



# Biodiversity inventories in high gear: DNA barcoding facilitates a rapid biotic survey of a temperate nature reserve

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## Abstract

### Background

Comprehensive biotic surveys, or 'all taxon biodiversity inventories' (ATBI), have traditionally been limited in scale or scope due to the complications surrounding specimen sorting and species identification. To circumvent these issues, several ATBI projects have successfully integrated DNA barcoding into their identification procedures and witnessed

acceleration in their surveys and subsequent increase in project scope and scale. The Biodiversity Institute of Ontario partnered with the **rare Charitable Research Reserve** and delegates of the 6th International Barcode of Life Conference to complete its own rapid, barcode-assisted ATBI of an established land trust in Cambridge, Ontario, Canada.

## New information

The existing species inventory for the **rare Charitable Research Reserve** was rapidly expanded by integrating a DNA barcoding workflow with two surveying strategies – a comprehensive sampling scheme over four months, followed by a one-day bioblitz involving international taxonomic experts. The two surveys resulted in 25,287 and 3,502 specimens barcoded, respectively, as well as 127 human observations. This barcoded material, all vouchered at the Biodiversity Institute of Ontario collection, covers 14 phyla, 29 classes, 117 orders, and 531 families of animals, plants, fungi, and lichens. Overall, the ATBI documented 1,102 new species records for the nature reserve, expanding the existing long-term inventory by 49%. In addition, 2,793 distinct Barcode Index Numbers (BINs) were assigned to genus or higher level taxonomy, and represent additional species that will be added once their taxonomy is resolved. For the 3,502 specimens, the collection, sequence analysis, taxonomic assignment, data release and manuscript submission by 100+ co-authors all occurred in less than one week. This demonstrates the speed at which barcode-assisted inventories can be completed and the utility that barcoding provides in minimizing and guiding valuable taxonomic specialist time. The final product is more than a comprehensive biotic inventory – it is also a rich dataset of fine-scale occurrence and sequence data, all archived and cross-linked in the major biodiversity data repositories. This model of rapid generation and dissemination of essential biodiversity data could be followed to conduct regional assessments of biodiversity status and change, and potentially be employed for evaluating progress towards the Aichi Targets of the Strategic Plan for Biodiversity 2011–2020.

## Keywords

DNA barcoding, species identification, biodiversity assessment, biotic inventory, Barcode Index Numbers, Operational Taxonomic Units, *rare* Charitable Research Reserve

## Introduction

It is now universally accepted that we have entered a period of unprecedented global biodiversity loss (Simberloff 1996, Pimm et al. 1995, Pimm et al. 2014), and quantifying this diversity rapidly and on a massive scale is required to begin the challenging process of halting this trend. The completion of biodiversity inventories at various geographic and time scales can contribute to national and international assessments of biodiversity knowledge, deemed necessary by the newly established Intergovernmental Science-Policy Platform on

Biodiversity and Ecosystem Services (Díaz et al. 2015). These assessments are fundamental for evaluating progress towards – and potentially reaching – the Convention on Biological Diversity’s Aichi Targets of the Strategic Plan for Biodiversity 2011–2020 (<http://www.cbd.int/sp/targets/>). Specifically, biodiversity inventories address a component of Aichi target 19, to improve and disseminate biodiversity knowledge, particularly its status and trends.

Even prior to the concept’s introduction (Janzen and Hallwachs 1994), several ‘all taxon biodiversity inventories’ (ATBI) and similar initiatives emerged to document large blocks of life in a circumscribed region or protected area. These comprehensive biotic surveys, particularly those in tropical locales, have traditionally been mired at the stage of specimen sorting and species identification. The taxonomic impediment – the shortage of taxonomic information and the gaps in our taxonomic knowledge – have severely limited and slowed the sorting and naming of collected material (Janzen 1993, Lawton et al. 1998, Janzen 2004). The integration of DNA barcoding however, has simplified, accelerated, and democratized this task (Hebert et al. 2003, Packer et al. 2009, Cristescu 2014, Joly et al. 2014). Several ATBI projects have now successfully integrated DNA barcoding into their identification procedures, observed this acceleration, and in many cases, even increased the scope or scale of their project as a result. A few notable ATBIs that have incorporated DNA barcoding for species identification include projects in the Área de Conservación Guanacaste, Costa Rica (Janzen et al. 2009), Churchill, Canada (Zhou et al. 2009), Great Smoky Mountains, United States (Zhou et al. 2011), Madang, Papua New Guinea (Novotny et al. 2007), Moorea, French Polynesia (Check 2006), Zackenberg, Greenland (Wirta et al. 2015), and Mount Kinabalu, Malaysia (Merckx et al. 2015).

Following this model, the present study introduces DNA barcoding to a long-term biotic inventorying effort being conducted in a temperate nature reserve. The objective is to gauge the effect of adding this tool, in terms of both acceleration and increase of taxonomic scope, while concurrently constructing a reference DNA barcode library to facilitate future research and monitoring at this site. The existing inventory is expanded by employing two surveying strategies – a longer and comprehensive invertebrate trapping scheme, followed by a concentrated effort involving taxonomic experts in the form of a bioblitz (Lundmark 2003). In both cases, DNA barcoding is employed to sort the material rapidly into operational taxonomic units (OTUs), provide taxonomic assignment at varying levels of resolution depending on the taxon group, and organize the OTUs and linked specimen vouchers for examination by experts. The results demonstrate the speed at which barcode-assisted surveys can be completed, the role that barcoding plays in limiting and optimizing valuable taxonomic specialist time, and ultimately, a scalable model for rapid biotic surveys and dissemination of the rich biodiversity data captured. The product is not merely a comprehensive biotic inventory, but also a rich dataset of fine-scale occurrence and sequence data, all stored and cross-linked in several public biodiversity data repositories.

## Materials and methods

### Study Site and Existing Species Inventory

The **rare Charitable Research Reserve** is a 365+ hectare land reserve which was set aside in 2001 to preserve the cultural history and ecological integrity of the area, while providing opportunities for scientific research and public education within the context of an urbanized region. It is located at the confluence of the Speed and Grand Rivers in Cambridge, Ontario, Canada (43.381128, -80.357807), where the Carolinian and Northern Hardwood forests also meet. The reserve contains a diversity of habitats including existing and reclaimed agricultural lands, wetlands, floodplains, shrub thickets, limestone cliffs and alvars, cold-water creeks, and old growth forest. Due to these diverse habitats, as well as the organization's mandate to facilitate scientific research, **rare** has been the site of a variety of innovative research studies, including studies on fern genetics (Henry et al. 2014), prairie community establishment (Harvey and MacDougall 2014), and pollination services (Woodcock et al. 2014). For the present study, we chose sampling sites to encompass a wide range of habitats within the area. In advance of the bioblitz, sampling was conducted within an alvar, reclaimed agricultural fields, forest edges, and a wetland (Fig. 1). Six additional sites were sampled for the bioblitz: terrestrial and aquatic sampling was performed at the Grand River, Blair Flats Wetland, and Cruickston Creek; terrestrial sampling was conducted at an alvar, a cedar stand, and a silver maple wetland (Fig. 1). The wetlands on the reserve are part of the Barrie's Lake Bauman Creek Wetland Complex, which has been classified as a Provincially Significant Wetland by the Ontario Ministry of Natural Resources. Much of the property is also considered locally significant by the Regional Municipality of Waterloo.

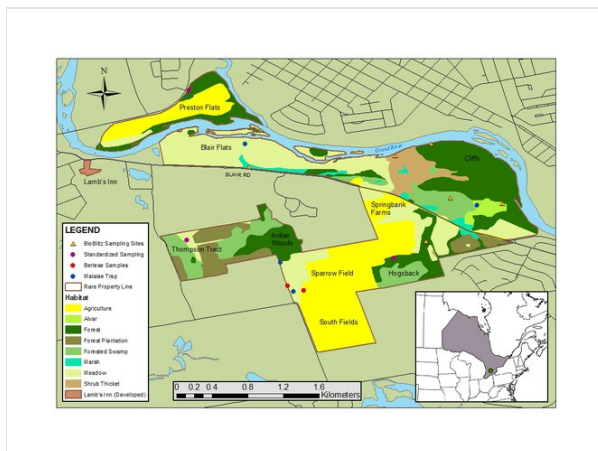


Figure 1.

Map indicating habitat types and sampling sites for the 2015 biotic survey conducted at **rare Charitable Research Reserve** in Cambridge, Ontario, Canada.

Prior to this study, 2,246 species had been recorded at **rare**, including birds (231), mammals (37), insects (832), plants (836), mosses (63) and lichens (21) (Suppl. material 1; note that 218 species still require confirmation, denoted by parentheses). These observations have come from a variety of sources including **rare** staff and advisors, citizen scientists, and academic researchers, some of whom have made notable contributions to this inventory, such as Woodcock et al. 2014 who added 150 species of pollinators. Others have provided observations of rarely encountered species, such as the rove beetles *Xantholinus elegans* (Olivier, 1795) (first record for North America) and *Xantholinus linearis* (Olivier, 1794) (previously known from the east coast of Canada, now present in Ontario) (Brunke and Majka 2010). The **rare** reserve also hosts several species that fall on the [provincial](#) or [national](#) lists of conservation concern: 1% of the total have a status ranging from special concern, threatened or endangered (15, 6 and 7 species, respectively), while 1.5% have an undefined status of rare or uncommon (15 and 19 species, respectively). Several of these species, such as the barn swallow [*Hirundo rustica* (Linnaeus, 1758)], which has been nationally listed as threatened since 2011, are the subjects of active recovery projects at **rare**. Similar to many species inventories, **rare's** list is evidently more complete for charismatic and well-studied taxa, such as birds, butterflies and vascular plants. The observations for these groups would be enabled by excellent field guides and the disproportionate interest of citizen scientists; the opposite would be the case for most invertebrate taxa, and **rare's** inventory reflects this. If it is assumed that the proportions of major taxonomic groups inhabiting this reserve resemble those for similar temperate sites (e.g., Great Smoky Mountains: Sharkey 2001) or the Canadian terrestrial and freshwater biota in general (Mosquin et al. 1995), this inventory is deficient in several major groups such as insects, arachnids, nematodes, fungi and lichens. The supporting data for most species entries are also lacking, such as specific locality, date or identifier of each observation. In addition, the bioblitz has highlighted errors in the inventory which may have been present due to the compilation of observations from a variety of sources including non-experts. Furthermore, nearly all observations are not supported by voucher specimens or images to permit verification (Bortolus 2008).

## Survey Strategies and Specimen Collection

Two strategies were employed in an effort to maximize the diversity of organisms inventoried. The first was a comprehensive collecting scheme executed over a period of approximately four months (May to August 2015). It involved a variety of targeted taxa and techniques, but heavily favoured the collection of terrestrial arthropods by passive trapping. Four Malaise traps were set up in various habitats around the **rare** property (Fig. 1) and were serviced weekly. Three pitfall traps were set up in close proximity to each Malaise trap and serviced in parallel. From May 25-31 and July 6-12, 2015, 'standardized sampling' procedures developed by the Biodiversity Institute of Ontario were employed at three different sites at **rare** (Fig. 1). Standardized sampling includes 20 pitfall traps, 10 pan traps, three litter and/or soil samples for Berlese funnels, one flight intercept trap and one Malaise trap – all deployed for a total of seven days. Standardized sampling also includes 60 total minutes of sweep netting, which is performed in three sessions with four collectors sweep netting for five consecutive minutes simultaneously. Each session is pooled into one

sample and preserved in 95% ethanol. Passive traps (pitfall, pan, intercept) were deployed with soapy water and serviced every two days, while the Malaise trap used 95% ethanol and ran for the duration of the collecting period. All specimens collected through this standardized sampling routine were consolidated into individual jars for each technique. From July 23 to Aug 13, 2015, at least two ultraviolet light traps were deployed for one night per week; each trap was left overnight using ethyl acetate as a killing agent. On August 5, 2015, several aquatic samples were collected using stable dip nets for surber sampling, deploying hand nets along the stream banks and selective turning of stones to recover macroinvertebrates hiding below. Then the sample was passed through a 50 µm mesh net to capture the smaller invertebrates. All specimens collected from these samples were preserved in 95% ethanol. This first strategy of comprehensive sampling over several months was conducted by technical staff, including undergraduate students, and completed on Aug 15, 2015.

The second strategy for surveying the reserve was a more concentrated effort and involved taxonomic experts – the execution of a bioblitz (Lundmark 2003). Termed the '**rare** BioBlitz', the event involved 113 participants from 31 institutions and coincided with the 6th International Barcode of Life Conference (Adamowicz 2015). Collection efforts at the bioblitz were focused on six sites selected based on habitat diversity, proximity, and potential species diversity (Fig. 1). Sampling efforts were concentrated between 1-3 pm and 9-11 pm and targeted taxa that fell within the expertise of the participants and in groups underrepresented in the **rare** inventory (e.g., spiders, parasitic wasps, mites, nematodes, fungi, and lichens). Various methods for collecting both terrestrial and aquatic arthropods were employed, including dip nets, seine nets, sweep netting, and plankton netting. Small teams surveyed the property and adjacent rivers for taxonomic groups not collected in the four previous months, including fungi, lichens, and vascular plants. Since the inventory is fairly complete for vascular plants (836 species), an effort was made to barcode all species of Blair Flats, a tall grass prairie site that is an active research site (e.g., Harvey and MacDougall 2014). For these taxa, specimens were collected in the field into bags and processed afterward (e.g., pressed and dried onto herbarium sheets). Fungal specimens were collected and processed in a similar manner. Several taxa were targeted for sightings only, where no voucher specimens were collected; these groups included fish, birds, bats, herptiles and odonates (for bat sightings protocol, see Suppl. material 2). All collected specimens were sorted and identified to the lowest taxonomic level possible by the appropriate expert, both on site and following the event from August 16-20, 2015. Vertebrates, plants, fungi and lichens were almost all identified to species, while most invertebrate specimens were assigned to order or family prior to analysis. Invertebrate specimens were either stored in 95% ethanol or pinned after collection. For all invertebrate, plant, and fungal taxa, voucher specimens were collected where possible and deposited in the Biodiversity Institute of Ontario's natural history collection ([BIOUG](#)) or herbarium ([BIO-OAC](#)) for permanent storage (Schilthuizen et al. 2015).

## DNA Barcode Analysis

Both surveying strategies provided a large number of specimens that were sorted and prepared for subsequent DNA barcode analyses at the Canadian Centre for DNA barcoding (CCDB; [www.ccdb.ca](http://www.ccdb.ca)). A total of 25,287 specimens were sequenced from collection efforts from May to August 2015, followed by 3,502 specimens directly following the *rare* BioBlitz on Aug 16, 2015. Tissue samples were prepared in 96-well plate format and when necessary, the whole specimen proceeded through lysis and was recovered as voucher from the filter plate (Porco et al. 2010). Tissue lysis and DNA extraction varied slightly for different taxa (Suppl. material 3), but followed standard CCDB procedures (Ivanova et al. 2006, deWaard et al. 2008, Ivanova et al. 2008, Ivanova et al. 2011, Fazekas et al. 2012).

One or more standard DNA barcode markers were targeted for each major group of organisms: for animals, the mitochondrial gene *cytochrome oxidase subunit 1* (COI) (Hebert et al. 2003); for plants, the plastid marker *rbcl* (Hollingsworth et al. 2009) and the nuclear ribosomal internal transcribed spacer 2 (ITS2) marker (Hollingsworth 2011, Schoch et al. 2012); and for fungi and lichens (where only the fungal component was targeted), the internal transcribed spacer (ITS) marker (Schoch et al. 2012). PCR amplification, cycle sequencing and sequence analysis followed typical CCDB protocols (Ivanova and Grainger 2006, Kuzmina and Ivanova 2011). The primer cocktails used for PCR and sequencing are detailed in Suppl. material 3. The sequences were manually assembled and edited before upload to in the Barcode of Life Data Systems (BOLD, [www.boldsystems.org](http://www.boldsystems.org)) (Ratnasingham and Hebert 2007). The DNA extracts for all specimens are stored in the DNA Archive of the CCDB where they are available for additional study.

## Barcode Index Numbers and Taxonomic Assignment

For the sequences derived from animal specimens, the records were assigned operational taxonomic units (OTUs) called Barcode Index Numbers (BINs) by the Refined Single Linkage (RESL) algorithm implemented on BOLD (Ratnasingham and Hebert 2013). For the sequences that have at least 500 bp coverage of the barcode region, < 1% ambiguous bases, and no stop codon or contamination flags, the RESL algorithm calculates the number of clusters and their membership (see Ratnasingham and Hebert 2013). The RESL algorithm runs weekly on all qualifying barcode sequences in BOLD, which as of August 2015, includes 5M specimens and 420K BINs. The BIN system is accessible through public, individual 'BIN pages' and permits rapid diversity assessments, even in the absence of taxonomic information. BINs show a high concordance with traditional taxonomic species names and can be used as a reliable proxy for species.

For each specimen that was assigned an existing BIN, the record received the existing identification of the BIN to the lowest level that did not have taxonomic conflict. For each specimen assigned a new BIN for BOLD, the sequence was queried through the BOLD Identification Engine (BOLD-ID Engine; [http://www.boldsystems.org/index.php/IDS\\_OpenIdEngine](http://www.boldsystems.org/index.php/IDS_OpenIdEngine)). Identifications were applied based on sequence similarity (<15% for family, <5%



for genus) if the query sequence fell within a monophyletic cluster of BINs assigned to this family or genus. For animal records that did not receive BINs (<500bp), the sequence was similarly queried through the BOLD-ID Engine, but used a <2% similarity cutoff for assignment to species, in addition to the genus and family thresholds. Following this, a neighbour-joining tree was constructed and examined for unexpected placements which might indicate overlooked contamination events or analytical error. Finally, specimens and images were inspected morphologically to check for errors and refine the assigned taxonomy where possible.

## Data resources

Collection data, taxonomic assignment, sequence, electropherograms and primer details for each specimen record, and often a high resolution image, are available on BOLD in the public dataset, "**rare** BioBlitz 2015 [DS-RBB15]" (<http://dx.doi.org/10.5883/DS-RBB15> or [http://boldsystems.org/index.php/MAS\\_Management\\_OpenDataSet?datasetcode=DS-RBB15](http://boldsystems.org/index.php/MAS_Management_OpenDataSet?datasetcode=DS-RBB15)). The sequence data for each successfully barcoded specimen were deposited to GenBank by using the 'Submit to GenBank' function in the BOLD workbench (see Suppl. material 4 for accession numbers).

With the 'Data Spreadsheets' function in the BOLD workbench, the complete dataset was downloaded and reformatted into a Darwin Core Archive (Suppl. material 5) for upload to the Canadensys repository (<http://www.canadensys.net>), Canada's national node for the Global Biodiversity Information Facility (<http://www.gbif.org>). The online resource (<http://doi.org/10.5886/hh6td9jn>) contains all records of the 2015 inventory, including human observations. The citation for the resource is as follows:

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\* See Suppl. material 6 for complete list of contributors, institutions and email addresses

Checklist of species observed or collected at the *rare* Charitable Research Reserve in Cambridge, Ontario, Canada. The first of five checklists for Kingdom Animalia, this checklist contains members of Phylum Annelida and Phylum Arthropoda (Class Arachnida and Class Insecta up to Order Dermaptera).

Kingdom Animalia

Phylum Annelida

Class Clitellata

Order Arhynchobdellida

Family Erpobdellidae

*Erpobdella punctata* Leidy, 1870

Order Haplotaxida

Family Lumbricidae

*Lumbricus terrestris* Linnaeus, 1758

Phylum Arthropoda

Class Arachnida

Order Araneae

Family Agelenidae

*Agelenopsis potteri* Blackwall, 1846

Family Amaurobiidae

*Callobius bennetti* Blackwall, 1846

Notes: [BOLD:AAB8212](#)

Family Anyphaenidae

*Anyphaena celer* Hentz, 1847

*Anyphaena pectorosa* L. Koch, 1866

Notes: [BOLD:AAD6926](#)

*Hibana gracilis* Hentz, 1847

Notes: [BOLD:AAN6394](#)

*Wulfila saltabundus* Hentz, 1847

Notes: [BOLD:AAC6924](#)

**Family Araneidae**

*Acanthepeira stellata* Walckenaer, 1805

Notes: [BOLD:AAD7855](#)

*Araneus diadematus* Clerck, 1757

Notes: [BOLD:AAA4125](#)

*Araneus trifolium* Hentz, 1847

Notes: [BOLD:AAB8544](#)

*Araniella displicata* Hentz, 1847

Notes: [BOLD:AAA8399](#)

*Argiope aurantia* Lucas, 1833

Notes: [BOLD:AAB7933](#)

*Argiope trifasciata* Forsskål, 1775

*Eustala anastera* Walckenaer, 1841

Notes: [BOLD:AAL4913](#)

*Eustala cepina* Walckenaer, 1841

Notes: [BOLD:AAB7935](#)

*Eustala emertoni* Banks, 1904

*Hypsosinga pygmaea* Sundevall, 1831

Notes: [BOLD:ABX6180](#)

*Hypsosinga rubens* Hentz, 1847

Notes: [BOLD:AAN6264](#)

*Larinioides cornutus* Clerck, 1757

Notes: [BOLD:AAA8999](#)

*Larinioides patagiatus* Clerck, 1757

*Mangora gibberosa* Hentz, 1847

Notes: [BOLD:AAB7330](#)

*Mangora maculata* Keyserling, 1865

*Mangora placida* Hentz, 1847

Notes: [BOLD:AAI4456](#)|[BOLD:ACE4103](#)

*Neoscona arabesca* Walckenaer, 1841

Notes: [BOLD:AAA4123](#)

**Family Clubionidae**

*Clubiona abboti* L. Koch, 1866

Notes: [BOLD:AAD1564](#)

*Clubiona bryantae* Gertsch, 1941

*Clubiona johnsoni* Gertsch, 1941

Notes: [BOLD: AAN4847](#)

*Clubiona maritima* L. Koch, 1867

Notes: [BOLD: AAI4085](#)

*Clubiona obesa* Hentz, 1847

Notes: [BOLD: AAD5417](#)

*Clubiona pallidula* Clerck, 1757

Notes: [BOLD: AAI4087](#)

## Family Dictynidae

*Cicurina brevis* Emerton, 1890

Notes: [BOLD: AAC8284](#)

*Cicurina itasca* Chamberlin & Ivie, 1940

Notes: [BOLD: AAI4031](#)

*Cicurina pallida* Keyserling, 1887

Notes: [BOLD: AAF3046](#)

*Dictyna bellans* Chamberlin, 1919

Notes: [BOLD: AAI6249](#)

*Dictyna bostoniensis* Emerton, 1888

Notes: [BOLD: AAL1061](#)

*Dictyna brevitarsa* Emerton, 1915

Notes: [BOLD: AAB2306](#)

*Dictyna foliacea* Hentz, 1850

Notes: [BOLD: AAI6247](#)

*Dictyna volucripes* Keyserling, 1881

Notes: [BOLD: AAB1638](#) | [BOLD: ACE2869](#)

*Emblyna annulipes* Blackwall, 1846

*Emblyna hentzi* Kaston, 1945

Notes: [BOLD: AAI6251](#)

*Emblyna manitoba* Ivie, 1947

Notes: [BOLD: AAI9209](#)

*Emblyna sublata* Hentz, 1850

Notes: [BOLD: AAA7272](#)

**Family Gnaphosidae**

***Drassyllus depressus* Emerton, 1890**

Notes: [BOLD:AAD8676](#)

***Drassyllus niger* Banks, 1896**

Notes: [BOLD:AAI9037](#)

***Gnaphosa parvula* Banks, 1896**

Notes: [BOLD:AAC3779](#)

***Haplodrassus signifer* C. L. Koch, 1839**

Notes: [BOLD:AAD0462](#)

***Herpyllus ecclesiasticus* Hentz, 1832**

Notes: [BOLD:AAF2106](#)

***Micaria pulicaria* Sundevall, 1831**

Notes: [BOLD:AAC6612](#)

***Sergiolus ocellatus* Walckenaer, 1837**

Notes: [BOLD:ACV6055](#)

***Zelotes hentzi* Barrows, 1945**

Notes: [BOLD:AAA8914](#)

***Zelotes pseustes* Chamberlin, 1922**

**Family Hahniidae**

***Neoantistea agilis* Keyserling, 1887**

Notes: [BOLD:ACV5090](#)

***Neoantistea gosiuta* Gertsch, 1934**

Notes: [BOLD:AAG9583](#)

**Family Linyphiidae**

***Agyneta fabra* Keyserling, 1886**

Notes: [BOLD:AAE3860](#)

***Agyneta micaria* Emerton, 1882**

Notes: [BOLD:AAAN6265](#)

***Agyneta unimaculata* Banks, 1892**

Notes: [BOLD:AAH0003](#)

***Bathyphantes brevis* Emerton, 1911**

Notes: [BOLD:AAC5851](#)

***Bathyphantes pallidus* Banks, 1892**Notes: [BOLD: AAC9112](#)***Centromerus sylvaticus* Blackwall, 1841**Notes: [BOLD: AAA4132](#)***Ceraticelus atriceps* O. P.-Cambridge, 1874**Notes: [BOLD: AAI3701](#)***Ceraticelus similis* Banks, 1892**Notes: [BOLD: AAF1318](#)***Ceratinella brunnea* Emerton, 1882**Notes: [BOLD: AAD2101](#)***Ceratinops crenatus* Emerton, 1882**Notes: [BOLD: ACF8798](#)***Ceratinops latus* Emerton, 1882**Notes: [BOLD: AAI5447](#)***Ceratinopsis auriculata* Emerton, 1909**Notes: [BOLD: ACR6338](#)***Ceratinopsis labradorensis* Emerton, 1925**Notes: [BOLD: ACV5182](#)***Collinsia plumosa* Emerton, 1882**Notes: [BOLD: AAM9146](#)***Eridantes erigonoides* Emerton, 1882**Notes: [BOLD: AAH0004](#)***Erigone atra* Blackwall, 1833**Notes: [BOLD: ACE5877](#)***Erigone autumnalis* Emerton, 1882**Notes: [BOLD: AAH0001](#)***Erigone blaesa* Crosby & Bishop, 1928**Notes: [BOLD: ACE9601](#)***Frontinella communis* Hentz, 1850**Notes: [BOLD: AAE0825](#)***Grammonota angusta* Dondale, 1959**Notes: [BOLD: AAD1498](#)

***Grammonota inornata* Emerton, 1882**Notes: [BOLD:ACV5737](#)***Hypomma marxi* Keyserling, 1886**Notes: [BOLD:AAB9520](#)***Hypselistes florens* O. P.-Cambridge, 1875**Notes: [BOLD:AAB4233](#)***Mermessus index* Emerton, 1914**Notes: [BOLD:ACL4554](#)***Mermessus trilobatus* Emerton, 1882**Notes: [BOLD:AAC8898](#)***Microlinyphia mandibulata* Emerton, 1882**Notes: [BOLD:AAF4994](#)***Neriene clathrata* Sundevall, 1830**Notes: [BOLD:AAA8358](#)[BOLD:AAB7327](#)***Neriene montana* Clerck, 1757*****Neriene variabilis* Banks, 1892*****Pityohyphantes costatus* Hentz, 1850*****Pityohyphantes subarcticus* Chamberlin & Ivie, 1943*****Pocadicnemis americana* Millidge, 1976**Notes: [BOLD:AAC9060](#)***Tennesseeillum formica* Emerton, 1882**Notes: [BOLD:AAG5631](#)***Tenuiphantes zebra* Emerton, 1882**Notes: [BOLD:AAI8098](#)***Walckenaeria directa* O. P.-Cambridge, 1874**Notes: [BOLD:AAH8313](#)***Walckenaeria fallax* Millidge, 1983**Notes: [BOLD:AAH8314](#)***Walckenaeria pinocchio* Kaston, 1945**Notes: [BOLD:ACT1115](#)***Walckenaeria spiralis* Emerton, 1882**Notes: [BOLD:AAH8314](#)

**Family Lycosidae**

***Arctosa emertoni* Gertsch, 1934**

Notes: [BOLD:ACW1682](#)

***Pardosa distincta* Blackwall, 1846**

Notes: [BOLD:AAC7802](#)

***Pardosa milvina* Hentz, 1844**

Notes: [BOLD:AAB7668](#)

***Pardosa modica* Blackwall, 1846**

Notes: [BOLD:AAA5090](#)

***Pardosa moesta* Banks, 1892**

Notes: [BOLD:AAB0863](#)

***Pardosa saxatilis* Hentz, 1844**

Notes: [BOLD:AAB7667](#)

***Pirata piraticus* Clerck, 1757**

Notes: [BOLD:AAB6784](#)

***Pirata praedo* Kulczynski, 1885**

Notes: [BOLD:AAC5349](#)

***Piratula cantralli* Wallace & Exline, 1978**

Notes: [BOLD:ABZ5613](#)

***Piratula minuta* Emerton, 1885**

Notes: [BOLD:AAE4247](#)

***Schizocosa avida* Walckenaer, 1837**

Notes: [BOLD:AAD3880](#)

***Schizocosa crassipalpa* Roewer, 1951**

Notes: [BOLD:AAC4687](#)

***Schizocosa mccooki* Montgomery, 1904**

Notes: [BOLD:AAH0055](#)

***Schizocosa ocreata* Hentz, 1844**

Notes: [BOLD:AAA7232](#)

***Trochosa ruricola* De Geer, 1778**

Notes: [BOLD:AAB0726](#)

***Trochosa terricola* Thorell, 1856**

Notes: [BOLD:AAB0727](#)



**Family Mimetidae**

*Mimetus epeiroides* Emerton, 1882

Notes: [BOLD:AAG5658](#)

*Mimetus haynesi* Gertsch & Mulaik, 1940

Notes: [BOLD:AAK6284](#)

*Mimetus notius* Chamberlin, 1923

**Family Philodromidae**

*Philodromus cespitum* Walckenaer, 1802

Notes: [BOLD:AAB3836](#)

*Philodromus imbecillus* Keyserling, 1880

Notes: [BOLD:AAI2838](#)

*Philodromus praelustris* Keyserling, 1880

Notes: [BOLD:AAD2665](#)

*Philodromus rufus* subsp. *vibrans* Dondale

*Thanatus coloradensis* Keyserling, 1880

Notes: [BOLD:AAM7986](#)

*Tibellus maritimus* Menge, 1875

Notes: [BOLD:AAA7188](#)

*Tibellus oblongus* Walckenaer, 1802

Notes: [BOLD:AAA7188](#)

**Family Phrurolithidae**

*Phrurotimpus borealis* Emerton, 1911

Notes: [BOLD:AAC7234](#)

*Scotinella pugnata* Emerton, 1890

Notes: [BOLD:AAK7452](#)

**Family Pisauridae**

*Dolomedes striatus* Giebel, 1869

Notes: [BOLD:ACI5773](#)

*Dolomedes tenebrosus* Hentz, 1844

*Pisaurina mira* Walckenaer, 1837

Notes: [BOLD:AAI2721](#)

**Family Salticidae**

*Eris militaris* Hentz, 1845

Notes: [BOLD:AAA5654](#)

***Evarcha hoyi* Peckham & Peckham, 1883**

Notes: [BOLD:AAC0342](#)[BOLD:ACL8050](#)

***Habronattus decorus* Blackwall, 1846**

***Marpissa formosa* Banks, 1892**

Notes: [BOLD:AAG0312](#)

***Naphrys pulex* Hentz, 1846**

Notes: [BOLD:AAC2433](#)

***Neon nelli* Peckham & Peckham, 1888**

Notes: [BOLD:AAD9221](#)

***Pelegrina galathea* Walckenaer, 1837**

Notes: [BOLD:AAB2930](#)

***Pelegrina insignis* Banks, 1892**

Notes: [BOLD:AAB2928](#)

***Pelegrina proterva* Walckenaer, 1837**

***Phidippus audax* Hentz, 1845**

***Phidippus clarus* Keyserling, 1885**

***Salticus scenicus* Clerck, 1757**

***Sitticus floricola* subsp. *palustris* Peckham and Peckham, 1883**

***Synageles noxiosus* Hentz, 1850**

Notes: [BOLD:ACL8115](#)

***Tutelina harti* Peckham, 1891**

Notes: [BOLD:AAW8769](#)

***Tutelina similis* Banks, 1895**

Notes: [BOLD:AAF6387](#)

***Zygoballus nervosus* Peckham & Peckham, 1888**

Notes: [BOLD:ACA1490](#)

#### Family Tetragnathidae

***Leucauge venusta* Walckenaer, 1841**

Notes: [BOLD:AAB8714](#)

***Pachygnatha dorothea* McCook, 1894**

Notes: [BOLD:AAE5304](#)

***Pachygnatha tristriata* C. L. Koch, 1845**

Notes: [BOLD:AAF1571](#)

***Pachygnatha xanthostoma* C. L. Koch, 1845**Notes: [BOLD:ACO7247](#)|[BOLD:ACP5884](#)|[BOLD:ACU5364](#)***Tetragnatha caudata* Emerton, 1884**Notes: [BOLD:AAE3958](#)|[BOLD:ACN4034](#)|[BOLD:AAP3715](#)***Tetragnatha extensa* Linnaeus, 1758*****Tetragnatha guatemalensis* O. P.-Cambridge, 1889*****Tetragnatha laboriosa* Hentz, 1850**Notes: [BOLD:AAA6381](#)|[BOLD:ACR6860](#)***Tetragnatha shoshone* Levi, 1981**Notes: [BOLD:AAB7995](#)***Tetragnatha straminea* Emerton, 1884**Notes: [BOLD:AAD7095](#)***Tetragnatha viridis* Walckenaer, 1841**Notes: [BOLD:AAG5659](#)|[BOLD:AAN6335](#)**Family Theridiidae*****Dipoena nigra* Emerton, 1882**Notes: [BOLD:AAF4974](#)***Enoplognatha caricis* Fickert, 1876**Notes: [BOLD:AAO3896](#)***Enoplognatha ovata* Clerck, 1757**Notes: [BOLD:AAA6910](#)***Euryopsis funebris* Hentz, 1850**Notes: [BOLD:AAJ0542](#)***Hentziectypus globosus* Hentz, 1850**Notes: [BOLD:AAN6263](#)***Neospintharus trigonum* Hentz, 1850**Notes: [BOLD:AAB0273](#)***Neottiura bimaculata* Linnaeus, 1767**Notes: [BOLD:AAK8332](#)|[BOLD:ACN7831](#)***Parasteatoda tabulata* Levi, 1980*****Parasteatoda tepidariorum* C. L. Koch, 1841**Notes: [BOLD:AAC0175](#)

***Theridion albidum* Banks, 1895**Notes: [BOLD:AAV3042](#)***Theridion differens* Emerton, 1882**Notes: [BOLD:AAC3269](#)***Theridion glaucescens* Becker, 1879**Notes: [BOLD:AAG1794](#)***Theridion murarium* Emerton, 1882**Notes: [BOLD:AAC6350](#)***Theridula emertoni* Levi, 1954**Notes: [BOLD:AAD2291](#)***Thymoites unimaculatus* Emerton, 1882**Notes: [BOLD:AAE7853](#)***Yunohamella lyrica* Walckenaer, 1841**Notes: [BOLD:AAG4815](#)**Family Thomisidae*****Mecaphesa asperata* Hentz, 1847**Notes: [BOLD:ACE7683](#)***Misumena vatia* Clerck, 1757**Notes: [BOLD:AAA6275](#)***Misumenoides formosipes* Walckenaer, 1837*****Misumessus oblongus* Keyserling, 1880*****Ozyptila americana* Banks, 1895*****Ozyptila praticola* C. L. Koch, 1837**Notes: [BOLD:AAC7413](#)***Tmarus angulatus* Walckenaer, 1837**Notes: [BOLD:ABY7475](#)***Xysticus bicuspis* Keyserling, 1887**Notes: [BOLD:AAJ9685](#)***Xysticus discursans* Keyserling, 1880**Notes: [BOLD:AAJ9718](#)|[BOLD:ACV2014](#)|[BOLD:ACV5078](#)***Xysticus elegans* Keyserling, 1880**Notes: [BOLD:AAC1568](#)

*Xysticus emertoni* Keyserling, 1880

Notes: [BOLD:AAB4300](#)

*Xysticus funestus* Keyserling, 1880

*Xysticus luctans* C. L. Koch, 1845

Notes: [BOLD:AAF8190](#)

*Xysticus punctatus* Keyserling, 1880

Notes: [BOLD:AAD2346](#)

*Xysticus winnipegensis* Turnbull, Dondale & Redner, 1965

Notes: [BOLD:AAM6956](#)

#### Family Uloboridae

*Uloborus glomus* Walckenaer, 1841

Notes: [BOLD:AAJ7823](#)

#### Order Mesostigmata

#### Family Ascidae

*Arctoseius cetratus* Sellnick, 1940

Notes: [BOLD:ACF8021](#)

#### Family Rhodacaridae

*Rhodacarellus silesiacus* Willmann, 1935

#### Order Opiliones

#### Family Phalangiiidae

*Oligolophus tridens* C. L. Koch, 1836

Notes: [BOLD:AAM8194](#)

*Phalangium opilio* Linnaeus, 1758

Notes: [BOLD:AAI4346](#)

*Platybunus triangularis* Herbst, 1799

Notes: [BOLD:ABW0506](#)

#### Family Sclerosomatidae

*Leiobunum aldrichi* Weed, 1893

Notes: [BOLD:AAH7061](#)

*Leiobunum ventricosum* Wood, 1868

#### Order Sarcoptiformes

#### Family Euzetidae

*Euzetes globulus* Nicolet, 1855

Notes: [BOLD:AAF9090](#)

**Family Gustaviidae**

*Gustavia microcephala* Nicolet, 1855

Notes: [BOLD:ACE3149](#)

**Family Liacaridae**

*Dorycranosus acutidens* Aoki, 1965

Notes: [BOLD:AAF9274](#)

**Family Mochlozetidae**

*Podoribates pratensis* Banks, 1895

Notes: [BOLD:AAF9173](#)

**Family Mycobatidae**

*Punctoribates punctum* Koch, 1839

Notes: [BOLD:AAH6516](#)|[BOLD:ACB6310](#)

**Family Oppiidae**

*Oppia nitens* Koch, 1836

Notes: [BOLD:AAF0868](#)

**Family Oribatulidae**

*Oribatula tibialis* Nicolet, 1855

Notes: [BOLD:ACI4357](#)

**Family Scheloribatidae**

*Scheloribates clavilanceolatus* Ewing, 1907

Notes: [BOLD:AAF9097](#)

**Family Tectocepheidae**

*Tectocepheus sarekensis* Trägårdh, 1910

Notes: [BOLD:AAM3402](#)|[BOLD:AAM4355](#)

**Order Trombidiformes****Family Arrenuridae**

*Arrenurus reflexus* Marshall, 1908

Notes: [BOLD:AAE6722](#)

**Class Branchiopoda****Order Diplostraca****Family Bosminidae**

*Bosmina liederii* De Melo and Hebert, 1994

**Family Eurycercidae**

*Eurycercus longirostris* Hann, 1982

**Class Chilopoda****Order Geophilomorpha****Family Schendylidae**

*Schendyla nemorensis* C.L.Koch, 1837

Notes: [BOLD:AAG8560](#)

**Order Lithobiomorpha****Family Lithobiidae**

*Lithobius microps* Meinert, 1868

Notes: [BOLD:AAH6432](#)

**Class Collembola**

*Entomobrya atrocincta* Schott, 1896

Notes: [BOLD:ACE5102](#)

**Family Entomobryidae**

*Entomobrya nivalis* Linnaeus, 1758

Notes: [BOLD:ACL6239](#)

*Lepidocyrtus paradoxus* Uzel, 1891

*Orchesella villosa* Linnaeus, 1767

Notes: [BOLD:AAA8726](#)

*Pseudosinella octopunctata* Boerner, 1901

Notes: [BOLD:AAA9292](#)

**Family Isotomidae**

*Parisotoma notabilis* Schaffer, 1896

**Order Poduromorpha****Family Hypogastruridae**

*Ceratophysella bengtssoni* Ågren, 1904

Notes: [BOLD:AAI3738](#)

**Order Symphypleona****Family Dicyrtomidae**

*Dicyrtomina minuta* Fabricius, 1783

**Family Katiannidae**

*Sminthurinus elegans* Fitch, 1862

Notes: [BOLD:AAB3495](#)[BOLD:AAB3496](#)

*Brachyiulus pusillus* Leach, 1815

Notes: [BOLD:AAM7944](#)

**Family Julidae**

*Cylindroiulus caeruleocinctus* Wood, 1864

Notes: [BOLD:AAH7472](#)

*Julus scandinavus* Latzel, 1884

Notes: [BOLD:AAH7469](#)

*Ophiulus pilosus* Newport, 1843

**Class Insecta****Order Coleoptera****Family Anobiidae**

*Caenocara* sp.

*Ptilinus ruficornis* Say, 1823

**Family Anthicidae**

*Malporus formicarius* LaFerté-Sénéctère, 1849

Notes: [BOLD:ACF8552](#)

*Notoxus desertus* Casey, 1895

Notes: [BOLD:ABX0657](#)

*Stricticomus tobias* Marseul, 1879

Notes: [BOLD:AAQ1028](#)

**Family Anthribidae**

*Anthribus nebulosus* Forster, 1770

Notes: [BOLD:AAO1339](#)

*Ormiscus walshii* LeConte, 1876

Notes: [BOLD:AAU7341](#)



**Family Buprestidae**

*Agrilus sulciollis* Lacordaire, 1835

**Family Byrrhidae**

*Simplocaria semistriata* Fabricius, 1801

Notes: [BOLD:ABW1696](#)

**Family Byturidae**

*Byturus unicolor* Say, 1823

**Family Cantharidae**

*Cantharis rufa* Linnaeus, 1758

*Chauliognathus pensylvanicus* DeGeer, 1774

*Rhagonycha fulva* Scopoli, 1763

*Rhaxonycha carolina* Fabricius, 1801

**Family Carabidae**

*Agonoleptus conjunctus* Say, 1823

Notes: [BOLD:AAE9008](#)

*Agonum fidele* Casey, 1920

*Agonum gratiosum* Mannerheim, 1853

*Amara angustata* Say, 1823

*Amara rubrica* Haldeman, 1843

Notes: [BOLD:AAM7658](#)

*Bembidion frontale* LeConte, 1847

Notes: [BOLD:AAU7150](#)

*Bembidion obtusum* Audinet-Serville, 1821

Notes: [BOLD:AAP9490](#)

*Calleida punctata* LeConte, 1846

*Carabus granulatus* Linnaeus, 1758

*Carabus nemoralis* Müller, 1764

*Chlaenius tricolor* Dejean, 1826

*Clivina fossor* Linnaeus, 1758

Notes: [BOLD:AAH0274](#)

*Colliuris pensylvanica* Linnaeus, 1758

*Dyschirius setosus* LeConte, 1857

*Elaphrus clairvillei* Kirby, 1837

*Lebia fuscata* Dejean, 1825

Notes: [BOLD:AAH0212](#)

*Lebia solea* Hentz, 1830

*Lebia viridis* Say, 1823

Notes: [BOLD:AAH0141](#)

*Platynus hypolithos* Say, 1823

*Pterostichus melanarius* Illiger, 1798

Family Cerambycidae

*Acalymma vittata* Barber, 1947

*Astylopsis macula* Say, 1826

*Astylopsis sexguttata* Say, 1826

*Bellamira scalaris* Say, 1826

*Calligrapha californica* subsp. *coreopsivora* Brown

*Chaetocnema* sp.

*Charidotella sexpunctata* subsp. *bicolor* Fabricius, 1798

*Chrysochus auratus* Fabricius, 1775

*Chrysolina hudsonica* Brown, 1938

*Cicindela punctulata* subsp. *punctulata* Olivier

*Cicindela sexguttata* Fabricius, 1775

*Clytus ruricola* Olivier, 1795

*Crepidodera* sp.

*Cyrtophorus verrucosus* Olivier, 1795

Notes: [BOLD:AAD4513](#)

*Deloyala guttata* Olivier, 1790

*Dibolia* sp.

*Epitrix* sp.

*Euderces picipes* Fabricius, 1787

*Gaurotes cyanipennis* Say, 1824

Notes: [BOLD:AAI7042](#)

*Longitarsus* sp.

*Mantura floridana* Crotch, 1873

*Megacyllene robiniae* Forster, 1771

*Molorchus bimaculatus* Say, 1824

Notes: [BOLD:AAH0019](#)

*Neoclytus acuminatus* subsp. *acuminatus* Fabricius

*Oberea tripunctata* Swederus, 1787

*Obrium rufulum* Gahan, 1908

*Oulema palustris* Blatchley, 1913

*Paria* sp.

*Phyllotreta* sp.

*Phymatodes amoenus* Say, 1824

*Plagioderma versicolor* Laicharting, 1781

*Psylliodes punctulata* Melsheimer, 1847

*Pyrrhalta* sp.

*Systema blanda* F. E. Melsheimer, 1847

*Tetraopes tetrophthalmus* Forster, 1771

*Tetrops praeusta* Linnaeus, 1758

Notes: [BOLD:AAE9431](#)

*Trigonarthris proxima* Say, 1824

*Trirhabda* sp.

*Typocerus velutinus* subsp. *velutinus* Olivier

*Urgleptes querci* Fitch, 1858

*Xylotrechus convergens* LeConte, 1873

*Xylotrechus gemellus* Casey, 1893

*Zeugophora varians* Crotch, 1873

#### Family Cerylonidae

*Philothermus glabriculus* LeConte, 1863

Notes: [BOLD:ABX9329](#)

#### Family Chrysomelidae

*Altica chalybea* Illiger, 1807

*Altica* sp.

*Cassida rubiginosa* Müller, 1776

Notes: [BOLD:AAO0522](#)

*Crepidodera heikertingeri* Lazorko, 1974

Notes: [BOLD:AAG4462](#)

*Dibolia borealis* Chevrolat in Guérin-Méneville, 1834

Notes: [BOLD:AAL0908](#)

*Epitrix cucumeris* Harris, 1851

Notes: [BOLD:ABA9101](#)

- Exema canadensis* Pierce, 1940  
*Helocassis clavata* Fabricius, 1798  
*Microrhopala vittata* Fabricius, 1798  
*Neogalerucella californiensis* Linnaeus, 1767  
 Notes: [BOLD:AAL2945](#)
- Ophraella conferta* J. L. LeConte, 1865  
 Notes: [BOLD:ACF8270](#)
- Paria fragariae* Wilcox, 1954  
 Notes: [BOLD:ABA3960](#)|[BOLD:ACF6671](#)
- Phyllotreta striolata* Fabricius, 1801  
 Notes: [BOLD:AAL5267](#)
- Plagiodera versicolora* Laicharting, 1781  
*Psylliodes affinis* Paykull, 1799  
 Notes: [BOLD:AAU6967](#)
- Psylliodes napi* Fabricius, 1792  
*Psylliodes picinus* Marsham, 1802  
*Pyrrhalta viburni* Paykull, 1799  
*Trirhabda borealis* Blake, 1931  
 Notes: [BOLD:AAG4458](#)
- Xanthonia decemnotata* Say, 1824  
 Notes: [BOLD:ABA6335](#)|[BOLD:ACJ0239](#)

#### Family Ciidae

- Ceracis thoracicornis* Ziegler, 1845

#### Family Cleridae

- Cymatodera bicolor* Say, 1825  
 Notes: [BOLD:AAU6910](#)
- Enoclerus nigripes* Say, 1823  
 Notes: [BOLD:AAU6970](#)
- Enoclerus rosmarus* Say, 1823  
*Isohydnocera curtipennis* Newman  
*Phyllobaenus verticalis* Say, 1835  
*Placopterus thoracicus* Olivier, 1795  
 Notes: [BOLD:AAP8584](#)

***Zenodosus sanguineus* Say, 1835**Notes: [BOLD:ABA6311](#)**Family Coccinellidae*****Coccinella septempunctata* Linnaeus, 1758*****Coleomegilla maculata* De Geer, 1775**Notes: [BOLD:AAD7604](#)***Coleomegilla maculata* subsp. *lengi* Timberlake*****Didion punctatum* Melsheimer, 1847*****Harmonia axyridis* Pallas, 1773**Notes: [BOLD:AAB5640](#)***Hippodamia glacialis* Fabricius, 1775**Notes: [BOLD:AAH3305](#)***Hippodamia variegata* Goeze, 1777*****Hyperaspis binotata* Say, 1826*****Hyperaspis* cf. *binotata******Propylaea quatuordecimpunctata* Linnaeus, 1758**Notes: [BOLD:AAF6935](#)***Propylea quatuordecimpunctata* Linnaeus, 1758*****Psyllobora vigintimaculata* subsp. *maculata* Say*****Scymnus* sp.*****Stethorus punctillum* Weise, 1891**Notes: [BOLD:AAN6149](#)**Family Corylophidae*****Orthoperus scutellaris* LeConte, 1878**Notes: [BOLD:AAU7040](#)***Sericoderus lateralis* Gyllenhal, 1827**Notes: [BOLD:ABA2914](#)**Family Cryptophagidae*****Atomaria ehippiata* Zimmermann, 1869****Family Curculionidae*****Acoptus suturalis* LeConte, 1876**Notes: [BOLD:AAU6930](#)***Barypeithes pellucidus* Boheman, 1834**Notes: [BOLD:AAG5192](#)

***Hylesinus aculeatus* Say, 1824**

Notes: [BOLD:AAU7331](#)

***Hypera zoilus* Scopoli, 1763**

***Isochnus sequensi* Stierlin 1894**

Notes: [BOLD:ACA3052](#)

***Madarellus undulatus* Say, 1824**

Notes: [BOLD:AAV6533](#)

***Monarthrum mali* Fitch, 1855**

Notes: [BOLD:ACD0202](#)

***Orchestes alni* Linnaeus 1758**

Notes: [BOLD:AAM7726](#)

***Phyllobius oblongus* Linnaeus, 1758**

Notes: [BOLD:AAF9187](#)

***Pityogenes hopkinsi* Swaine, 1915**

Notes: [BOLD:ABW5076](#)

***Polydrusus impressifrons* Gyllenhal, 1834**

Notes: [BOLD:AAO4332](#)

***Sitona lineellus* Bonsdorff, 1785**

***Tychius meliloti* Stephens, 1831**

Notes: [BOLD:AAM7740](#)

***Xyleborinus alni* Nijima 1909**

Notes: [BOLD:AAB2754](#)

***Xyleborinus saxeseni* Ratzeburg, 1837**

Notes: [BOLD:AAB9578](#)

***Xyleborus dispar* Fabricius, 1792**

Notes: [BOLD:AAD0158](#)

***Xylosandrus germanus* Blandford, 1894**

Notes: [BOLD:AAF7523](#)

#### Family Dytiscidae

***Desmopachria convexa* Aubé, 1838**

#### Family Elateridae

***Aeolus mellillus* Say, 1836**

***Ampedus areolatus* Say, 1823**

Notes: [BOLD:ACM2015](#)

***Ampedus linteus* Say, 1839**

Notes: [BOLD:AAU7141](#)

***Ampedus nigricollis* Herbst, 1801**

Notes: [BOLD:AAH2376](#)

***Ampedus oblessus* Say, 1833**

Notes: [BOLD:ACA3849](#)

***Ampedus protervus* LeConte, 1853**

Notes: [BOLD:ACR3975](#)

***Athous brightwelli* Kirby, 1837**

***Corymbitodes tarsalis* Melsheimer, 1844**

Notes: [BOLD:ACV5201](#)

***Ctenicera cylindriciformis* Herbst, 1806**

Notes: [BOLD:AAH2370](#)

***Dalopius vagus* Brown, 1934**

***Hemicrepidius memnonius* Herbst, 1806**

***Melanotus castanipes* Paykull, 1800**

Notes: [BOLD:AAH2378](#)

#### Family Endomychidae

***Mycetina perpulchra* Newman, 1838**

***Phymaphora pulchella* Newman, 1838**

Notes: [BOLD:ACI7114](#)

#### Family Erotylidae

***Triplax flavicollis* Lacordaire, 1842**

***Triplax thoracica* Say, 1825**

***Tritoma pulchra* Say, 1826**

***Tritoma sanguinipennis* Say, 1825**

#### Family Eucnemidae

***Dirrhagofarsus lewisi* Fleutiaux, 1900**

***Hylis terminalis* LeConte, 1866**

***Isorhipis obliqua* Say, 1836**

***Microrhagus* sp.**

*Microrhagus subsinuata* LeConte

*Microrhagus triangularis* Say, 1823

Family Gyrinidae

*Dineutus assimilis* Kirby, 1937

Family Haliplidae

*Haliphus immaculicollis* Harris, 1828

Family Hydrophilidae

*Anacaena lutescens* Stephens, 1829

*Cercyon haemorrhoidalis* Fabricius, 1775

Notes: [BOLD:ABV1545](#)

*Enochrus ochraceus* Melsheimer, 1844

*Tropisternus natator* Orchymont, 1938

Family Kateretidae

*Brachypterolus pulicarius* Linnaeus, 1758

Family Lampyridae

*Ellychnia corrusca* Linnaeus, 1767

Notes: [BOLD:ACV4844](#)

*Lucidota atra* G. Olivier, 1790

*Photinus* sp.

*Pyractomena* sp.

*Pyropyga nigricans* Say, 1823

Family Languriidae

*Acropteroxys gracilis* Newman 1838

Family Latridiidae

*Corticicara gibbosa* Herbst, 1793

Notes: [BOLD:AAI8935](#)

Family Leiodidae

*Anisotoma obsoleta* Horn, 1880

Notes: [BOLD:AAR3435](#)

*Anisotoma* sp.

*Catops paramericus* Peck and Cook, 2002

Notes: [BOLD:AAH3504](#)



*Catops* sp.

*Lionothus* sp.

*Nemadus* sp.

*Prionochaeta opaca* Say, 1825

Notes: [BOLD: AAP6949](#)

*Ptomophagus* sp.

*Sciodreporides fumatus* subsp. *terminans* LeConte

#### Family Melandryidae

*Dircaea liturata* LeConte, 1866

*Epicauta pensylvanica* De Geer, 1775

*Melandrya striata* Say, 1824

Notes: [BOLD: AAK7242](#)

#### Family Meloidae

*Epicauta murina* LeConte, 1853

*Meloe impressus* Kirby, 1837

#### Family Melyridae

*Collops quadrimaculata* Fabricius, 1798

*Hypebaeus apicalis* Say, 1825

Notes: [BOLD: AAN5932](#)

#### Family Mordellidae

*Mordellina infima* LeConte, 1862

*Mordellistena andreae* LeConte, 1862

*Mordellistena bifasciata* Ray, 1936

*Mordellistena cervicalis* LeConte, 1862

*Mordellistena cf. lutea*

*Mordellistena ornata* Melsheimer, 1845

*Mordellistena picilabris* Helmuth, 1864

*Mordellistena* sp.

*Mordellochroa scapularis* Say, 1824

Notes: [BOLD: AAU6912](#)

*Paramordellaria triloba* Say, 1824

*Tomoxia lineela* LeConte

Family Mycetophagidae

*Mycetophagus pluripunctatus* LeConte, 1856

Family Nitidulidae

*Carpophilus sayi* Parsons, 1943

*Conotelus obscurus* Erichson, 1843

*Glischrochilus fasciatus* Olivier, 1790

*Glischrochilus quadrisignatus* Say 1835

*Glischrochilus sanguinolentus* subsp. *sanguinolentus* Olivier, 1790

*Omosita colon* Linnaeus, 1758

*Stelidota octomaculata* Say, 1825

Notes: [BOLD:AAH0115](#)

Family Pedilidae

*Pedilus lugubris* Say

Family Phalacridae

*Acyломus pugetanus* Casey, 1916

Notes: [BOLD:AAH0135](#)

*Olibrus semistriatus* LeConte, 1856

*Stilbus apicalis* Melsheimer, 1844

Notes: [BOLD:AAH0134](#)

Family Psephenidae

*Psephenus herricki* DeKay, 1844

Family Ptilodactylidae

*Ptilodactyla* sp.

Family Ptinidae

*Hadrobregmus notatus* Say, 1825

Notes: [BOLD:AAP8586](#)

**Family Pyrochroidae**

*Dendroides canadensis* Leconte

*Schizotus cervicalis* Newman, 1838

**Family Rhipiphoridae**

*Pelecotoma flavipes* Melsheimer, 1846

*Rhipiphorus fasciatus* Say, 1824

**Family Scarabaeidae**

*Amphimallon majale* Razumowski, 1789

*Aphodius granarius* Linnaeus, 1767

*Ataenius strigatus* Say, 1823

*Calamosternus granarius* Linnaeus, 1767

Notes: [BOLD:AAM7733](#)

*Onthophagus orpheus* subsp. *canadensis* Fabricius, 1801

*Osmoderma scabra* Palisot de Beauvois, 1805

*Phyllophaga futilis* LeConte, 1850

Notes: [BOLD:AAD1098](#)

*Phyllophaga rugosa* Melsheimer, 1845

Notes: [BOLD:AAJ2312](#)

*Popillia japonica* Newman, 1841

*Rhyssalus germanus* Linnaeus, 1767

*Trox scabrosus* Beauvois, 1805

**Family Scirtidae**

*Cyphon laevipennis* Tournier, 1868

Notes: [BOLD:AAG3633](#)

*Cyphon obscurus* Guerin and Memeville, 1834

Notes: [BOLD:AAG7259](#)

*Cyphon pusillus* LeConte

Notes: [BOLD:AAP7021](#)

***Scirtes tibialis* Guerin****Family Scolytidae*****Hylurgopinus rufipes* Eichhoff, 1868*****Scolytus mali* Bechstein, 1805*****Xyleborus sayi* Hopkins, 1915****Family Scraptiidae*****Anaspis rufa* Say, 1826**Notes: [BOLD:AAH0469](#)***Canifa pallipes* Melsheimer, 1846****Family Silphidae*****Necrophila americana* Linnaeus, 1758*****Nicrophorus orbicollis* Say, 1825**Notes: [BOLD:AAE1939](#)***Oiceoptoma inaequale* Fabricius, 1781****Family Silvanidae*****Ahasverus advena* Waltl, 1834**Notes: [BOLD:AAJ2005](#)***Silvanus bidentatus* Fabricius, 1792**Notes: [BOLD:AAO0157](#)***Telephanus velox* Haldeman, 1846**Notes: [BOLD:AAW6380](#)**Family Staphylinidae*****Amischa analis* Gravenhorst, 1802**Notes: [BOLD:ABA5313](#)***Anotylus insecatus* Gravenhorst, 1806**Notes: [BOLD:AAR3352](#)***Anotylus tetracarinatus* Block, 1799*****Atheta brunneipennis* Thomson, 1852**Notes: [BOLD:ABA9094](#)***Bisnius blandus* Gravenhorst, 1806*****Carpelimus fuliginosus* Gravenhorst, 1802**Notes: [BOLD:AAO0558](#)***Coproporus ventriculus* Say, 1834**Notes: [BOLD:ACV1788](#)

***Lordithon appalachianus* Campbell, 1982**Notes: [BOLD:ABA6331](#)***Lordithon cinctus* Gravenhorst, 1802**Notes: [BOLD:ABA6370](#)***Meronera venustula* Erichson, 1839**Notes: [BOLD:ABW2870](#)***Myllaena arcana* Casey, 1911**Notes: [BOLD:ACJ6804](#)***Philonthus caeruleipennis* Mannerheim, 1830*****Philonthus flavibasis* Casey, 1915**Notes: [BOLD:AAH0113](#)***Platydracus cinnamopterus* Gravenhorst, 1802**Notes: [BOLD:ACJ0017](#)***Scaphidium quadriguttatum* Melsheimer**Notes: [BOLD:ACP0011](#)***Sepedophilus cinctulus* Erichson, 1839**Notes: [BOLD:ACC1294](#)***Sepedophilus testaceus* Fabricius, 1793**Notes: [BOLD:AAH0108](#)***Stenichnus scutellaris* Muller & Kunze, 1822**Notes: [BOLD:AAN9916](#)***Tachinus corticinus* Gravenhorst, 1802**Notes: [BOLD:AAH0107](#)***Tachyporus atriceps* Stephens, 1832**Notes: [BOLD:ABX2484](#)***Tachyporus chrysomelinus* Linnaeus, 1758**Notes: [BOLD:AAN9511](#)***Tachyporus elegans* Horn, 1877**Notes: [BOLD:AAU6934](#)***Tachyporus nitidulus* Fabricius, 1781**Notes: [BOLD:ABA9096](#)***Trichophya pilicornis* Gyllenhal, 1810**Notes: [BOLD:ABW9580](#)

***Xantholinus linearis* Olivier, 1795**Notes: [BOLD:AAG4333](#)**Family Stenotrachelidae*****Cephaloon lepturoides* Newman, 1838****Family Synchronidae*****Mallogrya subaenea* Horn, 1888**Notes: [BOLD:AAK7440](#)***Synchroa punctata* Newman, 1838****Family Tetratomidae*****Eustrophus tomentosus* Say, 1827**Notes: [BOLD:ACI7017](#)**Family Throscidae*****Aulonthroscus constrictor* Say, 1839**Notes: [BOLD:AAU7339](#)***Aulonthroscus distans* Blanchard, 1917**Notes: [BOLD:ABA9083](#)***Aulonthroscus* sp.*****Trixagus carinicollis* Schaeffer, 1916**Notes: [BOLD:AAN6148](#)***Trixagus chevrolati* Bonvouloir, 1859****Family Trogossitidae*****Tenebroides corticalis* Melsheimer, 1844****Order Dermaptera****Family Forficulidae*****Forficula auricularia* Linnaeus, 1758*****Forficula auricularia*-A Linnaeus, 1758**Notes: [BOLD:AAG9897](#)

Checklist of species observed or collected at the *rare* Charitable Research Reserve in Cambridge, Ontario, Canada. The second of five checklists for Kingdom Animalia, this checklist contains members of Phylum Arthropoda, Class Insecta (Orders Diptera, Ephemeroptera, and Hemiptera).

Phylum Arthropoda

Kingdom Animalia

Class Insecta

Order Diptera

Family Agromyzidae

*Agromyza frontella* Rondani, 1874

Notes: [BOLD:AAJ7105](#)

*Aulagromyza luteoscutellata* de Meijere, 1924

Notes: [BOLD:AAJ9681](#)

*Calycomyza majuscula* Frick, 1956

Notes: [BOLD:AAV4861](#)

*Cerodontha biseta* Hendel, 1920

*Cerodontha dorsalis* Loew, 1863

*Cerodontha fasciata* Strobl, 1880

*Cerodontha muscina* Meigen, 1830

Notes: [BOLD:AAF1051](#)

*Chromatomyia lactuca* Frost, 1924

*Japanagromyza viridula* Coquillett, 1902

Notes: [BOLD:AAI7960](#)

*Liriomyza brassicae* Riley, 1885

Notes: [BOLD:AAF6806](#)

*Liriomyza fricki* Spencer, 1965

Notes: [BOLD:ACE7414](#)

*Nemorimyza posticata* Meigen, 1830

Notes: [BOLD:AAG9234](#)|[BOLD:ACJ0616](#)

***Ophiomyia labiatarum* Hering, 1937**

***Ophiomyia nasuta* Melander, 1913**

Notes: [BOLD:AAK5607](#)

***Ophiomyia quinta* Spencer, 1969**

Notes: [BOLD:AAI3360](#)|[BOLD:ABZ1036](#)

***Ophiomyia similata* Malloch, 1918**

Notes: [BOLD:AAP8823](#)|[BOLD:ACV3095](#)|[BOLD:ACV5944](#)

***Phytoliriomyza dorsata* Siebke, 1864**

Notes: [BOLD:AAG4751](#)

***Phytoliriomyza robiniae* Valley, 1982**

Notes: [BOLD:AA1337](#)

***Phytomyza flavicornis* Fallen, 1823**

Notes: [BOLD:AAH9376](#)

***Phytomyza solidaginophaga* Sehgal, 1971**

Notes: [BOLD:AAL4176](#)

***Pseudonapomyza europaea* Spencer, 1973**

#### Family Anisopodidae

***Sylvicola alternatus* Say, 1823**

Notes: [BOLD:AAG2000](#)

***Sylvicola fuscatus* Fabricius, 1775**

Notes: [BOLD:AAG1998](#)

#### Family Anthomyiidae

***Anthomyia pluvialis* Linnaeus, 1758**

Notes: [BOLD:AAP2970](#)

***Delia antiqua* Meigen, 1826**

***Delia platura* Meigen, 1826**

Notes: [BOLD:AAA3453](#)

***Eustalomyia festiva* Zetterstedt, 1845**

Notes: [BOLD:AAP8833](#)

***Eutrichota pilimana* Ringdahl, 1918**

Notes: [BOLD:AAP2968](#)

***Hylemyza partita* Meigen, 1826**

Notes: [BOLD:AAG2463](#)



***Pegomya flavifrons* Walker, 1849**

Notes: [BOLD:AAG2479](#)

**Family Anthomyzidae**

***Mumetopia occipitalis* Melander, 1913**

Notes: [BOLD:AAG4827](#)

***Stiphrosoma balteatum* Rohacek & Barber, 2005**

**Family Asilidae**

***Dioctria baumhaueri* Meigen, 1820**

***Efferia aestuans* Linnaeus, 1763**

***Efferia albibarbis* Macquart, 1838**

***Laphria canis* Williston, 1883**

***Laphria canis complex* Williston, 1883**

***Laphria cinerea* Back, 1904**

***Laphria flavicollis* Say, 1824**

***Laphria janus* McAtee, 1919**

***Laphria sicula* McAtee, 1919**

***Laphria thoracica* Fabricius, 1805**

***Machimus sadyates* Walker, 1849**

**Family Aulacigastridae**

***Aulacigaster neoleucopeza* Mathis & Freidberg, 1994**

Notes: [BOLD:AAV0437](#)|[BOLD:ABV3853](#)

**Family Bombyliidae**

***Anthrax irroratus* Say, 1823**

***Bombylius major* Linnaeus, 1758**

Notes: [BOLD:ABV0388](#)

***Hemipenthes morio* Linnaeus, 1758**

***Hemipenthes sinuosa* Wiedemann, 1821**

***Hemipenthes webberi* Johnson, 1919**

***Xenox tigrinus* De Geer, 1776**

**Family Calliphoridae**

***Calliphora livida* Hall, 1948**

Notes: [BOLD:ABY7153](#)

***Cynomya cadaverina* Robineau-Desvoidy, 1830**

Notes: [BOLD:AAB0868](#)

***Phormia regina* Meigen, 1826**Notes: [BOLD:AAB9140](#)***Pollenia angustigena* Wainwright, 1940**Notes: [BOLD:AAP2825](#)***Pollenia griseotomentosa* Jacentkovsky, 1944**Notes: [BOLD:AAI2766](#)***Pollenia labialis* Robineau-Desvoidy, 1863**Notes: [BOLD:AAI2765](#)***Pollenia pediculata* Macquart, 1834**Notes: [BOLD:AAG6745](#)***Pollenia rudis* Fabricius, 1794**Notes: [BOLD:AAH3035](#)**Family Cecidomyiidae*****Asteromyia carbonifera* Osten Sacken, 1862**Notes: [BOLD:AAA2254](#)[BOLD:ABX5689](#)***Asteromyia laeviana* Felt, 1907**Notes: [BOLD:ABV1420](#)***Asteromyia modesta* Felt, 1907**Notes: [BOLD:AAM1947](#)[BOLD:AAM1948](#)[BOLD:AAM1954](#)[BOLD:ACG8775](#)[BOLD:ACN2213](#)***Asteromyia tumifica* Beutenmuller, 1907**Notes: [BOLD:ACL0470](#)***Janetiella glechomae* Tavares, 1930**Notes: [BOLD:AAQ0642](#)***Mayetiola destructor* Say, 1817**Notes: [BOLD:ABV9277](#)**Family Ceratopogonidae*****Stilobezzia antennalis* Coquillett, 1901****Family Chironomidae*****Bryophaenocladus ictericus* Meigen, 1830**Notes: [BOLD:AAM6273](#)***Bryophaenocladus* sp. 8ES**Notes: [BOLD:AAG1021](#)

***Camptocladius stercorarius* De Geer, 1776**Notes: [BOLD:AAN5341](#)***Chironomus acidophilus* Keyl, 1960**Notes: [BOLD:AAJ4295](#)***Chironomus dilutus* Kiknadze & Butler, 1999**Notes: [BOLD:AAB4658](#)***Chironomus maturus* Johannsen, 1908**Notes: [BOLD:AAB4657](#)***Chironomus melanescens* Keyl, 1961**Notes: [BOLD:AAI4303](#)***Chironomus ochreatus* Townes, 1945**Notes: [BOLD:ACV5571](#)***Cladotanytarsus atridorsum* Kieffer, 1924**Notes: [BOLD:AAJ3263](#)***Conchapelopia telema* Roback, 1971**Notes: [BOLD:AAC4802](#)|[BOLD:AAN5351](#)***Corynoneura scutellata* Winnertz, 1846**Notes: [BOLD:AAN5330](#)***Cricotopus annulator cplx* Goetghebuer, 1927*****Cricotopus bicinctus* Meigen, 1818**Notes: [BOLD:ACC7282](#)***Cricotopus* sp. 18ES*****Cricotopus* sp. 19ES**Notes: [BOLD:AAP5141](#)***Cricotopus tremulus* Linnaeus, 1758**Notes: [BOLD:AAE4298](#)***Cricotopus triannulatus* Macquart, 1826**Notes: [BOLD:AAP5920](#)***Cricotopus trifascia* Edwards, 1929**Notes: [BOLD:ACS9429](#)|[BOLD:ACT0257](#)***Cricotopus vierriensis* Goetghebuer, 1935**Notes: [BOLD:AAG1005](#)|[BOLD:ACV5403](#)|[BOLD:ACV5404](#)

***Dicrotendipes modestus* Say, 1823**Notes: [BOLD:AAL7329](#)***Dicrotendipes tritomus* Kieffer, 1916**Notes: [BOLD:AAC0706](#)***Gymnometriocnemus brumalis* Edwards, 1929**Notes: [BOLD:AAP6873](#)***Lauterborniella agrayloides* Kieffer, 1911**Notes: [BOLD:AAN5343](#)***Limnophyes natalensis* Kieffer, 1914**Notes: [BOLD:AAB7361](#)***Limnophyes* sp. 14ES**Notes: [BOLD:ABU5525](#)***Metriocnemus* sp. 4ES**Notes: [BOLD:ABX5809](#)***Micropsectra nigripila* Johannsen, 1905*****Micropsectra subletteorum* Anderson, Stur & Ekrem, 2013**Notes: [BOLD:AAF7088](#)***Microtendipes pedellus* De Geer, 1776**Notes: [BOLD:AAE0707](#)***Monopelopia tenuicalcar* Kieffer, 1918**Notes: [BOLD:AAM6277](#)***Nanocladius anderseni* Saether, 1977**Notes: [BOLD:AAC3041](#)***Nilotanypus fimbriatus* Walker, 1828**Notes: [BOLD:AAE5762](#)***Orthocladius carlatus* Roback, 1957**Notes: [BOLD:AAG1000](#)***Orthocladius doreus* Roback, 1957**Notes: [BOLD:AAB2641](#)|[BOLD:AAB2645](#)|[BOLD:ACV3368](#)***Orthocladius oliveri* Sponis, 1977**Notes: [BOLD:AAB7872](#)***Orthocladius rivulorum* Kieffer, 1909**Notes: [BOLD:AAB3988](#)

***Pagastia orthogonia* Oliver, 1959**Notes: [BOLD:AAI2601](#)***Paraphaenocladus impensus* Walker, 1856**Notes: [BOLD:AAC4197](#)***Paratanytarsus dissimilis* Johannsen, 1905**Notes: [BOLD:AAE3698](#)***Paratanytarsus grimmii* Schneider, 1885**Notes: [BOLD:AAD1485](#)***Paratanytarsus laccophilus* Edwards, 1929**Notes: [BOLD:AAC8842](#)|[BOLD:ACF2457](#)***Paratanytarsus sp. 7TE***Notes: [BOLD:AAP2907](#)***Paratanytarsus sp. TE03***Notes: [BOLD:AAE3675](#)***Polypedilum convictum* Walker, 1856**Notes: [BOLD:AAD1397](#)***Psectrocladius obivus* Walker, 1856**Notes: [BOLD:AAF6432](#)***Rheocricotopus robacki* Beck and Beck, 1964**Notes: [BOLD:AAM6249](#)***Rheotanytarsus pellucidus* Walker, 1848**Notes: [BOLD:AAI0332](#)***Smittia edwardsi* Goetghebuer, 1932**Notes: [BOLD:AAF4817](#)***Smittia sp. 14ES***Notes: [BOLD:AAM7064](#)***Smittia sp. 22ES***Notes: [BOLD:AAN5358](#)***Smittia sp. 23ES***Notes: [BOLD:AAH9641](#)***Smittia sp. 8ES***Notes: [BOLD:ACP4736](#)

***Stempellinella fimbriata* Ekrem, 2007**Notes: [BOLD:AAD0300](#)***Tanytarsus glabrescens* Edwards, 1929**Notes: [BOLD:ACV5604](#)|[BOLD:ACV5898](#)***Tanytarsus guerlus* Roback, 1957**Notes: [BOLD:AAC4523](#)|[BOLD:AAC4525](#)***Tanytarsus mendax* Kieffer, 1925**Notes: [BOLD:ACJ3722](#)|[BOLD:ACV3832](#)***Tanytarsus recurvatus* Brundin, 1947**Notes: [BOLD:AAC3354](#)***Tanytarsus wirthi* Ekrem, Sublette & Sublette, 2003**Notes: [BOLD:AAD2144](#)***Thienemanniella xena* Roback, 1957**Notes: [BOLD:AAD5253](#)|[BOLD:AAD5254](#)**Family Chloropidae*****Chaetochlorops inquilinus* Coquillett, 1898*****Elachiptera costata* Loew, 1863*****Elachiptera nigriceps* Loew, 1863**Notes: [BOLD:AAP5169](#)***Elachiptera sibirica* Loew, 1858**Notes: [BOLD:AAH4208](#)***Eribolus longulus* Loew, 1863*****Gaurax dubius* Macquart, 1835**Notes: [BOLD:ACC7744](#)***Gaurax pallidipes* Malloch, 1915**Notes: [BOLD:AAH4210](#)***Gaurax varihalteratus* Malloch, 1913**Notes: [BOLD:ACM2340](#)***Hapleginella conicola* Greene, 1918*****Malloewia abdominalis* Becker, 1912**Notes: [BOLD:ABW1379](#)***Malloewia nigripalpis* Malloch, 1913**Notes: [BOLD:ABZ4644](#)

***Ocella provocans* Becker, 1912**

***Oscinella frit* Linnaeus, 1758**

***Oscinisoma alienum* Becker, 1912**

Notes: [BOLD:ACE3223](#)

***Psilacrum arpidia* Malloch, 1916**

Notes: [BOLD:ACE0829](#)

***Rhopalopterus carbonarium* Loew, 1869**

***Thaumatomyia glabra* Meigen, 1830**

Notes: [BOLD:AAH4135](#)

#### Family Chyromyidae

***Gymnochiromyia concolor* Malloch, 1914**

Notes: [BOLD:ACV5890](#)

#### Family Clusiidae

***Clusia czernyi* Johnson, 1913**

Notes: [BOLD:AAF4394](#)

***Clusia lateralis* Walker, 1849**

***Clusiodes johnsoni* Malloch, 1922**

Notes: [BOLD:AAJ4032](#)

***Clusiodes melanostomus* Loew, 1864**

Notes: [BOLD:AAJ4031](#)

***Sobarocephala flaviseta* Johnson, 1913**

Notes: [BOLD:AAN5648](#)

***Sobarocephala setipes* Melander and Argo, 1924**

#### Family Conopidae

***Physocephala marginata* Say, 1823**

#### Family Culicidae

***Aedes canadensis* Theobald**

***Aedes cinereus* Meigen, 1818**

Notes: [BOLD:AAC1222](#)

***Aedes* sp.**

***Aedes stimulans* (Walker, 1848)**

***Aedes vexans* Meigen, 1830**

Notes: [BOLD:AAA7067](#)

***Anopheles quadrimaculatus* Say, 1824**

***Coquillettidia perturbans* Walker, 1856**

Notes: [BOLD:AAB2539](#)

***Culex restuans* Theobald, 1901**

Notes: [BOLD:AAA7661](#)

***Culex territans* Walker, 1856**

Notes: [BOLD:AAB6943](#)[BOLD:ABY7666](#)

***Mansonia perturbans* Walker**

**Family Dolichopodidae**

***Dolichopus orichalceus* Gosseries, 1989**

***Dolichopus terminalis* Loew, 1866**

***Gymnopternus celer* Meigen, 1824**

***Medetera signaticornis* Loew, 1857**

Notes: [BOLD:AAZ3931](#)

***Neurigona disjuncta* Van Duzee, 1913**

Notes: [BOLD:ABW1193](#)

***Xanthochlorus helvinus* Loew, 1861**

**Family Drosophilidae**

***Chymomyza amoena* Loew, 1862**

Notes: [BOLD:AAE2703](#)

***Drosophila affinis* Sturtevant, 1916**

Notes: [BOLD:AAB8851](#)

***Drosophila falleni* Wheeler, 1960**

Notes: [BOLD:AAB7507](#)

***Leucophenga varia* Walker, 1849**

Notes: [BOLD:AAG8500](#)

***Scaptomyza adusta* Loew, 1862**

Notes: [BOLD:AAG8491](#)

**Family Empididae**

***Rhamphomyia versicolor* Chillcott, 1959**

Notes: [BOLD:AAM7337](#)



**Family Ephydriidae**

*Athyroglossa dinorata* Mathis & Zatwarnicki, 1990

*Athyroglossa granulosa* Cresson, 1922

Notes: [BOLD:ABY0801](#)

*Axysta extera* Cresson, 1942

*Coenia curvicauda* Meigen, 1830

*Discocerina obscurella* Fallen, 1813

*Discomyza incurva* Fallen 1823

Notes: [BOLD:ABA8754](#)

*Hyadina albovenosa* Coquillett, 1900

*Hydrellia albilabris* Meigen, 1830

*Hydrellia griseola* Fallen, 1813

*Hydrellia ischiaca* Loew, 1862

*Hydrellia notata* Deonier, 1971

*Nostima scutellaris* Cresson, 1933

*Ochthera anatolikos* Clausen, 1977

*Parydra aquila* Fallen, 1813

*Philygria debilis* Loew, 1861

*Philygria obtecta* Becker, 1896

Notes: [BOLD:AAG2740](#)

*Pseudohyadina longicornis* Sturtevant and Wheeler, 1954

*Scatella favillacea* Loew, 1862

*Scatella stagnalis* Fallen, 1813

*Scatella tenuicosta* Collin, 1930

*Scatophila despecta* Haliday, 1839

*Scatophila virildella* Sturtevant & Wheeler, 1954

**Family Fanniidae**

*Fannia armata* Meigen, 1826

Notes: [BOLD:AAU6630](#)

**Family Heleomyzidae**

*Suillia quinquepunctata* Say, 1823

Notes: [BOLD:AAC8595](#)

**Family Hybotidae**

*Leptozepea flavipes* Meigen, 1820

Notes: [BOLD:ACE5974](#)

***Platypalpus annulatus* Fallen, 1815**

***Platypalpus holosericus* Melander, 1924**

Notes: [BOLD:AAP6357](#)

***Platypalpus melleus* Melander, 1927**

Notes: [BOLD:AAV3697](#)

***Platypalpus niger* Meigen, 1804**

***Platypalpus pulicarius* Meigen, 1830**

Notes: [BOLD:AAQ0265](#)

***Platypalpus stabilis* Collin, 1961**

***Platypalpus unguiculatus* Zetterstedt, 1838**

Notes: [BOLD:ABA0579](#)

***Tachydromia aemula* Loew, 1864**

Notes: [BOLD:AAN5500](#)

#### Family Keroplatidae

***Orfelia nemoralis* Meigen, 1818**

Notes: [BOLD:AAP2528](#)

#### Family Lauxaniidae

***Lauxania shewelli* Perusse & Wheeler 2000**

***Poecilominettia puncticeps* Coquillett, 1902**

Notes: [BOLD:AAN8633](#)

#### Family Limoniidae

***Epiphragma fasciapenne* Say, 1823**

Notes: [BOLD:ACL8650](#)

***Erioptera caliptera* Say, 1823**

Notes: [BOLD:AAN5882](#)

***Erioptera ebenina* Alexander, 1926**

Notes: [BOLD:ACB0353](#)

***Helius flavipes* Macq.**

Notes: [BOLD:AAF9008](#)

***Ilisia venusta* Osten Sacken, 1860**

***Ormosia affinis* Lundbeck, 1898**

Notes: [BOLD:AAU6544](#)

***Ormosia meigenii* Osten Sacken, 1859**

Notes: [BOLD:ACA9818](#)

***Pseudolimnophila inornata* Osten Sacken, 1869**Notes: [BOLD:AAI1351](#)

## Family Lonchopteridae

***Lonchoptera bifurcata* Fallen, 1810**

## Family Micropezidae

***Compsobata univitta* Walker, 1849**Notes: [BOLD:AAP8989](#)***Rainieria antennaepes* Say, 1823**

## Family Milichiidae

***Leptometopa latipes* Meigen, 1830**Notes: [BOLD:AAP8985](#)***Paramyia nitens* Loew, 1869**Notes: [BOLD:AAG0166](#)|[BOLD:AAG0169](#)***Phleomyia indecora* Loew, 1869**

## Family Muscidae

***Coenosia tigrina* Fabricius, 1775*****Helina depuncta* Fallen, 1825*****Helina evecta* Harris, 1780**Notes: [BOLD:AAC2498](#)***Helina rufitibia* Stein, 1898**Notes: [BOLD:AAG1742](#)***Lispe albitarsis* Stein, 1898**Notes: [BOLD:AAP1125](#)***Lispocephala erythrocer* (Robineau-Desvoidy, 1830)*****Macrorchis ausoba* Walker, 1849*****Muscina levida* Harris, 1788**Notes: [BOLD:AAB8817](#)***Myospila meditabunda* Fabricius, 1781**Notes: [BOLD:AAD7145](#)

## Family Mycetophilidae

***Aglaomyia gatineau* Vockeroth, 1980**Notes: [BOLD:ABV3010](#)***Exechia attrita* Johannsen, 1912**Notes: [BOLD:ACM3454](#)

***Mycetophila caudata* Staeger, 1840**

Notes: [BOLD:AAI3260](#)

***Mycetophila fungorum* De Geer, 1776**

Notes: [BOLD:ACF2821](#)

***Mycetophila ocellus* Walker, 1848**

Notes: [BOLD:AAP4734](#)

***Paratinia recurva* Johannsen, 1910**

***Symmerus lautus* Loew, 1869**

***Trichonta submaculata* (Staeger, 1840)**

Notes: [BOLD:AAU4912](#)

***Zygomysia zaitzevi* Chandler, 1991**

**Family Odiniidae**

***Odinia betulae* Sabrosky, 1959**

Notes: [BOLD:AAP8071](#)

***Odinia mejerei* Collin, 1952**

Notes: [BOLD:ACV3828](#)

**Family Opomyzidae**

***Geomyza apicalis* (Meigen, 1830)**

Notes: [BOLD:ACM2703](#)

***Geomyza tripunctata* Fallen, 1823**

**Family Pediciidae**

***Pedicia inconstans* Osten Sacken, 1859**

**Family Phoridae**

***Conicera dauci* Meigen, 1830**

Notes: [BOLD:AAN8685](#)

***Megaselia arcticae* Disney, 2004**

Notes: [BOLD:AAG3248](#)

***Megaselia citrinella* Buck & Disney, 2001**

***Megaselia fungivora* Wood, 1909**

***Megaselia lucifrons* (Schmitz, 1918)**

Notes: [BOLD:AAL9075](#)

***Megaselia nigriceps* Loew, 1866**

Notes: [BOLD:AAV6384](#)

***Megaselia rufipes* Meigen, 1804**Notes: [BOLD:AAG3274](#)***Megaselia variana* Schmitz, 1926**Notes: [BOLD:AAZ6701](#)

## Family Pipunculidae

***Pipunculus hertzogi* Rapp, 1943**

## Family Psilidae

***Loxocera cylindrica* Say, 1823*****Psila lateralis* Loew, 1860**Notes: [BOLD:AAF9707](#)***Psila persimilis* Wakerly, 1959*****Psila rosae* Fabricius, 1794**Notes: [BOLD:AAP6388](#)

## Family Psychodidae

***Psychoda trinodulosa* Tonnoir, 1922**Notes: [BOLD:AA8770](#)

## Family Rhagionidae

***Bolbomyia nana* Loew, 1862**Notes: [BOLD:ACV5660](#)***Chrysopilus thoracicus* Fabricius, 1805*****Rhagio tringarius* Linnaeus, 1758**

## Family Sarcophagidae

***Boettcheria bisetosa* Parker, 1914**Notes: [BOLD:AAH7139](#)***Boettcheria cimbicis* Townsend, 1892*****Sarcophaga subvicina* Baranov, 1937**Notes: [BOLD:AAG6743](#)***Senotainia trilineata* Wulp, 1890**Notes: [BOLD:AAG6744](#)

## Family Scathophagidae

***Americina adusta* Loew, 1863**Notes: [BOLD:AAH4235](#)***Megaphthalma pallida* Fallen, 1819**Notes: [BOLD:AAH4234](#)

***Parallelomma vittatum* Meigen, 1826**

***Scathophaga furcata* Say, 1823**

Notes: [BOLD:AAH0022](#)

#### Family Sciaridae

***Bradysia difformis* Frey, 1948**

Notes: [BOLD:AAV1295](#)

***Bradysia fenestralis* Zetterstedt, 1838**

Notes: [BOLD:AAV1366](#)

***Bradysia nitidicollis* Meigen, 1818**

***Bradysia pallipes* Fabricius, 1787**

Notes: [BOLD:AAM9254](#)

***Bradysia scabricornis* Tuomikoski, 1960**

Notes: [BOLD:ABA0929](#)

***Bradysia vagans* Winnertz, 1868**

Notes: [BOLD:AAM9252](#)

***Camptochaeta uniformis* Mohrig & Menzel, 1990**

Notes: [BOLD:ACA4924](#)

***Corynoptera bicuspidata* Lengersdorf, 1926**

Notes: [BOLD:AAU6513](#)

***Corynoptera cuniculata* Lengersdorf, 1942**

Notes: [BOLD:AAU6537](#)

***Corynoptera melanochaeta* Mohrig & Menzel, 1992**

Notes: [BOLD:AAM9242](#)

***Corynoptera saccata* Tuomikoski, 1960**

Notes: [BOLD:AAN6437](#)

***Corynoptera subcavipes* Menzel & Smith, 2007**

Notes: [BOLD:AAU6542](#)

***Cratyna ambigua* Lengersdorf, 1934**

Notes: [BOLD:AAH3968](#)[BOLD:AAN6439](#)

***Ctenosciara hyalipennis* Meigen, 1804**

Notes: [BOLD:AAH3983](#)

***Leptosciarella scutellata* Staeger, 1840**

Notes: [BOLD:ACD1218](#)

***Lycoriella castanescens* Lengersdorf, 1940**

Notes: [BOLD:ABA1215](#)

***Lycoriella perochaeta* Mohrig & Menzel, 1990**

Notes: [BOLD:ACC1855](#)

***Lycoriella stylata* Mohrig & Mamaev, 1985**

Notes: [BOLD:AAN6430](#)

***Scatopsciara atomaria* Zetterstedt, 1851**

Notes: [BOLD:AAN6431](#)

***Sciara humeralis* Zetterstedt, 1851**

#### Family Sciomyzidae

***Poecilographa decorum* Loew, 1864**

***Pteromicra similis* Steyskal, 1954**

Notes: [BOLD:AAG6869](#)

***Tetanocera plumosa* Loew, 1847**

***Trypetoptera canadensis* Macquart, 1843**

#### Family Sepsidae

***Nemopoda nitidula* Fallen, 1820**

Notes: [BOLD:AAG5640](#)

***Saltella sphondylii* Schrank, 1803**

***Sepsis punctum* Fabricius, 1794**

Notes: [BOLD:AAG5639](#)

#### Family Simuliidae

***Prosimulium arvum* Adler and Kim, 1985**

Notes: [BOLD:AAD4764](#)

***Prosimulium mixtum* Syme and Davies, 1958**

***Simulium vittatum* Zetterstedt, 1838**

Notes: [BOLD:AAA4121](#)

#### Family Sphaeroceridae

***Apteromyia claviventris* Strobl, 1909**

Notes: [BOLD:AAG7283](#)

***Coproica acutangula* Zetterstedt, 1847**

***Coproica ferruginata* Stenhammar, 1854**

Notes: [BOLD:AAN6407](#)

***Coproica hirtula* Rondani, 1880**

Notes: [BOLD:ACF7714](#)

***Copromyza equina* Fallen, 1820**

Notes: [BOLD:AAJ7412](#)

***Gonioneura spinipennis* Haliday, 1836**

***Ischiolepta pusilla* Fallen, 1820**

***Leptocera caenosa* Rondani, 1880**

***Leptocera erythrocerata* Becker, 1919**

Notes: [BOLD:AAG7276](#)

***Lotophila atra* Meigen, 1830**

***Minilimosina fungicola* Spuler, 1925**

***Minilimosina intercepta* Marshall, 1985**

Notes: [BOLD:AAG7309](#)

***Opalimosina mirabilis* Collin, 1902**

***Pullimosina heteroneura* Haliday, 1836**

***Pullimosina longicosta* Spuler, 1925**

***Pullimosina pullula* Zetterstedt, 1847**

***Rachispoda fumipennis*-group Spuler 1924**

***Rachispoda limosa* Fallén, 1820**

***Rachispoda lutosa*-group Stenhammar, 1855**

***Sclerocoelus sordipes* Adams 1904**

***Spelobia bifrons* Stenhammar, 1854**

***Spelobia clunipes* Meigen, 1830**

***Spelobia luteilabris* Rondani, 1880**

***Spelobia ochripes* Meigen, 1830**

Notes: [BOLD:AAG7279](#)

***Spelobia semioculata* Richards, 1965**

***Sphaerocera curvipes* Latreille, 1805**

***Telomerina flavipes* Meigen, 1830**

Notes: [BOLD:ACJ1971](#)

***Trachypella nuda* Rohacek and Marshall, 1985**

#### Family Stratiomyidae

***Actina viridis* Say, 1824**

Notes: [BOLD:AAP7640](#)



*Allognosta fuscitarsis* Say, 1823  
*Allognosta obscuriventris* Loew, 1863  
*Caloparyphus tetraspilus* Loew, 1866  
*Euparyphus stigmatalis* Loew, 1866  
*Microchrysa polita* Linnaeus, 1758  
*Nemotelus bruesii* Melander, 1903  
*Nemotelus centralis* Hanson, 1958  
*Psellidotus meganticus* Curran, 1925  
*Ptecticus gigliotosi* McFadden, 1971  
*Sargus decorus* Say, 1824  
*Stratiomys norma* Wiedemann, 1830  
*Stratiomys obesa* Loew, 1866

#### Family Syrphidae

*Allograpta micrura* Osten Sacken, 1877  
*Allograpta obliqua* Say, 1823

Notes: [BOLD:AAD8276](#)

*Brachyopa sedmani*  
*Brachypalpus oarus* Walker, 1849

Notes: [BOLD:AAP8757](#)

*Chalcosyrphus libo* Walker, 1849

Notes: [BOLD:AAG4679](#)

*Chalcosyrphus nemorum* Fabricius, 1805

Notes: [BOLD:AAG6762](#)

*Chrysotoxum pubescens* Loew, 1864

*Dasysyrphus venustus* Meigen

Notes: [BOLD:ACV5348](#)

*Epistrophe nitidicollis* Meigen, 1822  
*Eristalis arbustorum* Linnaeus, 1758  
*Eristalis dimidiata* Wiedemann, 1830  
*Eristalis flavipes* Walker, 1849  
*Eristalis stipator* Osten Sacken, 1877

***Eristalis tenax* Linnaeus, 1758**

***Eristalis transversa* Wiedemann, 1830**

***Eumerus* sp.**

***Eupeodes americanus* Wiedemann, 1830**

***Eupeodes volucris* Osten Sacken, 1877**

***Ferdinandea buccata* Loew, 1863**

Notes: [BOLD:AAE0948](#)

***Helophilus fasciatus* Walker, 1849**

***Heringia salax* Loew, 1866**

***Lejota aerea* Loew, 1872**

Notes: [BOLD:AA9807](#)

***Mallota posticata* Fabricius, 1805**

***Melanotstoma mellinum* Linnaeus 1758**

***Merodon equestris* Fabricius, 1794**

***Microdon tristis* Loew, 1864**

***Myolepta nigra* Loew, 1972**

Notes: [BOLD:AAV0836](#)

***Neoascia distincta* Williston, 1887**

Notes: [BOLD:AAG6766](#)

***Ocyptamus fuscipennis* Macquart, 1834**

***Orthonevra nitida* Wiedemann, 1830**

***Paragus haemorrhous* Meigen, 1822**

Notes: [BOLD:AAC2439](#)

***Parhelophilus laetus* Loew, 1963**

***Platycheirus hyperboreus* Staeger, 1845**

Notes: [BOLD:ACF4734](#)

***Platycheirus obscurus* Say, 1824**

Notes: [BOLD:AAF1237](#)

***Platycheirus quadratus* Say, 1823**

***Platycheirus scambus* Staeger, 1843**

***Sericomyia chrysotoxoides* Macquart, 1842**

Notes: [BOLD:ABX5395](#)

*Sphaerophoria asymmetrica* Knutson, 1973

*Sphaerophoria bifurcata* Knutson, 1973

*Sphaerophoria brevipilosa* Knutson, 1973

*Sphaerophoria contigua* Macquart, 1847

*Sphaerophoria philanthus* Meigen

*Sphegina keeniana* Williston, 1887

Notes: [BOLD:ACR0385](#)

*Sphegina petiolata* Coquillett, 1910

*Spilomyia longicornis* Loew, 1872

*Syritta pipiens* Linnaeus, 1758

*Syrphus rectus* Osten Sacken, 1875

*Syrphus ribesii* Linnaeus

Notes: [BOLD:AAA4570](#)

*Syrphus torvus* Osten Sacken, 1875

Notes: [BOLD:AAC6088](#)

*Toxomerus geminatus* Say, 1923

Notes: [BOLD:AAC1312](#)

*Toxomerus marginatus* Say, 1823

Notes: [BOLD:AAA4277](#)

*Xanthogramma flavipes* Loew, 1863

Notes: [BOLD:AAK0114](#)

*Xylota quadrimaculata* Loew, 1866

#### Family Tabanidae

*Chrysops aestuans* Wulp, 1867

*Chrysops ater* Macquart, 1850

Notes: [BOLD:ACE5640](#)

*Chrysops calvus* Pechuman and Teskey, 1967

*Chrysops lateralis* Wiedemann, 1828

*Chrysops striatus* Osten Sacken, 1875

*Chrysops vittatus* Wiedemann, 1821

*Hybomitra epistates* Osten Sacken, 1878

*Hybomitra lasiophthalma* Macquart, 1838

Notes: [BOLD:AAF0889](#)

*Tabanus lineola* Fabricius

## Family Tachinidae

*Actia interrupta* Curran, 1933*Blepharomyia pagana* Meigen, 1824Notes: [BOLD:AAV0903](#)*Campylocheta teliosis* Reinhard, 1952*Ceracia dentata* Coquillett, 1895Notes: [BOLD:ABX6290](#)*Homalactia harringtoni* Coquillett, 1902Notes: [BOLD:AAP2717](#)*Leschenaultia exul* Townsend, 1892Notes: [BOLD:ACE2864](#)*Lydina americana* Townsend, 1892Notes: [BOLD:AAG2432](#)*Oswaldia minor* Curran, 1925Notes: [BOLD:ACF1129](#)*Phorocera obscura* Fallen, 1810Notes: [BOLD:ABY8575](#)*Siphona hokkaidensis* Mesnil, 1957Notes: [BOLD:AAG2172](#)*Siphona intrudens* Curran, 1932Notes: [BOLD:AAP2721](#)*Siphona pisinnia* O'Hara, 1983Notes: [BOLD:AAZ4865](#)

## Family Tephritidae

*Euaresta bella* Loew, 1862*Eurosta solidaginis* Fitch, 1855*Eutreta novaeboracensis* Fitch, 1855*Rhagoletis suavis* Loew, 1862*Urophora cardui* Linnaeus, 1758*Xanthomyia platyptera* Loew, 1873

**Family Tipulidae**

*Nephrotoma cornicina* Linnaeus, 1758

*Tipula (Beringotipula) coloradensis* Doane, 1911

*Tipula dorsimacula* Walker, 1848

Notes: [BOLD:AAF8990](#)

*Tipula mallochi* Alexander

**Family Xylomyidae**

*Macroceromys terminalis* Vasey 1977

*Solva pallipes* Loew, 1863

*Xylomyia americana* Weid

*Xylomyia simillima* Steyskal 1947

*Xylomyia tenthredinoides* Van der Wulp 1867

**Family Xylophagidae**

*Xylophagus lugens* Loew, 1863

Notes: [BOLD:AAJ9649](#)

*Xylophagus reflectens* Walker, 1848

Notes: [BOLD:AAM7333](#)|[BOLD:AAP7637](#)

**Order Ephemeroptera****Family Baetidae**

*Baetis intercalaris* McDunnough, 1921

*Callibaetis ferrugineus* Walsh, 1862

*Cloeon dipterum* Linnaeus, 1761

*Isxaeon anoka* Daggy, 1945

**Family Caenidae**

*Caenis latipennis* Banks, 1907

**Family Ephemeridae**

*Hexagenia limbata* Serville, 1829

**Family Heptageniidae**

*Stenacron interpunctatum* Say, 1839

**Order Hemiptera****Family Anthocoridae**

*Cardiastethus borealis* Kelton, 1977

*Orius insidiosus* Say, 1832

*Orius tristicolor* White, 1879

## Family Aphididae

*Acyrtosiphon malvae* Mosley, 1841

Notes: [BOLD:AAF3206](#)

*Acyrtosiphon pisum* Harris, 1776

*Aphis glycines* Matsumura, 1917

Notes: [BOLD:AAB7938](#)

*Aphis middletonii* Thomas, 1879

Notes: [BOLD:AAB6817](#)

*Aphis rubicola* Oestlund, 1887

Notes: [BOLD:AAF7621](#)

*Eriosoma americanum* Riley, C.V., 1879

Notes: [BOLD:AAD7955](#)

*Eucallipterus tiliae* Linnaeus, 1758

Notes: [BOLD:AAD0131](#)

*Lipaphis pseudobrassicae* Davis, 1914

Notes: [BOLD:AAD9153](#)

*Melaphis rhois* Fitch, 1866

Notes: [BOLD:AAA2079](#)

*Rhopalosiphum nymphaeae* Linnaeus, 1761

*Schizaphis scirpicola* Hille Ris Lambers, 1960

Notes: [BOLD:AAD1238](#)

## Family Belostomatidae

*Belostoma flumineum* Say, 1832

## Family Berytidae

*Neoneides muticus* Say, 1832

## Family Cercopidae

*Aphrophora alni* Fallén, 1805

*Aphrophora cribrata* Walker, 1851

*Clastoptera obtusa* Say, 1825

*Lepyronia quadrangularis* Say, 1825

*Neophilaenus lineatus* Linnaeus, 1758

*Philaenus spumarius* subsp. *quadrimaculatus* Schrank, 1776

*Philaenus spumarius* Linnaeus, 1758

**Family Cicadellidae**

***Agallia quadripunctata* Oman 1933**

Notes: [BOLD:AAG2899](#)

***Agallia* sp.**

***Agalliopsis ancistra* Oman 1970**

***Agalliopsis* sp.**

***Anoscopus flavostriatus* Donovan, 1799**

***Anoscopus flavostrigata* Donovan, 1799**

***Aphrodes* sp.**

***Arboridia* sp.**

***Athysansus argentarius* Metcalf, 1955**

***Balclutha* sp.**

***Ceratagallia* sp.**

***Chlorotettix unicolor* Fitch 1851**

***Cicadula melanogaster* Provancher 1872**

***Colladonus clitellarius* Say, 1830**

Notes: [BOLD:ACV9851](#)

***Cosmotettix cf. bilineatus***

***Cuerna striata* Walker, 1851**

***Deltocephalus pulicaris* Fallén 1806**

Notes: [BOLD:AAy8918](#)

***Dicraneura* sp.**

***Dikraneura mali* Provancher, 1890**

Notes: [BOLD:ABA5842](#)

***Dikrella cruentata* Gillette, 1898**

Notes: [BOLD:AAV0158](#)

***Diplocolenus abdominalis* Fabricius 1803**

Notes: [BOLD:AAG2897](#)

***Doratura stylata* Boheman, 1847**

Notes: [BOLD:AAG8821](#)

***Draeculacephala constricta* Davidson et DeLong, 1943**

***Draeculacephala* sp.**

***Elymana caduca* DeLong 1936**

***Empoasca coccinea* Fitch, 1851**

Notes: [BOLD:ABA5764](#)

***Empoasca decipiens* Zachvatkin, 1935**

Notes: [BOLD:AAV6741](#)

***Empoasca fabae* Cardoso, 1974**

Notes: [BOLD:AAG2868](#)|[BOLD:AAG2873](#)

***Empoasca* sp.**

***Erasmoneura nigra* Gillette, 1898**

***Eratoneura certa* Beamer, 1932**

Notes: [BOLD:ABA5787](#)

***Eratoneura flexibilis* Knull, 1949**

Notes: [BOLD:AAZ8495](#)|[BOLD:AAZ8496](#)

***Errastunus ocellaris* Fallén, 1806**

Notes: [BOLD:AAG8839](#)

***Erythridula dunnii* Hepner, 1976**

Notes: [BOLD:ABA5786](#)

***Erythridula scythia* Auten & Johnson, 1936**

Notes: [BOLD:AAN8412](#)

***Erythridula tenuispica* Beamer, 1930**

Notes: [BOLD:ABA5830](#)

***Erythridula wysongi* Ross & DeLong, 1953**

Notes: [BOLD:AAN8287](#)|[BOLD:ABZ1306](#)

***Erythroneura aza* Robinson, 1924**

Notes: [BOLD:AAV6747](#)

***Erythroneura bakeri* Dmitriev & Dietrich, 2007**

Notes: [BOLD:AAV0161](#)

***Erythroneura elegans* McAtee, 1920**

Notes: [BOLD:ABA5798](#)

***Erythroneura ontari* Robinson, 1924**

Notes: [BOLD:ABA5810](#)

***Erythroneura ontari* Robinson, 1924**

Notes: [BOLD:ABA5810](#)



Checklist of species observed or collected at the *rare* Charitable Research Reserve in Cambridge, Ontario, Canada. The third of five checklists for Kingdom Animalia, this checklist contains members of Phylum Arthropoda, Class Insecta (Orders Hemiptera, Hymenoptera and Lepidoptera).

Class Insecta

Order Hemiptera

Family Cicadellidae

*Erythroneura rubrella* McAtee, 1920

Notes: [BOLD:AAV0164](#)|[BOLD:ACC8414](#)

*Erythroneura* sp.

*Erythroneura tricincta* Fitch, 1851

Notes: [BOLD:AAV6738](#)|[BOLD:AAV6751](#)

*Erythroneura vitifex* Fitch, 1856

Notes: [BOLD:AAV6742](#)|[BOLD:ACQ8506](#)

*Erythroneura vitis* Harris, 1831

*Erythroneura vulnerata* Fitch, 1851

Notes: [BOLD:AAO8361](#)|[BOLD:AAV6752](#)|[BOLD:ABA5772](#)|[BOLD:ABY9043](#)|[BOLD:ABY9046](#)|[BOLD:ACQ3943](#)|[BOLD:ACV2800](#)|[BOLD:ACV2885](#)|[BOLD:ACV2886](#)

*Eupteryx atropunctata* Goeze, 1778

Notes: [BOLD:AAG2869](#)

*Eupteryx flavoscuta* Gillette, 1898

Notes: [BOLD:ABA5805](#)

*Fieberiella florii* Stål, 1864

*Forcipata acclina* DeLong & Caldwell, 1936

*Forcipata loca* DeLong & Caldwell, 1936

Notes: [BOLD:ACC8165](#)

*Graphocephala coccinea* Forster, 1771

*Graphocephala* sp.

*Gyponana* sp.

*Hymetta balteata* McAtee, 1919

Notes: [BOLD:AAV0157](#)

*Jikradia olitoria* Say, 1830

*Latalus ocellaris* De Long & Slesman, 1929

*Macropsis basalis* Van Duzee, 1889

Notes: [BOLD:ACC9200](#)

*Macrosteles quadrilineatus* Forbes, 1885

Notes: [BOLD:AAA9422](#)

*Macrosteles* sp.

*Macrosteles variatus* Fallén, 1806

Notes: [BOLD:AAV0236](#)

*Neokolla hieroglyphica* Say, 1830

Notes: [BOLD:AAN8418](#)

*Oncopsis sobria* Walker, 1851

Notes: [BOLD:ACI7197](#)

*Osbornellus limosus* DeLong, 1941

*Penthimia americana* Fitch, 1851

*Scaphoideus major* Osborn, 1900

Notes: [BOLD:AAV6734](#)

*Scaphoideus* sp.

*Scaphytopius* sp.

*Sorhoanus pascuellus* Fallén, 1826

*Typhlocyba arsinoe* McAtee, 1926

*Typhlocyba niobe* McAtee, 1926

Notes: [BOLD:ABA5877](#)

*Typhlocyba pomaria* McAtee, 1926

Notes: [BOLD:AAF5980](#)

*Zonocyba hockingensis* Knull, 1945

Notes: [BOLD:ACV8488](#)

**Family Cicadidae**

*Tibicen canicularis* Harris, 1841

**Family Clastopteridae**

*Clastoptera proteus* Fitch, 1851

**Family Corixidae**

*Palmacorixa buenoi* Abbott, 1913

*Sehirus cinctus* Palisot, 1811

*Trichocorixa borealis* Sailer, 1948

*Trichocorixa sexcincta* Champion, 1901

**Family Cydnidae**

*Sehirus cinctus cinctus* Palisot, 1811

**Family Cymidae**

*Cymus angustatus* Stål, 1874

**Family Delphacidae**

*Delphacodes* sp.

*Javasella pellucida* Fabricius, 1794

*Kosswigianella lutulenta* Van Duzee, 1894

*Liburniella ornata* Stål, 1862

*Megamelus lunatus* Beamer, 1955

*Pissonotus basalis* Van Duzee, 1897

**Family Derbidae**

*Cedusa incisa* Metcalf, 1923

**Family Dictyopharidae**

*Scolops sulcipes* Say, 1825

**Family Flatidae**

*Metcalfa pruinosa* Say, 1830

**Family Gelastocoridae**

*Gelastocoris oculatus* Fabricius, 1798

**Family Gerridae**

*Aquarius remigis* Say, 1832

**Family Issidae**

*Acanalonia bivittata* Say, 1825

**Family Lygaeidae**

*Kleidocerys resedae* subsp. *geminatus* Say, 1832

*Lygaeus kalmii* Stål, 1874

*Nysius* sp.

**Family Membracidae**

*Aтымna helena* Woodruff, 1915

Notes: [BOLD:AA9905](#)

*Campylenchia latipes* Say, 1824

*Ceresa* sp.

*Cyrtolobus* sp.

*Enchenopa binotata* Say, 1824

*Entylia carinata* Forster, 1771

*Micrutalis calva* Say, 1831

*Publilia concava* Say, 1824

*Telamona decorata* Ball, 1903

**Family Miridae**

*Adelphocoris lineolatus* Goeze, 1778

*Amblytylus nasutus* Kirschbaum, 1856

*Capsus ater* Linnaeus, 1758

*Ceratocapsus* sp.

*Chlamydatus associatus* Uhler, 1872

Notes: [BOLD:AAF3365](#)

*Chlamydatus* sp.

*Collaria meillearii* Provancher, 1872

*Criocoris saliens* Reuter, 1876

*Deraeocoris* sp.

*Fulvius slateri* Wheeler, 1977

*Halticus* sp.

*Heterocordylus malinus* Slingerland, 1909

*Leptopterna dolabrata* Linnaeus, 1758

*Litomiris* sp.

*Lopidea* sp.

*Lygidea* sp.

***Lygocoris pabulinus* Linnaeus, 1761**

Notes: [BOLD:AAB2218](#)

***Lygus* sp.**

***Nabica subcoleoprata* Kirby, 1837**

***Nabis roseipennis* Reuter, 1872**

***Neolygus* sp.**

***Orthocephalus* sp.**

***Orthops scutellatus* Uhler, 1877**

***Pagasa fusca* Stein, 1857**

***Paraproba capitata* Van Duzee, 1912**

***Phoenicocoris strobicola* Knight, 1923**

Notes: [BOLD:AAH8507](#)

***Phytocoris* sp.**

***Pithanus maerkelii* Herrich-Schaeffer, 1838**

***Plagiognathus* sp.**

***Poecilocapsus lineatus* Fabricius, 1798**

***Prepops* sp.**

***Slaterocoris* sp.**

***Stenodema trispinosa* Reuter, 1904**

***Stenodema vicinum* Provancher, 1872**

***Stenotus binotatus* Fabricius, 1794**

***Taedia* sp.**

Family Nabidae

***Hoplistoscelis sordidus* Reuter, 1872**

***Nabis rufusculus* Reuter, 1872**

Family Notonectidae

***Notonecta undulata* Say, 1832**

Family Oxycarenidae

***Crophius disconotus* Say, 1832**

Family Pachygronthidae

***Phlegyas abbreviatus* Uhler, 1876**

Family Pentatomidae

***Acrosternum hilare* Say, 1832**

*Banasa calva* Say, 1832

*Banasa dimidiata* Say, 1832

*Brochymena quadripustulata* Fabricius, 1775

*Cosmopepla lintneriana* Kirkaldy, 1909

*Euschistus tristigmus* subsp. *luridus* Dallas, 1851

*Neottiglossa undata* Say, 1832

*Parabrochymena arborea* Say, 1825

*Picromerus bidens* Linnaeus, 1758

*Podisus maculiventris* Say, 1832

Family Phymatidae

*Phymata americana* Melin, 1930

*Piesma cinerum* Say, 1832

Family Psyllidae

*Pachypsylla celtidismamma* Fletcher, 1882

*Psyllopsis fraxinicola* Foerster, 1848

Family Reduviidae

*Empicornis errabundus* Say, 1832

*Sinea diadema* Fabricius, 1776

*Zelus luridus* Stål, 1862

*Zelus tetracanthus* Stål, 1862

Family Rhopalidae

*Arhyssus* sp.

*Harmostes reflexulus* Say, 1832

*Stictopleurus punctiventris* Dallas, 1852

Family Rhyparochromidae

*Ligyrocoris diffusus* Uhler, 1871

*Megalonotus sabulicola* Thomson, 1870

*Sphragisticus nebulosus* Fallén, 1807

Family Saldidae

*Saldula confluenta* Say, 1832

*Saldula pallipes* Fabricius, 1794

*Saldula saltatoria* Linnaeus, 1758

Family Thyreocoridae

*Corimelaena pulicaria* Germar, 1839

*Galgupha atra* Amyot and Serville, 1843

**Family Tingidae**

*Corythucha marmorata* Uhler, 1878

*Corythucha* sp.

*Dictyla echii* Schrank, 1782

**Order Hymenoptera****Family Andrenidae**

*Andrena andrenoides* Cresson, 1878

*Andrena barbilabris* Kirby, 1802

Notes: [BOLD:AAB4998](#)

*Andrena canadensis* Dalla Torre, 1896

*Andrena carlini* Cockerell, 1901

*Andrena erythrogaster* Ashmead, 1890

*Andrena hirticincta* Provancher, 1888

*Andrena nasonii* Robertson, 1895

*Andrena obscuripennis* Smith, 1853

*Andrena rudbeckiae* Robertson, 1891

*Andrena solidaginis* Robertson, 1893

*Andrena* sp.

*Andrena thaspis* Graenicher, 1903

*Andrena wilkella* Kirby, 1802

*Perdita octomaculata* Say, 1824

*Pseudopanurgus nebrascensis* Crawford, 1903

**Family Anthophoridae**

*Anthophora furcata* Panzer, 1798

*Ceratina calcarata* Robertson, 1900

*Ceratina dupla* Say, 1837

*Ceratina* sp.

*Melissodes desponsa* Smith, 1854

**Family Apidae**

*Apis mellifera* Linnaeus, 1758

*Bombus bimaculatus* Cresson, 1863

*Bombus borealis* Kirby, 1837

***Bombus griseocollis* DeGeer, 1773**

***Bombus impatiens* Cresson, 1863**

Notes: [BOLD:ABZ2516](#)

***Bombus perplexus* Cresson, 1863**

***Bombus rufocinctus* Cresson, 1863**

***Bombus vagans* Smith, 1854**

***Ceratina mikmaqi* Rehan and Sheffield, 2011**

Notes: [BOLD:AAA2368](#)

***Melissodes boltoniae* Robertson, 1905**

***Melissodes communis* Cresson, 1878**

***Melissodes druriella* Kirby, 1802**

***Melissodes illata* Lovell & Cockerell, 1906**

***Melissodes subillata* LaBerge, 1961**

***Melissodes trinodis* Robertson, 1901**

***Melissodes wheeleri* Cockerell, 1906**

***Nomada articulata* Smith, 1854**

***Nomada bella* Cresson, 1863**

Notes: [BOLD:ABZ2527](#)

***Nomada bethunei* Cockerell, 1903**

***Nomada cressonii* Robertson, 1893**

***Nomada luteoloides* Robertson, 1895**

***Nomada pygmaea* Cresson, 1863**

Notes: [BOLD:ABZ6834](#)

***Nomada subrutila* Lovell & Cockerell, 1905**

Notes: [BOLD:AAC5044](#)

***Triepeolus helianthi* Robertson, 1897**

***Triepeolus nigrihirtus* Mitchell, 1962**

***Triepeolus obliteratus* Graenicher, 1911**

***Triepeolus simplex* Robertson, 1903**

***Xylocopa virginiana* Linnaeus, 1771**

Family Bethyridae

***Parasierola* sp.**

Family Braconidae

***Aphidius ervi* Haliday, 1834**

Notes: [BOLD:AAA4188](#)



***Ascogaster quadridentata* Wesmael, 1835**

***Asobara rufescens* Foerster, 1862**

Notes: [BOLD:AAU8583](#)

***Asobara* sp.**

***Cotesia xylina* Say, 1836**

Notes: [BOLD:AAA9386](#)

***Diaeretiella rapae* McIntosh, 1855**

Notes: [BOLD:AAG1421](#)

***Diolcogaster facetosa* Weed, 1888**

Notes: [BOLD:ABA5941](#)

***Ephedrus lacertosus* Haliday, 1833**

Notes: [BOLD:ACW2698](#)

***Peristenus* sp.**

***Pholetesor ornigis* Weed, 1887**

Notes: [BOLD:AAB0520](#)

***Pygostolus falcatus* Nees, 1834**

***Spathius elegans* Matthews, 1970**

#### Family Chalcididae

***Conura albifrons* Walsh, 1861**

Notes: [BOLD:AAG8371](#)

#### Family Chrysididae

***Cleptes semiauratus* Linnaeus, 1761**

#### Family Colletidae

***Colletes eulophi* Robertson, 1891**

***Colletes hyalinus* Provancher, 1888**

***Colletes mandibularis* Smith, 1853**

***Colletes nudus* Robertson, 1898**

***Colletes simulans* Cresson, 1868**

***Hylaeus affinis* Smith, 1853**

***Hylaeus cf. affinis***

***Hylaeus ellipticus* Kirby, 1827**

***Hylaeus mesillae* subsp. *cressoni* Cockerell, 1907**

***Hylaeus modestus* Say, 1837**

***Hylaeus* sp.**

**Family Crabronidae**

- Astata unicolor* Say, 1824  
*Cerceris arelate* Banks, 1912  
*Cerceris atramontensis* Banks, 1913  
*Cerceris clypeata* Dahlbom, 1844  
*Crossocerus annulipes* Lepeletier et Brullé, 1834  
*Crossocerus barbipes* Dahlbom, 1845  
Notes: [BOLD:AAG3190](#)
- Crossocerus elongatulus* van der Linden, 1829  
*Crossocerus tarsatus* subsp. *planipes* Fox, 1895  
*Diodontus minutus* Fabricius, 1793  
*Ectemnius cephalotes* Olivier, 1792  
*Ectemnius continuus* Fabricius, 1804  
*Ectemnius lapidarius* Panzer, 1804  
*Ectemnius maculosus* Gmelin, 1781  
*Ectemnius stirpicola* Packard, 1866  
*Gorytes atricornis* Packard, 1867  
*Gorytes simillimus* Smith, 1856  
*Hoplisoides nebulosus* Packard, 1867  
*Lestica confluenta* Say, 1837  
*Lestica producticollis* Packard, 1866  
*Lyroda subita* Say, 1837  
*Mimesa pauper* Packard, 1867  
*Oxybelus uniglumis* Linnaeus, 1758  
*Passaloecus cuspidatus* Smith, 1856  
Notes: [BOLD:AAG7762](#)
- Passaloecus singularis* Dahlbom, 1844  
*Pemphredon inornata* Say, 1824  
*Pemphredon lethifer* Shuckard, 1837  
*Philanthus bilunatus* Cresson, 1865

*Pison koreense* Radoszkowski, 1887

*Psen monticola* Packard, 1867

*Rhopalum coarctatum* Scopoli, 1763

*Saygorytes phaleratus* Say, 1837

*Solierella peckhami* Ashmead, 1897

*Stigmus americanus* Packard, 1867

Notes: or fraternus

*Stigmus fraternus* Say, 1824

*Tachysphex antennatus* Fox, 1894["", 1893"]

*Tachysphex pompiliformis* Panzer, 1803

*Trypoxylon attenuatum* Smith, 1851

*Trypoxylon carinatum* Say, 1837

*Trypoxylon clavicerum* Lepeletier & Serville, 1828

*Trypoxylon frigidum* Smith, 1856

Notes: [BOLD:AAG3193](#)

*Trypoxylon johnsoni* Fox, 1891

*Trypoxylon lactitarse* Saussure, 1867

*Trypoxylon politum* Drury, 1773

#### Family Diapriidae

*Belyta validicornis* Thomson, 1858

Notes: [BOLD:AAU8736](#)

#### Family Encyrtidae

*Copidosoma floridanum* Ashmead, 1900

Notes: [BOLD:AAA7203](#)

#### Family Eupelmidae

*Eupelmus vesicularis* Retzius, 1783

#### Family Formicidae

*Camponotus herculeanus* Linnaeus, 1758

Notes: [BOLD:AAA2372](#)

*Camponotus nearcticus* Emery, 1893

Notes: [BOLD:AAD4432](#)

*Camponotus pennsylvanicus* De Geer, 1773

Notes: [BOLD:AAA9461](#)

*Camponotus* sp.

*Crematogaster cerasi* Fitch, 1855

*Crematogaster* sp.

*Formica lasioides* Emery, 1893

Notes: [BOLD:AAE0406](#)

*Formica* sp.

*Lasius alienus* Foerster, 1850

Notes: [BOLD:AAA9049](#)

*Lasius claviger* Roger, 1862

*Lasius nearcticus* Wheeler, 1906

Notes: [BOLD:AAD1528](#)

*Lasius neoniger* Emery, 1893

Notes: [BOLD:AAB9126](#)

*Lasius* sp.

*Leptothorax ambiguus* Emery, 1895

*Myrmica* sp.

*Ponera pennsylvanica* Buckley, 1866

Notes: [BOLD:AAF0443](#)

*Prenolepis imparis* Say, 1836

Notes: [BOLD:AAC1302](#)

*Stenamma brevicorne* Mayr, 1886

Notes: [BOLD:AAH7068](#)

*Stigmatomma pallipes* Haldeman, 1844

*Tapinoma sessile* Say, 1836

Notes: [BOLD:AAA3893](#)[BOLD:AAA3900](#)

*Temnothorax ambiguus* Emery, 1895

Notes: [BOLD:AAG0685](#)

#### Family Halictidae

*Agapostemon radiatus* Forster, 1771

*Agapostemon sericeus* Förster, 1771

*Agapostemon virescens* Fabricius, 1775

*Augochlora aurata* Smith, 1853

*Augochlora pura* Say, 1837

*Augochlorella aurata* Smith, 1853

Notes: [BOLD:AAD6445](#)

*Dialictus* sp.

*Halictus confusus* Smith, 1853

*Halictus ligatus* Say, 1837

*Halictus rubicundus* Christ, 1791

*Lasioglossum anomalum* Robertson, 1892

*Lasioglossum atwoodi* Gibbs, 2010

*Lasioglossum birkmanni* Crawford, 1906

*Lasioglossum bruneri* Crawford, 1902

*Lasioglossum comagenense* (Knerer & Atwood, 1964)

*Lasioglossum coriaceum* Smith, 1853

Notes: [BOLD:AAB7007](#)

*Lasioglossum cressonii* Robertson, 1890

*Lasioglossum dreisbachi* Mitchell, 1960

*Lasioglossum ephialtum* Gibbs, 2010

*Lasioglossum fattigi* Mitchell, 1960

*Lasioglossum foxii* Robertson, 1895

*Lasioglossum heterognathum* Mitchell, 1960

*Lasioglossum hitchensi* Gibbs, 2012

*Lasioglossum imitatum* Smith, 1853

*Lasioglossum leucozonium* Schrank, 1781

*Lasioglossum lineatum* Crawford, 1906

*Lasioglossum macoupinense* Robertson, 1895

*Lasioglossum michiganense* Mitchell, 1960

*Lasioglossum nigroviride* Graenicher, 1911

*Lasioglossum paradmirandum* Knerer & Atwood, 1966

*Lasioglossum pectinatum* Robertson, 1890

*Lasioglossum pectorale* Smith, 1853

*Lasioglossum perpunctatum* Ellis, 1913

*Lasioglossum pilosum* Smith, 1853

*Lasioglossum platyparium* Robertson, 1895

*Lasioglossum pruinosum* Robertson, 1892

*Lasioglossum* sp. 1

*Lasioglossum* sp. 2

*Lasioglossum subversans* Mitchell, 1960

*Lasioglossum tegulare* Robertson, 1890

*Lasioglossum tenax* Sandhouse, 1924

*Lasioglossum timothyi* Gibbs, 2010

*Lasioglossum versans* Lovell, 1905

Notes: [BOLD:ABZ6180](#)

*Lasioglossum versatum* Robertson, 1902

*Lasioglossum vierecki* Crawford, 1904

*Lasioglossum weemsi* Mitchell, 1960

*Lasioglossum zonulum* Smith, 1848

*Lasioglossum zophops* Ellis, 1914

*Sphecodes atlantis* Mitchell, 1956

*Sphecodes clematidis* Robertson, 1897

*Sphecodes confertus* Say, 1837

*Sphecodes cressonii* Robertson, 1903

*Sphecodes davisii* Robertson, 1897

*Sphecodes dichrous* Smith, 1853

*Sphecodes heraclei* Robertson, 1897

*Sphecodes levis* Lovell & Cockerell, 1907

*Sphecodes minor* Robertson, 1898

*Sphecodes persimilis* Lovell & Cockerell, 1907

*Sphecodes pycnanthemis* Robertson, 1897

*Sphecodes ranunculi* Robertson, 1897

Notes: [BOLD:AAG7655](#)

*Sphecodes* sp.

*Sphecodes stygius* Robertson, 1893

*Sphecodes wheeleri* Mitchell, 1956

#### Family Ichneumonidae

*Agrothereutes abbreviatus* Fabricius, 1794

Notes: [BOLD:AAG7687](#)

*Agrypon flexorium* Thunberg, 1822

Notes: [BOLD:AAH7052](#)

*Aritranis director* Thunberg, 1822

Notes: [BOLD:AAG7768](#)

***Bathyplectes anurus* Thomson, 1887**Notes: [BOLD:ABA6269](#)***Bathythrix decipiens* Gravenhorst, 1829**Notes: [BOLD:AAU8495](#)***Campoletis flavicincta* Ashmead, 1890**Notes: [BOLD:AAZ8146](#)***Cryptus albitarsis* Cresson, 1864**Notes: [BOLD:AAH1693](#)***Cylloceria melancholica* Gravenhorst, 1820*****Cymodusa distincta* Cresson, 1864**Notes: [BOLD:ABZ4364](#)***Diadegma pendulum* Walley, 1967**Notes: [BOLD:AAZ9563](#)***Dialipsis dissimilis* Dasch, 1992**Notes: [BOLD:ABA6048](#)***Diplazon laetatorius* Fabricius, 1781**Notes: [BOLD:AAD4214](#)***Dolichomitus irritator* Fabricius, 1775**Notes: [BOLD:AAU8680](#)***Dusona minor* Provancher, 1879**Notes: [BOLD:AAH1652](#)***Enytus apostata* Gravenhorst, 1829**Notes: [BOLD:AAG5797](#)***Exochus nigripalpis* Thomson, 1887**Notes: [BOLD:AAG7713](#)***Hyposoter inquinatus* Holmgren, 1860**Notes: [BOLD:AAU8361](#)***Ichneumon discoensis* Fox, 1892**Notes: [BOLD:ACE9045](#)***Ischnus inquisitorius* Muller, 1776**Notes: [BOLD:AAG7737](#)***Iseropus stercorator* Fabricius, 1793**Notes: [BOLD:AAO2094](#)

***Lissonota coracina* Gmelin, 1790**

***Megacara hortulana* Gravenhorst, 1829**

Notes: [BOLD:AAU8687](#)

***Mesochorus suomiensis* Schwenke, 1999**

Notes: [BOLD:AAZ1979](#)

***Ophion bilineatus* Say, 1829**

Notes: [BOLD:AAG8323](#)

***Ophion clave* Viereck, 1905**

Notes: [BOLD:AAG7774](#)

***Ophion idoneus* Viereck, 1905**

Notes: [BOLD:AAN8172](#)

***Ophion* sp. 5 MDS2014**

Notes: [BOLD:AAI3361](#)

***Oresbius taeniatus* Townes, 1962**

***Orthocentrus fulvipes* Gravenhorst, 1829**

Notes: [BOLD:AAM9125](#)

***Phobocampe bicingulata* Gravenhorst, 1829**

Notes: [BOLD:AAM7401](#)

***Pimpla aequalis* Provancher, 1880**

Notes: [BOLD:AAG7634](#)

***Pleolophus basizonus* Gravenhorst**

***Podoschistus vittifrons* Cresson, 1868**

Notes: [BOLD:AAL0380](#)

***Stenomacrus nemoralis* Holmgren, 1858**

Notes: [BOLD:AAM7494](#)

***Tranosema rostrale* Brischke, 1880**

Notes: [BOLD:AAD1926](#)

***Zaglyptus varipes* Gravenhorst, 1829**

Family Leucospidae

***Leucospis affinis* Say, 1824**

Family Megachilidae

***Anthidiellum notatum* Latreille, 1809**



*Anthidium manicatum* Linnaeus, 1758  
*Coelioxys rufitarsus* Smith, 1854  
*Heriades variolosa* subsp. *variolosa* Cresson, 1872  
*Hoplitis pilosifrons* Cresson, 1864  
*Hoplitis producta* Cresson, 1864  
*Hoplitis truncata* Cresson, 1878  
*Megachile brevis* Say, 1837  
*Megachile campanulae* Robertson, 1903  
*Megachile frigide* Smith, 1853  
*Megachile gemula* Cresson, 1878  
*Megachile inermis* Provancher, 1888  
*Megachile latimanus* Say, 1823  
*Megachile lippiae* Cockerell, 1900  
*Megachile mendica* Cresson, 1878  
*Megachile montivaga* Cresson, 1878  
*Megachile perihirta* Cockerell, 1898  
*Megachile pugnata* Say, 1837  
*Megachile relativa* Cresson, 1878  
*Megachile rotundata* Fabricius, 1793  
*Megachile texana* Cresson, 1878  
*Osmia coerulescens* Mitchell, T.B. 1962  
*Osmia conjuncta* Cresson, 1864  
*Osmia lignaria* Say, 1837

Notes: [BOLD:AAE5495](#)

*Osmia proxima* Cresson, 1864  
*Osmia pumila* Cresson, 1864  
*Stelis lateralis* Cresson, 1864

#### Family Mutillidae

*Myrmosa unicolor* Say, 1824  
*Pseudomethoca frigida* Smith 1855

#### Family Mymaridae

*Anaphes listronoti* Huber, 1997  
*Gonatocerus morrilli* Howard, 1908  
*Ooetonus silvensis* Girault, 1916

Notes: [BOLD:AAN7553](#)

### Family Platygasteridae

*Platygaster variabilis* Fouts, 1924

Notes: [BOLD:ABW3242](#)

*Synopeas pennsylvanicum* Fouts, 1924

Notes: [BOLD:ABA6127](#)

*Telenomus podisi* Ashmead, 1893

Notes: [BOLD:AAG7891](#)|[BOLD:AAY9192](#)|[BOLD:ACU5364](#)

### Family Pompilidae

*Agenioideus cinctellus* Spinola, 1808

*Agenioideus humilis* Cresson, 1867

*Anoplius imbellis* Banks, 1944

*Anoplius nigerrimus* van der Vecht, 1973

*Anoplius virginianus* Cresson

*Aporinellus wheeleri* Baquaert, 1919

*Arachnospila michiganensis* subsp. *michiganensis* (Dreisbach)

*Auplopus carbonarius* Scopoli, 1763

*Auplopus mellipes* subsp. *variitarsatus* Dalla Torre, 1897

*Auplopus nigrellus* Banks, 1912

*Caliadurgus fasciatellus* subsp. *alienatus* Smith, 1855

*Dipogon sayi* subsp. *sayi* Banks, 1941

*Episyron biguttatus* subsp. *biguttatus* Fabricius, 1798

*Priocnemis cornica* Say, 1836

*Priocnemis germana* Cresson, 1867

*Priocnemis minorata* Banks, 1912

*Priocnemis notha* subsp. *notha* Cresson, 1867

*Priocnemis scitula* subsp. *relicta* Banks, 1912

### Family Pteromalidae

*Mesopolobus bruchophagi* Gahan, 1917

Notes: [BOLD:ACL4975](#)

### Family Sapygidae

*Sapyga centrata* Say, 1836

Notes: [BOLD:ACL7820](#)

**Family Sierolomorphidae**

*Sierolomorpha canadensis* Provancher, 1888

**Family Siricidae**

*Tremex columba* Linnaeus

**Family Sphecidae**

*Chalybion californicum* de Saussure, 1867

*Isodontia auripes* Fernald, 1906

*Isodontia mexicana* de Saussure, 1867

*Sceliphron caementarium* Drury, 1773

*Sphex ichneumoneus* Linnaeus, 1758

**Family Tenthredinidae**

*Ametastegia aperta* Norton, 1861

Notes: [BOLD:AAI4543](#)

*Ametastegia pallipes* Spinola

Notes: [BOLD:AAE5602](#)

*Caulocampus acericaulis* MacGillivray, 1906

Notes: [BOLD:ACJ9109](#)

*Dolerus asper* Zaddach, 1859

Notes: [BOLD:AAG7773](#)

*Dolerus nitens* Zaddach 1859

Notes: [BOLD:ACV5952](#)

*Empria maculata* Norton, 1861

Notes: [BOLD:ACC8799](#)

*Empria nordica* Ross 1936

Notes: [BOLD:ACI4328](#)

*Fenusa ulmi* Sundevall

Notes: [BOLD:AAN7643](#)

*Halidamia affinis* Fallén 1807

Notes: [BOLD:AAN7641](#)

*Macrophya flavolineata* Norton 1860

Notes: [BOLD:ABU8852](#)

*Metallus lanceolatus* Thomson, 1870

Notes: [BOLD:AAP1085](#)

***Monophadnus pallescens* Gmelin 1790**Notes: [BOLD:ACK2140](#)***Pachynematus extensicornis* Norton**Notes: [BOLD:AAN8130](#)***Periclista* sp. tM8**Notes: [BOLD:AAG3550](#)***Priophorus compressicornis* Fabricius, 1804**Notes: [BOLD:ACI7354](#)***Pristiphora chlorea* Norton 1867**Notes: [BOLD:ACG2990](#)[BOLD:ACM9731](#)***Taxonus epicera* Say 1836**Notes: [BOLD:ACC7921](#)***Taxonus pallicoxus* Provancher 1885**Notes: [BOLD:AAG7788](#)***Taxonus terminalis* Say 1824**Notes: [BOLD:AAU8702](#)***Tomostethus multinctus* Rohwer**Notes: [BOLD:ACV5036](#)**Family Trichogrammatidae*****Trichogramma platneri* Nagarkatti, 1975**Notes: [BOLD:AAE0242](#)**Family Vespidae*****Ancistrocerus adiabatus* subsp. *adiabatus* Saussure, 1852*****Ancistrocerus albophaleratus* de Saussure, 1855*****Ancistrocerus antilope* subsp. *antilope* Panzer, 1798*****Ancistrocerus campestris* Saussure, 1852*****Ancistrocerus catskill* Saussure, 1853*****Ancistrocerus unifasciatus* subsp. *unifasciatus* Saussure, 1852*****Dolichovespula arenaria* Fabricius**Notes: [BOLD:ACE9710](#)

***Eumenes crucifer* Provancher, 1888**

***Eumenes fraternus* Say**

***Euodynerus foraminatus* subsp. *foraminatus* de Saussure, 1853**

***Euodynerus leucomelas* subsp. *leucomelas* de Saussure, 1856**

***Monobia quadridens* Linnaeus, 1763**

***Parancistrocerus leionotus* Viereck, 1906**

***Parancistrocerus pedestris* de Saussure, 1855**

Notes: subsp pedestris? No authorship found

***Parancistrocerus pensylvanicus* de Saussure, 1856**

***Parancistrocerus pensylvanicus* subsp. *pensylvanicus* de Saussure, 1856**

***Polistes dominula* Christ, 1791**

Notes: [BOLD:AAB7105](#)

***Polistes fuscatus* Fabricius, 1793**

***Symmorphus canadensis* Saussure, 1855**

***Symmorphus cristatus* Saussure, 1856**

***Vespula flavopilosa* Jakobson, 1978**

***Vespula germanica* Fabricius, 1793**

Notes: [BOLD:AAG9055](#)

***Vespula maculifrons* Buysson**

Notes: [BOLD:AAD5593](#)

***Vespula vidua* de Saussure, 1854**

Notes: [BOLD:AAN8137](#)

***Vespula vulgaris* Linnaeus, 1758**

## Order Lepidoptera

### Family Blastobasidae

***Asaphocrita busckiella* Dietz, 1910**

Notes: [BOLD:AAA8938](#)

***Blastobasis glandulella* Riley, 1871**

Notes: [BOLD:AAB1096](#)

### Family Bucculatricidae

***Bucculatrix ainliella* Murtfeldt 1905**

Notes: [BOLD:AAB4931](#)

***Bucculatrix pomifoliella* Clemens, 1860**

Notes: [BOLD:AAD2085](#)

### Family Cosmopterigidae

*Cosmopterix montisella* Chambers, 1875

Notes: [BOLD:AAH4285](#)

*Teladoma helianthi* Busck, 1932

Notes: [BOLD:AAE1519](#)

### Family Crambidae

*Acentria ephemerella* Denis & Schiffermüller, 1775

*Agriphila vulgivagella* Clemens, 1860

*Anania funebris* Ström, 1768

Notes: [BOLD:AAB4181](#)

*Desmia maculalis* Westwood, 1832

Notes: [BOLD:ACE8375](#)

*Elophila gyralis* Hulst, 1886

*Elophila icciusalis* Walker, 1859

*Elophila tinealis* Munroe, 1972

Checklist of species observed or collected at the *rare* Charitable Research Reserve in Cambridge, Ontario, Canada. The fourth of five checklists for Kingdom Animalia, this checklist contains members of Phylum Arthropoda, Class Insecta (Orders Lepidoptera to Trichoptera), and Class Malacostraca. From Phylum Chordata, it contains Classes Actinopterygii, Amphibia, and Aves (Orders Anseriformes to Passeriformes).

Kingdom Animalia

Phylum Arthropoda

Class Insecta

Order Lepidoptera

Family Crambidae

*Loxostege sticticalis* Linnaeus, 1761

*Microcrambus elegans* Clemens, 1860

*Nomophila nearctica* Munroe, 1973

*Perispasta caeculalis* Zell., 1875

*Petrophila bifascialis* Robinson, 1869

*Sitochroa palealis* Denis & Schiffermüller, 1775

*Udea rubigalis* Guenée, 1854

*Urola nivalis* Drury, 1773

#### Family Depressariidae

*Agonopterix arenella* Denis & Schiffermüller, 1775

Notes: [BOLD:AAC6982](#)

*Agonopterix pulvipennella* Clemens, 1864

Notes: [BOLD:AAA7550](#)

*Depressaria depressana* Fabricius, 1775

*Machimia tentoriferella* Clemens, 1860

#### Family Drepanidae

*Drepana arcuata* Walker

#### Family Elachistidae

*Perittia herrichiella* Herrich-Schaffer, 1855

#### Family Epermeniidae

*Epermenia alba punctella* Busck, 1908

Notes: [BOLD:AAF0142](#)

#### Family Erebiidae

*Apantesis phalerata* Harris, 1841

*Cisseps fulvicollis* Hübner, 1818

*Ctenucha virginica* Esper, 1794

*Hypena madefactalis* Guenée, 1854

*Hypena scabra* Fabricius, 1798

*Hyphantria cunea* Drury, 1773

*Lymantria dispar* subsp. *dispar* Linnaeus, 1758

*Rivula propinqualis* Guenée, 1854

Notes: [BOLD:AAA4282](#)

#### Family Gelechiidae

*Bryotropha hodgei* Rutten & Karsholt, 2004

Notes: [BOLD:AAH4276](#)

*Chionodes fondella* Busck, 1906

Notes: [BOLD:ABA4737](#)

***Chrysoesthia sexguttella* Thunberg, 1794**

Notes: [BOLD:AAD8505](#)

***Dichomeris furia* Hodges, 1986**

Notes: [BOLD:AAI9560](#)

***Dichomeris inserrata* Walsingham, 1882**

Notes: [BOLD:AAH4488](#)

***Dichomeris leuconotella* Busck, 1904**

***Dichomeris ligulella* Hübner, 1818**

Notes: [BOLD:AAA8109](#)

***Dichomeris mercatrix* Hodges, 1986**

***Helcystogramma hystricella* Braun, 1921**

Notes: [BOLD:AAE7016](#)

***Metzneria lappella* Linnaeus, 1758**

***Monochroa fragariae* Busck, 1919**

***Scrobipalpa acuminatella* Sircom, 1850**

Notes: [BOLD:AAC1644](#)

***Scrobipalpula physaliella* Chambers, 1872**

Notes: [BOLD:ACB8750](#)

***Scrobipalpula sacculicola* Braun, 1925**

Notes: [BOLD:ABY8834](#)

***Sinoe chambersi* Lee, 2012**

Notes: [BOLD:ACF2217](#)

***Xenolechia ontariensis* Keifer, 1933**

Notes: [BOLD:AAC6357](#)

#### Family Geometridae

***Alsophila pometaria* Harris, 1841**

Notes: [BOLD:AAB0196](#)

***Besma quercivoraria* Guenée in Boisduval and Guenée, 1858**

***Biston betularia* Linnaeus, 1758**

***Campaea perlata* Guenée in Boisduval and Guenée, 1858**

***Coryphista meadii* Packard, 1874**

***Costaconvexa centrostrigaria* Wollaston, 1858**

***Ecliptopera silaceata* [Denis and Schiffermüller], 1775**



***Ennomos magnaria* Guenée in Boisduval and Guenée, 1858**

***Epirrhoe alternata* Müller, 1764**

***Euchlaena serrata* Drury, 1773**

***Idea dimidiata* Hufnagel, 1767**

***Operophtera bruceata* Hulst, 1886**

Notes: [BOLD:AAA2999](#)

***Orthonama obstipata* Fabricius, 1794**

***Phigalia titea* Cramer, 1780**

Notes: [BOLD:AAA5234](#)

***Plagodis phlogosaria* Guenée in Boisduval and Guenée, 1858**

Notes: [BOLD:AAA3984](#)

***Pleuoprucha insulsaria* Guenée in Boisduval and Guenée, 1858**

***Scopula inductata* Guenée in Boisduval and Guenée, 1858**

***Speranza pustularia* Guenée in Boisduval and Guenée, 1858**

Notes: [BOLD:AAA4456](#)

***Synchlora frondaria* Guenée in Boisduval and Guenée, 1858**

***Trichodezia albovittata* Guenée in Boisduval and Guenée, 1858**

Notes: [BOLD:AAA6926](#)

***Xanthorhoe ferrugata* Clerck, 1759**

Notes: [BOLD:AAA3817](#)

***Xanthorhoe lacustrata* Guenée in Boisduval and Guenée, 1858**

Notes: [BOLD:AAA8660](#)

#### Family Gracillariidae

***Acrocercops astericola* Frey & Boll, 1873**

Notes: [BOLD:AAD3996](#)

***Caloptilia packardella* Chambers, 1872**

Notes: [BOLD:AAD2590](#)

***Cameraria saccharella* Braun, 1908**

Notes: [BOLD:AAH4493](#)

***Cremastobombicia solidaginis* Frey & Boll, 1876**

***Parornix betulae* Stainton, 1854**

Notes: [BOLD:AAE3418](#)

***Parornix crataegifoliella* Clemens, 1860**

Notes: [BOLD:AAF8198](#)

*Phyllocnistis ampelopsiella* Chambers, 1871

Notes: [BOLD:AAI3015](#)

*Phyllocnistis vitegenella* Clemens, 1859

Notes: [BOLD:AAI3014](#)

*Phyllonorycter clemensella* Chambers, 1871

Notes: [BOLD:AAN8981](#)

*Phyllonorycter maestingella* Müller, 1764

Notes: [BOLD:AAL6962](#)

*Phyllonorycter ostryaefoliella* Clemens, 1859

Notes: [BOLD:AAD7999](#)

*Phyllonorycter propinquinella* Braun, 1908

Notes: [BOLD:AAH4497](#)

*Phyllonorycter salicifoliella* Chambers, 1871

Notes: [BOLD:AAD4915](#)

*Phyllonorycter trinotella* Braun, 1908

Notes: [BOLD:AAG1128](#)

*Phyllonorycter tritaenianella* Chambers, 1871

Notes: [BOLD:AAF6577](#)

#### Family HesperIIDae

*Anatrytone logan* W. H. Edwards, 1863

*Ancyloxypha numitor* Fabricius, 1793

*Atalopedes campestris* Boisduval, 1852

*Carterocephalus palaemon* Pallas, 1771

*Epargyreus clarus* Cramer, 1775

*Erynnis baptisiae* W. Forbes, 1936

*Erynnis juvenalis* Fabricius, 1793

Notes: [BOLD:AAC6872](#)

*Erynnis lucilius* Scudder and Burgess, 1870

*Euphyes conspicua* W. H. Edwards, 1863

*Euphyes dion* W. H. Edwards, 1879

*Euphyes vestrus* Boisduval, 1852

*Pholisora catullus* Fabricius, 1793

*Poanes hobomok* T. Harris, 1862

*Poanes massasoit* Scudder, 1863  
*Poanes viator* W. H. Edwards, 1865  
*Polites mystic* W. H. Edwards, 1863  
*Polites origenes* Fabricius, 1793  
*Polites peckius* W. Kirby, 1837  
*Polites themistocles* Latreille, 1824  
*Pompeius verna* W. H. Edwards, 1862  
*Thymelicus lineola* Ochsenheimer, 1808  
*Wallengrenia egeremet* Scudder, 1863

#### Family Lasiocampidae

*Malacosoma disstria* Hubner

Notes: [BOLD:AAA4130](#)

*Tolyte vellea* Stoll, 1791

#### Family Lycaenidae

*Celastrina ladon* Cramer, 1780  
*Celastrina neglecta* W. H. Edwards, 1862  
*Cupido comyntas* Godart, 1824  
*Feniseca tarquinius* Fabricius, 1793  
*Lycaena hyllus* Cramer, 1775  
*Satyrium titus* Fabricius, 1793  
*Satyrium acadicum* W. H. Edwards, 1862  
*Satyrium calanus* Hübner, 1809  
*Satyrium caryaevorus* McDunnough, 1942  
*Satyrium liparops* LeConte, 1833

#### Family Lymantriidae

*Dasychira basiflava* Packard, 1864  
*Orgyia definita* Packard, 1864  
*Orgyia leucostigma* J. E. Smith, 1797

#### Family Momphidae

*Mompha terminella* Humphreys & Westwood, 1845  
 Notes: [BOLD:AAX4784](#)

#### Family Nepticulidae

*Ectoedemia argyropeza* Zeller, 1839  
 Notes: [BOLD:AAC1036](#)

***Stigmella microtheriella* Stainton, 1854**

Notes: [BOLD:AAI0007](#)

***Stigmella rhamnicola* Braun, 1916**

Notes: [BOLD:AAU7678](#)

### Family Noctuidae

***Achatia distincta* Hübner, 1813**

Notes: [BOLD:AAB7392](#)

***Agrotis ipsilon* Hufnagel, 1766**

***Agrotis venerabilis* Walker, 1857**

***Allagrapha aerea* Hübner, 1803**

***Amphipoea americana* Speyer, 1875**

***Amphipoea interoceanica* Smith, 1899**

***Amphipyra pyramidoides* Guenée, 1852**

Notes: [BOLD:AAA8525](#)

***Anathix ralla* Grote and Robinson, 1868**

Notes: [BOLD:AAC9569](#)

***Apamea devastator* Brace, 1819**

***Autographa precatationis* Guenée, 1852**

***Caenurgina crassiuscula* Haworth, 1809**

***Catocala cerogama* Guenée, 1852**

Notes: [BOLD:AAB3383](#)

***Catocala grynea* Cramer, 1779**

***Cerastis tenebrifera* Walker, 1865**

Notes: [BOLD:AAC1487](#)

***Chrysodeixis includens* Walker, 1858**

***Crocigrapha normani* Grote, 1874**

Notes: [BOLD:AAA6924](#)

***Cucullia asteroides* Guenée, 1852**

***Cucullia convexipennis* Grote and Robinson, 1868**

***Euplexia benesimilis* McDunnough, 1922**

Notes: [BOLD:AAA4097](#)

***Eupsilia devia* Grote, 1875**

Notes: [BOLD:AAD9847](#)

***Feltia jaculifera* Guenée, 1852**

***Hyppa xylinoides* Guenée, 1852**

Notes: [BOLD:ABY9574](#)

***Idia aemula* Hübner, 1814**

***Lacinipolia meditata* Grote, 1873**

***Lacinipolia renigera* Stephens, 1829**

***Leucania commoides* Guenée, 1852**

***Leucania multilinea* Walker, 1856**

***Leucania phragmitidicola* Guenée, 1852**

***Leucania pseudargyria* Guenée, 1852**

***Loscopia velata* Walker, 1865**

***Macrochilo absorptalis* Walker, 1859**

***Melanchra adjuncta* Guenée, 1852**

Notes: [BOLD:ACF4823](#)

***Meropleon diversicolor* Morrison, 1874**

***Morrisonia confusa* Hübner, 1831**

Notes: [BOLD:AAA6652](#)

***Mythimna unipuncta* Haworth, 1809**

***Noctua pronuba* Linnaeus, 1758**

***Ochropleura implecta* Lafontaine, 1998**

***Oligia modica* Guenée, 1852**

***Orthosia hibisci* Guenée, 1852**

Notes: [BOLD:AAA4128](#)

***Orthosia rubescens* Walker, 1865**

Notes: [BOLD:AAC0946](#)

***Palthis angulalis* Hübner, 1796**

Notes: [BOLD:AAA3933](#)

***Peridroma saucia* Hübner, 1808**

***Phalaenostola metonalis* Walker, 1859**

***Protodeltote albidula* Guenée, 1852**

***Pseudohermonassa bicarnea* Guenée, 1852**

***Renia adspersgillus* Bosc, 1800**

***Striacosta albicosta* Smith, 1888**

***Sunira bicolorago* Guenée, 1852**

Notes: [BOLD:AAA4426](#)

***Xestia smithii* Snellen, 1896**Notes: [BOLD:AAA2590](#)**Family Nolidae*****Nola ovilla* Grote, 1875**Notes: [BOLD:AAD1810](#)**Family Notodontidae*****Schizura unicornis* J. E. Smith, 1797*****Symmerista leucitys* Franclemont, 1946****Family Nymphalidae*****Aglais milberti* Godart, 1819*****Asterocampa clyton* Boisduval and Le Conte, 1835*****Boloria Bellona* Fabricius, 1775*****Boloria selene* [Schifferrmüller], 1775*****Cercyonis pegala* Fabricius, 1775*****Chlosyne nycteis* E. Doubleday, 1847*****Coenonympha tullia* Müller, 1764*****Danaus plexippus* Linnaeus, 1758*****Euphydryas phaeton* Drury, 1773*****Euptoieta claudia* Cramer, 1775*****Junonia coenia* Hübner, 1822*****Lethe anhedon* A. Clark, 1936*****Lethe appalachia* R. Chermock, 1947*****Lethe eurydice* Linnaeus, 1763*****Libytheana carinenta* Cramer, 1777*****Limenitis archippus* Cramer, 1775*****Limenitis arthemis* Drury, 1773*****Megisto cymela* Cramer, 1777*****Nymphalis antiopa* Linnaeus, 1758*****Nymphalis l-album* [Schifferrmüller], 1775*****Phyciodes cocyta* Cramer, 1777*****Phyciodes tharos* Drury, 1773*****Polygonia comma* T. Harris, 1842*****Polygonia interrogationis* Fabricius, 1798**

*Polygonia progne* Cramer, 1775

*Speyeria Cybele* Fabricius, 1775

*Vanessa atalanta* Linnaeus, 1758

*Vanessa cardui* Linnaeus, 1758

*Vanessa virginiensis* Drury, 1773

#### Family Papilionidae

*Papilio canadensis* Rothschild and Jordan, 1906

*Papilio cressphontes* Cramer, 1777

*Papilio glaucus* Linnaeus, 1758

*Papilio polyxenes* Fabricius, 1775

#### Family Pieridae

*Colias eurytheme* Boisduval, 1852

*Colias philodice* Godart, 1819

*Pieris oleracea* T. Harris, 1829

*Pieris rapae* Linnaeus, 1758

*Pyrisitia lisa* Boisduval and Le Conte, 1830

#### Family Plutellidae

*Plutella porrectella* Linnaeus, 1758

Notes: [BOLD:ACG9804](#)

*Plutella xylostella* Linnaeus, 1758

Notes: [BOLD:AAA1513](#)

#### Family Psychidae

*Psyche casta* Pallas, 1767

Notes: [BOLD:ACL8669](#)

#### Family Pterophoridae

*Gillmeria pallidactyla* Haworth, 1811

*Hellinsia homodactylus* Walker, 1864

*Hellinsia pectodactylus* Staudinger, 1859

#### Family Sphingidae

*Deidamia inscriptum* Harris, 1839

Notes: [BOLD:AAB0001](#)

#### Family Tischeriidae

*Coptotriche badiella* Chambers, 1875

Notes: [BOLD:ACU4456](#)

**Family Tortricidae**

***Acleris chalybeana* Fernald, 1882**

Notes: [BOLD:AAA7667](#)

***Acleris cornana* McDunnough, 1933**

***Ancylis muricana* Walsingham, 1879**

Notes: [BOLD:AAU7760](#)

***Argyrotaenia mariana* Fernald, 1882**

Notes: [BOLD:AAA4119](#)

***Choristoneura rosaceana* Harris, 1841**

Notes: [BOLD:AAA1517](#)

***Cochylis hoffmanana* Kearfott, 1907**

Notes: [BOLD:AAB3571](#)

***Cochylis temerana* Busck, 1907**

Notes: [BOLD:AAB7534](#)

***Endothenia hebesana* Walker, 1863**

***Epinotia medioviridana* Kearfott, 1908**

***Eucosma similana* Clemens, 1860**

***Grapholita prunivora* Walsh, 1868**

Notes: [BOLD:AAG0330](#)

***Olethreutes atrodentana* Fernald, 1882**

***Olethreutes fasciatana* Clemens, 1860**

***Olethreutes permundana* Clemens, 1860**

***Pandemis lamprosana* Robinson, 1869**

***Phaneta ochrocephala* Walsingham, 1895**

***Phaneta parmatana* Clemens, 1860**

***Phaneta tomonana* Kearfott, 1907**

***Platynota idaeusalis* Walker, 1859**

Notes: [BOLD:ABY7901](#)

***Pristerognatha fuligana* Denis & Schiffermüller, 1775**

Notes: [BOLD:AAC7661](#)

***Proteoteras aesculana* Riley, 1881**

Notes: [BOLD:AAA6740](#)



**Order Mantodea****Family Mantidae**

*Mantis religiosa* subsp. *religiosa* Linnaeus, 1758

**Order Mecoptera****Family Bittacidae**

*Bittacus strigosus* Hagen, 1861

**Family Panorpidae**

*Panorpa galerita* Byers, 1962

*Panorpa latipennis* Hine, 1901

*Panorpa subfurcata* Westwood, 1846

**Order Neuroptera****Family Chrysopidae**

*Chrysopa oculata* Say, 1839

**Family Hemerobiidae**

*Hemerobius humulinus* Linnaeus, 1758

Notes: [BOLD:AAG0892](#)|[BOLD:AAN7492](#)

*Hemerobius stigma* Stephens, 1836

Notes: [BOLD:AAG0891](#)

*Micromus posticus* Walker, 1853

Notes: [BOLD:AAG0906](#)

**Order Odonata****Family Aeshnidae**

*Aeshna umbrosa* Walker, 1908

*Anax junius* Drury, 1773

**Family Calopterygidae**

*Hetaerina americana* Fabricius, 1798

**Family Coenagrionidae**

*Argia moesta* Hagen, 1861

*Enallagma antennatum* Say, 1839

*Enallagma civile* Hagen, 1861

*Enallagma ebrium* Hagen, 1861

*Enallagma exsulans* Hagen, 1861

*Enallagma geminatum* Kellicott, 1895

*Enallagma signatum* Hagen, 1861

*Ischnura kellicotti* Williamson, 1898

*Ischnura posita* Hagen, 1861

*Ishnura verticalis* Say, 1839

*Nehalennia irene* Hagen, 1861

Family Lestidae

*Lestes disjunctus* Selys, 1862

*Lestes rectangularis* Say, 1839

Family Libellulidae

*Erythemis simplicicollis* Say, 1839

*Libellula luctuosa* Burmeister, 1839

*Libellula pulchella* Drury, 1773

*Libellula quadrimaculata* Linnaeus, 1758

*Pachydiplax longipennis* Burmeister, 1839

*Plathemis lydia* Drury, 1773

*Sympetrum internum* Montgomery, 1943

*Sympetrum obtrusum* Hagen, 1867

*Sympetrum semicinctorum* Say, 1839

*Tamea lacerat* Hagen, 1861

Order Orthoptera

Family Acrididae

*Cholealtis conspera* Harris, 1841

*Chorthippus curtipennis* Harris, 1835

*Chortophaga viridifasciata* De Geer, 1773

*Dissosteira carolina* Linnaeus, 1758

*Dissosteria carolina* Linnaeus, 1758

*Melanoplus bivattatus* Say, 1825

*Melanoplus sanguinipes* subsp. *sanguinipes* Fabricius, 1798

*Melanoplus* sp.

Family Gryllidae

*Allonemobius fasciatus* De Geer, 1773

*Gryllus veletis* Alexander and Bigelow, 1960

*Oecanthus nigricornis* F. Walker, 1869

*Oecanthus quadripunctatus* Beutenmuller, 1894

Family Tetrigidae

*Tetrix arenosum* subsp. *angusta* Hancock, 1896

*Tetrix subulata* Linnaeus, 1761

**Family Tetrioniidae**

*Conocephalus brevipennis* Scudder, 1863

*Scudderia* sp.

**Order Phasmatodea****Family Heteronemiidae**

*Diapheromera femorata* Say, 1824

**Order Plecoptera****Family Chloroperlidae**

*Sweltsa onkos* Ricker, 1935

**Order Psocoptera****Family Amphipsocidae**

*Polypsocus corruptus* Hagen, 1861

**Family Caeciliidae**

*Caecilius* sp.

**Family Caeciliusidae**

*Valenzuela flavidus* Stephens, 1836

Notes: [BOLD:AAH3228](#)|[BOLD:AAN8447](#)

**Family Ectopsocidae**

*Ectopsocus meridionalis* Ribaga, 1904

**Family Mesopsocidae**

*Mesopsocus unipunctatus* Müller, 1764

**Family Peripsocidae**

*Peripsocus subfasciatus* Rambur, 1842

**Family Psocidae**

*Blaste opposita* Banks, 1907

*Metylophorus novaescotiae* Walker, 1853

**Family Stenopsocidae**

*Graphopsocus cruciatus* Linnaeus, 1768

Notes: [BOLD:ACA2933](#)|[BOLD:ACB0984](#)

**Order Thysanoptera****Family Aeolothripidae**

*Aeolothrips ericae* Bagnall, 1920

Notes: [BOLD:ABA2981](#)

**Family Phlaeothripidae**

*Haplothrips verbasci* Osborn, 1897

Notes: [BOLD:AAI6861](#)

**Family Thripidae**

*Chirothrips manicatus* Haliday, 1836

*Odontothrips biuncus* John, 1921

*Taeniothrips inconsequens* Uzel, 1895

Notes: [BOLD:ACC0651](#)

**Order Trichoptera****Family Helicopsychidae**

*Helicopsyche borealis* Hagen, 1861

**Family Hydropsychidae**

*Ceratopsyche morosa* Hagen, 1861

Notes: [BOLD:AAA3679](#)

*Cheumatopsyche campyla* Ross, 1938

Notes: [BOLD:AAA3892](#)[BOLD:ACE5263](#)

*Hydropsyche phalerata* Hagen, 1861

Notes: [BOLD:AAC3243](#)

**Family Hydroptilidae**

*Agraylea multipunctata* Curtis, 1834

*Hydroptila armata* Ross, 1938

*Hydroptila perdita* Morton, 1905

Notes: [BOLD:AAE5187](#)

*Hydroptila spatulata* Morton, 1905

Notes: [BOLD:AAD0137](#)

*Orthotrichia cristata* Morton, 1905

**Family Leptoceridae**

*Oecetis avara* Banks, 1895

*Oecetis cinerascens* Hagen, 1861

*Oecetis inconspicua* Walker, 1852

Notes: [BOLD:AAA1532](#)

*Oecetis nocturna* Ross, 1966

**Family Limnephilidae**

*Ironoquia punctatissima* Walker, 1852

*Pycnopsyche antica* Walker, 1852

**Family Phryganeidae**

*Banksiola crotchi* Banks, 1944

**Family Polycentropodidae**

*Plectrocnemia cinerea* Hagen, 1861

Notes: [BOLD:AAA3441](#)|[BOLD:ACL7631](#)

**Class Malacostraca****Order Amphipoda****Family Hyalellidae**

*Hyalella azteca* Saussure, 1858

**Order Decapoda****Family Cambaridae**

*Orconectes propinquus* Girard, 1852

**Order Isopoda****Family Trachelipodidae**

*Trachelipus rathkii* Brandt, 1833

Notes: [BOLD:AAH4102](#)

**Family Trichoniscidae**

*Hyloniscus riparius* Koch, 1838

Notes: [BOLD:AAV6495](#)

*Trichoniscus pusillus* Brandt, 1833

Notes: [BOLD:AAN7523](#)

**Phylum Chordata****Class Actinopterygii****Order Cypriniformes****Family Catostomidae**

*Catostomus catostomus* Forster, 1773

*Catostomus commersonii* Lacepède, 1803

*Hypentelium nigricans* Lesueur, 1817

*Moxostoma erythrurum* Rafinesque, 1818

*Moxostoma valenciennesi* Jordan, 1885

**Family Cyprinidae**

- Cyprinella spiloptera* Cope, 1867
- Cyprinus Carpio* Linnaeus, 1758
- Luxilus chrysocephalus* Rafinesque, 1820
- Luxilus cornutus* Mitchill, 1817
- Nocomis biguttatus* Kirtland, 1840
- Nocomis micropogon* Cope, 1865
- Notropis heterodon* Cope, 1865
- Notropis photogenis* Cope, 1865
- Pimephales notatus* Rafinesque, 1820
- Rhinichthys atratulus* Hermann, 1804
- Semotilus atromaculatus* Mitchill, 1818

**Order Esociformes****Family Esocidae**

- Esox lucius* Linnaeus, 1758

**Order Gasterosteiformes****Family Gasterosteidae**

- Culaea inconstans* Kirtland, 1840

**Order Perciformes****Family Centrarchidae**

- Ambloplites rupestris* Rafinesque, 1817
- Lepomis gibbosus* Linnaeus, 1758
- Micropterus dolomieu* Lacepède, 1802
- Micropterus salmoides* Lacepède, 1802
- Pomoxis nigromaculatus* Lesueur in Cuvier and Valenciennes, 1829

**Family Percidae**

- Etheostoma blennioides* Rafinesque, 1819
- Etheostoma exile* Girard, 1859
- Etheostoma nigrum* Rafinesque, 1820
- Perca flavescens* Mitchill, 1814
- Percina maculata* Girard, 1859

**Order Salmoniformes****Family Salmonidae**

- Salvelinus fontinalis* Mitchill, 1814

**Order Siluriformes**

**Family Ictaluridae**

*Ameiurus nebulosus* Lesueur, 1819

*Noturus flavus* Rafinesque, 1818

**Class Amphibia****Order Anura****Family Bufonidae**

*Anaxyrus americanus* Holbrook, 1836

**Family Hylidae**

*Hyla versicolor* LeConte, 1825

*Pseudacris crucifer* Wied-Neuwied, 1838

*Pseudacris triseriata* Wied-Neuwied, 1838

**Family Ranidae**

*Lithobates catesbeiana* Shaw, 1802

*Lithobates clamitans* Latreille in Sonnini de Manoncourt and Latreille, 1801

*Lithobates pipiens* Schreber, 1782

*Lithobates sylvatica* LeConte, 1825

**Order Caudata****Family Ambystomidae**

*Ambystoma jeffersonianum* x *laterale* var. *hybrid species: jefferson and blue-spotted* Green, 1827 and Hallowell, 1856

*Ambystoma laterale* Hallowell, 1856

*Ambystoma maculatum* Shaw, 1802

**Family Plethodontidae**

*Hemidactylium scutatum* Temminck and Schlegel, 1838

*Plethodon cinereus* Green, 1818

**Class Aves****Order Anseriformes****Family Anatidae**

*Aix sponsa* Linnaeus, 1758

*Anas acuta* Linnaeus, 1758

*Anas americana* Gmelin, 1789

*Anas clypeata* Linnaeus, 1758

*Anas crecca* Linnaeus, 1758

*Anas discors* Linnaeus, 1766

*Anas platyrhynchos* Linnaeus, 1758

*Anas rubripes* Brewster, 1902  
*Anas strepera* Linnaeus, 1758  
*Aythya affinis* Eyton, 1838  
*Aythya americana* Eyton, 1838  
*Aythya collaris* Donovan, 1809  
*Aythya marila* Linnaeus, 1761  
*Aythya valisineria* A. Wilson, 1814  
*Branta bernicla* Linnaeus, 1758  
*Branta canadensis* Linnaeus, 1758  
*Branta hutchinsii* Richardson, 1832  
*Bucephala albeola* Linnaeus, 1758  
*Bucephala clangula* Linnaeus, 1758  
*Chen caerulescens* Linnaeus, 1758  
*Clangula hyemalis* Linnaeus, 1758  
*Cygnus buccinator* Richardson, 1831  
*Cygnus columbianus* Ord, 1815  
*Cygnus olor* Gmelin, 1789  
*Lophodytes cucullatus* Linnaeus, 1758  
*Melanerpes erythrocephalus* Linnaeus, 1758  
*Mergus merganser* Linnaeus, 1758  
*Mergus serrator* Linnaeus, 1758  
*Oxyura jamaicensis* Gmelin, 1789

Order Apodiformes

Family Apodidae

*Chaetura pelagica* Linnaeus, 1758

Family Trochilidae

*Archilochus colubris* Linnaeus, 1758

Order Caprimulgiformes

Family Caprimulgidae

*Caprimulgus vociferus* A. Wilson, 1812

*Chordeiles minor* J. R. Forster, 1771

Order Charadriiformes

Family Charadriidae

*Charadrius semipalmatus* Bonaparte, 1825

*Charadrius vociferus* Linnaeus, 1758



**Family Laridae**

*Chroicocephalus philadelphia* Ord, 1815

*Larus delawarensis* Ord, 1815

*Larus fuscus* Linnaeus, 1758

*Larus glaucooides* B. Meyer, 1822

*Larus hyperboreus* Gunnerus, 1767

*Larus marinus* Linnaeus, 1758

*Larus smithsonianus* Coues, 1862

*Larus thayeri* W. S. Brooks, 1915

*Mniotilta varia* Linnaeus, 1766

*Sterna hirundo* Linnaeus, 1758

**Family Scolopacidae**

*Actitis macularius* Linnaeus, 1766

*Arenaria interpres* Linnaeus, 1758

*Bartramia longicauda* Bechstein, 1812

*Calidris alpina* Linnaeus, 1758

*Calidris bairdii* Coues, 1861

*Calidris melanotos* Vieillot, 1819

*Calidris minutilla* Vieillot, 1819

*Calidris pusilla* Linnaeus, 1766

*Gallinago delicata* Ord, 1825

*Scolopax minor* Gmelin, 1789

*Tringa flavipes* Gmelin, 1789

*Tringa melanoleuca* Gmelin, 1789

*Tringa solitaria* A. Wilson, 1813

**Family Sternidae**

*Hydroprogne caspia* Pallas, 1770

**Order Ciconiiformes****Family Ardeidae**

*Ardea alba* Linnaeus, 1758

*Ardea herodias* Linnaeus, 1758

*Botaurus lentiginosus* Rackett, 1813

*Butorides virescens* Linnaeus, 1758

*Chlidonias niger* Linnaeus, 1758

*Egretta caerulea* Linnaeus, 1758

**Order Columbiformes****Family Columbidae**

*Columba livia* Gmelin, 1789

*Zenaida macroura* (Linnaeus, 1758)

**Order Coraciiformes****Family Alcedinidae**

*Megaceryle alcyon* Linnaeus, 1758

**Order Cuculiformes****Family Cuculidae**

*Coccyzus americanus* Linnaeus, 1758

*Coccyzus erythrophthalmus* A. Wilson, 1811

**Order Falconiformes****Family Accipitridae**

*Accipiter cooperii* Bonaparte, 1828

*Accipiter gentilis* Linnaeus, 1758

*Accipiter striatus* Vieillot, 1808

*Agelaius phoeniceus* Linnaeus, 1766

*Aquila chrysaetos* Linnaeus, 1758

*Buteo jamaicensis* Gmelin, 1788

*Buteo lagopus* Pontoppidan, 1763

*Buteo lineatus* Gmelin, 1788

*Buteo platypterus* Vieillot, 1823

*Circus cyaneus* Linnaeus, 1766

*Haliaeetus leucocephalus* Linnaeus, 1766

**Family Cathartidae**

*Cathartes aura* Linnaeus, 1758

**Family Falconidae**

*Falco columbarius* Linnaeus, 1758

*Falco peregrinus* Tunstall, 1771

*Falco sparverius* Linnaeus, 1758

**Family Pandionidae**

*Pandion haliaetus* Linnaeus, 1758

**Order Galliformes****Family Odontophoridae**

*Colinus virginianus* Linnaeus, 1758

**Family Phasianidae**

*Bonasa umbellus* Linnaeus, 1766

*Meleagris gallopavo* Linnaeus, 1758

*Phasianus colchicus* Linnaeus, 1758

**Order Gaviiformes****Family Gaviidae**

*Gavia immer* Brunnich, 1764

**Order Gruiformes****Family Gruidae**

*Grus canadensis* Linnaeus, 1758

**Family Rallidae**

*Fulica americana* Gmelin, 1789

*Porzana carolina* Linnaeus, 1758

*Rallus limicola* Vieillot, 1819

**Order Passeriformes****Family Alaudidae**

*Eremophila alpestris* (Linnaeus, 1758)

**Family Bombycillidae**

*Bombycilla cedrorum* Vieillot, 1808

**Family Calcaridae**

*Calcarius lapponicus* Linnaeus, 1758

**Family Cardinalidae**

*Cardinalis cardinalis* Linnaeus, 1758

*Passerina cyanea* Linnaeus, 1766

*Pheucticus ludovicianus* Linnaeus, 1766

*Plectrophenax nivalis* Linnaeus, 1758

**Family Certhiidae**

*Certhia americana* Bonaparte, 1838

**Family Corvidae**

*Corvus brachyrhynchos* C. L. Brehm, 1822

*Corvus corax* Linnaeus, 1758

*Cyanocitta cristata* Linnaeus, 1758

**Family Emberizidae**

*Ammodramus leconteii* Audubon, 1844

*Ammodramus nelsoni* Allen, 1875

*Ammodramus savannarum* Gmelin, 1789  
*Junco hyemalis* Linnaeus, 1758  
*Melospiza georgiana* Latham, 1790  
*Melospiza lincolni* Audubon, 1834  
*Melospiza melodia* A. Wilson, 1810  
*Passerculus sandwichensis* Gmelin, 1789  
*Passerella iliaca* Merrem, 1786  
*Pipilo erythrophthalmus* Linnaeus, 1758  
*Pipilo maculatus* Swainson, 1827  
*Poocetes gramineus* Gmelin, 1789  
*Spizella arborea* A. Wilson, 1810  
*Spizella pallida* Swainson, 1832  
*Spizella passerina* Bechstein, 1798  
*Spizella pusilla* A. Wilson, 1810  
*Zonotrichia albicollis* Gmelin, 1789  
*Zonotrichia leucophrys* J. R. Forster, 1772

Family Fringillidae

*Carduelis flammea* Linnaeus, 1758  
*Carduelis pinus* A. Wilson, 1810  
*Carduelis tristis* Linnaeus, 1758  
*Carpodacus mexicanus* Statius Muller, 1776  
*Carpodacus purpureus* Gmelin, 1789  
*Coccothraustes vespertinus* W. Cooper, 1825  
*Loxia curvirostra* Linnaeus, 1758

Checklist of species observed or collected at the *rare* Charitable Research Reserve in Cambridge, Ontario, Canada. The fifth of five checklists for Kingdom Animalia, this checklist contains records from Phylum Chordata, Class Aves (Orders Passeriformes to Strigiformes), Class Mammalia, and Class Reptilia, as well as Phylum Gastropoda.

Phylum Chordata

Class Aves

Order Passeriformes

Family Fringillidae

*Loxia leucoptera* Gmelin 1789

Family Hirundinidae

*Hirundo rustica* Linnaeus, 1758

*Petrochelidon pyrrhonota* (Vieillot, 1817)

*Riparia riparia* Linnaeus, 1758

*Stelgidopteryx serripennis* Audubon, 1838

*Tachycineta bicolor* Vieillot, 1808

Family Icteridae

*Dolichonyx oryzivorus* Linnaeus, 1758

*Euphagus carolinus* Statius Muller, 1776

*Euphagus cyanocephalus* Wagler, 1829

*Icterus galbula* Linnaeus, 1758

*Icterus spurius* Linnaeus, 1766

*Molothrus ater* Boddaert, 1783

*Quiscalus quiscula* Linnaeus, 1758

*Sturnella magna* Linnaeus, 1758

*Xanthocephalus xanthocephalus* Bonaparte, 1826

Family Laniidae

*Lanius excubitor* Linnaeus, 1758

**Family Mimidae**

*Dumetella carolinensis* Linnaeus, 1766

*Mimus polyglottos* Linnaeus, 1758

*Toxostoma rufum* Linnaeus, 1758

**Family Motacillidae**

*Anthus rubescens* Tunstall, 1771

**Family Paridae**

*Poecile atricapillus* Linnaeus, 1766

**Family Parulidae**

*Cardellina canadensis* Linnaeus, 1766

*Cardellina pusilla* A. Wilson, 1811

*Geothlypis philadelphia* A. Wilson, 1810

*Geothlypis trichas* Linnaeus, 1766

*Leiothlypis celata* Say, 1822

*Leiothlypis peregrina* A. Wilson, 1811

*Leiothlypis ruficapilla* A. Wilson, 1811

*Oporornis agilis* A. Wilson, 1812

*Setophaga americana* Linnaeus, 1758

*Setophaga caerulescens* J. F. Gmelin, 1789

*Setophaga castanea* A. Wilson, 1810

*Setophaga citrina* Boddaert, 1783

*Setophaga coronata* Linnaeus, 1766

*Setophaga discolor* Vieillot, 1809

*Setophaga fusca* Statius Müller, 1776

*Setophaga magnolia* A. Wilson, 1811

*Setophaga palmarum* J. F. Gmelin, 1789

*Setophaga pensylvanica* Linnaeus, 1766

*Setophaga petechia* Linnaeus, 1766

*Setophaga pinus* Linnaeus, 1766

*Setophaga ruticilla* Linnaeus, 1758

*Setophaga striata* J. R. Forster, 1772

*Setophaga tigrina* J. F. Gmelin, 1789

*Setophaga virens* J. F. Gmelin, 1789

*Vermivora chrysoptera* Linnaeus, 1766

*Vermivora cyanoptera* Olson & Reveal, 2009

**Family Passeridae**

*Passer domesticus* Linnaeus, 1758

**Family Peucedramidae**

*Nycticorax nycticorax* Linnaeus, 1758

*Parkesia noveboracensis* J. F. Gmelin, 1789

*Picoides arcticus* Swainson, 1832

*Seiurus aurocapilla* Linnaeus, 1766

**Family Regulidae**

*Regulus calendula* (Linnaeus, 1766)

*Regulus satrapa* Lichtenstein 1823

**Family Sittidae**

*Sitta canadensis* Linnaeus, 1766

*Sitta carolinensis* Latham, 1790

**Family Sturnidae**

*Sturnus vulgaris* Linnaeus, 1758

**Family Sylviidae**

*Polioptila caerulea* Linnaeus, 1766

**Family Thraupidae**

*Piranga olivacea* Gmelin, 1789

**Family Troglodytidae**

*Cistothorus palustris* A. Wilson, 1810

*Thryothorus ludovicianus* (Latham, 1790)

*Troglodytes aedon* Vieillot, 1809

*Troglodytes hiemalis* Vieillot, 1819

**Family Turdidae**

*Catharus fuscescens* (Stephens, 1817)

*Catharus guttatus* Pallas, 1811

*Catharus minimus* Lafresnaye, 1848

*Catharus ustulatus* Nuttall, 1840

*Hylocichla mustelina* Gmelin, 1789

*Sialia sialis* Linnaeus, 1758

*Turdus migratorius* Linnaeus, 1766

**Family Tyrannidae**

*Contopus cooperi* Nuttall, 1831

*Contopus virens* Linnaeus, 1766

*Empidonax alnorum* Brewster, 1895

*Empidonax flaviventris* W. M. Baird & S. F. Baird, 1843

*Empidonax minimus* W. M. Baird & S. F. Baird, 1843

*Empidonax traillii* Audubon, 1828

*Myiarchus crinitus* Linnaeus, 1758

*Sayornis phoebe* Latham, 1790

*Tyrannus tyrannus* Linnaeus, 1758

Family Vireonidae

*Vireo flavifrons* Vieillot, 1808

*Vireo gilvus* Vieillot, 1808

*Vireo griseus* Boddaert, 1783

*Vireo olivaceus* Linnaeus, 1766

*Vireo philadelphicus* Cassin, 1851

*Vireo solitarius* A. Wilson, 1810

Order Pelecaniformes

Family Phalacrocoracidae

*Phalacrocorax auritus* Lesson, 1831

Order Piciformes

Family Picidae

*Colaptes auratus* Linnaeus, 1758

*Dryocopus pileatus* Linnaeus, 1758

*Melanerpes carolinus* Linnaeus, 1758

*Picoides pubescens* Linnaeus, 1766

*Picoides villosus* Linnaeus, 1766

*Sphyrapicus varius* Linnaeus, 1766

Order Podicipediformes

Family Podicipedidae

*Podiceps auritus* Linnaeus, 1758

*Podiceps grisegena* Boddaert, 1783

*Podilymbus podiceps* Linnaeus, 1758

Order Strigiformes

Family Strigidae

*Aegolius acadicus* Gmelin, 1788

*Asio flammeus* Pontoppidan, 1763

*Bubo virginianus* Gmelin, 1788



*Megascops asio* Linnaeus, 1758

*Strix varia* Barton, 1799

Class Mammalia

Order Artiodactyla

Family Cervidae

*Odocoileus virginianus* Zimmermann, 1780

Order Carnivora

Family Canidae

*Canis latrans* Say, 1823

*Vulpes vulpes* Linnaeus, 1758

Family Felidae

*Lynx rufus* Schreber, 1777

Family Mephitidae

*Mephitis mephitis* Schreber, 1776

Family Mustelidae

*Lontra canadensis* Schreber, 1777

*Mustela erminea* Linnaeus, 1758

*Neovison vison* Schreber, 1777

Family Procyonidae

*Procyon lotor* Linnaeus, 1758

Order Chiroptera

Family Vespertilionidae

*Eptesicus fuscus* Palisot de Beauvois, 1796

*Lasionycteris noctivagans* LeConte, 1831

*Lasiurus borealis* Müller, 1776

*Lasiurus cinereus* Palisot de Beauvois, 1796

*Myotis lucifugus* LeConte, 1831

*Myotis septentrionalis* Trouessart, 1897

Order Didelphimorphia

Family Didelphidae

*Didelphis virginiana* Kerr, 1792

Order Lagomorpha

Family Leporidae

*Lepus americanus* Erxleben, 1777

*Lepus europaeus* Pallas, 1778

*Sylvilagus floridanus* J. A. Allen, 1890

Order Rodentia

Family Castoridae

*Castor canadensis* Kuhl, 1820

Family Cricetidae

*Microtus pennsylvanicus* Ord, 1815

*Myodes gapperi* Vigors, 1830

*Ondatra zibethicus* Linnaeus, 1766

*Peromyscus leucopus* Rafinesque, 1818

*Peromyscus maniculatus* Wagner, 1845

Family Dipodidae

*Zapus hudsonius* Zimmermann, 1780

Family Erethizontidae

*Erethizon dorsatus* Linnaeus, 1758

Family Muridae

*Mus musculus* Linnaeus, 1758

*Rattus norvegicus* Berkenhout, 1769

Family Sciuridae

*Glaucomys sabrinus* Shaw, 1801

*Marmota monax* Linnaeus, 1758

*Sciurus carolinensis* Gmelin, 1788

*Tamias striatus* Linnaeus, 1758

*Tamiasciurus hudsonicus* Erxleben, 1777

Order Soricomorpha

Family Soricidae

*Blarina brevicauda* Say, 1823

*Sorex cinereus* Kerr, 1792

*Sorex fumeus* G. M. Miller, 1895

Family Talpidae

*Condylura cristata* Linnaeus, 1758

Class Reptilia

Order Squamata

Family Colubridae

*Lampropeltis triangulum* subsp. *triangulum* (Lacépède, 1789)

*Nerodia sipedon* Linnaeus, 1758

*Opheodrys vernalis* Harlan, 1827

*Regina septemvittata* Say, 1825

*Storeria dekayi* Holbrook, 1839

*Storeria occipitomaculata* Storer, 1839

*Thamnophis sauritus* Linnaeus, 1766

*Thamnophis sirtalis* subsp. *sirtalis* (Linnaeus, 1758)

Order Testudines

Family Chelydridae

*Chelydra serpentina* Linnaeus, 1758

Family Emydidae

*Chrysemys picta* Schneider, 1783

Phylum Mollusca

Class Gastropoda

Family Discidae

*Anguispira alternata* Say, 1816

Family Pristilomatidae

*Hawaiiia minuscula* A. Binney, 1841

Family Succineidae

*Novisuccinea ovalis* Say, 1817

Family Vertiginidae

*Vertigo bollesiana* E. S. Morse, 1865

Order Basommatophora

Family Planorbidae

*Gyraulus circumstriatus* Tryon, 1866

Order Hygrophila

Family Physidae

*Physa gyrina* Say, 1821

Order Pulmonata

Family Zonitidae

*Paravitrea multidentata* A. Binney, 1840

Order Stylommatophora

Family Agriolimacidae

*Deroceras reticulatum* Muller, 1774

Family Arionidae

*Arion fuscus* (O. F. Müller, 1774)

*Arion subfuscus* Draparnaud, 1805

Family Gastrodontidae

*Oxychilus allarius* (J. S. Miller, 1822)

*Zonitoides arboreus* Say, 1816

Notes: [BOLD:AAN3419](#)

Family Helicidae

*Cepaea nemoralis* Linnaeus, 1758

*Cochlicopa lubrica* (Muller, 1774)

Family Helicodiscidae

*Helicodiscus parallelus* Say, 1817

Family Hygromiidae

*Trochulus hispidus* (Linnaeus, 1758)

Notes: [BOLD:ACI9420](#)

Family Succineidae

*Succinea putris* Linnaeus, 1758

Family Vitrinidae

*Vitrina angelicae* Beck, 1837

Checklist of species observed or collected at the *rare* Charitable Research Reserve in Cambridge, Ontario, Canada. This checklist contains members of Kingdom Amoebozoa, Phylum Mycetozoa.

Class Myxogastria

Order Liceales

Family Tubiferaceae

*Lycogala epidendrum* Linnaeus, 1829

Notes: / flavofuscum

Order Liceida

Family Reticulariaceae

*Tubifera ferruginosa* (Batsch) J.F. Gmel.

**Order Stemonitida****Family Stemonitidae**

*Stemonitis axifera* Bull, 1791

Checklist of species observed or collected at the *rare* Charitable Research Reserve in Cambridge, Ontario, Canada. This checklist contains records from Kingdom Fungi, including Phyla Ascomycota, Basidiomycota, and Zygomycota.

**Phylum Ascomycota**

*Dictyocatenulata alba* Finley & E. F. Morris 1967

**Phylum Ascomycota****Class Arthoniomycetes****Order Arthoniales****Family Arthoniaceae**

*Arthonia caesia* Koerber, 1861

*Arthonia caudata* Willey, 1892

*Arthonia radiata* Vetensk-Akad, 1808

**Class Dothideomycetes****Order Pleosporales****Family Venturiaceae**

*Apiosporina morbosa* Arx, 1954

**Order Polyporales****Family Fomitopsidaceae**

*Ischnoderma resinosum* Schrader, 1794

*Piptoporus betulinus* Bulliard, 1780

*Postia caesia* Schrad, 1881

Notes: (*Oligoporus caesius*)

*Postia fragilis* Jülich, 1982

**Family Ganodermataceae**

*Ganoderma applanatum* Persoon, 1799

*Ganoderma lucidum* Curtis 1791

Notes: or *Ganoderma tsugae*

**Family Meripilaceae**

*Gloeoporus dichrous* Fries, 1815

*Grifola frondosa* Dickson, 1785

**Family Meruliaceae**

*Bjerkandera adusta* Willdenow, 1787

*Climacodon septentrionale* Fries, 1821

*Phlebia radiata* Fries, 1821

*Porotheleum fimbriatum* Persoon, 1818

**Family Phanerochaetaceae**

*Steccherinum ochraceum* Persoon, 1792

**Family Polyporaceae**

*Cerrena unicolor* Bulliard, 1785

*Favolus alveolaris* De Candolle 1815

*Laetiporus sulphureus* Bulliard, 1780

*Lenzites betulina* Linnaeus, 1753

*Polyporus badius* Persoon, 1801

*Polyporus brumalis* Persoon, 1794

*Trametes elegans* Sprengel, 1820

*Trichaptum abietinum* Dickson, 1972

Notes: (?)

*Tyromyces chioneus* Fries, 1815

Notes: (*Tyromyces albellus*, *Polyorus albellus*)

**Family Steccherinaceae**

*Irpex lacteus* Fries, 1818

**Class Eurotiomycetes****Order Mycocaliciales****Family Mycocaliciaceae**

*Mycocalicium subtile* Persoon, 1925

*Phaeocalicium curtisii* Tuckerman, 1975

**Order Verrucariales****Family Verrucariaceae**

*Verrucaria calkinsiana* Servit, 1950

**Class Lecanoromycetes****Order Baeomycetales****Family Trapeliaceae***Trapelia involuta* (Taylor) Hertel*Trapelia placodioides* Coppins & P. James**Order Candelariales****Family Candelariaceae***Candelaria concolor* (Dicks.) Stein*Candelariella aurella* (Hoffm.) Zahlbr.*Candelariella efflorescens* R.C. Harris & W.R. Buck**Order Lecanorales****Family Acarosporaceae***Acarospora glaucocarpa* (Ach.) Körb.**Family Cladoniaceae***Cladonia ochrochlora* Flörke**Family Lecanoraceae***Lecanora allophana* (Ach.) Nyl. 1872Notes: f. *sorediata**Lecanora allophana* f. *sorediata**Lecanora pulicaris* (Pers.) Ach.*Lecanora sambuci* (Pers.) Nyl.*Lecanora symmicta* (Ach.) Ach.*Lecanora thysanophora* R. C. Harris*Lecidella carpathica* Körb.**Family Parmeliaceae***Flavoparmelia caperata* (Linnaeus) Hale (1986)*Flavopunctelia flaventior* (Stirt.) Hale*Melanelixia subaurifera* (Nyl.) O. Blanco et al.*Parmelia squarrosa* Hale*Parmelia sulcata* Taylor*Punctelia rudecta* (Ach.) Krog*Punctelia subrudecta* (Nyl.) Krog*Xanthoparmelia cumberlandia* (Gyeln.) Hale, 1974

## Family Peltigeraceae

*Peltigera evansiana* Gyelnik

*Peltigera rufescens* (Weiss) Humb.

## Family Porpidiaceae

*Bilimbia sabuletorum* (Schreb.) Arnold

## Family Psoraceae

*Protoblastenia rupestris* (Scop.) J. Steiner

*Psora decipiens* (Hedwig) Hoffm.

## Family Ramalinaceae

*Bacidia schweinitzii* (Fr. ex E. Michener) A. Schneider

*Lecania croatica* (Zahlbr.) Kotlov

*Lecania naegelii* (Hepp) Diederich & v. d. Boom

## Family Stereocaulaceae

*Lepraria incana* (Linnaeus) Ach.

*Lepraria lobificans* Nyl.

## Order Lecanoromycetes

## Family Thelenellaceae

*Julella fallaciosa* (Arnold) R. C. Harris

## Order Ostropales

## Family Coenogoniaceae

*Coenogonium pineti* (Ach.) Lücking & Lumbsch, 2004

## Family Graphidaceae

*Graphis scripta* (Linnaeus) Ach. (1809)

## Family Phlyctidaceae

*Phlyctis* spp.

## Family Stictidaceae

*Conotrema urceolatum* (Ach.) Gilenstam 2005

## Order Teloschistales

## Family Physciaceae

*Buellia punctata* (Hoffm.) A. Massal.

*Buellia stillingiana* J. Steiner 1919

*Hyperphyscia adglutinata* (Flörke) H. Mayrhofer & Poelt

*Phaeophyscia adiastrata* (Essl.) Essl. 1978

*Phaeophyscia orbicularis* (Neck.) Moberg

*Phaeophyscia pusilloides* (Zahlbr.) Essl. 1978



*Phaeophyscia rubropulchra* (Degel.) Moberg 1978

*Physcia adscendens* (Th. Fr.) H. Olivier

*Physcia aipolia* (Ehrh. ex Humb.) Fűrnr.

*Physcia millegrana* Degel.

*Physcia stellaris* (Linnaeus) Nyl.

*Physciella chloantha* (Ach.) Essl.

*Physconia detersa* (Nyl.) Poelt

#### Family Teloschistaceae

*Caloplaca flavovirescens* (Wulfen) Søchting, Frödén & Arup

*Caloplaca pyracea* (Ach.) Zwackh

*Xanthomendoza fallax* (Hepp ex Arn.) Soechting, KSRnefelt & S. Kondratyuk

*Xanthomendoza ulophyllodes* (RSsSnen) Soechting, KSRnefelt & S. Kondratyuk

*Xanthoria parietina* (Linnaeus) Th. Fr.

#### Class Leotiomycetes

##### Order Helotiales

##### Family Bulgariaceae

*Bulgaria inquinans* (Pers.) Fr. (1822)

##### Family Helotiaceae

*Ascocoryne cylichnium* (Tul.) Korf 1971

*Bisporella citrina* (Batsch) Korf & S.E.Carp. (1974)

*Chlorociboria aeruginascens* (Nyl.) Kanouse 1947

##### Family Hemiphacidiaceae

*Chlorencoelia versiformis* (Pers.) J.R.Dixon (1975)

#### Class Pezizomycetes

##### Order Pezizales

##### Family Pezizaceae

*Peziza repanda* Pers. (1808)

##### Family Pyronemataceae

*Aleuria aurantia* (Pers.) Fuckel, 1870

*Jafnea semitosta* (Berk. & M.A. Curtis) Korf

*Scutellinia scutellata* (Linnaeus) Lambotte 1887

*Scutellinia setosa* Nees) Kuntze (1891)

Notes: /erinaceous

***Tarzetta cupularis* (Linnaeus) Svrček (1981)**

Class Sordariomycetes

Order Hypocreales

Family Bionectriaceae

*Ovicuculispora parmeliae* (Berk. & Curt.) Etayo

Family Hypocreaceae

*Hypomyces lactifluorum* (Schwein.) Tul. & C. Tul. 1860

Order Xylariales

Family Xylariaceae

*Daldinia concentrica* (Bolton) Ces. & De Not. 1863*Hypoxyton fragiforme* (Pers.) J. Kickx f. 1835*Ustulina deusta* (Hoffm.) P.M.D. Martin, (1970)

Notes: (?)

*Xylaria longipes* Nitschke 1867*Xylaria polymorpha* (Pers.) Grev. 1824

Phylum Basidiomycota

Class Agaricomycetes

Order Agaricales

Family Agaricaceae

*Agaricus arvensis* Schaeff. 1774*Agaricus placomyces* Peck 1878*Calvatia gigantea* (Batsch) Lloyd 1904*Coprinus comatus* (O.F. Müll.) Pers. 1797*Lepiota clypeolaria* (Bull.) P. Kumm. 1871*Lepiota cristata* Barla*Leucoagaricus naucinus* Wasser, 1977Notes: (*Lepiota naucina*)*Lycoperdon perlatum* Persoon, 1796Notes: (*Lycoperdon gemmatum*)*Parasola plicatilis* (Curtis) Redhead, Vilgalys & Hopple 2001

Family Amanitaceae

*Amanita bisporigera* G.F.Atk., 1906

**Family Bolbitiaceae**

*Conocybe rugosa* (Peck) Watling, 1981

*Panaeolus foenisecii* R.Maire, 1933

Notes: (*Panaeolina foenisecii*)

**Family Cortinariaceae**

*Gymnopilus spectabilis* (Fr.) A. H. Smith

Notes: (*Gymnopilus junonius*)

*Phaeomarasmius proximans* Singer, 1989

**Family Entolomataceae**

*Clitopilus prunulus* P. Kumm., 1871

*Clitopilus scyphoides* Singer, 1946

*Entoloma abortivum* Donk, 1949

*Entoloma* spp.

*Entoloma strictus* Hesler (1967)

Notes: (*Nolanea strictia*)

*Leptonia incana* Gillet, ?

Notes: Or euchlora

**Family Hygrophoraceae**

*Arrhenia epichysium* (Pers.) Redhead, Lutzoni, Moncalvo & Vilgalys 2002

*Hygrocybe coccinea* P. Kumm, 1871

*Hygrocybe flavescens* Singer, 1951

*Hygrocybe miniata* P. Kumm, 1871

*Hygrocybe pratensis* Murrill, 1914

Notes: (*Camarophyllus pratensis*)

*Hygrocybe punicea* P. Kumm, 1871

*Hygrocybe virginea* P.D. Orton & Watling, 1969

*Hygrophorus eburneus* Fries, 1838

**Family Hymenogastraceae**

*Galerina autumnalis* (Peck) A.H. Sm. & Singer

Notes: (*Galerina marginata*)

*Hebeloma crustuliniforme* Bulliard, 1787

**Family Inocybaceae**

*Crepidotus applanatus* Persoon, 1796

*Crepidotus mollis* Staude, 1857

*Inocybe rimosa* Bulliard, 1789

*Inocybe* spp.

*Crepidotus crocophyllus* Berkeley, 1847

Family Lycoperdaceae

*Lycoperdon pyriforme* Schaeffer, 1774

Family Lyophyllaceae

*Lyophyllum decastes* Fries, 1818

Family Marasmiaceae

*Baeospora myosura* Fries, 1818

*Clitocybula oculus* Peck, 1878

*Marasmius rotula* Scopoli, 1772

*Micromphale foetidum* (Sowerby) Singer, 1949

*Pleurocybella porrigens* (Pers.) Singer, 1947

Notes: / *Phylotus porrigens*

*Rhodocollybia butryacea* (Bulliard, 1792) Lennox, 1979

Notes: (*Collybia butryacea*)

*Gymnopus acervatus* Fries, 1821

Notes: / *Connopus acervatus*

*Xerula furfuracea* (Peck, 1893) R. H. Petersen, 2010

Family Mycenaceae

*Mycena galericulata* (Scop.) Gray (1821)

*Mycena haematopus* (Pers.) P.Kummer, 1871

*Mycena inclinata* (Fr.) Quél., 1872

*Mycena leaiana* (Berk.) Saccardo, 1891

*Mycena olida* Bresadola, 1887

*Mycena osmundicola* J. E. Lange, 1914

*Mycena* spp.

*Panellus stipticus* (Bull.) P.Karst. (1879)

*Xeromphalina kauffmanii* A. H. Smith, 1953

Family Physalacriaceae

*Armillaria gallica* Marxmüller & Romagnesi, 1987

*Armillaria mellea* complex (Vahl, 1790) Kummer, 1871

*Armillaria ostoyae* (Romagnesi, 1970) Herink, 1973

*Flammulina velutipes* (Curtis, 1782) Singer, 1951

*Hymenopellis limonispora* R.H. Petersen, 2010

*Xerula megalospora* (Clements, 1896) R. H. Petersen, 2010

#### Family Pleurotaceae

*Pleurotus ostreatus* (Jacquin) Kummer, 1871

#### Family Pluteaceae

*Pluteus atricapillus* (Schaeffer) Kummer, 1871

*Pluteus atromarginatus* (Konrad, 1927) Kühner, 1935

*Pluteus cervinus* (Schaeffer, 1774) Kummer, 1871

Notes: (*Pluteus atricapillus*)

*Pluteus hongoi* Singer, 1989

*Pluteus longistriatus* Peck, 1885

*Pluteus umbrosus* (Pers.) P. Kummer, 1871

Notes: (*Pluteus granularis*)

#### Family Psathyrellaceae

*Coprinellus micaceus* (Bull.:Fr.) Vilgalys, Hopple & Jacq. Johnson

*Coprinopsis atramentaria* (Bull.) Redhead, Vilgalys & Moncalvo (2001)

*Coprinus disseminatus* (Pers.) J.E.Lange (1938)

*Psathyrella candolleana* (Fr.) Maire, 1937

#### Family Schizophyllaceae

*Schizophyllum commune* Fries, 1815

#### Family Strophariaceae

*Agrocybe praecox* (Pers.) Fayod

*Gymnopilus penetrans* (Fr.) Maire

*Gymnopolis sapineus* (Fr.) Maire

*Hypholoma capnoides* (Fr.) P. Kummer, 1871

*Hypholoma fasciculare* (Huds.:Fr.) P. Kummer

*Hypholoma sublateritium* (Fr.) Quélet

*Pholiota aurivella* (Batsch) P.Kumm. (1871)

*Pholiota squarrosa* (Batsch) Kummer, 1871

*Pholiota squarrosoides* (Peck, 1879) Saccardo, 1887

**Family Tricholomataceae**

*Clitocybe ectypoides* (Pk) Sacc.

*Clitocybe gibba* (Persoon, 1801) Harmaja, 2003

*Collybia cookei* (Bres.) J.D.Arnold (1935)

*Hygrophorus langei* (Kühner) A. Pearson, 1952

Notes: (?)

*Hypsizygus tessulatus* (Bull:Fr) Singer

*Lepista irina* (Fr.) H.E. Bigelow 1959

*Lepista nuda* (Bull.) Cooke 1871

Notes: (*Clitocybe nuda*)

*Omphalina* spp.

*Phyllotopsis nidulans* (Pers.) Singer 1936

*Rhodotus palmatus* (Bull.) Maire 1926

*Tricholoma aurantium* (Schaeff.) Ricken 1914

*Tricholoma myomyces* (Schaeff.) P. Kumm. 1871

*Tricholoma terreum* (P.Kumm., 1871)

*Tricholoma virgatum* (P.Kumm., 1871)

*Xeromphalina caudicinalis* (Kühner & Maire, 1934)

*Panellus serotinus* (Kühner, 1950)

**Family Clavariaceae**

*Multiclavula mucida* (R.H. Peterson, 1967)

**Order Boletales**

**Family Boletaceae**

*Boletinellus merulioides* (Schwein.) Murrill 1909

*Leccinum scabrum* Gray 1821

**Family Sclerodermataceae**

*Scleroderma areolatum* Ehrenberg, 1818

*Scleroderma citrinum* Persoon, 1801

*Scleroderma michiganense* (Guzmán) Guzmán 1970

**Family Suillaceae**

*Suillus americanus* (Peck) Snell (1959)

*Suillus brevipes* (Peck) Kuntze 1898

*Suillus granulatus* (Linnaeus) Roussel 1796

*Suillus luteus* (Linnaeus) Roussel 1796

**Order Cantharellales****Family Cantharellaceae**

*Craterellus fallax* Smith 1968

**Order Corticiales****Family Corticiaceae**

*Phlebia tremellosa* (Schrader) Nakasone & Burdsall, 1984

**Order Geastrales****Family Geastraceae**

*Geastrum fimbriatum* Fries 1829

*Geastrum quadrifidum* Persoon, 1794

**Order Gomphales****Family Gomphaceae**

*Ramaria* spp.

*Ramaria stricta* var. *concolor* (Persoon) Quélet 1888

**Order Hymenochaetales****Family Hymenochaetaceae**

*Phellinus igniarius* (Linnaeus) Quélet 1886

**Order Phallales****Family Phallaceae**

*Phallus duplicatus* Bosc (1811)

*Phallus impudicus* Linnaeus 1753

*Phallus ravenelii* Berkeley & M.A.Curtis (1873)

**Order Polyporales****Family Meruliaceae**

*Loweomyces fractipes* (Berkeley & M.A. Curtis) Jülich 1982

**Family Polyporaceae**

*Daedaleopsis confragosa* (Bolton) J. Schröter 1888

*Fomes fomentarius* (Linnaeus) J. Kickx, 1867

*Polyporus radicans* Schweinitz, 1832.

*Polyporus squamosus* (Hudson) Fries 1821

*Polyporus varius* (Persoon) Fries 1821

*Trametes gibbosa* (Persoon) Fries 1836

*Trametes pubescens* (Schumacher) Pilát, 1939.

*Trametes versicolor* (Linnaeus) Lloyd 1921

*Trichaptum bifforme* (Fries) Ryvarden, 1972

*Truncospora ohiensis* (Berkeley) Pilát 1953

Order Russulales

Family Hericiaceae

*Hericium americanum* Ginns 1984

*Hericium coralloides* (Scopoli) Persoon, 1794

*Hericium erinaceus* (Bulliard) Persoon, 1797.

Family Russulaceae

*Lactarius torminosus* (Schaeffer) Gray 1821

*Russula rosacea* (Persoon) Gray 1821

*Russula* spp.

Family Stereaceae

*Stereum ostrea* (Blume & Nees) Fries, 1838.

*Stereum rugosum* Persoon 1794

*Stereum striatum* (Fries) Fries 1838

Family Auriscalpiaceae

*Lentinellus ursinus* (Fries) Kühner 1926

Order Thelephorales

Family Bankeraceae

*Boletopsis subsquamosa* (Linnaeus) Kotl.& Pouz.

Class Basidiomycetes

Order Cortinariales

Family Cortinariaceae

*Inocybe geophylla* var. *geophylla* (Persoon) Kummer, 1871

Class Dacrymycetes

Order Dacrymycetales

Family Dacrymycetaceae

*Calocera cornea* (Batsch) Fries, 1827.

Class Tremellomycetes

Order Tremellales

Family Exidiaceae

*Exidia alba* (Lloyd) Burt 1921

Notes: / *Ductifera pululahuana*



*Exidia glandulosa* (Bulliard) Fries (1822)

Family Tremellaceae

*Tremella foliacea* Persoon (1800)

*Tremella reticulata* (Berkeley) Farl. (1908)

Class Ustilaginomycetes

Order Ustilaginales

Family Ustilaginaceae

*Ustilago maydis* (DC.) Corda

Phylum Zygomycota

Class Zygomycetes

Order Mortierellales

Family Mortierellaceae

*Mortierella hyalina* (Harz) W. Gams

Checklist of species observed or collected at the *rare* Charitable Research Reserve in Cambridge, Ontario, Canada. The first of two checklists for Kingdom Plantae, this checklist contains records from Phyla Bryophyta, Equisetophyta, Lycopodiophyta and Magnoliophyta (Class Liliopsida and Magnoliopsida).

Kingdom Plantae

Phylum Bryophyta

Class Bryopsida

Order Bryales

Family Bryaceae

*Bryum caespiticium* Hedw.

*Bryum argenteum* Hedw.

Family Mniaceae

*Mnium marginatum* (With.) Brid. ex P. Beauv.

**Family Plagiomniaceae**

*Plagiomnium cuspidatum* (Hedw.) T. Kop.

**Order Dicranales****Family Dicranaceae**

*Dicranum flagellare* Hedw.

*Dicranum montanum* Hedw.

**Family Ditrichaceae**

*Ceratodon purpureus* (Hedw.) Brid.

*Ditrichum* spp.

**Family Fissidentaceae**

*Fissidens adianthoides* Hedw.

*Fissidens taxifolius* Hedw.

*Fissidens* spp.

**Family Leucobryaceae**

*Leucobryum glaucum* (Hedw.) Ångstr. in Fries

**Order Encalyptales****Family Encalyptaceae**

*Encalypta procera* Bruch

**Order Grimmiiales****Family Grimmiaceae**

*Schistidium apocarpa* (Hedw.) Bsg

*Schistidium rivulare* (Brid.) Podp.

**Order Hedwigiales****Family Hedwigiaceae**

*Hedwigia ciliata* (Hedw.) P. Beauv.

**Order Hypnales****Family Amblystegiaceae**

*Amblystegium serpens* (Hedw.) Schimp. in B.S.G.

*Amblystegium varium* (Hedw.) Lindb.

*Campylium chrysophyllum* (Brid.) J. Lange

*Campylium hispidulum* (Brid.) Mitt.

*Campylium* spp.

*Hygroamblystegium fluviatile* (Hedw.) Loeske

*Hygroamblystegium tenax* (Hedw.) Jenn.

*Leptodictyum riparium* (Hedw.) Warnst.

*Drepanocladus aduncus* (Hedw.) Warnst.

Family Anomodontaceae

*Anomodon attenuatus* (Hedw.) Hüb.

*Anomodon rostratus* (Hedw.) Schimp.

Family Brachytheciaceae

*Brachythecium* spp.

*Cirriphyllum piliferum* (Hedw.) Grout

*Eurhynchium hians* (Hedw.) Sande Lac.

*Eurhynchium pulchellum* (Hedw.) Jenn.

Family Climaciaceae

*Climacium americanum* Brid.

*Climacium dendroides* (Hedw.) Web. & Mohr

Family Entodontaceae

*Entodon seductrix* (Hedw.) C. Müll.

Family Fontinalaceae

*Fontinalis hypnoides* Hartm.

Family Hylocomiaceae

*Rhytidiadelphus triquetrus* (Hedw.) Warnst.

Family Hypnaceae

*Callicladium haldanianum* (Grev.) Crum

*Homomallium adnatum* (Hedw.) Broth.

*Hypnum curvifolium* Hedw.

*Hypnum imponens* Hedw.

*Hypnum lindbergii* Mitt.

*Hypnum* spp.

*Platydictya subtilis* (Hedw.) Crum

*Taxiphyllum deplanatum* (Bruch & Schimp. ex Sull.) Fleisch.

Family Leskeaceae

*Leskea polycarpa* Hedw.

*Leskeella nervosa* (Brid.) Loeske

Family Plagiotheciaceae

*Isopterygiopsis muelleriana* (Schimp.) Iwats.

Family Thuidiaceae

*Thuidium recognitum* (Hedw.) Lindb.

*Thuidium delicatulum* (Hedw.) Schimp. in B.S.G.

## Order Orthotrichales

## Family Orthotrichaceae

*Orthotrichum anomalum* Hedw.

## Order Pottiales

## Family Pottiaceae

*Barbula convoluta* Hedw.

*Desmatodon obtusifolius* (Schwaegr.) Schimp.

*Hymenostylium recurvirostre* (Hedw.) Dix.

*Tortella tortuosa* (Hedw.) Limpr.

*Barbula unguiculata* Hedw.

*Tortula ruralis* (Hedw.) Gaertn. et al.

*Weissia* spp.

## Order Splachnales

## Family Meesiaceae

*Leptobryum pyriforme* (Hedw.) Wils.

## Class Polytrichopsida

## Order Polytrichales

## Family Polytrichaceae

*Atrichum angustatum* (Brid.) Bruch & Schimp. in B.S.G.

*Atrichum undulatum* (Hedw.) P. Beauv.

*Polytrichum* spp.

## Class Sphagnopsida

## Order Sphagnales

## Family Sphagnaceae

*Sphagnum* spp.

## Class Tetrarhizopsida

## Order Tetrarhizales

## Family Tetrarhizaceae

*Tetrarhizella pellucida* Hedw.

## Phylum Equisetophyta

## Class Equisetopsida

## Order Equisetales

## Family Equisetaceae

*Equisetum arvense* Linnaeus

*Equisetum hyemale* subsp. *affine* (Engelm.) Calder & Roy L. Taylor

*Equisetum palustre* Linnaeus

*Equisetum pratense* Ehrh.

*Equisetum scirpoides* Michx.

*Equisetum sylvaticum* Linnaeus

*Equisetum variegatum* subsp. *variegatum* Schleich. ex F. Weber & D. Mohr

Phylum Lycopodiophyta

Class Lycopodiopsida

Family Huperziaceae

Family Huperziaceae

*Huperzia lucidula* (Michx.) Trevis.

Order Lycopodiales

Family Lycopodiaceae

*Lycopodiella inundata* (Linnaeus) Holub

*Lycopodium annotinum* Linnaeus

*Lycopodium obscurum* Linnaeus

*Lycopodium* ssp.

Order Selaginellales

Order Selaginellales

Family Selaginellaceae

*Selaginella eclipses* W.R. Buck

Phylum Magnoliophyta

Class Liliopsida

Order Alismatales

Family Alismataceae

*Sagittaria latifolia* Willd.

*Sagittaria rigida* Pursh

Family Araceae

*Arisaema triphyllum* (Linnaeus) Schott

*Symplocarpus foetidus* (Linnaeus) Salisb. ex Nutt.

Family Butomaceae

*Butomus umbellatus* Linnaeus

Family Potamogetonaceae

*Potamogeton crispus* Linnaeus

*Stuckenia pectinata* (Linnaeus) Börner

**Family Tofieldiaceae**

*Triantha glutinosa* (Michx.) Baker

**Order Arales****Family Araceae**

*Calla palustris* Linnaeus

*Lemna minor* Linnaeus

*Wolffia borealis* (Engelm. ex Hegelm.) Landolt

*Wolffia columbiana* H. Karst.

**Order Asparagales****Family Amaryllidaceae**

*Allium tricoccum* Aiton

**Family Asparagaceae**

*Asparagus officinalis* Linnaeus

*Convallaria majalis* Linnaeus

*Maianthemum canadense* Desf.

*Maianthemum racemosum* subsp. *racemosum* (Linnaeus) Link

*Maianthemum stellatum* (Linnaeus) Link

**Family Iridaceae**

*Iris pseudacorus* Linnaeus

**Family Orchidaceae**

*Cypripedium acaule* Aiton

*Cypripedium arietinum* R. Br.

*Cypripedium parviflorum* var. *pubescens* (Willd.) O.W. Knight

*Cypripedium reginae* Walter

**Order Cyperales****Family Cyperaceae**

*Carex albursina* E. Sheld.

*Carex aquatilis* Wahlenb.

*Carex arctata* Boott ex Hook.

*Carex atherodes* Spreng.

*Carex backii* Boott

*Carex bebbii* Olney ex Fernald

*Carex blanda* Dewey

*Carex bromoides* Schkuhr ex Willd.

*Carex chordorrhiza* Ehrh. ex L. f.

*Carex comosa* Boott  
*Carex crinita* Lam.  
*Carex cristatella* Britton  
*Carex deweyana* Schwein.  
*Carex diandra* Schrank  
*Carex disperma* Dewey  
*Carex eburnea* Boott  
*Carex foenea* Willd.  
*Carex formosa* Dewey  
*Carex glaucodea* Tuck. ex Olney  
*Carex gracillima* Schwein.  
*Carex granularis* Muhl. ex Willd.  
*Carex grisea* Wahlenb.  
*Carex hirtifolia* Mack.  
*Carex hitchcockiana* Dewey  
*Carex hystericina* Muhl. ex Willd.  
*Carex intumescens* Rudge  
*Carex jamesii* Schwein.  
*Carex lacustris* Willd.  
*Carex laevivaginata* (Kük.) Mack.  
*Carex lasiocarpa* Ehrh.  
*Carex laxiculmis* Schwein.  
*Carex laxiflora* Lam.  
*Carex leptalea* Wahlenb.  
*Carex livida* (Wahlenb.) Willd.  
*Carex lupuliformis* Sartwell ex Dewey  
*Carex lupulina* Muhl. ex Willd.  
*Carex normalis* Mack.  
*Carex peckii* Howe  
*Carex pedunculata* Muhl. ex Willd.  
*Carex pensylvanica* Lam.  
*Carex plantaginea* Lam.  
*Carex platyphylla* J. Carey  
*Carex projecta* Mack.  
*Carex pseudocyperus* Linnaeus

*Carex retrorsa* Schwein.  
*Carex rosea* Schkuhr ex Willd.  
*Carex scabrata* Schwein.  
*Carex schweinitzii* Dewey ex Schwein.  
*Carex scoparia* Schkuhr ex Willd.  
*Carex sparganioides* Muhl. ex Willd.  
*Carex* spp.  
*Carex stipata* Muhl. ex Willd.  
*Carex stricta* Lam.  
*Carex tetanica* Schkuhr  
*Carex tonsa* var. *rugosperma* (Mack.) Crins  
*Carex trichocarpa* Muhl. ex Willd.  
*Carex trisperma* Dewey  
*Carex utriculata* Boott  
*Carex vulpinoidea* Michx.  
*Carex woodii* Dewey  
*Cyperus bipartitus* Torr.  
*Cyperus esculentus* Linnaeus  
*Dulichium arundinaceum* (Linnaeus) Britton  
*Eleocharis acicularis* (Linnaeus) Roem. & Schult.  
*Eleocharis intermedia* Schult.  
*Eriophorum virginicum* Linnaeus  
*Eriophorum viridicarinatum* (Engelm.) Fernald  
*Schoenoplectiella smithii* var. *smithii* (A. Gray) Hayasaka  
*Schoenoplectus tabernaemontani* (C.C. Gmel.) Palla  
*Scirpus atrovirens* Willd.  
*Scirpus cyperinus* (Linnaeus) Kunth

Order Juncales

Family Juncaceae

*Juniperus virginiana* Linnaeus  
*Luzula acuminata* Raf.  
*Luzula multiflora* subsp. *multiflora* (Ehrh.) Lej.

Order Liliales

Family Iridaceae

*Iris* spp.



*Iris versicolor* Linnaeus

*Sisyrinchium angustifolium* Mill.

*Sisyrinchium montanum* Greene

*Sisyrinchium mucronatum* Michx.

Family Liliaceae

*Clintonia borealis* (Aiton) Raf.

*Erythronium albidum* Nutt.

*Erythronium americanum* subsp. *americanum* Ker Gawl.

*Hemerocallis fulva* (Linnaeus) L.

*Hemerocallis lilioasphodelus* Linnaeus

*Lilium canadense* Linnaeus

*Lilium michiganense* Farw.

*Lilium philadelphicum* Linnaeus

*Lilium superbum* Linnaeus

*Medeola virginiana* Linnaeus

*Polygonatum biflorum* (Walter) Elliott

*Polygonatum pubescens* (Willd.) Pursh

*Streptopus lanceolatus* var. *lanceolatus* (Aiton) Reveal

*Trillium erectum* Linnaeus

*Trillium grandiflorum* (Michx.) Salisb.

*Trillium* spp.

*Uvularia grandiflora* Sm.

Family Melanthiaceae

*Anticlea elegans* var. *glaucus* (Nutt.) Zomlefer & Judd

Family Smilacaceae

*Smilax herbacea* Linnaeus

*Smilax tamnoides* Linnaeus

Order Najadales

Family Najadaceae

*Najas flexilis* (Willd.) Rostk. & W.L.E. Schmidt

Family Potamogetonaceae

*Potamogeton amplifolius* Tuck.

*Potamogeton pusillus* subsp. *pusillus* Linnaeus

Order Orchidales

Family Orchidaceae

*Aplectrum hyemale* (Muhl. ex Willd.) Torr.  
*Epipactis helleborine* (Linnaeus) Crantz  
*Galearis spectabilis* (Linnaeus) Raf.  
*Liparis loeselii* (Linnaeus) Rich.  
*Platanthera dilatata* (Pursh) Lindl. ex L.C. Beck  
*Platanthera hyperborea* (Linnaeus) Lindl.  
*Platanthera nivea* (Nutt.) Luer  
*Spiranthes lucida* (H.H. Eaton) Ames

#### Order Poales

##### Family Juncaceae

*Juncus acuminatus* Michx.  
*Juncus articulatus* Linnaeus  
*Juncus brachycarpus* Engelm.  
*Juncus bufonius* Linnaeus  
*Juncus dudleyi* Wiegand  
*Juncus effusus* Linnaeus  
*Juncus nodosus* Linnaeus  
*Juncus tenuis* Willd.

##### Family Poaceae

*Agrostis capillaris* Linnaeus  
*Agrostis gigantea* Roth  
*Agrostis stolonifera* Linnaeus  
*Alopecurus aequalis* Sobol.  
*Andropogon gerardii* Vitman  
*Avena fatua* Linnaeus  
*Avena sativa* Linnaeus  
*Brachyelytrum erectum* (Schreb.) P. Beauv.  
*Briza maxima* Linnaeus  
*Bromus ciliatus* Linnaeus  
*Bromus latiglumis* (Scribn. ex Shear) Hitchc.  
*Bromus pubescens* Muhl. ex Willd.  
*Calamagrostis canadensis* (Michx.) P. Beauv.  
*Cinna arundinacea* Linnaeus  
*Dactylis glomerata* Linnaeus  
*Danthonia spicata* (Linnaeus) P. Beauv. ex Roem. & Schult.

*Dichanthelium dichotomum* var. *dichotomum* (Linnaeus) Gould  
*Dichanthelium latifolium* (Linnaeus) Harvill  
*Dichanthelium linearifolium* (Scribn.) Gould  
*Digitaria sanguinalis* (Linnaeus) Scop.  
*Eleusine indica* (Linnaeus) Gaertn.  
*Elymus canadensis* Linnaeus  
*Elymus hystrix* Linnaeus  
*Elymus lanceolatus* subsp. *psammophilus* (J.M. Gillett & H. Senn) Á. Löve  
*Elymus repens* (Linnaeus) Gould  
*Elymus riparius* Wiegand  
*Elymus virginicus* var. *virginicus* Linnaeus  
*Festuca rubra* subsp. *rubra* Linnaeus  
*Glyceria borealis* (Nash) Batch.  
*Glyceria canadensis* (Michx.) Trin.  
*Glyceria maxima* (Hartm.) Holmb.  
*Glyceria septentrionalis* Hitchc.  
*Glyceria striata* (Lam.) Hitchc.  
*Leersia oryzoides* (Linnaeus) Sw.  
*Lolium perenne* Linnaeus  
*Milium effusum* Linnaeus  
*Muhlenbergia glomerata* (Willd.) Trin.  
*Muhlenbergia mexicana* var. *mexicana* (Linnaeus) Trin.  
*Muhlenbergia tenuiflora* (Willd.) Britton, Sterns & Poggenb.  
*Oryzopsis asperifolia* Michx.  
*Panicum capillare* Linnaeus  
*Panicum virgatum* Linnaeus  
*Patis racemosa* (Smith) Romaschenko, P.M. Peterson & Soreng  
*Phalaris arundinacea* Linnaeus  
*Poa compressa* Linnaeus  
*Poa nemoralis* Linnaeus  
*Poa pratensis* subsp. *pratensis* Linnaeus  
*Poa* ssp.  
*Schizachne purpurascens* (Torr.) Swallen  
*Schizachyrium scoparium* (Michx.) Nash

*Setaria viridis* (Linnaeus) P. Beauv.  
*Sorghastrum nutans* (Linnaeus) Nash  
*Sporobolus vaginiflorus* (Torr. ex A. Gray) Alph. Wood  
*Bromus inermis* Leysser  
*Bromus kalmii* A. Gray  
*Echinochloa crus-galli* (Linnaeus) P. Beauv.  
*Phleum pratense* Linnaeus  
*Phragmites australis* (Cav.) Trin. ex Steud.  
*Setaria pumila* (Poir.) Roem. & Schult.  
*Spartina pectinata* Link

Family Typhaceae

*Typha angustifolia* Linnaeus  
*Typha latifolia* Linnaeus

Order Typhales

Family Sparganiaceae

*Sparganium americanum* Nutt.  
*Sparganium eurycarpum* Engelm.

Class Magnoliopsida

Order Apiales

Family Apiaceae

*Aegopodium podagraria* Linnaeus  
*Angelica atropurpurea* Linnaeus  
*Cicuta bulbifera* Linnaeus  
*Cicuta maculata* Linnaeus  
*Conioselinum chinense* (Linnaeus) Britton, Sterns & Poggenb.  
*Cryptotaenia canadensis* (Linnaeus) DC.  
*Daucus carota* Linnaeus  
*Erigenia bulbosa* (Michx.) Nutt.  
*Heracleum mantegazzianum* Sommier & Levier  
*Osmorhiza claytonii* (Michx.) C.B. Clarke  
*Sanicula canadensis* var. *grandis* Fernald  
*Sanicula marilandica* Linnaeus  
*Sium suave* Walter  
*Thaspium trifoliatum* var. *aureum* (Linnaeus) Britton  
*Zizia aurea* (Linnaeus) W.D.J. Koch

**Family Araliaceae**

*Aralia elata* (Miq.) Seem.

*Aralia nudicaulis* Linnaeus

*Aralia racemosa* subsp. *racemosa* Linnaeus

*Hydrocotyle americana* Linnaeus

*Panax quinquefolius* Linnaeus

*Panax trifolius* Linnaeus

**Order Aristolochiales****Family Aristolochiaceae**

*Asarum canadense* Linnaeus

**Order Asterales****Family Asteraceae**

*Achillea millefolium* Linnaeus

*Ageratina altissima* (Linnaeus) King & H. Rob.

*Ambrosia artemisiifolia* Linnaeus

*Ambrosia trifida* Linnaeus

*Antennaria neglecta* Greene

*Arctium lappa* Linnaeus

*Arctium minus* Bernh.

*Artemisia campestris* subsp. *caudata* (Michx.) H.M. Hall & Clem.

*Artemisia vulgaris* Linnaeus

*Aster* spp.

*Bidens cernua* Linnaeus

*Bidens connata* Muhl. ex Willd.

*Bidens frondosa* Linnaeus

*Bidens* spp.

*Bidens vulgata* Greene

*Carduus nutans* Linnaeus

*Centaurea jacea* Linnaeus

*Centaurea stoebe* subsp. *micranthos* (Gugler) Hayek

*Cichorium intybus* Linnaeus

*Cirsium arvense* (Linnaeus) Scop.

*Cirsium discolor* (Muhl. ex Willd.) Spreng.

*Cirsium muticum* Michx.

*Cirsium oleraceum* (Linnaeus) Scop.

*Cirsium pumilum* var. *hillei* (Canby) B. Boivin  
*Cirsium vulgare* (Savi) Ten.  
*Echinacea purpurea* (Linnaeus) Moench  
*Erechtites hieraciifolius* (Linnaeus) Rafinesque ex de Candolle  
*Erigeron annuus* (Linnaeus) Pers.  
*Erigeron canadensis* Linnaeus  
*Erigeron philadelphicus* var. *philadelphicus* Linnaeus  
*Erigeron pulchellus* Michx.  
*Erigeron strigosus* Muhl. ex Willd.  
*Eupatorium hyssopifolium* Linnaeus  
*Eupatorium perfoliatum* Linnaeus  
*Eurybia macrophylla* (Linnaeus) Cass.  
*Euthamia graminifolia* (Linnaeus) Nutt.  
*Eutrochium maculatum* var. *maculatum* (Linnaeus) E.E. Lamont  
*Eutrochium purpureum* var. *purpureum* (Linnaeus) E.E. Lamont  
*Helenium flexuosum* Raf.  
*Helianthus annuus* Linnaeus  
*Helianthus decapetalus* Linnaeus  
*Helianthus giganteus* Linnaeus  
*Helianthus tuberosus* Linnaeus  
*Heliopsis helianthoides* (Linnaeus) Sweet  
*Hieracium umbellatum* Linnaeus  
*Hieracium vulgatum* Fr.  
*Inula helenium* Linnaeus  
*Lactuca canadensis* Linnaeus  
*Lactuca serriola* Linnaeus  
*Lapsana communis* Linnaeus  
*Leucanthemum vulgare* Lam.  
*Liatris cylindracea* Michx.  
*Matricaria discoidea* DC.  
*Nabalus albus* (Linnaeus) Hooker  
*Nabalus altissimus* (Linnaeus) Hooker  
*Onopordum acanthium* Linnaeus  
*Packera aurea* (Linnaeus) Á. Löve & D. Löve  
*Pilosella ×floribunda* (Wimmer & Grabowski) Fries

Notes: X floribundum

*Pilosella aurantiaca* (Linnaeus) F.W. Schultz & Schultz Bipontinus  
*Pilosella caespitosa* (Dumortier) P.D. Sell & C. West  
*Pilosella officinarum* F.W. Schultz & Schultz Bipontinus  
*Pilosella piloselloides* subsp. *piloselloides* (Villars) Soják  
*Pilosella piloselloides* subsp. *praealta* (Gochnat) S. Bräutigam & Greuter  
*Prenanthes* spp.  
*Ratibida pinnata* (Vent.) Barnhart  
*Rudbeckia hirta* Linnaeus  
*Rudbeckia laciniata* Linnaeus  
*Solidago altissima* var. *altissima* Linnaeus  
*Solidago caesia* Linnaeus  
*Solidago canadensis* Linnaeus  
*Solidago flexicaulis* Linnaeus  
*Solidago gigantea* Aiton  
*Solidago hispida* Muhl. ex Willd.  
*Solidago juncea* Aiton  
*Solidago nemoralis* subsp. *nemoralis* Aiton  
*Solidago patula* Muhl. ex Willd.  
*Solidago ptarmicoides* (Torr. & A. Gray) B. Boivin  
*Solidago rigida* Linnaeus  
*Solidago rugosa* subsp. *rugosa* Mill.  
*Solidago* spp.  
*Solidago ulmifolia* Muhl. ex Willd.  
*Sonchus arvensis* subsp. *arvensis* Linnaeus  
*Sonchus asper* (Linnaeus) Hill  
*Sonchus oleraceus* Linnaeus  
*Symphotrichum cordifolium* (Linnaeus) G.L. Nesom  
*Symphotrichum ericoides* var. *ericoides* (Linnaeus) G.L. Nesom  
*Symphotrichum laeve* (Linnaeus) Á. Löve & D. Löve  
*Symphotrichum lanceolatum* (Willd.) G.L. Nesom  
*Symphotrichum lateriflorum* var. *lateriflorum* (Linnaeus) Á. Löve & D. Löve  
*Symphotrichum lateriflorum* var. *hirsuticaule* (Lindl. ex DC.) G.L. Nesom  
*Symphotrichum novae-angliae* (Linnaeus) G.L. Nesom

*Symphyotrichum novi-belgii* (Linnaeus) G.L. Nesom  
*Symphyotrichum oolentangiense* var. *oolentangiense* (Riddell) G.L. Nesom  
*Symphyotrichum oolentangiense* (Riddell) G.L. Nesom  
*Symphyotrichum pilosum* var. *pilosum* (Willd.) G.L. Nesom  
*Symphyotrichum puniceum* (Linnaeus) Á. Löve & D. Löve  
*Symphyotrichum racemosum* (Elliot) G.L. Nesom  
*Symphyotrichum* spp.  
*Symphyotrichum urophyllum* (Lindl.) G.L. Nesom  
*Tanacetum vulgare* Linnaeus  
*Taraxacum officinale* F.H. Wigg.  
*Tragopogon dubius* Scop.  
*Tragopogon pratensis* Linnaeus  
*Tussilago farfara* Linnaeus  
*Xanthium strumarium* Linnaeus

Family Campanulaceae

*Lobelia siphilitica* Linnaeus

Order Boraginales

Family Boraginaceae

*Hackelia virginiana* (Linnaeus) I.M. Johnst.

*Myosotis scorpioides* Linnaeus

Order Brassicales

Family Brassicaceae

*Hesperis matronalis* Linnaeus

*Rorippa sylvestris* (Linnaeus) Besser

Order Campanulales

Family Campanulaceae

*Campanula rapunculoides* Linnaeus

*Campanula rotundifolia* Linnaeus

*Lobelia cardinalis* Linnaeus

*Lobelia inflata* Linnaeus

Order Capparales

Family Brassicaceae

*Alliaria petiolata* (M. Bieb.) Cavara & Grande

Notes: or petiolata



*Barbarea vulgaris* W.T. Aiton  
*Berteroa incana* (Linnaeus) DC.  
*Brassica juncea* (Linnaeus) Czern.  
*Brassica rapa* Linnaeus  
*Capsella bursa-pastoris* (Linnaeus) Medik.  
*Cardamine bulbosa* (Schreb. ex Muhl.) Britton, Sterns & Poggenb.  
*Cardamine concatenata* (Michx.) Sw.  
*Cardamine diphylla* (Michx.) Alph. Wood  
*Cardamine maxima* (Nutt.) Alph. Wood  
*Cardamine pensylvanica* Muhl. ex Willd.  
*Erysimum cheiranthoides* Linnaeus  
*Nasturtium officinale* W.T. Aiton  
*Rorippa palustris* subsp. *palustris* Linnaeus  
*Sinapis alba* Linnaeus  
*Sinapis arvensis* Linnaeus  
*Sisymbrium altissimum* Linnaeus  
*Thlaspi arvense* Linnaeus  
*Turritis glabra* Linnaeus

Order Caryophyllales

Family Amaranthaceae

*Amaranthus albus* Linnaeus  
*Amaranthus retroflexus* Linnaeus  
*Amaranthus tuberculatus* (Moq.) J.D. Sauer

Family Caryophyllaceae

*Arenaria serpyllifolia* Linnaeus  
*Cerastium arvense* subsp. *arvense* Linnaeus  
*Cerastium fontanum* subsp. *vulgare* (Hartm.) Greuter & Burdet  
*Dianthus armeria* Linnaeus  
*Dianthus barbatus* Linnaeus  
*Saponaria officinalis* Linnaeus  
*Silene latifolia* (Mill.) Britten & Rendle  
*Silene vulgaris* (Moench) Garcke  
*Stellaria graminea* Linnaeus

Family Chenopodiaceae

*Chenopodium album* Linnaeus

**Family Phytolaccaceae**

*Phytolacca americana* var. *americana* Linnaeus

**Family Polygonaceae**

*Persicaria hydropiper* (Linnaeus) Opiz

*Persicaria pensylvanica* (Linnaeus) M. Gómez

*Rumex britannica* Linnaeus

*Rumex crispus* Linnaeus

*Rumex obtusifolius* Linnaeus

*Rumex verticillatus* Linnaeus

**Family Portulacaceae**

*Claytonia virginica* Linnaeus

**Order Celastrales****Family Aquifoliaceae**

*Ilex verticillata* (Linnaeus) A. Gray

**Family Celastraceae**

*Celastrus scandens* Linnaeus

*Euonymus alatus* (Thunb.) Siebold

*Euonymus atropurpureus* Jacq.

*Euonymus obovatus* Nutt.

**Order Cornales****Family Cornaceae**

*Cornus alternifolia* L. f.

*Cornus canadensis* Linnaeus

*Cornus obliqua* Raf.

*Cornus racemosa* Lam.

*Cornus rugosa* Lam.

*Cornus stolonifera* Michx.

**Order Cucurbitales****Family Cucurbitaceae**

*Echinocystis lobata* (Michx.) Torr. & A. Gray

**Order Dipsacales****Family Adoxaceae**

*Viburnum acerifolium* Linnaeus

*Viburnum lantana* Linnaeus

*Viburnum lentago* Linnaeus

*Viburnum opulus* Linnaeus

*Viburnum opulus* var. *americanum* Aiton

*Viburnum rafinesquianum* Schult.

Family Caprifoliaceae

*Caprifoliaceae* spp.

*Diervilla lonicera* Mill.

*Dipsacus sativus* (Linnaeus) Honck.

*Linnaea borealis* subsp. *longiflora* (Torr.) Hultén

*Lonicera canadensis* Bartram & W. Bartram ex Marshall

*Lonicera dioica* Linnaeus

*Lonicera morrowii* A. Gray

*Lonicera tatarica* Linnaeus

*Sambucus canadensis* Linnaeus

*Sambucus nigra* Linnaeus

*Sambucus racemosa* subsp. *pubens* (Michx.) House

*Symphoricarpos albus* (Linnaeus) S.F. Blake

*Symphoricarpos occidentalis* Hook.

*Triosteum aurantiacum* E.P. Bicknell

Family Dipsacaceae

*Dipsacus fullonum* Linnaeus

Family Valerianaceae

*Valeriana edulis* subsp. *cilata* (Torrey & A. Gray) F.G. Meyer

Order Ericales

Family Balsaminaceae

*Impatiens capensis* Meerb.

Family Ericaceae

*Epigaea repens* Linnaeus

*Gaultheria hispidula* (Linnaeus) Muhl. ex Bigelow

*Gaultheria procumbens* Linnaeus

*Vaccinium angustifolium* Aiton

*Vaccinium myrtilloides* Michx.

Family Primulaceae

*Lysimachia arvensis* (Linnaeus) U. Manns & Anderberg

Family Pyrolaceae

*Pyrola elliptica* Nutt.

*Pyrola* spp.

Order Euphorbiales

Family Euphorbiaceae

*Euphorbia cyparissias* Linnaeus

*Euphorbia esula* Linnaeus

Checklist of species observed or collected at the *rare* Charitable Research Reserve in Cambridge, Ontario, Canada. The second of two checklists for Kingdom Plantae, this checklist contains records from Phyla Magnoliophyta (Class Magnoliopsida), Marchantiophyta, Pinophyta, and Pteridophyta.

Phylum Magnoliophyta

Kingdom Plantae

Class Magnoliopsida

Order Fabales

Family Fabaceae

*Amorpha canescens* Pursh

*Amphicarpaea bracteata* (Linnaeus) Fernald

*Apios americana* Medik.

*Desmodium canadense* (Linnaeus) DC.

*Glycyrrhiza lepidota* Pursh

*Lespedeza capitata* Michx.

*Lotus corniculatus* Linnaeus

*Medicago lupulina* Linnaeus

*Medicago sativa* subsp. *sativa* Linnaeus

*Melilotus albus* Medik.

*Robinia pseudoacacia* Linnaeus

*Trifolium aureum* Pollich

*Trifolium campestre* Schreb.

*Trifolium hybridum* Linnaeus

*Trifolium pratense* Linnaeus

*Trifolium repens* Linnaeus

*Vicia americana* Muhl. ex Willd.

*Vicia cracca* Linnaeus

Order Fagales

Family Betulaceae

*Alnus glutinosa* (Linnaeus) Gaertn.

*Alnus incana* subsp. *rugosa* (Du Roi) R.T. Clausen

*Betula alleghaniensis* Britton

*Betula papyrifera* Marshall

*Betula pendula* Roth

*Betula populifolia* Marshall

*Betula pumila* Linnaeus

*Carpinus caroliniana* subsp. *virginiana* (Marshall) Furlow

*Corylus americana* Walter

*Corylus cornuta* subsp. *cornuta* Marshall

*Ostrya virginiana* (Mill.) K. Koch

Family Fagaceae

*Fagus grandifolia* Ehrh.

*Quercus alba* Linnaeus

*Quercus bicolor* Willd.

*Quercus ellipsoidalis* E.J. Hill

*Quercus macrocarpa* Michx.

*Quercus palustris* Münchh.

*Quercus rubra* Linnaeus

*Quercus velutina* Lam.

Family Juglandaceae

*Juglans nigra* Linnaeus

Order Gentianales

Family Apocynaceae

*Apocynum androsaemifolium* Linnaeus

*Apocynum cannabinum* Linnaeus

*Apocynum* sp.

Notes: X floribundum

*Vinca minor* Linnaeus

Family Asclepiadaceae

*Asclepias exaltata* Linnaeus

*Asclepias incarnata* subsp. *incarnata* Linnaeus

*Asclepias syriaca* Linnaeus

*Asclepias tuberosa* Linnaeus

Family Gentianaceae

*Gentiana andrewsii* Griseb.

*Gentiana rubricaulis* Schwein.

*Gentianella quinquefolia* subsp. *quinquefolia* (Linnaeus) Small

*Gentianopsis crinita* (Froel.) Ma

*Gentianopsis virgata* subsp. *virgata* (Raf.) Holub

Notes: or *virgata*

Family Rubiaceae

*Galium aparine* Linnaeus

*Galium asprellum* Michx.

Order Geraniales

Family Balsaminaceae

*Impatiens glandulifera* Royle

*Impatiens pallida* Nutt.

Family Geraniaceae

*Geranium maculatum* Linnaeus

*Geranium robertianum* Linnaeus

Family Oxalidaceae

*Oxalis corniculata* Linnaeus

*Oxalis montana* Raf.

*Oxalis stricta* Linnaeus

Order Haloragales

Family Haloragaceae

*Myriophyllum heterophyllum* Michx.

*Myriophyllum verticillatum* Linnaeus

Order Hamamelidales

Family Platanaceae

*Platanus occidentalis* Linnaeus

**Order Juglandales****Family Juglandaceae**

*Carya cordiformis* (Wangenh.) K. Koch

*Carya glabra* (Mill.) Sweet

*Carya ovata* var. *ovata* (Mill.) K. Koch

*Juglans cinerea* Linnaeus

**Order Lamiales****Family Boraginaceae**

*Anchusa arvensis* (Linnaeus) M. Bieb.

*Cynoglossum officinale* Linnaeus

*Echium vulgare* Linnaeus

*Lithospermum parviflorum* Weakley, Witsell & D. Estes

*Myosotis laxa* Lehm.

*Myosotis verna* Nutt.

*Symphytum officinale* Linnaeus

**Family Lamiaceae**

*Agastache nepetoides* (Linnaeus) Kuntze

*Ajuga reptans* Linnaeus

*Blephilia hirsuta* (Pursh) Benth.

*Clinopodium vulgare* Linnaeus

*Collinsonia canadensis* Linnaeus

*Galeopsis tetrahit* Linnaeus

*Glechoma hederacea* Linnaeus

*Lamium amplexicaule* Linnaeus

*Leonurus cardiaca* Linnaeus

*Lycopus americanus* Muhl. ex W.P.C. Bartram

*Lycopus asper* Greene

*Lycopus uniflorus* Michx.

*Melissa officinalis* Linnaeus

*Mentha arvensis* auct. non L.

*Mentha canadensis* Linnaeus

*Mentha* sp.

Notes: X piperita

*Mentha spicata* Linnaeus  
*Monarda didyma* Linnaeus  
*Monarda fistulosa* Sims  
*Nepeta cataria* Linnaeus  
*Physostegia virginiana* subsp. *virginiana* (Linnaeus) Benth.  
*Prunella vulgaris* subsp. *vulgaris* Linnaeus  
*Prunella vulgaris* subsp. *lanceolata* (W.P.C. Barton) Piper & Beattie  
*Prunella vulgaris* Linnaeus  
*Pycnanthemum virginianum* (Linnaeus) Rob. & Fernald  
*Scutellaria galericulata* Linnaeus  
*Scutellaria lateriflora* Linnaeus  
*Stachys hispida* Pursh  
*Stachys palustris* Linnaeus  
*Teucrium canadense* subsp. *canadense* Linnaeus

Family Oleaceae

*Ligustrum vulgare* Linnaeus  
*Syringa vulgaris* Linnaeus

Family Plantaginaceae

*Linaria vulgaris* Mill.  
*Plantago lanceolata* Linnaeus  
*Plantago major* Linnaeus  
*Plantago rugelii* Decne.  
*Veronica anagallis-aquatica* Linnaeus

Family Scrophulariaceae

*Verbascum phoeniceum* Linnaeus  
*Verbascum thapsus* Linnaeus  
*Veronica chamaedrys* Linnaeus  
*Veronica officinalis* Linnaeus  
*Veronica serpyllifolia* Linnaeus

Family Verbenaceae

*Verbena hastata* Linnaeus  
*Verbena simplex* Lehm.  
*Verbena stricta* Vent.  
*Verbena urticifolia* Linnaeus



**Order Laurales****Family Lauraceae**

*Lindera benzoin* (Linnaeus) Blume

**Order Linales****Family Linaceae**

*Linum virginianum* Linnaeus

**Order Magnoliales****Family Annonaceae**

*Asimina triloba* (Linnaeus) Dunal

**Order Malpighiales****Family Hypericaceae**

*Hypericum ascyron* Linnaeus

*Hypericum mutilum* subsp. *mutilum* Linnaeus

*Hypericum perforatum* Linnaeus

*Hypericum punctatum* Lam.

**Family Salicaceae**

*Populus alba* Linnaeus

*Populus balsamifera* Linnaeus

*Populus deltoides* W. Bartram ex Marshall

*Populus grandidentata* Michx.

*Populus nigra* Linnaeus

*Populus tremuloides* Michx.

**Order Malvales****Family Malvaceae**

*Abutilon theophrasti* Medik.

*Malva moschata* Linnaeus

**Family Tiliaceae**

*Tilia americana* Linnaeus

**Order Myrtales****Family Lythraceae**

*Lythrum salicaria* Linnaeus

**Family Onagraceae**

*Chamerion angustifolium* subsp. *angustifolium* (Linnaeus) Holub

*Circaea alpina* Linnaeus

*Circaea canadensis* subsp. *canadensis* (Linnaeus) Hill

*Epilobium ciliatum* subsp. *glandulosum* (Lehm.) Hoch & P.H. Raven

*Epilobium coloratum* Biehler

*Epilobium hirsutum* Linnaeus

*Epilobium leptophyllum* Raf.

*Epilobium strictum* Muhl.

*Ludwigia polycarpa* Short & Peter

*Oenothera biennis* Linnaeus

*Oenothera serrulata* Nuttall

Family Thymelaeaceae

*Dirca palustris* Linnaeus

Order Nymphaeales

Family Cabombaceae

*Brasenia schreberi* J.F. Gmel.

Order Papaverales

Family Papaveraceae

*Chelidonium majus* Linnaeus

*Dicentra canadensis* (Goldie) Walp.

*Dicentra cucullaria* (Linnaeus) Bernh.

*Sanguinaria canadensis* Linnaeus

Order Piperales

Family Saururaceae

*Saururus cernuus* Linnaeus

Order Plantaginales

Family Plantaginaceae

*Callitriche palustris* Linnaeus

*Chelone glabra* Linnaeus

*Digitalis lanata* Ehrh.

*Digitalis lutea* Linnaeus

Notes: or grandiflora

*Digitalis purpurea* Linnaeus

Order Polygalales

Family Polygalaceae

*Polygala* spp

*Polygala verticillata* var. *verticillata* Linnaeus

*Polygaloides paucifolia* (Willdenow) J.R. Abbott

Order Polygonales

Family Polygonaceae

*Fallopia convolvulus* (Linnaeus) Á. Löve

*Fallopia scandens* (Linnaeus) Holub

*Persicaria hydropiperoides* (Michx.) Small

*Persicaria maculosa* Gray

*Persicaria punctata* (Elliott) Small

*Persicaria sagittata* (Linnaeus) H. Gross

*Polygonum aviculare* Linnaeus

Order Primulales

Family Primulaceae

*Lysimachia borealis* (Rafinesque) U. Manns & Anderberg

*Lysimachia ciliata* Linnaeus

*Lysimachia nummularia* Linnaeus

*Lysimachia thyrsoflora* Linnaeus

*Primula mistassinica* Michx.

Order Ranunculales

Family Berberidaceae

*Berberis canadensis* Mill.

*Berberis thunbergii* DC.

*Berberis vulgaris* Linnaeus

*Caulophyllum thalictroides* (Linnaeus) Michx.

*Podophyllum peltatum* Linnaeus

Family Menispermaceae

*Menispermum canadense* Linnaeus

Family Ranunculaceae

*Actaea pachypoda* Elliott

*Actaea rubra* (Aiton) Willd.

*Actaea* spp.

*Anemone acutiloba* (DC.) G. Lawson

*Anemone americana* (DC.) H. Hara

*Anemone canadensis* Linnaeus

*Anemone cylindrica* A. Gray

*Anemone quinquefolia* Linnaeus  
*Anemone virginiana* var. *virginiana* Linnaeus  
*Anemone virginiana* var. *alba* (Oakes) Alph. Wood  
*Aquilegia canadensis* Linnaeus  
*Caltha palustris* Linnaeus  
*Clematis virginiana* Linnaeus  
*Coptis trifolia* (Linnaeus) Salisb.  
*Ranunculus abortivus* Linnaeus  
*Ranunculus acris* Linnaeus  
*Ranunculus hispidus* var. *caricetorum* (Greene) T. Duncan  
*Ranunculus recurvatus* var. *recurvatus* Poir.  
*Ranunculus repens* Linnaeus  
*Ranunculus sceleratus* var. *sceleratus* Linnaeus  
*Thalictrum dasycarpum* Fisch. & Avé-Lall.  
*Thalictrum dioicum* Linnaeus  
*Thalictrum pubescens* Pursh  
*Thalictrum thalictroides* (Linnaeus) Eames & B. Boivin

#### Order Rhamnales

##### Family Elaeagnaceae

*Elaeagnus angustifolia* Linnaeus  
*Elaeagnus umbellata* Thunb.  
*Shepherdia canadensis* (Linnaeus) Nutt.

##### Family Rhamnaceae

*Frangula alnus* Mill.  
*Rhamnus alnifolia* L'Hér.

#### Order Rosales

##### Family Cannabaceae

*Humulus lupulus* Linnaeus

##### Family Crassulaceae

*Sedum acre* Linnaeus

##### Family Grossulariaceae

*Ribes americanum* Mill.  
*Ribes cynosbati* Linnaeus  
*Ribes glandulosum* Grauer  
*Ribes hirtellum* Michx.

*Ribes lacustre* (Pers.) Poir.

*Ribes oxycanthoides* var. *oxycanthoides* Linnaeus

*Ribes rubrum* Linnaeus

*Ribes* ssp.

*Ribes triste* Pall.

Family Hydrangeaceae

*Philadelphus coronarius* Linnaeus

Family Rhamnaceae

*Rhamnus cathartica* Linnaeus

Family Rosaceae

*Agrimonia gryposepala* Wallr.

*Amelanchier arborea* (F. Michx.) Fernald

*Amelanchier laevis* Wiegand

*Amelanchier spicata* (Lam.) K. Koch

*Aruncus dioicus* (Walter) Fernald

*Crataegus chrysocarpa* Ashe

*Crataegus crus-galli* Linnaeus

*Crataegus dissona* Sarg.

*Crataegus punctata* Jacq.

*Crataegus* spp.

*Dasiphora fruticosa* auct. non (Linnaeus) Rydb.

*Fragaria vesca* Linnaeus

*Fragaria virginiana* Duchesne

*Geum aleppicum* Jacq.

*Geum canadense* Jacq.

*Geum fragarioides* (Michaux) Smedmark

*Geum laciniatum* Murray

*Geum rivale* Linnaeus

*Geum urbanum* Linnaeus

*Malus coronaria* (Linnaeus) Mill.

*Malus pumila* Mill.

*Physocarpus opulifolius* (Linnaeus) Maxim.

*Potentilla anserina* subsp. *anserina* Linnaeus

*Potentilla argentea* Linnaeus

*Potentilla norvegica* Linnaeus

*Potentilla recta* Linnaeus  
*Potentilla simplex* Michx.  
*Prunus americana* Marshall  
*Prunus avium* (Linnaeus) L.  
*Prunus mahaleb* Linnaeus  
*Prunus pennsylvanica* L. f.  
*Prunus serotina* Ehrh.  
*Prunus virginiana* subsp. *virginiana* Linnaeus  
*Pyrus communis* Linnaeus  
*Rosa blanda* Aiton  
*Rosa cinnamomea* L. sensu 1759, non 1753  
*Rosa multiflora* Thunb.  
*Rosa palustris* Marshall  
*Rosa rugosa* Thunb.  
*Rosa virginiana* Mill.  
*Rubus allegheniensis* Porter  
*Rubus canadensis* Linnaeus  
*Rubus flagellaris* Willd.  
*Rubus hispidus* Linnaeus  
*Rubus idaeus* Linnaeus  
*Rubus occidentalis* Linnaeus  
*Rubus pubescens* Raf.  
*Rubus repens* (Linnaeus) Kuntze  
*Sorbus americana* Marshall  
*Sorbus aucuparia* Linnaeus  
*Spiraea alba* Du Roi

Family Saxifragaceae

*Micranthes virginiana* (Michx.) Small  
*Mitella diphylla* Linnaeus  
*Mitella nuda* Linnaeus  
*Parnassia glauca* Raf.  
*Tiarella cordifolia* Linnaeus

Order Rubiales

Family Rubiaceae

*Galium circaezans* Michx.

*Galium mollugo* Linnaeus  
*Galium palustre* Linnaeus  
*Galium tinctorium* Linnaeus  
*Galium trifidum* subsp. *trifidum* Linnaeus  
*Galium triflorum* Michx.  
*Mitchella repens* Linnaeus

Order Salicales

Family Salicaceae

*Salix ×fragilis* Linnaeus  
*Salix alba* Linnaeus  
*Salix amygdaloides* Andersson  
*Salix bebbiana* Sarg.  
*Salix candida* Flügge ex Willd.  
*Salix cordata* Muhl.  
*Salix discolor* Muhl.  
*Salix eriocephala* Michx.  
*Salix exigua* Nutt.  
*Salix humilis* var. *humilis* Marshall  
*Salix lucida* Muhl.  
*Salix nigra* Marshall  
*Salix pedicellaris* Pursh  
*Salix petiolaris* Sm.  
*Salix purpurea* Linnaeus  
*Salix serissima* (L.H. Bailey) Fernald  
*Salix viminalis* Linnaeus

Order Sapindales

Family Aceraceae

*Acer nigrum* F. Michaux  
*Acer platanooides* Linnaeus  
*Acer rubrum* Linnaeus  
*Acer saccharinum* Linnaeus  
*Acer saccharum* Marshall  
*Acer spicatum* Lam.

Family Anacardiaceae

*Rhus aromatica* Aiton

*Rhus typhina* Linnaeus

*Toxicodendron radicans* subsp. *negundo* (Greene) Gillis

*Toxicodendron radicans* var. *rydbergii* (Small ex Rydb.) Erskine

*Toxicodendron vernix* (Linnaeus) Kuntze

Family Rutaceae

*Zanthoxylum americanum* Mill.

Family Sapindaceae

*Acer negundo* Linnaeus

*Aesculus hippocastanum* Linnaeus

Family Staphyleaceae

*Staphylea trifolia* Linnaeus

Order Saxifragales

Family Haloragaceae

*Myriophyllum sibiricum* Kom.

Order Scrophulariales

Family Oleaceae

*Fraxinus americana* Linnaeus

*Fraxinus nigra* Marsh.

*Fraxinus pennsylvanica* Marshall

Family Orobanchaceae

*Conopholis americana* (Linnaeus) Wallr.

*Epifagus virginiana* (Linnaeus) W.P.C. Barton

Family Scrophulariaceae

*Aureolaria flava* (Linnaeus) Farw.

*Aureolaria virginica* (Linnaeus) Pennell

*Pedicularis canadensis* Linnaeus

*Penstemon digitalis* Nutt. ex Sims

*Penstemon hirsutus* (Linnaeus) Willd.

*Scrophularia lanceolata* Pursh

*Scrophularia marilandica* Linnaeus

*Verbascum blattaria* Linnaeus

*Veronica americana* Schwein. ex Benth.

Order Solanales

Family Convolvulaceae

*Calystegia spithamea* (Linnaeus) Pursh



*Convolvulus arvensis* Linnaeus

*Cuscuta gronovii* Willd. ex Schult.

Family Hydrophyllaceae

*Hydrophyllum canadense* Linnaeus

*Hydrophyllum virginianum* Linnaeus

Family Polemoniaceae

*Phlox subulata* subsp. *subulata* Linnaeus

Family Solanaceae

*Physalis heterophylla* Nees

*Solanum dulcamara* Linnaeus

*Solanum lycopersicum* Linnaeus

Order Urticales

Family Moraceae

*Morus alba* Linnaeus

Family Ulmaceae

*Celtis occidentalis* Linnaeus

*Ulmus americana* Linnaeus

*Ulmus pumila* Linnaeus

*Ulmus rubra* Muhl.

*Ulmus thomasi* Sarg.

Family Urticaceae

*Boehmeria cylindrica* (Linnaeus) Sw.

*Laportea canadensis* (Linnaeus) Wedd.

*Pilea pumila* (Linnaeus) A. Gray

*Urtica dioica* subsp. *gracilis* (Aiton) Selander

*Urtica dioica* subsp. *dioica* Linnaeus

Order Violales

Family Cucurbitaceae

*Sicyos angulatus* Linnaeus

Family Violaceae

*Viola adunca* var. *adunca* Sm.

*Viola canadensis* Linnaeus

*Viola cucullata* Aiton

*Viola labradorica* Schrank

*Viola macloskeyi* F.E. Lloyd

*Viola nephrophylla* Greene

*Viola pubescens* Aiton

*Viola renifolia* A. Gray

*Viola rostrata* Pursh

*Viola sororia* Willd.

*Viola sororia* var. *affinis* (Leconte) L.E. McKinney

*Viola* spp.

Order Vitales

Family Vitaceae

*Parthenocissus quinquefolia* (Linnaeus) Planch.

*Vitis riparia* Michx.

Order Lamiales

Family Phrymaceae

*Phryma leptostachya* Linnaeus

Order Saxifragales

Family Hamamelidaceae

*Hamamelis virginiana* Linnaeus

Phylum Marchantiophyta

Class Jungermanniopsida

Order Metzgeriales

Family Aneuraceae

*Aneura pinguis* (Linnaeus) Dumort.

Order Jungermanniales

Family Geocalycaceae

*Lophocolea heterophylla* (Schrad.) Dum.

Family Porellaceae

*Porella platyphylla* (Linnaeus) Pfeiff.

Family Radulaceae

*Radula complanata* (Linnaeus) Dum.

Order Porellales

Family Frullaniaceae

*Frullania eboracensis* Gottsche

Class Marchantiopsida

Order Marchantiales

Family Aytoniaceae

*Reboulia hemisphaerica* (Linnaeus) Raddi

Family Conocephalaceae

*Conocephalum conicum* (Linnaeus) Lindb.

Family Marchantiaceae

*Marchantia polymorpha* Linnaeus

Phylum Pinophyta

Class Pinopsida

Order Cupressales

Family Cupressaceae

*Juniperus communis* Linnaeus

*Juniperus communis* var. *depressa* Pursh

Order Pinales

Family Cupressaceae

*Thuja occidentalis* Linnaeus

Family Pinaceae

*Larix decidua* Mill.

*Larix laricina* (Du Roi) K. Koch

*Picea abies* (Linnaeus) Karst.

*Picea glauca* (Moench) Voss

*Picea pungens* Engelm.

*Pinus banksiana* Lamb.

*Pinus resinosa* Aiton

*Pinus strobus* Linnaeus

*Pinus sylvestris* Linnaeus

*Tsuga canadensis* (Linnaeus) Carrière

Phylum Pteridophyta

Class Filicopsida

Order Ophioglossales

Family Ophioglossaceae

*Botrypus virginianus* (Linnaeus) Michaux

Order Polypodiales

Family Aspleniaceae

*Asplenium platyneuron* (Linnaeus) Britton, Sterns & Poggenb.

*Asplenium trichomanes* subsp. *trichomanes* Linnaeus

*Asplenium viride* Huds.

Family Dennstaedtiaceae

*Pteridium aquilinum* var. *latiusculum* (Desv.) Underw. ex A. Heller

Family Dryopteridaceae

*Athyrium filix-femina* var. *angustum* (Willd.) G. Lawson

*Cystopteris bulbifera* (Linnaeus) Bernh.

*Cystopteris fragilis* (Linnaeus) Bernh.

Notes: or *tenuis*

*Deparia acrostichoides* (Sw.) M. Kato

*Dryopteris* ×*triploidea* Wherry

*Dryopteris carthusiana* (Vill.) H.P. Fuchs

Notes: or *spinulosa*

*Dryopteris clintoniana* (D.C. Eaton) Dowell

*Dryopteris cristata* (Linnaeus) A. Gray

*Dryopteris goldiana* (Hook. ex Goldie) A. Gray

*Dryopteris intermedia* (Muhl. ex Willd.) A. Gray

*Dryopteris marginalis* (Linnaeus) A. Gray

*Gymnocarpium dryopteris* (Linnaeus) Newman

*Matteuccia struthiopteris* var. *pennsylvanica* (Willd.) C.V. Morton

*Onoclea sensibilis* Linnaeus

*Polystichum acrostichoides* (Michx.) Schott

Family Osmundaceae

*Osmunda claytoniana* Linnaeus

*Osmunda regalis* var. *spectabilis* (Willd.) A. Gray

Family Polypodiaceae

*Polypodium virginianum* Linnaeus

Notes: or *vulgare*

Family Pteridaceae

*Adiantum pedatum* Linnaeus

*Pellaea glabella* Mett. ex Kuhn

Family Thelypteridaceae

*Thelypteris noveboracensis* (Linnaeus) Nieuwl.

*Thelypteris palustris* var. *pubescens* (G. Lawson) Fernald

## Class Polypodiopsida

### Order Osmundales

#### Family Osmundaceae

#### *Osmundastrum cinnamomea* (Linnaeus) C. Presl

## Analysis

The two surveying strategies – a four-month long terrestrial arthropod survey, followed by a concentrated bioblitz targeting a variety of taxa – resulted in 25,287 and 3,502 specimens barcoded, respectively, out of a total of 32,645 specimens collected. Observations of an additional 125 species and two higher taxa (for which no voucher specimen was kept) were recorded at the bioblitz (Suppl. material 7). Altogether the surveys covered 14 phyla, 29 classes, 117 orders, and 531 families of animals, plants, fungi and lichens. This comprised 3,986 BINs of animals, 1,193 of which are identified to species (Suppl. materials 4, 8, 9).

The most diverse groups were Ichneumonidae, Chironomidae, and Cecidomyiidae with 188, 365, and 584 BINs respectively. In terms of abundance, the three groups Sciaridae, Cecidomyiidae, and Chironomidae had the largest number of specimens with 1,528, 2,477, and 9,636 specimens. The most abundant BINs were [BOLD:ACC0651](#) (Thripidae: *Taeniothrips inconsequens*), [BOLD:AAD5253](#) (Chironomidae: *Thienemanniella xena*), and [BOLD:AAP5920](#) (Chironomidae: *Cricotopus triannulatus*) with 349, 636, and 1619 specimens collected. For these three BINs, and many similarly abundant BINs, the presence of closely allied and morphologically similar taxa makes oversampling of these exceptionally common species unavoidable.

Combining all existing data results in a final tally of 3,348 species (Table 1), 1,102 of them new records for the reserve (Suppl. material 10). An incidence-based rarefaction analysis (Fig. 2 Suppl. material 11) computed in EstimateS (Colwell and Elsensohn 2014) approximates that 6,744 BINs of invertebrate animals are present at the reserve, indicating that our inventory is at most 30% complete. 1,918 BINs were singletons (i.e. represented by one specimen); the high proportion of singletons (48%) is another indication that the species inventory is far from complete (Magurran 2004). For comparison, the Great Smoky Mountains National Park (North Carolina and Tennessee, United States) established an [AT BI effort](#) in 1998 and have tallied 18,545 of the estimated 100,000 species present in the park. In only a few months, our survey found 20% of the Great Smoky Mountains total from 17 years of effort. The Great Smoky Mountains National Park has recognized the contribution DNA barcoding can play in their ATBI effort and have included this method in their survey (e.g., Scholtens and Wagner 2007, Zhou et al. 2011).

## Discussion

The present study has conducted an expansive biotic survey, released the data in several public biodiversity data repositories, and published the unique process and findings – all within a relatively modest timeframe. This model for rapid generation and dissemination of critical biodiversity data could be followed to conduct regional assessments of biodiversity status and change, and potentially aid in evaluating progress towards the Aichi Targets of the Strategic Plan for Biodiversity 2011–2020. To fully appreciate this approach, a closer look at four elements is presented: highlights of the biotic inventory, the multiple levels of acceleration, future improvements to the resource, and the utility of the resource going forward.

Table 1.

Summary of species inventory for **rare Charitable Research Reserve** in Cambridge, Ontario, Canada, following the present study.

Major Group	Common Name	No. on previous inventory	No. on 2015 surveys	New Species	New Total
Annelida	Earthworms	0	2	2	2
Arthropoda:Arachnida	Spiders and others	0	198	198	198
Arthropoda:Crustacea	Crustaceans	0	7	7	7
Arthropoda:Entognatha	Collembola	0	9	9	9
Arthropoda:Insecta	Insects	832	895	778	1,610
Arthropoda:Myriapoda	Millipedes, Centipedes	0	6	6	6
Chordata:Actinopterygii	Fishes	28	14	3	31
Chordata:Amphibia	Amphibians	13	2	0	13
Chordata:Aves	Birds	231	87	0	231
Chordata:Mammalia	Mammals	37	6	1	38
Chordata:Reptilia	Reptiles	10	0	0	10
Fungi	Fungus, Lichens	191	84	60	251
Mollusca	Snails, Clams	0	18	18	18
Plantae	Plants, Mosses, Liverworts	901	103	20	921
Protozoa	Protozoans	3	3	0	3
	<b>Total Species</b>	2,246	1,433	1,102	3,348

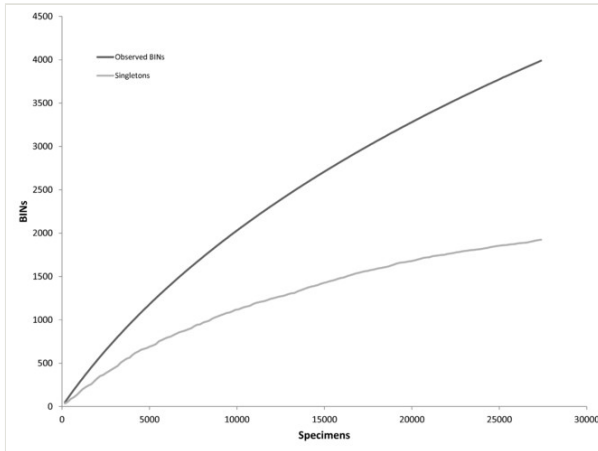


Figure 2.

Accumulation curves for singleton and total observed BINs for the 2015 survey of **rare Charitable Research Reserve**.

## Resource Highlights

The biotic inventory of **rare Charitable Research Reserve** performed between May and August 2015 was noteworthy for a number of reasons. The taxonomic scope of the surveys, which covered fourteen phyla over several kingdoms, was only made possible by the integration of DNA barcoding and by assembling a diverse group of experts. Taxa that appeared under-represented on the prior species inventory were targeted where possible, and in many cases, increased significantly. Spiders (Araneae) for instance were completely absent from the prior inventory. Using the expertise of single specialist, focused collecting efforts, and a comprehensive barcode reference library for Canadian spiders (Blagoev et al. 2015) our survey resulted in the addition of 181 species (12.3% of Canadian fauna), two of which were newly recorded for BOLD (*Grammonota inornata*, *Philodromus praelustris*) and three representing new provincial records (*Cicurina pallida*, *Neoantistea gosiuta*, *Xysticus winnipegensis*) (Suppl. material 12). Likewise, only 21 lichen species were reported from **rare** previously, but 53 were collected in a single day at the reserve, increasing the species list to 66. Not all the significant increases were in understudied taxa however: 18 snail and slug species (Mollusca) were added, all new to the reserve; 14 species of fishes were observed, adding three to the previous list of 28; and one mammal (hoary bat, *Lasiurus cinereus*) of the six observed were added to the list for a total of 37. In terms of BINs, many under-represented taxa did not witness a dramatic increase in named species, but did see large numbers of individual (and unnamed) BINs inventoried; the mites (Acari; 268 BINs) and gall midges (Cecidomyiidae; 584 BINs) are remarkable examples.

## Rapid Creation of the Resource

The rapidness of conducting this inventory was due to the acceleration of several steps that comprise the procedure. Firstly, several types of passive traps were employed to acquire large sample sizes for minimal collector effort. For instance, malaise traps often collect 2,000 specimens in a single week with only minutes of servicing time. Secondly, as discussed above, the addition of DNA barcoding streamlines sorting of the material, dividing the specimens into distinct units, minimizing the total number of specimens that require examination. Thirdly, in addition to the initial sorting, barcoding also provides nearly instant taxonomic assignment by querying against reference libraries using BOLD; the resolution of the assignment for queried records depends on the completeness of the reference library. Fourthly, the processing of the bioblitz material and analyses of the DNA barcode data were accelerated at all possible stages to test how quickly a large volume of specimens could proceed through all steps. The generation of data following the bioblitz was impressive: tissue sampling and lysis within 12 hours; DNA extraction and PCR within 24 h; cycle sequencing, cleanup and sequencer loading by 48 h; edited and validated sequences on BOLD by 72 h; taxonomic assignment, data release and manuscript presubmission by 96 h; final manuscript submission to BDJ by 108 h. The laboratory steps are mostly accelerated by automation, while data sharing is greatly facilitated by data release platforms such as BOLD and the Integrated Publishing Toolkit of Canadensys (Robertson et al. 2014), and finally, the manuscript stage is sped up considerably by the online writing tools introduced by Pensoft and other publishers.

## Refinement of the Resource

Many BINs are presently identified only to family, subfamily, or at most, genus level. It's important to note that the inventoried taxa that lack species-level determination, including intractable groups such as mites and midges, will be refined over time. Not only does DNA barcoding, empowered by the BIN system, roughly sort the material to direct and minimize the efforts of taxonomic experts (deWaard et al. 2009), but it also facilitates crowd-sourcing of taxonomic refinement. For example, if two specimens are collected in unrelated projects and locations, but assigned to the same BIN, any taxonomic determination on one specimen will be applicable to the other, and the pertinent data (such as identifier and locality) is shared on the public BIN page. For the specimens of this study, their taxonomy could be honed by the efforts of completely unrelated (but now linked) projects.

In addition to this passive approach to refining the taxonomy of these specimens, we will be actively pursuing expert determinations for the unnamed BINs. For many groups, the experts among our coauthors will be able to provide species level resolution in a short period of time (e.g., J.F.-T. specializes in Braconidae, particularly the subfamily Microgasterinae). For other BINs, and over a longer period of time, it will be necessary to solicit determinations from our network of collaborators that specialize on Nearctic taxa. The public release of these data to multiple data repositories should also aid in recruiting active specialists presently outside our network. The vouchered material, all deposited in a single repository ([BIOUG](#)), can be quickly assembled and loaned out, along with the



associated data and files that may assist in determinations (e.g., tree files and image libraries: Suppl. materials 8, 9). There will however be taxa for which species names will be problematic, due to a lack of active specialists, keys, and/or revisionary work, and where a large proportion of that taxon awaits description. For example, the number of gall midges (Diptera: Cecidomyiidae) inventoried for rare (584) is nearly six times the number of Canadian species described to date (ca. 100, following Gagne and Jaschhof 2014).

When a significant number of species and other taxon categories become available, the refined dataset can be updated in the various data repositories and potentially in a second, updated version of the paper in BDJ. Any subsequent versions – each with a separate Digital Object Identifier (DOI) – would be linked to the original paper, allowing for continuing improvement and additions to the species list for the reserve. It is important to emphasize that the taxa awaiting species-level determination still have persistent identifiers as part of the BIN system; each BIN is assigned a BOLD-generated uniform resource identifier (URI) upon its establishment (e.g. [BOLD:AAA0001](#)). Until the species binomial is determined or described, this URI can be used in its place. For example, this URI permits assessing and comparing local diversity (Young et al. 2012) despite uncertainty in taxonomic placement.

### Utility of the Resource

While the overarching objective of the study was to develop, assess and demonstrate a model for conducting and disseminating DNA barcode-assisted biotic surveys, a valuable resource was created in the process. The **rare Charitable Research Reserve** provides a unique urban reserve with the infrastructure necessary to conduct research in its diversity of habitats; a barcode reference library and updated species inventory can now both be added to the infrastructure shared with their researchers and educators. Ecological studies in particular, such as the ongoing prairie community field experiments (e.g., Harvey and MacDougall 2014), could benefit greatly from this resource that allows the investigation of ecological questions previously impossible to address (Joly et al. 2014, Kress et al. 2015). Moreover, these studies and others are increasingly using next generation sequencing (NGS) technologies, where validated reference libraries linked to voucher specimens are of critical importance, since this link is generally lost in NGS studies (Cristescu 2014). This reference library created can also be amalgamated with external barcode records, local inventories, and taxon-specific efforts to create regional and national libraries; this study for instance has enhanced the reference library for animals by providing 468 unique BINs to BOLD. Finally, as mentioned above, it is crucial that we begin to assess biodiversity change and disseminate these data widely -- the resource created here can form the baseline for accessible, repeated assessments, to gauge trends in an important temperate reserve.

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## Author contributions

Author contributions: P.D.N.H. and J.R.D. designed the study; J.S., C.N.S. and M.R.Y. oversaw specimen and sequence analyses; A.C.T., J.R.D. and V.L.-B. conducted the analyses. J.M. and E.S. provided specimen images. All authors discussed the results and contributed to specimen collection, identifications, and to the manuscript, which was written by J.R.D., R.D., J.F.-T.

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## Supplementary materials

### Suppl. material 1: Species inventory of rare prior to May 2015

**Authors:** Telfer et al.

**Data type:** checklist

**Brief description:** Species inventory for *rare* Charitable Research Reserve in Cambridge, Canada as of May 2015, prior to the present study.

**Filename:** Suppl materials 1 - Existing Inventory.xlsx - [Download file](#) (156.97 kb)

### Suppl. material 2: Bat protocols

**Authors:** Telfer et al.

**Data type:** protocols

**Brief description:** Protocols for the bat component of *rare* BioBlitz

**Filename:** Suppl materials 2 - Bat protocols.pdf - [Download file](#) (362.98 kb)

### Suppl. material 3: Lysis, primer and marker details

**Authors:** Telfer et al.

**Data type:** laboratory

**Brief description:** Details for laboratory work.

**Filename:** Suppl materials 3 - Lab Details.xlsx - [Download file](#) (10.47 kb)

**Suppl. material 4: Summary data for 2015 inventory**

**Authors:** Telfer et al.

**Data type:** summary

**Brief description:** Summary data for the 28,789 specimens collected for the 2015 inventory, including BIN assignments and locality

**Filename:** Suppl materials 4 - Summary Data.xlsx - [Download file](#) (2.18 MB)

**Suppl. material 5: Darwin core archive**

**Authors:** Telfer et al.

**Data type:** occurrences

**Brief description:** Darwin core archive of 2015 *rare* species inventory

**Filename:** Suppl materials 5 - Darwin Core Archive.zip - [Download file](#) (1.05 MB)

**Suppl. material 6: Contributors list**

**Authors:** Telfer et al.

**Data type:** authors

**Brief description:** A list of all contributors who took part in the collection and identification of specimens collected as part of the 2015 inventory.

**Filename:** Suppl materials 6 - Contributors.xls - [Download file](#) (43.00 kb)

**Suppl. material 7: Human observations during rare BioBlitz**

**Authors:** Telfer et al.

**Data type:** occurrences

**Brief description:** Human observations during *rare* BioBlitz, of mostly plants, birds, etc.

**Filename:** Suppl materials 7 - Species sightings.xlsx - [Download file](#) (23.87 kb)

**Suppl. material 8: BIN representative tree**

**Authors:** Telfer et al.

**Data type:** tree

**Brief description:** A neighbour-joining tree constructed from a single representative of each distinct BIN collected in *rare*, along with a single representative of clusters without BINs.

**Filename:** Suppl materials 8 - COI Tree.pdf - [Download file](#) (242.06 kb)

**Suppl. material 9: BIN image library**

**Authors:** Telfer et al.

**Data type:** images

**Brief description:** A collection of representative images of each BIN collected from the *rare* Charitable Research Reserve. BINs are listed in the same order as the tree. Specimens without BINs are not included.

**Filename:** Suppl materials 9 - Tree Images.pdf - [Download file](#) (163.93 MB)

**Suppl. material 10: Final combined inventory for rare Charitable Research Reserve**

**Authors:** Telfer et al.

**Data type:** checklist

**Brief description:** The final combined inventory for *rare* Charitable Research Reserve as of August 2015; including previous checklist and all 2015 species added.

**Filename:** Suppl materials 10 - Final Inventory.xlsx - [Download file](#) (328.53 kb)

**Suppl. material 11: Raw data for accumulation curve**

**Authors:** Telfer et al.

**Data type:** occurrences

**Brief description:** Lot and BIN data was downloaded for each specimen that received a BIN from BOLD Systems. It was formatted for input into EstimateS (Version 9.1.0) for creation of an accumulation curve.

**Filename:** Suppl materials 11 - Accumulation Curve data.xlsx - [Download file](#) (477.00 kb)

**Suppl. material 12: Sampling and new record images**

**Authors:** Telfer et al.

**Data type:** images

**Brief description:** Images of sampling sites, sampling techniques, specimen processing, and three new provincial spider records.

**Filename:** Suppl materials 12 - Sampling and Specimen Images.pdf - [Download file](#) (1.16 MB)