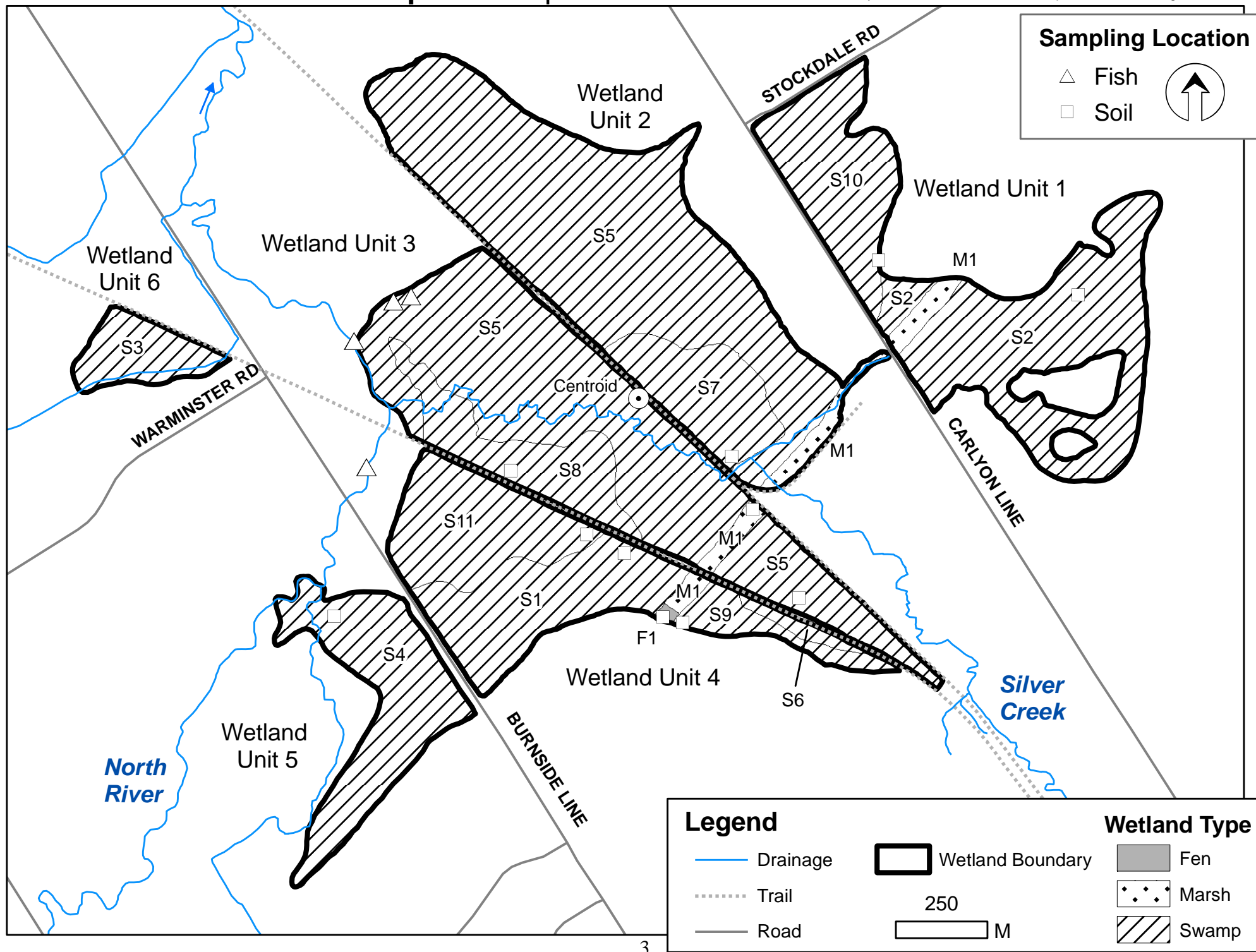
2. WETLAND EVALUATION

A map of the wetland communities in the complex was produced (Figure 2). The communities are divided into wetland types (F=fen, S=swamp, M= marsh), and each community has been given an alpha-numeric identifier according to the evaluation system protocol.

Figure 2

North River Swamp Township of Severn

Produced by the Severn Sound Environmental Association with Data supplied under License by Members of the Ontario Geospatial Data Exchange, 2008.



Under the 3rd Edition Ontario Wetland Evaluation System Southern Manual, a wetland evaluation is scored in four main categories: Biological, Social, Hydrological, and Special Features components. The Biological section assesses ecological and biological values of the wetland. The Social component evaluates the uses that wetlands provide to people (e.g., recreational opportunities and natural resources such as timber and fur bearing mammals). The Hydrological category evaluates factors such as flood attenuation and water quality improvement. The Special Features component allows attributes such as significant wildlife habitat and rare species to be evaluated. The Extra Information section of the evaluation provides an opportunity for reporting additional information that does not receive points toward the evaluation score, such as the presence of invasive species or other notable species such as Osprey (*Pandion haliaetus*) and Loon (*Gavia immer*).

Points are awarded for each category, based on the evaluation system protocol. The sum of the points from all categories results in the final score for the wetland or wetland complex, and represents the status of the wetland at the time of the study. Each of the four components can score a maximum of 250 points, and thus a wetland or wetland complex can score a maximum of 1000 points. Wetlands that receive a total score of 600 points (or greater) or score 200 points (or greater) in either the Biological or Special Features scoring components are categorized as Provincially Significant Wetlands. Wetlands that receive a total score of less than 600 points and score less than 200 points in each of the Biological and Special Features scoring components are categorized as Non-provincially Significant Wetlands, and are often designated Locally Significant Wetlands by municipalities. The significant findings of the field work for the North River Swamp evaluation are outlined below.

2.1 Biological Component

The North River Swamp wetland complex contains three distinct wetland types: fen, swamp and marsh. Overall, the wetland is dominated by swamp (97%), with a small component of marsh (2%) and fen (1%) habitat (Figure 2). Swamp habitat in the wetland consists of deciduous (Figure 3), coniferous (Figure 4), dead tree (Figure 5), and tall shrub swamp. Six individual wetland units make up the 209.5 hectare North River Swamp (Figure 2).



Figure 3: Deciduous Swamp Community S4



Figure 4: Coniferous Swamp Community S2



Figure 5: Dead Tree Swamp Community S6

The habitat and topography surrounding North River Swamp is a diverse mixture of row crops, pasture, deciduous, coniferous and mixed forest, fence rows with cover, hilly terrain, and creek flood plains. Part of the North River Swamp overlaps with the Ardtrea Island Provincially Significant Earth Science Area of Natural and Scientific Interest (ANSI). In addition, North River Swamp is located within approximately 1.7 km of Silver Creek Locally Significant Wetland, and 1.8 km of Orillia Dump Swamp Locally Significant Wetland. Habitat variety adjacent to wetlands and connectivity to other natural areas is valuable from a biological perspective, because high ecological diversity typically supports a large number of species of plants and animals, and landscape connectivity allows animals to move between areas of high habitat importance.

2.2 Social Component

The field crew noted the presence of a number of potential resources in North River Swamp that contribute to the scoring for the social component of the evaluation, including wood products and wildlife species. Approximately 194 hectares of the wetland is dominated by deciduous and coniferous forest. The field crew directly observed or found evidence (e.g., scat, tracks, browse) of several economically valuable wildlife species in the wetland, including Beaver (*Castor canadensis*), Raccoon (*Procyon lotor*), and Red Squirrel (*Tamiasciurus hudsonicus*). Minnows and Snapping Turtle (*Chelydra serpentina serpentina*) were observed by the field crew in the wetland in 2007, and also contribute to the social score for the wetland.

North River Swamp is located approximately 4 km northwest of the settlement area of the City of Orillia. A portion of North River Swamp (11%) is owned by the Township of Severn, and the remainder is in private ownership. The wetland is occasionally used for hunting and fishing, and is also regularly visited by naturalists and birdwatchers, who view species in the wetland from the vantage point of the Uthoff trail. There are no known visits to the wetland by educational groups, and no maintained facilities such as a board walk.

There is moderate human disturbance to the wetland, including roads, trails and utility corridors (Figure 6) that pass through the wetland, and garbage dumping and all-terrain vehicle damage (Figure 7) in some locations.



Figure 6: Utility Corridor in Community M1



Figure 7: ATV Damage in Community F1

In addition to the original 1985 wetland evaluation, a number of studies have been done on the North River Swamp area, including the Ardtrea Island Provincially Significant ANSI report, and fisheries studies in Silver Creek (SSEA unpublished).

2.3 Hydrological Component

North River Swamp is downstream of Bass Lake, the main detention area in the North River Swamp catchment area (Figure 8). As a result, North River Swamp receives a relatively low score for flood attenuation in the catchment area. Based on the land use within the catchment area, North River Swamp receives a moderate score for short term water quality improvement.

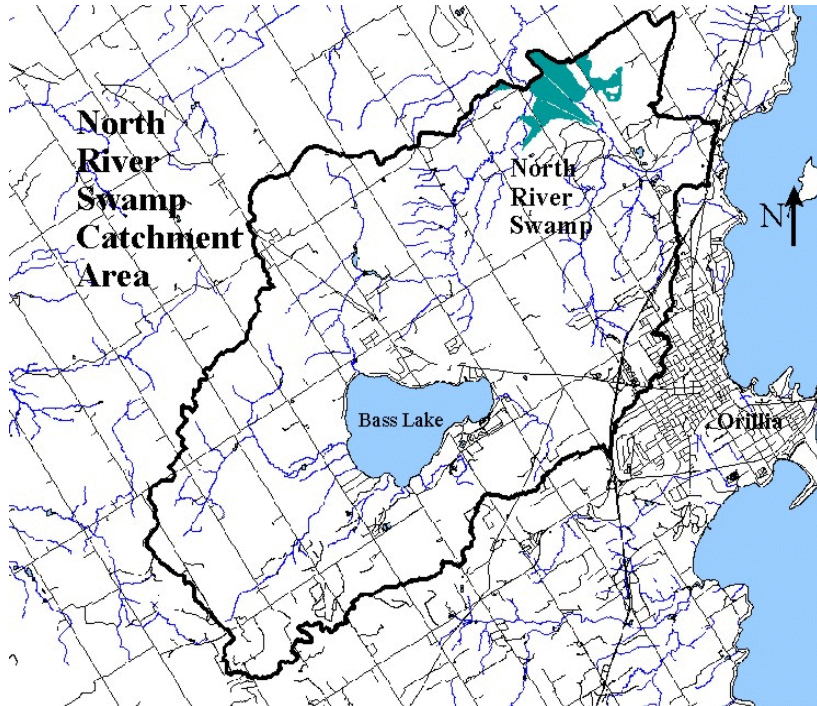


Figure 8: North River Swamp Catchment Area

There are numerous springs and seeps in North River Swamp, including groundwater discharge throughout wetland community S2 (Figure 9). In addition, there is a small area of marl deposits (Figure 10), and the wetland is surrounded by hilly topography. These factors contribute to a moderately high score for groundwater discharge.



Figure 9: Groundwater Discharge in Community S2



Figure 10: Marl Deposits in Community F1

2.4 Special Features Component

Special features attributes include rare species and significant wildlife habitat. During field visits to North River Swamp, the field crew recorded 123 plant species (Appendix A), and 149 wildlife species, including birds, mammals, amphibians, reptiles, butterflies, dragonflies and damselflies, and fish (Appendix B) in the wetland and adjacent uplands.

The field crew documented 62 species of birds in the wetland during field visits, including breeding birds, summer residents and migrants. Waterfowl utilizing the wetland included Wood Duck (*Aix sponsa*) and Mallard (*Anas platyrhynchos*). Other wetland avifauna noted included Great Blue Heron (*Ardea herodias*), Green Heron (*Butorides virescens*), Alder Flycatcher (*Empidonax alnorum*), Northern Waterthrush (*Seiurus noveboracensis*), Swamp Sparrow (*Melospiza georgiana*), and Belted Kingfisher (*Ceryle alcyon*), among many others.

Migrant birds observed using the wetland in spring/fall included: Golden-crowned Kinglet (*Regulus satrapa*), and Ruby-crowned Kinglet (*Regulus calendula*). Several additional bird species were observed outside the wetland boundaries, including Pine Warbler (*Dendroica pinus*), Savannah Sparrow (*Passerculus sandwichensis*), Baltimore Oriole (*Icterus galbula*), and a small flock of Pine Grosbeak (*Pinicola enucleator*) in the fall.

Seven species of amphibians and three species of reptiles were observed in the wetland during the field season: Red-spotted Newt (*Notophthalmus viridescens viridescens*), American Toad (*Bufo americanus*), Gray Treefrog (*Hyla versicolor*), Spring Peeper (*Pseudacris crucifer*), Wood Frog (*Rana sylvatica*), Northern Leopard Frog (*Rana pipiens*), Green Frog (*Rana clamitans melanota*), Common Snapping Turtle (Figure 11), Eastern Garter Snake (*Thamnophis sirtalis sirtalis*), and Northern Water Snake (*Nerodia sipedon sipedon*).



Figure 11: Snapping Turtle (*Chelydra serpentina serpentina*)

Mammals were observed directly and/or were identified by the presence of tracks, scat, and browse. Five mammal species were identified in the wetland during 2007 field work, including Eastern Chipmunk (*Tamias striatus*), Beaver, Raccoon, Red Squirrel and White-tailed Deer (*Odocoileus virginianus*).

Minnows were trapped in the summer and fall 2007 at five locations in North River Swamp (Figure 2). Fish species trapped and observed in the wetland included Creek Chub (*Semotilus atromaculatus*) and Rainbow Trout (*Oncorhynchus mykiss*). In addition, fish sampling by SSEA in 2000 at a station in Silver Creek within the wetland boundaries documented Creek Chub, Brook Trout (*Salvelinus fontinalis*), Longnose Dace (*Rhinichthys cataractae*), Mud Minnow (*Umbra* sp.), Blacknose Dace (*Rhinichthys atratulus*), and Sculpin (*Cottus* sp.).

Twenty-eight species of dragonflies and damselflies were documented in North River Swamp during 2007 field investigations. Dragonfly and damselfly species observed during field investigations included Calico Pennant (*Celithemis elisa*), Slaty Skimmer (*Libellula incesta*), Fawn Darner (*Boyeria vinosa*), Dragonhunter (*Hagenius brevistylus*), Shadow Darner (*Aeshna umbrosa umbrosa*) (Figure 12), Emerald Spreadwing (*Lestes dryas*), Variable Dancer (*Argia fumipennis violacea*), and Sedge Sprite (*Nehalinnia irene*). Three species uncommon in Simcoe County were identified in the wetland: Sweetflag Spreadwing (*Lestes forcipatus*), Frosted Whiteface (*Leucorrhinia frigida*), and Band-winged Meadowhawk (*Sympetrum emicinctum*).



photo: Bob Bowles

Figure 12: Shadow Darner (*Aeshna umbrosa umbrosa*)

Twenty-eight species of butterflies were identified in the wetland during 2007, including six uncommon Simcoe County species: Black Swallowtail (*Papilio polyxenes*), Summer Azure (*Celastrina neglecta*), Silvery Blue (*Glaucopsyche lygdamus*), Baltimore Checkerspot (*Euphydryas phaeton*), Gray Comma (*Polygonia progne*), and Least Skipper (*Ancyloxypha numitor*). Milbert's Tortoiseshell (*Nymphalis milberti*) (Figure 13), another uncommon species for Simcoe County, was observed outside the boundaries of North River Swamp.

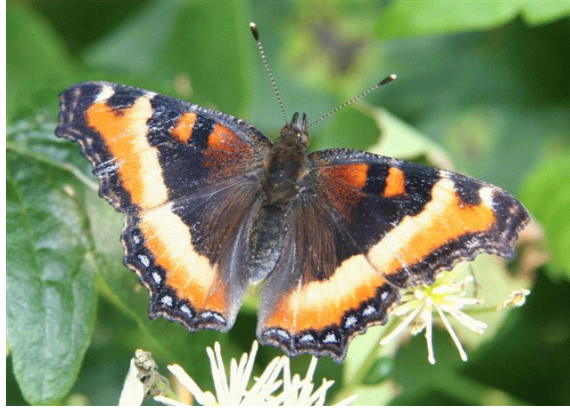


photo: Bob Bowles

Figure 13: Milbert's Tortoiseshell (*Nymphalis milberti*)

There is no known breeding, migration, or feeding habitat for Endangered species in North River Swamp. Zebra Clubtail (*Stylurus scudderi*) (Figure 14), a Provincially Significant dragonfly species, was observed during 2007 fieldwork. However, in consultation with OMNR, it was determined that the wetland area it was found in should be complexed with the Silver Creek wetland system, rather than North River Swamp. It is probable that this species occurs within the North River Swamp complex as well, but that has not been verified at this time.



photo: Bob Bowles

Figure 14: Zebra Clubtail (*Stylurus scudderi*)

2.4.1 Fish and Wildlife Habitat

North River Swamp contains stands of coniferous trees mixed with deciduous trees and shrubs, which provides good winter cover for White-tailed Deer. In addition, habitat in the wetland may attract deer from a nearby deer concentration area, and thus the wetland is considered locally significant winter cover for wildlife (B. Allan, pers. comm.).

While waterfowl breeding, staging and moulting occur in North River Swamp, they are not known to be of national, provincial or regional significance, and thus score relatively low in the evaluation.

Fish habitat is present in North River Swamp, as evidenced by the minnows trapped and larger fish observed during 2007 field visits, as well as results from previous fish studies (OMNR unpublished, SSEA unpublished). In addition, the streams are considered to be coldwater fish habitat; as a result, spawning and nursery habitat, and migration and staging habitat are considered locally significant by the OMNR (B. Allan, pers. comm.).

2.5 Extra Information

Non-native, invasive species are of concern in many wetlands, including North River Swamp. The non-native, invasive shrubs Glossy Buckthorn (*Rhamnus frangula*) and Common Buckthorn (*Rhamnus cathartica*) were observed in several locations in North River Swamp, both in the understory and as taller shrubs. These species will likely continue to spread through the wetland over time and eventually begin to out-compete native species for habitat, reducing overall plant diversity in the wetland.

Another problem non-native, invasive species, Giant Hogweed (*Heracleum mantegazzianum*), was observed at the edge of the Uhthoff trail and extending into the wetland (Figure 15). The sap of this large plant causes a severe reaction when it contacts bare skin that is then exposed to sunlight.



photo: Bob Bowles

Figure 15: Giant Hogweed (*Heracleum mantegazzianum*)

2.6 Evaluation Score

The total score for North River Swamp is 642, making it a Provincially Significant Wetland. North River Swamp scores 156 in the Biological component, 160 in the Social component, 148 in the Hydrological component, and 178 in the Special Features component. The Data and Scoring Record is on file with the OMNR Midhurst District.

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Appendix A
Plants of North River Swamp
Observed during 2007 Wetland Evaluation field work

Family Name	Genus	Species	Common Name	Additional Notes
PINACEAE	<i>Abies</i>	<i>balsamea</i>	Balsam Fir	
ACERACEAE	<i>Acer</i>	<i>rubrum</i>	Red Maple	
ACERACEAE	<i>Acer</i> X	<i>freemanii</i>	Hybrid Soft Maple	
POLYPODIACEAE	<i>Adiantum</i>	<i>pedatum</i>	Northern Maidenhair Fern	
LAMIACEAE	<i>Ajuga</i>	<i>reptans</i>	Creeping Bugleweed/Bugle	introduced species
ALISMATACEAE	<i>Alisma</i>	<i>plantago-aquatica</i>	Common Water-plantain	
BETULACEAE	<i>Alnus</i>	<i>incana ssp rugosa</i>	Speckled Alder	
RANUNCULACEAE	<i>Anemone</i>	<i>canadensis</i>	Canada Anemone	
RANUNCULACEAE	<i>Anemone</i>	<i>cylindrica</i>	Long-headed Thimblehead	
ARALIACEAE	<i>Aralia</i>	<i>hispidia</i>	Bristly Sarsaparilla	
ASCLEPIADACEAE	<i>Asclepias</i>	<i>incarnata ssp. incarnata</i>	Swamp Milkweed	
ASTERACEAE	<i>Aster</i>	<i>lanceolatus s lanceolatus</i>	Panicked Aster	
ASTERACEAE	<i>Aster</i>	<i>lateriflorus</i>	Calico Aster	
POLYPODIACEAE	<i>Athyrium</i>	<i>filix-femina ssp angustum</i>	Lady Fern	
BETULACEAE	<i>Betula</i>	<i>alleghaniensis</i>	Yellow Birch	
BETULACEAE	<i>Betula</i>	<i>papyrifera</i>	White Birch	
ASTERACEAE	<i>Bidens</i>	<i>cernua</i>	Nodding Beggarticks	
ASTERACEAE	<i>Bidens</i>	<i>frondosa</i>	Devil's Beggarticks	
POACEAE	<i>Calamagrostis</i>	<i>canadensis</i>	Canada Blue-Joint	
RANUNCULACEAE	<i>Caltha</i>	<i>palustris</i>	Marsh Marigold	
CYPERACEAE	<i>Carex</i>	<i>aurea</i>	Golden-fruited Sedge	
CYPERACEAE	<i>Carex</i>	<i>castanea</i>	Chestnut Sedge	
CYPERACEAE	<i>Carex</i>	<i>crinita</i>	Fringed Sedge	
CYPERACEAE	<i>Carex</i>	<i>flava</i>	Yellow Sedge	
CYPERACEAE	<i>Carex</i>	<i>gracillima</i>	Graceful Sedge	

Family Name	Genus	Species	Common Name	Additional Notes
CYPERACEAE	<i>Carex</i>	<i>hystericina</i>	Porcupine Sedge	
CYPERACEAE	<i>Carex</i>	<i>intumescens</i>	Bladder Sedge	
CYPERACEAE	<i>Carex</i>	<i>lupulina</i>	Hop Sedge	
CYPERACEAE	<i>Carex</i>	<i>scabrata</i>	Rough Sedge	
CYPERACEAE	<i>Carex</i>	<i>stipata</i>	Awl-fruited Sedge	
CYPERACEAE	<i>Carex</i>	<i>stricta</i>	Tussock Sedge	
CYPERACEAE	<i>Carex</i>	<i>vulpinoidea</i>	Fox Tail Sedge	
SCROPHULARIACEAE	<i>Chelone</i>	<i>glabra</i>	Turtlehead	
RANUNCULACEAE	<i>Clematis</i>	<i>virginiana</i>	Virgin's-bower	
LILIACEAE	<i>Clintonia</i>	<i>borealis</i>	Yellow Clintonia	
RANUNCULACEAE	<i>Coptis</i>	<i>trifolia</i> spp <i>groenlandica</i>	Goldthread	
CORNACEAE	<i>Cornus</i>	<i>alternifolia</i>	Alternate-leaved Dogwood	
CORNACEAE	<i>Cornus</i>	<i>amomum</i> ssp. <i>obliqua</i>	Silky Dogwood	
CORNACEAE	<i>Cornus</i>	<i>stolonifera</i>	Red-osier Dogwood	
ORCHIDACEAE	<i>Cypripedium</i>	<i>calceolus</i> var. <i>pubescens</i>	Large Yellow Lady's Slipper	
ORCHIDACEAE	<i>Cypripedium</i>	<i>calceolus</i> var. <i>parviflorum</i>	Small Yellow Lady's Slipper	
POLYPODIACEAE	<i>Cystopteris</i>	<i>bulbifera</i>	Bulblet Bladder Fern	
POACEAE	<i>Dactylis</i>	<i>glomerata</i>	Orchard Grass	introduced species
DROSERACEAE	<i>Drosera</i>	<i>rotundifolia</i>	Round-leaved Sundew	
POLYPODIACEAE	<i>Dryopteris</i>	<i>marginalis</i>	Marginal Wood Fern	
ORCHIDACEAE	<i>Epipactis</i>	<i>helleborine</i>	Helleborine	introduced species
EQUISETACEAE	<i>Equisetum</i>	<i>arvense</i>	Field Horsetail	
ASTERACEAE	<i>Eupatorium</i>	<i>maculatum</i>	Spotted Joe-pye-weed	
ASTERACEAE	<i>Eupatorium</i>	<i>perfoliatum</i>	Boneset	
ASTERACEAE	<i>Eupatorium</i>	<i>rugosum</i>	White Snakeroot	
OLEACEAE	<i>Fraxinus</i>	<i>nigra</i>	Black Ash	
OLEACEAE	<i>Fraxinus</i>	<i>pennsylvanica</i> var <i>subintegerrima</i>	Green Ash	
RUBIACEAE	<i>Galium</i>	<i>palustre</i>	Marsh Bedstraw	
GENTIANACEAE	<i>Gentiana</i>	<i>andrewsii</i>	Closed Gentian	

Family Name	Genus	Species	Common Name	Additional Notes
ROSACEAE	<i>Geum</i>	<i>aleppicum</i>	Yellow Avens	
ROSACEAE	<i>Geum</i>	<i>canadense</i>	White Avens	
POACEAE	<i>Glyceria</i>	<i>striata</i>	Fowl Meadow or Manna Grass	
POLYPODIACEAE	<i>Gymnocarpium</i>	<i>dryopteris</i>	Oak Fern	
APIACEAE	<i>Heracleum</i>	<i>mantegazzianum</i>	Giant Hog-weed	introduced species (photo)
POACEAE	<i>Hierochloe</i>	<i>odorata ssp.odorata</i>	Sweet Grass	
BALSAMINACEAE	<i>Impatiens</i>	<i>capensis</i>	Spotted Touch-me-not	
IRIDACEAE	<i>Iris</i>	<i>versicolor</i>	Large Blue-flag	
PINACEAE	<i>Larix</i>	<i>laricina</i>	Tamarack/American Larch	
ERICACEAE	<i>Ledum</i>	<i>groenlandicum</i>	Labrador Tea	
CAMPANULACEAE	<i>Lobelia</i>	<i>siphilitica</i>	Great Lobelia	
CAPRIFOLIACEAE	<i>Lonicera</i>	<i>tatarica</i>	Tartarian Honeysuckle	introduced species
FABACEAE	<i>Lotus</i>	<i>corniculatus</i>	Bird's-foot Trefoil	introduced species
LAMIACEAE	<i>Lycopus</i>	<i>americanus</i>	Cut-leaved Water-horehound	
PRIMULACEAE	<i>Lysimachia</i>	<i>ciliata</i>	Fringed Loosestrife	
POLYPODIACEAE	<i>Matteuccia</i>	<i>struthiopteris</i>	Ostrich Fern	
LAMIACEAE*	<i>Mentha</i>	<i>spicata</i>	Spearmint	introduced species
POACEAE	<i>Muhlenbergia</i>	<i>mexicana</i>	Satin Grass	
BORAGINACEAE	<i>Myosotis</i>	<i>scorpioides</i>	True Forget-me-not	introduced species
POLYPODIACEAE	<i>Onoclea</i>	<i>sensibilis</i>	Sensitive Fern	
OSMUNDACEAE	<i>Osmunda</i>	<i>cinnamomea</i>	Cinnamon Fern	
OSMUNDACEAE	<i>Osmunda</i>	<i>regalis</i>	Royal Fern	
BETULACEAE	<i>Ostrya</i>	<i>virginiana</i>	Ironwood / Hop Hornbeam	
SAXIFRAGACEAE	<i>Parnassia</i>	<i>glauca</i>	American Grass-of-Parnassus	
VITACEAE	<i>Parthenocissus</i>	<i>inserta</i>	Virginia Creeper	
POACEAE	<i>Phalaris</i>	<i>arundinacea</i>	Reed Canary Grass	
POACEAE	<i>Phragmites</i>	<i>australis</i>	Reed Grass	introduced species
PINACEAE	<i>Picea</i>	<i>mariana</i>	Black Spruce	
PINACEAE	<i>Pinus</i>	<i>strobus</i>	Eastern White Pine	

Family Name	Genus	Species	Common Name	Additional Notes
ORCHIDACEAE	<i>Pogonia</i>	<i>ophioglossoides</i>	Rose Pogonia	
POLYGONACEAE	<i>Polygonum</i>	<i>lapathifolium</i>	Pale Smartweed	
SALICACEAE	<i>Populus</i>	<i>balsamifera</i>	Balsam Poplar	
SALICACEAE	<i>Populus</i>	<i>tremuloides</i>	Trembling Aspen	
ROSACEAE	<i>Prunus</i>	<i>serotina</i>	Wild Black Cherry	
ROSACEAE	<i>Prunus</i>	<i>virginiana</i>	Choke Cherry	
FAGACEAE	<i>Quercus</i>	<i>rubra</i>	Red Oak	
RHAMNACEAE	<i>Rhamnus</i>	<i>cathartica</i>	Common Buckthorn	introduced species
RHAMNACEAE	<i>Rhamnus</i>	<i>frangula</i>	Glossy Buckthorn	introduced species
ANACARDIACEAE	<i>Rhus</i>	<i>radicans ssp. rydbergii</i>	Rydberg's Poison-ivy	
CYPERACEAE	<i>Rhynchospora</i>	<i>alba</i>	White Beaked-rush	
ROSACEAE	<i>Rubus</i>	<i>allegheniensis</i>	Alleghany Blackberry	
SALICACEAE	<i>Salix</i>	<i>amygdaloides</i>	Peachleaf Willow	
SALICACEAE	<i>Salix</i>	<i>discolor</i>	Pussy Willow	
SALICACEAE	<i>Salix</i>	<i>petiolaris</i>	Slender Willow	
CYPERACEAE	<i>Scirpus</i>	<i>atrovirens</i>	Dark Green Bulrush	
CYPERACEAE	<i>Scirpus</i>	<i>cyperinus</i>	Wool-grass	
LAMIACEAE	<i>Scutellaria</i>	<i>lateriflora</i>	Mad-dog Skullcap	
SOLANACEAE	<i>Solanum</i>	<i>dulcamara</i>	Climbing Nightshade	introduced species
ASTERACEAE	<i>Solidago</i>	<i>rugosa ssp. rugosa</i>	Rough Goldenrod	
ROSACEAE	<i>Spiraea</i>	<i>alba</i>	Narrow-leaved Meadowsweet	
ORCHIDACEAE	<i>Spiranthes</i>	<i>cernua</i>	Nodding Ladies' Tresses	
TAXACEAE	<i>Taxus</i>	<i>canadensis</i>	Canadian Yew	
RANUNCULACEAE	<i>Thalictrum</i>	<i>pubescens</i>	Tall Meadow-rue	
POLYPODIACEAE	<i>Thelypteris</i>	<i>palustris var. pubescens</i>	Marsh Fern	
CUPRESSACEAE	<i>Thuja</i>	<i>occidentalis</i>	N. White Cedar	
TILIACEAE	<i>Tilia</i>	<i>americana</i>	American Basswood	
ASTERACEAE	<i>Tragopogon</i>	<i>pratensis ssp. pratensis</i>	Meadow Goat's-beard	introduced species
LILIACEAE	<i>Trillium</i>	<i>cernuum</i>	Nodding Trillium	

Family Name	Genus	Species	Common Name	Additional Notes
CAPRIFOLIACEAE	<i>Triosteum</i>	<i>aurantiacum</i>	Scarlet-fruited Horse-gentian	
ASTERACEAE	<i>Tussilago</i>	<i>farfara</i>	Coltsfoot	introduced species
TYPHACEAE	<i>Typha</i>	<i>angustifolia</i>	Narrow-leaved Cattail	
TYPHACEAE	<i>Typha X</i>	<i>glauca</i>	Hybrid Cattail	
ULMACEAE	<i>Ulmus</i>	<i>americana</i>	American Elm	
URTICACEAE	<i>Urtica</i>	<i>dioica ssp. gracilis</i>	Stinging Nettle	
ERICACEAE	<i>Vaccinium</i>	<i>oxycocos</i>	Small Cranberry	
VERBENACEAE	<i>Verbena</i>	<i>hastata</i>	Blue Vervain	
CAPRIFOLIACEAE	<i>Viburnum</i>	<i>lentago</i>	Nannyberry	
VITACEAE	<i>Vitis</i>	<i>riparia</i>	Riverbank Grape	

Appendix B
Fauna of North River Swamp
Recorded During 2007 Wetland Evaluation Field Work

Common Name	Scientific Name	Additional Notes
Birds		
Double-crested Cormorant	<i>Phalacrocorax auritus</i>	observed outside wetland boundaries
Great Blue Heron	<i>Ardea herodias</i>	
Green Heron	<i>Butorides virescens</i>	
Turkey Vulture	<i>Cathartes aura</i>	
Wood Duck	<i>Aix sponsa</i>	
Mallard	<i>Anas platyrhynchos</i>	
Sharp-shinned Hawk	<i>Accipiter striatus</i>	
Broad-winged Hawk	<i>Buteo platypterus</i>	
Red-tailed Hawk	<i>Buteo jamaicensis</i>	
Rough-legged Hawk	<i>Buteo lagopus</i>	observed outside wetland; Provincially Significant species
Ruffed Grouse	<i>Bonasa umbellus</i>	
Killdeer	<i>Charadrius vociferus</i>	observed outside wetland boundaries
Solitary Sandpiper	<i>Tringa solitaria</i>	
American Woodcock	<i>Scolopax minor</i>	
Ring-billed Gull	<i>Larus delawarensis</i>	
Mourning Dove	<i>Zenaida macroura</i>	
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	
Ruby-throated Hummingbird	<i>Archilochus colubris</i>	
Belted Kingfisher	<i>Ceryle alcyon</i>	
Downy Woodpecker	<i>Picoides pubescens</i>	
Hairy Woodpecker	<i>Picoides villosus</i>	
Northern Flicker	<i>Colaptes auratus</i>	
Pileated Woodpecker	<i>Dryocopus pileatus</i>	
Eastern Wood-Pewee	<i>Contopus virens</i>	
Alder Flycatcher	<i>Empidonax alnorum</i>	
Least Flycatcher	<i>Empidonax minimus</i>	
Eastern Phoebe	<i>Sayornis phoebe</i>	
Great Crested Flycatcher	<i>Myiarchus crinitus</i>	
Eastern Kingbird	<i>Tyrannus tyrannus</i>	
Red-eyed Vireo	<i>Vireo olivaceus</i>	
Blue Jay	<i>Cyanocitta cristata</i>	
American Crow	<i>Corvus brachyrhynchos</i>	
Common Raven	<i>Corvus corax</i>	
Black-capped Chickadee	<i>Poecile atricapillus</i>	

Common Name	Scientific Name	Additional Notes
Red-breasted Nuthatch	<i>Sitta canadensis</i>	
White-breasted Nuthatch	<i>Sitta carolinensis</i>	
Brown Creeper	<i>Certhia americana</i>	
House Wren	<i>Troglodytes aedon</i>	
Winter Wren	<i>Troglodytes troglodytes</i>	
Golden-crowned Kinglet	<i>Regulus satrapa</i>	fall migrants
Ruby-crowned Kinglet	<i>Regulus calendula</i>	fall migrants
Veery	<i>Catharus fuscescens</i>	
Wood Thrush	<i>Hylocichla mustelina</i>	
American Robin	<i>Turdus migratorius</i>	
Gray Catbird	<i>Dumetella carolinensis</i>	
European Starling	<i>Sturnus vulgaris</i>	observed outside wetland boundaries
Cedar Waxwing	<i>Bombycilla cedrorum</i>	
Nashville Warbler	<i>Vermivora ruficapilla</i>	
Yellow Warbler	<i>Dendroica petechia</i>	
Black-throated Blue Warbler	<i>Dendroica caerulescens</i>	observed outside wetland boundaries
Yellow-rumped Warbler	<i>Dendroica coronata</i>	
Black-throated Green Warbler	<i>Dendroica virens</i>	
Pine Warbler	<i>Dendroica pinus</i>	observed outside wetland boundaries
Black-and-White Warbler	<i>Mniotilta varia</i>	
American Redstart	<i>Setophaga ruticilla</i>	
Ovenbird	<i>Seiurus aurocapillus</i>	
Northern Waterthrush	<i>Seiurus noveboracensis</i>	
Common Yellowthroat	<i>Geothlypis trichas</i>	
Chipping Sparrow	<i>Spizella passerina</i>	observed outside wetland boundaries
Savannah Sparrow	<i>Passerculus sandwichensis</i>	observed outside wetland boundaries
Song Sparrow	<i>Melospiza melodia</i>	
Swamp Sparrow	<i>Melospiza georgiana</i>	
White-throated Sparrow	<i>Zonotrichia albicollis</i>	
Dark-eyed Junco	<i>Junco hyemalis</i>	fall migrants
Northern Cardinal	<i>Cardinalis cardinalis</i>	
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>	
Indigo Bunting	<i>Passerina cyanea</i>	
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	
Common Grackle	<i>Quiscalus quiscula</i>	
Baltimore Oriole	<i>Icterus galbula</i>	observed outside wetland boundaries
Pine Grosbeak	<i>Pinicola enucleator</i>	observed outside wetland boundaries; fall migrants
American Goldfinch	<i>Carduelis tristis</i>	

Common Name	Scientific Name	Additional Notes
Amphibians		
Red-spotted Newt	<i>Notophthalmus viridescens viridescens</i>	
American Toad	<i>Bufo americanus</i>	
Tetraploid Gray Treefrog	<i>Hyla versicolor</i>	
Spring Peeper	<i>Pseudacris crucifer</i>	
Wood Frog	<i>Rana sylvatica</i>	
Northern Leopard Frog	<i>Rana pipiens</i>	
Green Frog	<i>Rana clamitans melanota</i>	
Reptiles		
Common Snapping Turtle	<i>Chelydra serpentina serpentina</i>	photo
Eastern Garter Snake	<i>Thamnophis sirtalis sirtalis</i>	
Northern Water Snake	<i>Nerodia sipedon sipedon</i>	
Dragonflies & Damselflies		
Ebony Jewelwing	<i>Calopteryx maculata</i>	
Emerald Spreadwing	<i>Lestes dryas</i>	
Sweetflag Spreadwing	<i>Lestes forcipatus</i>	uncommon species in Simcoe County
Variable Dancer	<i>Argia fumipennis violacea</i>	
Aurora Damsel	<i>Chromagrion conditum</i>	
Marsh Bluet	<i>Enallagma ebrium</i>	
Eastern Forktail	<i>Ischnura verticalis</i>	
Sedge Sprite	<i>Nehalinnia irene</i>	
Canadian Darner	<i>Aeshna canadensis</i>	
Shadow Darner (Common Paddletail)	<i>Aeshna umbrosa umbrosa</i>	
Common Green Darner	<i>Anax junius</i>	
Springtime Darner	<i>Basiaeschna janata</i>	uncommon species in Simcoe County; observed outside wetland
Fawn Darner	<i>Boyeria vinosa</i>	
Dragonhunter	<i>Hagenius brevistylus</i>	photo
Zebra Clubtail	<i>Stylurus scudderi</i>	observed outside wetland; Provincially Significant species (photo)
Beaverpond Baskettail	<i>Epitheca canis</i>	
Calico Pennant	<i>Celithemis elisa</i>	
Eastern Pondhawk	<i>Erythemis simplicicollis</i>	
Frosted Whiteface	<i>Leucorrhinia frigida</i>	uncommon species in Simcoe County
Dot-tailed Whiteface	<i>Leucorrhinia intacta</i>	
Belted Whiteface	<i>Leucorrhinia proxima</i>	
Slaty Skimmer	<i>Libellula incesta</i>	
Widow Skimmer	<i>Libellula luctuosa</i>	
Common Whitetail	<i>Plathemis (Libellula) lydia</i>	
Twelve-spotted Skimmer	<i>Libellula pulchella</i>	
Four-spotted Skimmer	<i>Libellula quadrimaculata</i>	

Common Name	Scientific Name	Additional Notes
Cherry-faced Meadowhawk	<i>Sympetrum internum</i>	
White-faced Meadowhawk	<i>Sympetrum obtrusum</i>	
Band-winged Meadowhawk	<i>Sympetrum semicinctum</i>	uncommon species in Simcoe County
Yellow-legged Meadowhawk	<i>Sympetrum vicinum</i>	
Butterflies		
Black Swallowtail	<i>Papilio polyxenes</i>	uncommon species in Simcoe County
Canadian Tiger Swallowtail	<i>Papilio canadensis</i>	
Mustard White	<i>Pieris oleracea (napi)</i>	
Cabbage White	<i>Pieris rapae</i>	
Clouded Sulphur	<i>Colias philodice</i>	
Orange Sulphur	<i>Colias eurytheme</i>	
Summer Azure	<i>Celastrina neglecta</i>	uncommon species in Simcoe County
Silvery Blue	<i>Glaucopsyche lygdamus</i>	uncommon species in Simcoe County
Great Spangled Fritillary	<i>Speyeria cybele</i>	
Meadow Fritillary	<i>Boloria bellona</i>	observed outside wetland boundaries
Northern Crescent	<i>Phyciodes pascoensis (selenis)</i>	
Baltimore Checkerspot	<i>Euphydryas phaeton</i>	uncommon species in Simcoe County
Question Mark	<i>Polygonia interrogationis</i>	
Gray Comma	<i>Polygonia progne</i>	uncommon species in Simcoe County
Mourning Cloak	<i>Nymphalis antiopa</i>	
Milbert's Tortoiseshell	<i>Nymphalis milberti</i>	uncommon species in Simcoe County; observed outside wetland (photo)
Red Admiral	<i>Vanessa atalanta</i>	
White Admiral	<i>Limenitis arthemis</i>	
Viceroy	<i>Limenitis archippus</i>	
Northern Pearly Eye	<i>Enodia anthedon</i>	
Eyed Brown	<i>Satyrodes eurydice</i>	
Little Wood Satyr	<i>Megisto cymela</i>	
Common Ringlet	<i>Coenonympha tullia</i>	
Common Wood Nymph	<i>Cercyonis pegala</i>	
Monarch	<i>Danaus plexippus</i>	'Special Concern' nationally and provincially
Dreamy Duskywing	<i>Erynnis icelus</i>	
Least Skipper	<i>Ancyloxypha numitor</i>	uncommon species in Simcoe County
European Skipper	<i>Thymelicus lineola</i>	
Northern Broken-dash	<i>Wallengrenia egeremet</i>	
Dun Skipper	<i>Euphyes vestris</i>	

Common Name	Scientific Name	Additional Notes
Mammals		
Eastern Chipmunk	<i>Tamias striatus</i>	
Red Squirrel	<i>Tamiasciurus hudsonicus</i>	
Beaver	<i>Castor canadensis</i>	
Raccoon	<i>Procyon lotor</i>	
White-tailed Deer	<i>Odocoileus virginianus</i>	
Fish		
Creek Chub	<i>Semotilus atromaculatus</i>	identified in minnow trap
Steelhead (Rainbow) Trout	<i>Oncorhynchus mykiss</i>	identified in dip net

Provincially Significant species include species tracked by the Natural Heritage Information Centre (NHIC) and those having a Provincial Rank of S1, S2, S3, or SH. Provincial Ranks are assigned by NHIC and are reported on the NHIC web-site: http://nhic.mnr.gov.on.ca/MNR/nhic/species/species_list.cfm

Uncommon designations are reported in: Bowles, R. L. 1998. Butterflies of Simcoe County
Bowles, R. L. 2006. Odonata of Simcoe County (revised).