

NS Species at Risk  
Conservation Fund



## Census of Globally Rare, Endemic Butterflies of Nova Scotia Gulf of St Lawrence Salt Marshes



Salt Marsh Copper (*Lycaena dospassosi*) female, Wallace Bay NWA, July 26th, 2008

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**Project name:** Census of Globally Rare, Endemic Butterflies of Nova Scotia Gulf of St Lawrence Salt Marshes

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**Abstract:** A total of 74 records of 14 species of salt marsh inhabiting butterflies were collected during the six days of Atlantic Canada Conservation Data Centre's (CDC) Nova Scotia fieldwork during the summer of 2008. Eleven records were directly related to target species of particular conservation concern. Indeed, four new sites harbouring the Salt Marsh Copper (*Lycaena dospassosi*) were located, but none of the fifty salt marshes visited were found to host either the Maritime Ringlet (*Coenonympha nipisiquit*) or the Short-tailed Swallowtail (*Papilio brevicauda*). More importantly, we now have a better understanding of the provincial, national, and international status and distribution of three globally rare, endemic salt marsh butterflies, i.e., the Salt Marsh Copper (*Lycaena dospassosi*), the Short-tailed Swallowtail (*Papilio brevicauda*), and the Maritime Ringlet (*Coenonympha nipisiquit*). Significantly, this project led to a 50% increase in total known Nova Scotia sites hosting the Salt Marsh Copper. In addition, a significant number of new records for other regionally and nationally rare species were collected during this project; illustrating the value of the sampling approach used. These results also illustrate the need for further intensive studies. Indeed, if we hope to get a better understanding of the true conservation status of these and other species potentially at risk or otherwise of conservation concern, more surveys are desperately needed.

## Introduction/Goals/Objectives

During the last 10 to 15 years, our general understanding of the ecology and diversity of butterflies (Lepidoptera) in Nova Scotia and across Canada has increased steadily. From a conservation standpoint, a significant proportion of the species of butterflies in North America are actually tied to habitats such as old fields and waste areas that could be described as “early successional” or “disturbed”, while still other species use more than a single type of larval foodplant and are therefore of somewhat limited conservation concern. In contrast, some butterfly species are much more specialized, i.e. very restricted in their use of larval foodplants or more confined to specialized habitats such as bogs, salt marshes or mature forests that harbour their particular larval foodplant which may also be rare and are therefore of much greater conservation concern. Such is the case with three species occurring in the salt marshes of the Atlantic region of Canada, namely the Maritime Ringlet (*Coenonympha nipisiquit*), the Short-tailed Swallowtail (*Papilio brevicauda*) and the Salt Marsh Copper (*Lycaena dospassosi*). In fact, this “Gulf of St Lawrence salt marsh trio” comprises three quarters of the four species of butterfly that are endemic to Canada. The fourth species, Johanssen’s Sulphur, is apparently tied to just a few suitable hillsides near Bernards Harbour in the Northwest Territories. The goal of this study was to get a better understanding of the distribution of the three species of rare, endemic salt marsh butterflies in Nova Scotia and the region.

Historically and more recently, approximately 9 000 butterfly records have been compiled by biologists and naturalists in the Maritimes to 2008. Despite the fact that most species of butterfly occurring in North America are generally well-known and considering the popularity of this group with naturalists generally, butterflies in our region have actually been lightly sampled as compared to most other regions of North America. Sampling in remote areas and certain habitats such as salt marshes in the region have been especially limited. In comparison, nearby jurisdictions such as Maine presently have about five times as many records to draw on for their conservation status evaluations (R.P Webster, pers. comm., 2008). Actual distribution of most rare species in this region, including the three target endemic salt marsh species in the present study, is still incompletely understood, making status assessments difficult.

This project used stratified random site selection and intensive targeted sampling to help better assess the status of endemic salt marsh butterflies along the Gulf of St Lawrence Coast of Nova Scotia. Although we focussed on the three endemic salt marsh species, we compiled data on all butterfly species encountered. We believe that the random selection of sites in this study produced results that provide a good indication of the status of these rare species across the entire study area.

## Methods Used / Outline of Work Completed

A total of fifty salt marsh sites were visited in the course of this study. Twenty-five of the initial forty-five stratified random selection sites, all of which were salt marshes along the Gulf of St Lawrence coast of Nova Scotia, were retained for further study (a “second pass”) after an initial visit during this survey. Each of the 25 sites found to be suitable, i.e. potentially host the any one of the target species, was sampled intensively (“first pass”), both by conducting surveys for adults and egg/larval searches on the different larval foodplants. Sampling focused mainly on a) locating larval foodplants and searching for signs of eggs/larvae/pupae and b) searching for, collecting or photographing adults when found, especially when sufficient amount of the larval foodplants were felt to be present to host a potential population in a radius of 100 m of the site centre harbouring the larval foodplants. Later (“second pass”), these areas were searched mainly for adults, but larval foodplants were still searched when encountered. A subset of twelve sites (including the four “control sites”) across the study region was visited more frequently in order to partially assess the phenology of at least the Salt Marsh Copper. Each site visit lasted between 30 and 90 minutes. All 45 initial sites were visited at least once between July 16th, 2008 and September 21st, 2008. A total of six 12-14 hour days were completed. However, a spate of bad weather in late July and early August made surveying the initially forecast 12 days for adults virtually impossible. Despite these challenges, it is felt that the effort made was still sufficient to conclude that the results obtained were representative of the actual status of some of the target species. However, a further six field days would be desirable to better ascertain the status of the target species. It is hoped that weather next summer will allow for this to happen. This is discussed in further detail in the discussion and conclusions sections.

As it became evident that preferred larval foodplant locally (*Ligusticum scoticum*-Scotch Lovage) for one of the three target species (*Papilio brevicauda*-Short-tailed Swallowtail) was not particularly common at the sites randomly selected in the study area, a further 5 specially-selected sites (for a total of 30 sites retained for future monitoring as described in the initial project outline) were added to the initial experimental design to increase the possibility of locating this species. These 5 “extra” sites were chosen to best approximate what was believed to be the habitat preferences of this and the other two target species, but this species was still not located. It would be desirable to choose a larger number of sites known to harbour Scotch Lovage (possibly next summer) to better ascertain whether this species is truly absent from this coastline.

**Table 1** (on page 6) identifies the sites visited. A map of these sites is found in Appendix 1, Finally, a database of all records (including non-butterflies) from Nova Scotia added by this study during the summer of 2008 is found in Appendix 2 (Excel spreadsheet), where records of the target endemic species found are presented in bold. A total of 156 records, representing 22 specimens, as well as

some ~75 sight or photographic records (especially of common or easily identifiable species), were gathered during this study. All specimens collected (photographic vouchers included) will be deposited at the Nova Scotia Museum of Natural History in the near future. The appendix 2 full spreadsheet includes: species name, surveyors' names, collection date, site name and geolocation. This dataset will shortly be incorporated into the Atlantic Canada Conservation Data Centre's (CDC's) database. With permission of staff of the NS Department of Natural Resources, this database will also shortly be forwarded to the Nova Scotia Museum of Natural History as well .

**Table 1- List of salt marsh/dune sites visited with geolocation, including four salt marsh control sites, summer 2008**

<b>Table 1- Nova Scotia Salt Marsh Butterflies Survey sites, 2009</b>			
Datum: NAD83			
<b>Site name</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Info</b>
Archie Pond	N 45.65592°	W 61.44031 °	not suitable for further study
Arisaig	N 45.75957°	W 62.16979 °	not suitable for further study
Ballantynes Cv	N 45.85945°	W 61.91833 °	not suitable for further study
Big Is Beach	N 45.67441°	W 62.38929 °	
Big Tracadie	N 45.61775°	W 61.61844 °	not suitable for further study
Blue Sea Beach	N 45.80468°	W 63.30329 °	
Breens	N 45.674 °	W 61.57876 °	not suitable for further study
Brown Bay	N 45.82619°	W 63.44572 °	not suitable for further study
Brownsville Huggans	N 45.64767°	W 62.38602 °	
<b>Brulé</b>	<b>N 45.74023°</b>	<b>W 63.21697 °</b>	<b>new SM Copper site 2009</b>
Cape John Megs Cv	N 45.79825°	W 63.10645 °	not suitable for further study
Caribou Waterside	N 45.75861°	W 62.77701 °	
Dunns Cv	N 45.66248°	W 61.93266 °	not suitable for further study
E Tracadie Barrios	N 45.64161°	W 61.62655 °	not suitable for further study
<b>Emery Is</b>	<b>N 45.76181°</b>	<b>W 63.3417 °</b>	<b>new SM Copper site 2009</b>
<b>Fox Hbr Fox Ck</b>	<b>N 45.85264°</b>	<b>W 63.48796 °</b>	<b>new SM Copper site 2009</b>
French Pt	N 45.62991°	W 62.44298 °	not suitable for further study
Havre Boucher Barach	N 45.67977°	W 61.52558 °	
Havre Boucher Op Jack	N 45.68466°	W 61.55342 °	not suitable for further study
Havre Boucher N	N 45.69056°	W 61.52699 °	
Hbr Centre	N 45.68653°	W 61.91569 °	
Lakevale North Lk	N 45.7799 °	W 61.91839 °	not suitable for further study
Lismore	N 45.70575°	W 62.26865 °	not suitable for further study
Livingston Cv	N 45.86862°	W 61.98102 °	not suitable for further study
Lr Barneys Rv	N 45.66486°	W 62.34796 °	
Mahoneys Beach	N 45.7045 °	W 61.90025 °	
Mahoneys Salt Marsh	N 45.70301°	W 61.90384 °	
Malagash 1	N 45.78877°	W 63.2721 °	
Malagash Pt	N 45.7933 °	W 63.25791 °	
Malignant Cv	N 45.78608°	W 62.08206 °	
Melmerby Beach	N 45.65725°	W 62.5091 °	
<b>Northport Shinimicas</b>	<b>N 45.93673°</b>	<b>W 63.87205 °</b>	<b>control site</b>
Ogdens Pnd	N 45.7196 °	W 61.89972 °	not suitable for further study
Placides Cove	N 45.62543°	W 61.6531 °	
Pomquet Evangeline	N 45.64204°	W 61.8493 °	
Pomquet Intervale	N 45.60553°	W 61.81471 °	not suitable for further study
Pomquet SW Hbr Rd	N 45.63781°	W 61.89104 °	
Port Howe Marsh Pt	N 45.8542 °	W 63.74222 °	
River John River Rd	N 45.75594°	W 63.06413 °	
Rushton Beach Prov Pk	N 45.75683°	W 63.12228 °	not suitable for further study
S Caribou Rd	N 45.73552°	W 62.75105 °	
<b>Sand Pt Tatamagouch</b>	<b>N 45.73125°</b>	<b>W 63.28691 °</b>	<b>control site</b>
Sinclairs Is	N 45.67717°	W 62.57589 °	
Skinners Cv	N 45.79308°	W 63.04415 °	
<b>Toney Ck</b>	<b>N 45.86391°</b>	<b>W 63.75864 °</b>	<b>control site</b>
Tracadie Benoit Is	N 45.63529°	W 61.68576 °	not suitable for further study
W Lakevale S Lk	N 45.76516°	W 61.9211 °	not suitable for further study
<b>Wallace</b>	<b>N 45.8197 °</b>	<b>W 63.48354 °</b>	<b>control site</b>
<b>Wallace Bay NWA</b>	<b>N 45.83079°</b>	<b>W 63.5662 °</b>	<b>new SM Copper site 2009</b>
William Pt	N 45.72836°	W 63.3111 °	not suitable for further study

## Results and Discussion / Lessons Learned

**Salt Marsh Copper-** Eight sites harbouring this species were recorded during the survey, including four new ones. These include Brulé, Emery Island, Fox Harbour and Wallace Bay National Wildlife Area. Interestingly, all sites harbouring this species were situated between the New Brunswick border and Brulé in Colchester County, strongly suggesting that this species is (still?) absent further along the coast. This is puzzling, given that apparently suitable habitat containing both the larval foodplant (*Potentilla egedii*, a silverweed) and the preferred nectaring plants for the adults (*Limonium nashii*, aka Sea Lavender) are available all the way to the Canso Causeway and likely beyond (Cape Breton and the Atlantic and Fundy coasts). Moreover, this species can be found at some sites such as Emery Island in very high numbers (likely in the thousands) quite far east in the study area. As mentioned briefly in the methods section, a spate of bad weather in late July and early August made sampling for adults of this



A somewhat worn-looking male SM Copper at Wallace NWA, July 26<sup>th</sup>, 2008



A male SM Copper nectaring on Sea Lavender at Northport, July 26<sup>th</sup>, 2008

species and the Maritime Ringlet problematical and possibly lead to some sites being recorded as not harbouring these species when they actually did. However, during the days we were present in the field, adults were flying at the control sites; therefore, it is felt that the sites recorded as negative for the SM Copper on that particularly day were likely accurate. In other words, the conclusion that this species seems to be absent in sites beyond Brulé in Colchester County is deemed to be accurate for the summer of 2008. It should also be pointed out that some butterfly experts feel that this species is actually rapidly expanding its range (cf Ross Layberry, Jim Edsall, pers. comm. 2008) and may colonize suitable habitats in the very near future, whilst others (cf R.P Webster, pers. comm. 2008) feel that this species has simply been overlooked in the past, given its habitat preference. Personally, I have seen encountered this species on roadsides in New Brunswick and Nova Scotia sometimes more than a kilometer from its most likely breeding area, therefore I am inclined to also

believe that this species is indeed expanding its range and will continue to do so, given the availability of suitable habitat.

**Short-tailed Swallowtail** - Despite the survey efforts described, no sign of the Short-tailed Swallowtail (*Papilio brevicauda*) was found anywhere in 50 sites visited. This was possibly due to the fact that its preferred larval foodplants (*Ligusticum scoticum* in the Maritimes) may be somewhat less common and growing in less dense patches along the Gulf of St Lawrence coast of Nova Scotia. As mentioned above, in order to insure that the absence of records of this species in our study was not an artifact of the random site selection, we specially chose a further 5 sites that most closely matched the known habitat preference of this species within the study area. These targeted sites along the coast still failed to turn up any specimens of the Short-tailed Swallowtail, but this should not be considered conclusive at this point. Indeed, further study would be desirable to better understand the extent of this species in Nova Scotia. This may be possible in the upcoming field season, i.e. to complete the days that we were unable to do during the summer of 2008.

**Maritime Ringlet** - Despite considerable survey efforts during the appropriate time period (mid-late July to mid-August) and the fact that both its larval food plant (*Spartina patens*- Salt Meadow Cordgrass) and its preferred nectar plant for adults (*Limonium nashii*- Sea Lavender) are relatively common in the study area, this species has not been found anywhere else than its stronghold in northeastern New Brunswick and the Gaspé peninsula of Québec. This species was listed as Endangered in Canada by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) in 1999. This survey further reinforces the results of other such surveys carried out in the region for this species over the last 10 years and supports the conclusion that this species remains restricted in its global range.

## **CONCLUSION and RECOMMENDATIONS**

Based on the results of this study, it would appear that the Maritime Ringlet is not present along the Gulf of St Lawrence Coast of mainland Nova Scotia. This is not surprising, based on the results of numerous previous studies. In order to ascertain whether the Short-Tailed Swallowtail is truly absent from this area, a more intensive survey specifically targeting a larger number of sites where Scotch Lovage is present in good amounts should be undertaken in the near future and may well happen next summer with the days we would like to complete as a follow-up to this study.

In the case of the Salt Marsh Copper, it appears to be present, often in good numbers in at least a few sites, along a 100 km stretch of this coastline between the New Brunswick/Nova Scotia border and the salt marshes around the villages of Tatamagouche and Brulé. Moreover, of the 9 sites now known to host



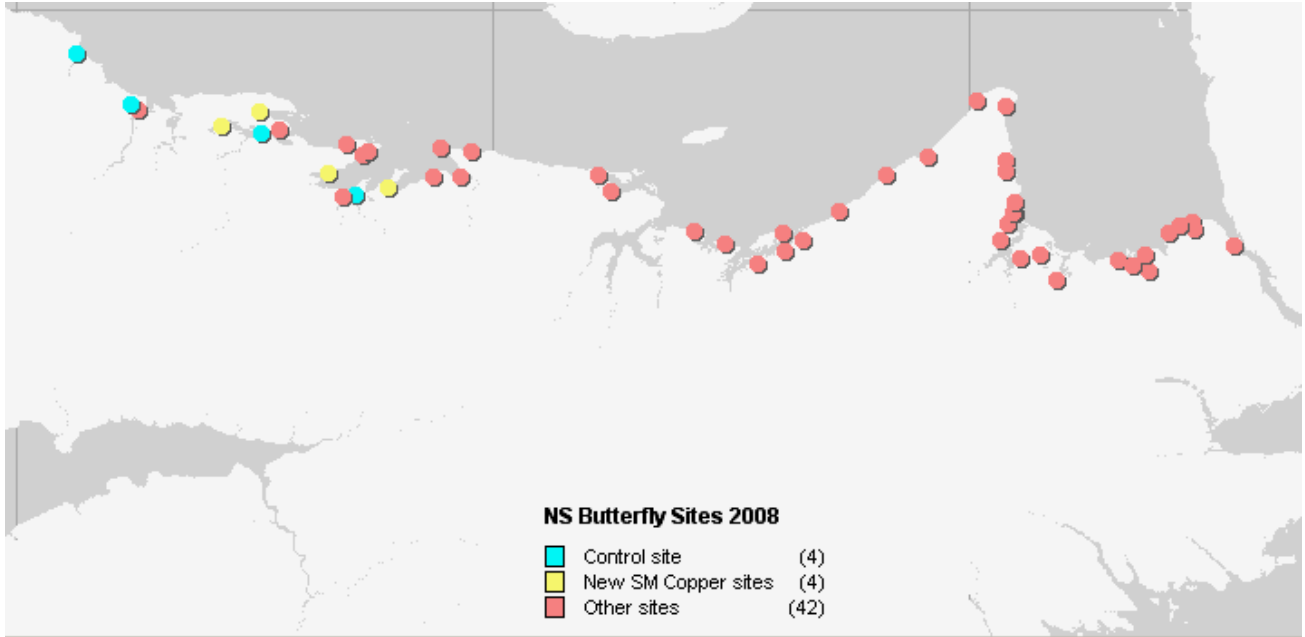
populations of the Salt Marsh Copper, at least three sites including: Emery Island near Malagash, the mouth of the Shinimicas River at Northport and the Wallace Bay National Wildlife Area salt marshes apparently harbour very healthy populations of this species (in the thousands of individuals). These populations may potentially serve as sources that could eventually assure the continued spread of the species or the re-colonization of sites where the Copper has suffered a local extinction. While there is no reason to suppose that these populations are under any immediate threat, these are still the only sites in Nova Scotia known at present to host important populations of this endemic butterfly which only uses salt marshes to complete its life cycle. Perhaps these sites should be protected from any further development. It is of course important to note that the site at Wallace Bay is already protected as a National Wildlife Area.

Further surveys along the Gulf of St Lawrence coast in subsequent years would be desirable to ascertain whether a) the Salt Marsh Copper is spreading and b) whether its population remains healthy. As salt marshes are a habitat that is somewhat under siege in the Maritimes (i.e. well over half of the salt marshes that were here at the time of first European contact have now disappeared), these butterflies could potentially serve as an additional indicator of the overall health of the remaining salt marshes along the coast.

## **Acknowledgements**

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**Appendix 1- Map of sites surveyed for 2008 NS Gulf of St Lawrence Salt Marsh Butterfly Survey**



## Appendix 2 – Spreadsheet of records

ScName	Common Name	Order	yyyy	mm	dd	SurveySite	LATDEC	LONGDEC	EOeid	Total observed
<i>Cicindela repanda novascotiae</i>	Bronzed Tiger Beetle	Coleoptera	2008	7	16	Northport Shinimicas Rv	45.935830	63.869230	photo	12
<i>Cicindela hirticollis rhodensis</i>	Hairy-necked Tiger Beetle	Coleoptera	2008	7	16	Northport Shinimicas Rv	45.935830	63.869230	photo	1
<i>Thymelicus lineola</i>	European Skipper	Lepidoptera	2008	7	16	Northport Shinimicas Rv	45.936730	63.872050	observation	20
<i>Satyrodes eurydice</i>	Eyed Brown	Lepidoptera	2008	7	16	Northport Shinimicas Rv	45.936730	63.872050	specimen	4
<i>Polites mystic</i>	Long Dash	Lepidoptera	2008	7	16	Northport Shinimicas Rv	45.936730	63.872050	observation	2
<i>Pieris rapae</i>	Cabbage White	Lepidoptera	2008	7	16	Northport Shinimicas Rv	45.936730	63.872050	observation	1
<i>Speyeria atlantis</i>	Atlantis Fritillary	Lepidoptera	2008	7	16	Northport Shinimicas Rv	45.936730	63.872050	observation	1
<i>Lestes unguiculatus</i>	Lyre-tipped Spreadwing	Odonata	2008	7	16	Northport Shinimicas Rv	45.936730	63.872050	in hand	6
<i>Libellula quadrimaculata</i>	Four-spotted Skimmer	Odonata	2008	7	16	Northport Shinimicas Rv	45.936730	63.872050	observation	2
<i>Ischnura verticalis</i>	Eastern Forktail	Odonata	2008	7	16	Northport Shinimicas Rv	45.936730	63.872050	observation	3
<i>Libellula pulchella</i>	Twelve-spotted Skimmer	Odonata	2008	7	16	Toney Ck	45.863910	63.758640	photo	4
<i>Lestes unguiculatus</i>	Lyre-tipped Spreadwing	Odonata	2008	7	16	Toney Ck	45.863910	63.758640	specimen	1
<i>Satyrodes eurydice</i>	Eyed Brown	Lepidoptera	2008	7	16	Toney Ck	45.863910	63.758640	specimen	1
<i>Lycaena dospassosi</i>	Salt Marsh Copper	Lepidoptera	2008	7	16	Toney Ck	45.863910	63.758640	specimen	12
<i>Coenonympha tullia inornata</i>	Inornate Ringlet	Lepidoptera	2008	7	16	Sand Pt	45.731250	63.286910	observation	2
<i>Phyciodes cocyta</i>	Northern Crescent	Lepidoptera	2008	7	16	Sand Pt	45.731250	63.286910	specimen	1
<i>Speyeria cybele novascotiae</i>	Great Spangled Fritillary	Lepidoptera	2008	7	16	Sand Pt	45.731250	63.286910	observation	1
<i>Libellula pulchella</i>	Twelve-spotted Skimmer	Odonata	2008	7	16	Sand Pt	45.731250	63.286910	observation	4
<i>Lycaena dospassosi</i>	Salt Marsh Copper	Lepidoptera	2008	7	16	Sand Pt	45.731250	63.286910	specimen	3
<i>Ischnura verticalis</i>	Eastern Forktail	Odonata	2008	7	16	Sand Pt	45.731250	63.286910	observation	7
<i>Libellula pulchella</i>	Twelve-spotted Skimmer	Odonata	2008	7	16	Caribou Waterside	45.758610	62.777010	observation	2
<i>Libellula quadrimaculata</i>	Four-spotted Skimmer	Odonata	2008	7	16	Caribou Waterside	45.758610	62.777010	observation	4
<i>Ischnura verticalis</i>	Eastern Forktail	Odonata	2008	7	16	Caribou Waterside	45.758610	62.777010	observation	7
<i>Speyeria atlantis</i>	Atlantis Fritillary	Lepidoptera	2008	7	16	Caribou Waterside	45.758610	62.777010	observation	1
<i>Ancyloxypha numitor</i>	Least Skipper	Lepidoptera	2008	7	16	Caribou Waterside	45.758610	62.777010	observation	1
<i>Thymelicus lineola</i>	European Skipper	Lepidoptera	2008	7	16	Caribou Waterside	45.758610	62.777010	observation	10
<i>Coenonympha tullia inornata</i>	Inornate Ringlet	Lepidoptera	2008	7	16	S Caribou Rd	45.735520	62.751050	observation	1
<i>Lestes unguiculatus</i>	Lyre-tipped Spreadwing	Odonata	2008	7	16	S Caribou Rd	45.735520	62.751050	specimen	8
<i>Phyciodes cocyta</i>	Northern Crescent	Lepidoptera	2008	7	16	S Caribou Rd	45.735520	62.751050	observation	2
<i>Polites mystic</i>	Long Dash	Lepidoptera	2008	7	16	S Caribou Rd	45.735520	62.751050	specimen	1
<i>Ischnura verticalis</i>	Eastern Forktail	Odonata	2008	7	17	Havre Boucher N	45.690560	61.526990	observation	1
<i>Thymelicus lineola</i>	European Skipper	Lepidoptera	2008	7	17	Havre Boucher N	45.690560	61.526990	observation	3
<i>Pieris rapae</i>	Cabbage White	Lepidoptera	2008	7	17	Havre Boucher N	45.690560	61.526990	observation	1
<i>Pieris rapae</i>	Cabbage White	Lepidoptera	2008	7	17	Havre Boucher Barachois	45.679770	61.525580	observation	1
<i>Thymelicus lineola</i>	European Skipper	Lepidoptera	2008	7	17	Havre Boucher Barachois	45.679770	61.525580	observation	1
<i>Satyrodes eurydice</i>	Eyed Brown	Lepidoptera	2008	7	17	Havre Boucher Cp Jack	45.684660	61.553420	observation	2
<i>Libellula quadrimaculata</i>	Four-spotted Skimmer	Odonata	2008	7	17	Breens	45.674000	61.578760	observation	4
<i>Libellula pulchella</i>	Twelve-spotted Skimmer	Odonata	2008	7	17	Breens	45.674000	61.578760	observation	1
<i>Satyrodes eurydice</i>	Eyed Brown	Lepidoptera	2008	7	17	Placides Cove	45.625430	61.653100	specimen	4
<i>Coenonympha tullia inornata</i>	Inornate Ringlet	Lepidoptera	2008	7	17	Placides Cove	45.625430	61.653100	observation	1
<i>Thymelicus lineola</i>	European Skipper	Lepidoptera	2008	7	17	Placides Cove	45.625430	61.653100	observation	11
<i>Phyciodes cocyta</i>	Northern Crescent	Lepidoptera	2008	7	17	Placides Cove	45.625430	61.653100	observation	2
<i>Libellula pulchella</i>	Twelve-spotted Skimmer	Odonata	2008	7	17	Placides Cove	45.625430	61.653100	observation	2

<i>Libellula quadrimaculata</i>	Four-spotted Skimmer	Odonata	2008	7	17	Placides Cove	45.625430	61.653100	observation	3
<i>Lestes unguiculatus</i>	Lyre-tipped Spreadwing	Odonata	2008	7	17	Placides Cove	45.625430	61.653100	in hand	2
<i>Libellula pulchella</i>	Twelve-spotted Skimmer	Odonata	2008	7	17	Pomquet Evangeline	45.642040	61.849300	specimen	1
<i>Ischnura verticalis</i>	Eastern Forktail	Odonata	2008	7	17	Pomquet Evangeline	45.642040	61.849300	observation	1
<i>Enallagma civile</i>	Familiar Bluet	Odonata	2008	7	17	Pomquet Evangeline	45.642040	61.849300	specimen	1
<i>Sympetrum internum</i>	Cherry-faced Meadowhawk	Odonata	2008	7	17	Pomquet Evangeline	45.642040	61.849300	specimen	1
<i>Satyroides eurydice</i>	Eyed Brown	Lepidoptera	2008	7	17	Pomquet Evangeline	45.642040	61.849300	observation	1
<i>Enallagma civile</i>	Familiar Bluet	Odonata	2008	7	17	Pomquet SW Hbr Rd	45.637810	61.891040	observation	1
<i>Libellula quadrimaculata</i>	Four-spotted Skimmer	Odonata	2008	7	17	Pomquet SW Hbr Rd	45.637810	61.891040	observation	1
<i>Libellula pulchella</i>	Twelve-spotted Skimmer	Odonata	2008	7	17	Pomquet SW Hbr Rd	45.637810	61.891040	observation	1
<i>Phyciodes cocyta</i>	Northern Crescent	Lepidoptera	2008	7	17	Pomquet SW Hbr Rd	45.637810	61.891040	observation	1
<i>Satyroides eurydice</i>	Eyed Brown	Lepidoptera	2008	7	17	Pomquet SW Hbr Rd	45.637810	61.891040	observation	1
<i>Celithemis elisa</i>	Calico Pennant	Odonata	2008	7	17	S Caribou Rd	45.735520	62.751050	specimen	1
<i>Libellula quadrimaculata</i>	Four-spotted Skimmer	Odonata	2008	7	17	S Caribou Rd	45.735520	62.751050	observation	6
<i>Libellula pulchella</i>	Twelve-spotted Skimmer	Odonata	2008	7	17	S Caribou Rd	45.735520	62.751050	observation	3
<i>Ladona julia</i>	Chalk-fronted Corporal	Odonata	2008	7	17	S Caribou Rd	45.735520	62.751050	observation	2
<i>Ischnura verticalis</i>	Eastern Forktail	Odonata	2008	7	17	S Caribou Rd	45.735520	62.751050	observation	13
<i>Thymelicus lineola</i>	European Skipper	Lepidoptera	2008	7	17	S Caribou Rd	45.735520	62.751050	observation	28
<i>Vanessa virginiensis</i>	American Lady	Lepidoptera	2008	7	17	S Caribou Rd	45.735520	62.751050	observation	1
<i>Lestes unguiculatus</i>	Lyre-tipped Spreadwing	Odonata	2008	7	17	S Caribou Rd	45.735520	62.751050	in hand	4
<i>Speyeria atlantis</i>	Atlantis Fritillary	Lepidoptera	2008	7	17	S Caribou Rd	45.735520	62.751050	observation	2
<i>Polites mystic</i>	Long Dash	Lepidoptera	2008	7	17	S Caribou Rd	45.735520	62.751050	observation	1
<i>Lycaena dospassosi</i>	Salt Marsh Copper	Lepidoptera	2008	7	26	Northport Shinimicas Rv	45.936730	63.872050	specimen	100+
<i>Satyroides eurydice</i>	Eyed Brown	Lepidoptera	2008	7	26	Northport Shinimicas Rv	45.936730	63.872050	observation	1
<i>Lestes unguiculatus</i>	Lyre-tipped Spreadwing	Odonata	2008	7	26	Northport Shinimicas Rv	45.936730	63.872050	observation	7
<i>Lycaena dospassosi</i>	Salt Marsh Copper	Lepidoptera	2008	7	26	Wallace Bay NWA	45.830790	63.566200	photo	100+
<i>Enallagma civile</i>	Familiar Bluet	Odonata	2008	7	26	Wallace Bay NWA	45.830790	63.566200	photo	6
<i>Libellula pulchella</i>	Twelve-spotted Skimmer	Odonata	2008	7	26	Wallace Bay NWA	45.830790	63.566200	observation	2
<i>Speyeria cybele novascotiae</i>	Great Spangled Fritillary	Lepidoptera	2008	7	26	Wallace Bay NWA	45.830790	63.566200	observation	1
<i>Ischnura verticalis</i>	Eastern Forktail	Odonata	2008	7	26	Wallace Bay NWA	45.830790	63.566200	observation	3
<i>Cercyonis pegala nephele</i>	Common Wood Nymph	Lepidoptera	2008	7	26	Wallace Bay NWA	45.830790	63.566200	observation	9
<i>Lycaena dospassosi</i>	Salt Marsh Copper	Lepidoptera	2008	7	26	Wallace	45.819700	63.483540	specimen	2
<i>Sympetrum costiferum</i>	Saffron-winged Meadowhawk	Odonata	2008	7	26	Wallace	45.819700	63.483540	specimen	4
<i>Cicindela duodecimguttata</i>	Twelve-spotted Tiger Beetle	Coleoptera	2008	7	26	Blue Sea Beach	45.804680	63.303290	photo	1
<i>Cicindela repanda novascotiae</i>	Bronzed Tiger Beetle	Coleoptera	2008	7	26	Blue Sea Beach	45.804680	63.303290	observation	2
<i>Sympetrum costiferum</i>	Saffron-winged Meadowhawk	Odonata	2008	7	26	Blue Sea Beach	45.804680	63.303290	observation	2
<i>Libellula quadrimaculata</i>	Four-spotted Skimmer	Odonata	2008	7	26	Blue Sea Beach	45.804680	63.303290	observation	1
<i>Libellula pulchella</i>	Twelve-spotted Skimmer	Odonata	2008	7	26	Malagash 1	45.788770	63.272100	specimen	2
<i>Cercyonis pegala nephele</i>	Common Wood Nymph	Lepidoptera	2008	7	26	Malagash 1	45.788770	63.272100	specimen	12
<i>Ischnura verticalis</i>	Eastern Forktail	Odonata	2008	7	26	Malagash 1	45.788770	63.272100	observation	4
<i>Sympetrum costiferum</i>	Saffron-winged Meadowhawk	Odonata	2008	7	26	Malagash 1	45.788770	63.272100	observation	2
<i>Phyciodes cocyta</i>	Northern Crescent	Lepidoptera	2008	7	26	Malagash 1	45.788770	63.272100	observation	1
<i>Colias philodice</i>	Clouded Sulphur	Lepidoptera	2008	7	26	Malagash 1	45.788770	63.272100	observation	1
<i>Lycaena dospassosi</i>	Salt Marsh Copper	Lepidoptera	2008	7	26	Emery Island	45.761810	63.341700	specimen	100+
<i>Cercyonis pegala nephele</i>	Common Wood Nymph	Lepidoptera	2008	7	26	Emery Island	45.761810	63.341700	observation	7
<i>Lestes unguiculatus</i>	Lyre-tipped Spreadwing	Odonata	2008	7	26	Emery Island	45.761810	63.341700	observation	2
<i>Enallagma civile</i>	Familiar Bluet	Odonata	2008	7	26	Emery Island	45.761810	63.341700	observation	5
<i>Lestes rectangularis</i>	Slender Spreadwing	Odonata	2008	7	26	Emery Island	45.761810	63.341700	observation	2

<i>Vanessa virginiensis</i>	American Lady	Lepidoptera	2008	7	26	S Caribou Rd	45.735520	62.751050	specimen	1
<i>Libellula quadrimaculata</i>	Four-spotted Skimmer	Odonata	2008	7	26	S Caribou Rd	45.735520	62.751050	observation	3
<i>Aeshna interrupta</i>	Variable Darner	Odonata	2008	7	26	S Caribou Rd	45.735520	62.751050	in hand	1
<i>Lestes unguiculatus</i>	Lyre-tipped Spreadwing	Odonata	2008	7	26	S Caribou Rd	45.735520	62.751050	in hand	1
<i>Speyeria atlantis</i>	Atlantis Fritillary	Lepidoptera	2008	7	27	Sinclairs Is	45.677170	62.575890	observation	1
<i>Cercyonis pegala nephele</i>	Common Wood Nymph	Lepidoptera	2008	7	27	Sinclairs Is	45.677170	62.575890	observation	3
<i>Pieris rapae</i>	Cabbage White	Lepidoptera	2008	7	27	Sinclairs Is	45.677170	62.575890	observation	2
<i>Cicindela tranquebarica</i>	Oblique-lined Tiger Beetle	Coleoptera	2008	7	27	Sinclairs Is	45.677170	62.575890	photo	1
<i>Cicindela repanda novascotiae</i>	Bronzed Tiger Beetle	Coleoptera	2008	7	27	Sinclairs Is	45.677170	62.575890	observation	1
<i>Pieris rapae</i>	Cabbage White	Lepidoptera	2008	7	27	Melmerby Beach	45.657250	62.509100	observation	2
<i>Cercyonis pegala nephele</i>	Common Wood Nymph	Lepidoptera	2008	7	27	Melmerby Beach	45.657250	62.509100	observation	5
<i>Phyciodes cocyta</i>	Northern Crescent	Lepidoptera	2008	7	27	Melmerby Beach	45.657250	62.509100	observation	1
<i>Cercyonis pegala nephele</i>	Common Wood Nymph	Lepidoptera	2008	7	27	Lr Barneys Rv	45.664860	62.347960	observation	1
<i>Phyciodes cocyta</i>	Northern Crescent	Lepidoptera	2008	7	27	Malignant Cove	45.786080	62.082060	specimen	1
<i>Enallagma civile</i>	Familiar Bluet	Odonata	2008	7	27	Harbour Ctr	45.686530	61.915690	photo	1
<i>Sympetrum obtrusum</i>	White-faced Meadowhawk	Odonata	2008	7	27	Harbour Ctr	45.686530	61.915690	in hand	2
<i>Sympetrum costiferum</i>	Saffron-winged Meadowhawk	Odonata	2008	7	27	Harbour Ctr	45.686530	61.915690	observation	1
<i>Lestes unguiculatus</i>	Lyre-tipped Spreadwing	Odonata	2008	7	27	Harbour Ctr	45.686530	61.915690	in hand	1
<i>Cercyonis pegala nephele</i>	Common Wood Nymph	Lepidoptera	2008	7	27	Harbour Ctr	45.686530	61.915690	observation	1
<i>Phyciodes cocyta</i>	Northern Crescent	Lepidoptera	2008	7	27	Harbour Ctr	45.686530	61.915690	observation	1
<i>Lycaena dospassosi</i>	Salt Marsh Copper	Lepidoptera	2008	8	2	Northport Shinimicas Rv	45.936730	63.872050	specimen	100+
<i>Cercyonis pegala nephele</i>	Common Wood Nymph	Lepidoptera	2008	8	2	Northport Shinimicas Rv	45.936730	63.872050	observation	2
<i>Enallagma civile</i>	Familiar Bluet	Odonata	2008	8	2	Wallace Bay NWA	45.830790	63.566200	observation	11
<i>Lycaena dospassosi</i>	Salt Marsh Copper	Lepidoptera	2008	8	2	Wallace Bay NWA	45.830790	63.566200	observation	100+
<i>Cercyonis pegala nephele</i>	Common Wood Nymph	Lepidoptera	2008	8	2	Wallace Bay NWA	45.830790	63.566200	observation	1
<i>Lycaena dospassosi</i>	Salt Marsh Copper	Lepidoptera	2008	8	2	Fox Hbr Fox Creek	45.852640	63.487960	specimen	3
<i>Sympetrum obtrusum</i>	White-faced Meadowhawk	Odonata	2008	8	2	Fox Hbr Fox Creek	45.852640	63.487960	in hand	1
<i>Libellula pulchella</i>	Twelve-spotted Skimmer	Odonata	2008	8	2	Fox Hbr Fox Creek	45.852640	63.487960	observation	1
<i>Sympetrum obtrusum</i>	White-faced Meadowhawk	Odonata	2008	8	2	Malagash Pt	45.793300	63.257910	observation	4
<i>Libellula pulchella</i>	Twelve-spotted Skimmer	Odonata	2008	8	2	Malagash Pt	45.793300	63.257910	observation	2
<i>Libellula quadrimaculata</i>	Four-spotted Skimmer	Odonata	2008	8	2	Malagash Pt	45.793300	63.257910	observation	2
<i>Lycaena dospassosi</i>	Salt Marsh Copper	Lepidoptera	2008	8	2	Emery Island	45.761810	63.341700	specimen	500+
<i>Lycaena dospassosi</i>	Salt Marsh Copper	Lepidoptera	2008	8	2	Brulé	45.740230	63.216970	specimen	100+
<i>Sympetrum costiferum</i>	Saffron-winged Meadowhawk	Odonata	2008	8	2	Brulé	45.740230	63.216970	observation	2
<i>Sympetrum obtrusum</i>	White-faced Meadowhawk	Odonata	2008	8	2	Brulé	45.740230	63.216970	in hand	1
<i>Enallagma civile</i>	Familiar Bluet	Odonata	2008	8	2	Brulé	45.740230	63.216970	observation	2
<i>Pieris rapae</i>	Cabbage White	Lepidoptera	2008	8	2	Rushton Beach Provincial Park	45.756830	63.122280	observation	1
<i>Lestes rectangularis</i>	Slender Spreadwing	Odonata	2008	8	2	River John River Rd	45.755940	63.064130	photo	1
<i>Lestes disjunctus</i>	Northern Spreadwing	Odonata	2008	8	2	River John River Rd	45.755940	63.064130	in hand	1
<i>Enallagma civile</i>	Familiar Bluet	Odonata	2008	8	2	River John River Rd	45.755940	63.064130	observation	3
<i>Ischnura verticalis</i>	Eastern Forktail	Odonata	2008	8	2	River John River Rd	45.755940	63.064130	observation	1
<i>Phyciodes cocyta</i>	Northern Crescent	Lepidoptera	2008	8	2	River John River Rd	45.755940	63.064130	observation	1
<i>Pieris rapae</i>	Cabbage White	Lepidoptera	2008	8	2	River John River Rd	45.755940	63.064130	observation	1
<i>Phyciodes cocyta</i>	Northern Crescent	Lepidoptera	2008	8	2	Skinnners Cv	45.793080	63.044150	observation	1
<i>Cercyonis pegala nephele</i>	Common Wood Nymph	Lepidoptera	2008	8	2	Skinnners Cv	45.793080	63.044150	observation	1
<i>Colias philodice</i>	Clouded Sulphur	Lepidoptera	2008	8	2	S Caribou Rd	45.735520	62.751050	observation	1
<i>Speyeria atlantis</i>	Atlantis Fritillary	Lepidoptera	2008	8	2	S Caribou Rd	45.735520	62.751050	observation	1
<i>Colias philodice</i>	Clouded Sulphur	Lepidoptera	2008	9	21	Dunns Cv	45.662480	61.932660	observation	1

<i>Enallagma civile</i>	Familiar Bluet	Odonata	2008	9	21	Harbour Ctr	45.686530	61.915690	observation	2
<i>Sympetrum danae</i>	Black Meadowhawk	Odonata	2008	9	21	Harbour Ctr	45.686530	61.915690	observation	2
<i>Sympetrum semicinctum</i>	Band-winged Meadowhawk	Odonata	2008	9	21	Harbour Ctr	45.686530	61.915690	observation	1
<i>Aeshna umbrosa</i>	Shadow Darner	Odonata	2008	9	21	Harbour Ctr	45.686530	61.915690	in hand	1
<i>Aeshna canadensis</i>	Canada Darner	Odonata	2008	9	21	Harbour Ctr	45.686530	61.915690	observation	1
<i>Lestes congener</i>	Spotted Spreadwing	Odonata	2008	9	21	Harbour Ctr	45.686530	61.915690	observation	5
<i>Sympetrum vicinum</i>	Autumn Meadowhawk	Odonata	2008	9	21	Harbour Ctr	45.686530	61.915690	observation	4
<i>Colias philodice</i>	Clouded Sulphur	Lepidoptera	2008	9	21	Harbour Ctr	45.686530	61.915690	observation	2
<i>Cicindela hirticollis rhodensis</i>	Hairy-necked Tiger Beetle	Coleoptera	2008	9	21	Mahoney Beach	45.704500	61.900250	specimen	1
<i>Cicindela tranquebarica</i>	Oblique-lined Tiger Beetle	Coleoptera	2008	9	21	Mahoney Beach	45.704500	61.900250	photo	2
<i>Cicindela duodecimguttata</i>	Twelve-spotted Tiger Beetle	Coleoptera	2008	9	21	Mahoney Beach	45.704500	61.900250	observation	1
<i>Colias philodice</i>	Clouded Sulphur	Lepidoptera	2008	9	21	Mahoney Salt Marsh	45.703010	61.903840	observation	1
<i>Lestes congener</i>	Spotted Spreadwing	Odonata	2008	9	21	Mahoney Salt Marsh	45.703010	61.903840	observation	3
<i>Sympetrum obtrusum</i>	White-faced Meadowhawk	Odonata	2008	9	21	Mahoney Salt Marsh	45.703010	61.903840	observation	1
<i>Colias philodice</i>	Clouded Sulphur	Lepidoptera	2008	9	21	Ogdens Pnd	45.719600	61.899720	observation	1
<i>Pyrrharctia isabella</i>	Banded Woolly Bear	Lepidoptera	2008	9	21	Brownsville Huggans	45.647670	62.386020	observation	1