

# Natural Heritage Information Centre

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## News from the Coordinator

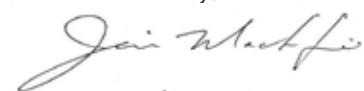
This year marks the 20th year of operations for the Ontario Natural Heritage Information Centre (NHIC). Many of you will recall our 10th anniversary in 2003 where we celebrated A Decade of Discovery. At that time, the NHIC had built upon the effort of our founding partner organizations and had amassed an impressive knowledge base from available natural history records and collections of rare species in Ontario. Today, this information continues to be collected, mined, reviewed and organized into a standard international scientific format, placed into secured Ontario government databases and made available to those who need to know about it.

Since 2003, the NHIC and its collaborators have recorded over 100 species new to Ontario. This includes over 40 species new to Canada, and even three species new to science!

These discoveries are great, but discovery is just the beginning of our journey. As Ontario's Conservation Data Centre, the NHIC is responsible for tracking location and condition information for species, plant communities and natural areas and determining conservation status. The aim of this information is to best inform conservation actions and resource and environmental legislation. Our experience is that species discoveries can have influence in many ways. They can lead to the identification of new elements of biodiversity that are truly rare and deserving of protection. Also, they can reveal new locations and populations and ecological insights for species previously thought to be vulnerable to extirpation that may, in fact, be able to thrive with a lower level of conservation intervention than originally thought. Either way, new knowledge and experience is always useful and enriching and often extremely valuable and practical.

As we continue to share our efforts, I'm positive that the next decade for all NHIC conservation partners and collaborators will be as interesting and rewarding as ever.

Yours in discovery,



NHIC coordinator



Photo: S.R. Brinker



Photo: M.J. Oldham

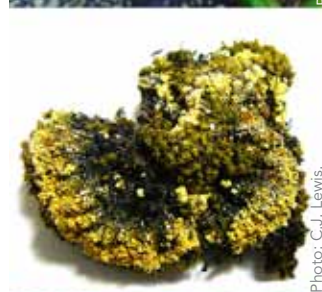


Photo: C.J. Lewis



Photo: C.D. Jones



Photo: E. Snyder



Photo: Brunke et al. 2012.

Photo: R.G. Forsyth

A selection of new species discoveries from the past decade, clockwise from top left: Alpine Azalea (*Kalmia procumbens*), Jointed Goatgrass (*Aegilops cylindrica*), Hine's Emerald (*Somatochlora hineana*), Round-mouth Vertigo (*Vertigo genesii*), A Rove Beetle (*Aleochara daviesi*), Pinkstink Dung Moss (*Splachnum sphaericum*), Tundra Sulphur Lichen (*Fulgensia bracteata* ssp. *bracteata*).

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Working with  
conservation partners

to track Ontario's biodiversity



Flooded Jellyskin (*Leptogium rivulare*) thalli (inset) and habitat, Hastings County, Ontario. Photo: S.R. Brinker.

## Improving our knowledge of lichens

Lichens are symbiotic organisms, consisting of at least two unrelated components: a fungus that provides structure (and constitutes the majority of the lichen biomass) and a photosynthetic component, either green algae or blue-green algae (cyanobacteria). While lichens are ubiquitous and are found in almost all habitats from the poles to the tropics, they are still frequently lumped with other seemingly peripheral groups such as mosses, algae, and fungi. With this stigma, perhaps it's no surprise lichens have not been mainstream conservation targets in Ontario. Nor have they traditionally garnered much attention by most Natural Heritage Programs. This is mainly due to the scarcity of distributional and abundance data, as well as lack of habitat and threat information to properly rank lichens. In addition, specialized effort is often required to identify many lichens. Despite these hurdles, there has been a growing interest in lichen ecology and conservation given their role in ecosystem functioning (e.g. soil stabilization, nitrogen fixation, food source for animals), and their usefulness as bioindicators for monitoring air quality and climate change. Furthermore, lichens can be used to assist in identifying certain conservation targets such as old growth forests. Within the past five years alone, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), the

body of experts responsible for determining which species are in danger of disappearing from Canada, has designated eight lichens as Species at Risk. One of the first lichens assessed by COSEWIC was Flooded Jellyskin (*Leptogium rivulare*) in 2004, when it was listed as Threatened in Canada.

## Flooded Jellyskin

Flooded Jellyskin is a cyanolichen; its symbiotic partner is a blue-green alga (in this case *Nostoc*). Only about 10% of lichen species worldwide are cyanolichens, and most are considered particularly sensitive to reductions in air quality and the acidifying effects of acid rain (Nash 1996). Flooded Jellyskin is also semi-aquatic, requiring periodic inundation by water. It is a small, foliose (leafy) lichen characterized by blue-gray lobes (or thalli) with a smooth surface and abundant small brown fruiting bodies (called apothecia) where the spores are produced by the fungal component. When wet, the lobes swell and become jelly-like, hence the name “jellyskin.” At the landscape scale, Flooded Jellyskin appears restricted to areas of calcareous influence with high calcium carbonate concentrations. These areas tend to be base rich either due to the underlying bedrock (e.g. dolomite, marble, or limestone), the parent material (e.g. glacial tills with high limestone fragment content, or glaciolacustrine sediments laid down in large pro-glacial lakes), or the water source. Flooded Jellyskin typically grows on the bark of trees, namely ash (*Fraxinus*), maple (*Acer*), and elm (*Ulmus*), or shrubs such as Buttonbush (*Cephalanthus occidentalis*), Red-osier Dogwood (*Cornus sericea*), or willows (*Salix*), as well as on rock. Being semi-aquatic, it is particularly susceptible to changes in water clarity and chemistry, as well as alterations to flood regimes.

## Status re-assessment

After 10 years following the first assessment, Flooded Jellyskin is due for its first COSEWIC status re-assessment. The following paragraphs highlight the efforts undertaken to improve our understanding of this lichen and the work by several Ontario Ministry of Natural Resources (OMNR) staff to help re-evaluate its status.

There were few recent observations of Flooded Jellyskin prior to its 2004 assessment, and two of the three documented Canadian

## Improving our knowledge of lichens

Chris Lewis searching for Flooded Jellyskin (*Leptogium rivulare*) along the Moira River.  
Photo: S.R. Brinker.



## Improving our knowledge of lichens

collections were vague and more than 50 years old. In fact, Wong and Brodo (1990) were likely the first to formally report Flooded Jellyskin from Ontario. The preliminary list of rare candidate macrolichens of Canada by Goward et al. (1998) gave Flooded Jellyskin a provisional listing of “Possibly Extirpated,” with no sightings since 1971 (based on a collection made by Dr. Irwin Brodo from the Ottawa region). It also had a subnational rank (S-rank) of “Historical” (SH) in Ontario, with no observations in 20 years. The 2004 COSEWIC status report completed by Robert E. Lee shed significant light on its ecology, status and distribution. Lee reported it from four extant Canadian locations including one from Manitoba, and three from Ontario (despite searching more than 60 sites in the vicinity of Ottawa); two historical sites, one from Temagami and one from Wawa, weren’t re-visited (COSEWIC 2004). After this status report was produced, Flooded Jellyskin was re-ranked by the NHIC to “Critically Imperiled” (S1).

### A new interest

Once it appeared on both Schedule 1 of the federal Species at Risk Act (SARA 2012) and Ontario’s Endangered Species Act (ESA 2007) as a Threatened species, a new-found interest in Flooded Jellyskin was stimulated along with a legislated requirement to have regard for the species and its habitat. A recovery team consisting of both federal [Canadian Wildlife Service (CWS)] and provincial (OMNR) representatives, as well as two expert consultants was formed. A major action item identified by the Recovery Team was the need for increased search effort. Between 2005 and 2009, casual searches in Ontario by several recovery team members including then consulting ecologist Chris Lewis (now Species at Risk Branch with the OMNR), OMNR Bancroft District Species at Risk Biologist Graham Cameron, and Kemptville District Ecologist Shaun Thompson resulted in the discovery of several previously undocumented eastern Ontario populations. As well, delineation of critical habitat was completed at Stoney Swamp on federally owned and managed National Capital Commission (NCC) lands. Meanwhile in Manitoba, CWS personnel visited the only known site in Manitoba and expanded the search area to nearby lakes; however, no new

sites were found, possibly due in part to the unexpectedly high water levels in 2006.

Gradually, more success came with a better understanding of Flooded Jellyskin habitat requirements and more focused searches. The first major break-out year occurred

Flooded Jellyskin (*Leptogium rivulare*) on Green Ash (*Fraxinus pennsylvanica*) in seasonally flooded habitat in April (left), and the same habitat in October.  
Photo: C.J. Lewis.



## Improving our knowledge of lichens

in 2010, when surveys undertaken by Shaun Thompson and members of CWS documented over 16 new populations in eastern Ontario forested vernal pool habitat. A resurvey of several lakes in Manitoba by CWS was also completed resulting in the discovery of seven new populations, all from rocky, seasonally flooded lakeshores (Environment Canada 2012). Success continued in 2011 with approximately 16 additional populations documented in Ontario, including two from remote locations in northwestern Ontario by NHIC Project Botanist Sam Brinker along the Severn River and the Stout Lake - Crooked Mouth River system during a Far North Natural Heritage trip (Oldham and Brinker 2012). Also of note was the rediscovery of the Lake Temagami site by Shaun Thompson, Brian Naylor, and Fred Pinto, previously known only by a 1946 collection by Roy F. Cain.

### Status update

In 2012, a project was initiated between the NHIC and COSEWIC to complete an update status report involving a team of experts consisting of Shaun Thompson, Chris Lewis, Sam Brinker and Graham Cameron. With a refined on-the-ground search image and detailed desktop screening of habitat involving examination of bedrock / surficial geology mapping, forest resource inventory (FRI) mapping and high-resolution spring and summer ortho-imagery, search success rates in habitat deemed suitable were as high as 50%. 2012 was a banner year, with over 30 previously unreported populations documented including the first record for Québec. Between the team members, well over 300 person hours were spent searching for Flooded Jellyskin between the years 2010-2012, at roughly 140 sites.

After three years of searches, approximately 165 Flooded Jellyskin observations were made from 11 different counties in Ontario and one new province (Figure 1). Overall, Flooded Jellyskin was found to be more locally common and widespread than previously thought in southeastern Ontario. Its southern Ontario range was expanded west over 400 km to southern Grey and Bruce Counties, and north to Algonquin Provincial Park; new records in northwestern Ontario represented an 800 kilometre range expansion from the nearest previously

Figure 1. Locations of extant Flooded Jellyskin (*Leptogium rivulare*) populations in Canada.



## Improving our knowledge of lichens

known historic site in Ontario at Wawa. In addition, Flooded Jellyskin was found to be less restricted in its habitat requirements than previously reported. Whereas historic previous records came mainly from the bases of periodically flooded trees in isolated vernal pools, the current study found that it also inhabits forested riverine floodplains, palustrine deciduous swamps and shoreline thicket swamps.

Surveys targeting Flooded Jellyskin also resulted in documenting 33 additional species of provincial conservation concern, summarized in Table 1. These included four species of reptiles, one amphibian, four vascular plants, three bryophytes, and 21 lichens.

Work conducted by the Recovery Team and the update status report team has greatly improved our understanding of Flooded Jellyskin in Ontario, Manitoba and Québec. The surveys have led to a re-ranking of its Ontario conservation status rank from S1 to S3. These surveys also highlight the importance of appropriately-weighted inventory effort for cryptic species, and the need for sufficient pre-assessment resources to avoid listing under-surveyed species. The update status report is currently in draft format and Flooded Jellyskin is scheduled for reassessment by COSEWIC in November of 2014. A Recovery Strategy has recently been published by Environment Canada (2013).

*Sam R. Brinker & Chris J. Lewis*

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Close-up image of Flooded Jellyskin (*Leptogium rivulare*) thalli and apothecia.  
Photo: S.R. Brinker.



## Improving our knowledge of lichens

Table 1. Additional species of provincial conservation concern documented during Flooded Jellyskin surveys in 2012.

| Common Name                                                                   | Scientific Name                   | COSEWIC <sup>1</sup> | COSSARO <sup>2</sup> | S-rank |
|-------------------------------------------------------------------------------|-----------------------------------|----------------------|----------------------|--------|
| <b>Reptiles</b>                                                               |                                   |                      |                      |        |
| Snapping Turtle                                                               | <i>Chelydra serpentina</i>        | SC                   | SC                   | S3     |
| Blanding's Turtle                                                             | <i>Emydoidea blandingii</i>       | THR                  | THR                  | S3     |
| Milksnake                                                                     | <i>Lampropeltis triangulum</i>    | SC                   | SC                   | S3     |
| Eastern Ribbonsnake                                                           | <i>Thamnophis sauritus</i>        | SC                   | SC                   | S3     |
| <b>Amphibians</b>                                                             |                                   |                      |                      |        |
| Western Chorus Frog (Great Lakes / St. Lawrence - Canadian Shield Population) | <i>Pseudacris triseriata</i>      | SC                   | NAR                  | S3     |
| <b>Vascular Plants</b>                                                        |                                   |                      |                      |        |
| Puttyroot                                                                     | <i>Aplectrum hyemale</i>          |                      |                      | S2     |
| Butternut                                                                     | <i>Juglans cinerea</i>            | END                  | END                  | S3?    |
| American Ginseng                                                              | <i>Panax quinquefolius</i>        | END                  | END                  | S2     |
| Braun's Holly Fern                                                            | <i>Polystichum braunii</i>        |                      |                      | S3     |
| <b>Bryophytes</b>                                                             |                                   |                      |                      |        |
| Hairlike Dichelyma Moss                                                       | <i>Dichelyma capillaceum</i>      |                      |                      | S3     |
| A Dichelyma Moss                                                              | <i>Dichelyma pallescens</i>       |                      |                      | S2     |
| A Liverwort                                                                   | <i>Porella pinnata</i>            |                      |                      | S3?    |
| <b>Lichens</b>                                                                |                                   |                      |                      |        |
| Shaggy Fringed Lichen                                                         | <i>Anaptychia palmulata</i>       |                      |                      | S3     |
| A Lichen                                                                      | <i>Arthothelium spectabile</i>    |                      |                      | S1     |
| Frosty-rimmed Dot Lichen                                                      | <i>Bacidia rubella</i>            |                      |                      | S2S3   |
| A Firedot Lichen                                                              | <i>Caloplaca chlorina</i>         |                      |                      | S1S3   |
| Brown-head Stubble Lichen                                                     | <i>Chaenotheca brunneola</i>      |                      |                      | S3     |
| A Gold Dust Lichen                                                            | <i>Chrysothrix xanthina</i>       |                      |                      | S1     |
| Cupped Fringe Lichen                                                          | <i>Heterodermia hypoleuca</i>     |                      |                      | S1     |
| Thousand-fruited Jelly Lichen                                                 | <i>Lempholemma polyanthes</i>     |                      |                      | S1S2   |
| Long-bearded Jellyskin Lichen                                                 | <i>Leptogium burnetiae</i>        |                      |                      | S1S3   |
| Brown-buttoned Jellyskin Lichen                                               | <i>Leptogium dactylinum</i>       |                      |                      | S2S3   |
| Appressed Jellyskin Lichen                                                    | <i>Leptogium subtile</i>          |                      |                      | S3?    |
| Birdnest Jellyskin Lichen                                                     | <i>Leptogium tenuissimum</i>      |                      |                      | S1S3   |
| Salted Ruffle Lichen                                                          | <i>Parmotrema crinitum</i>        |                      |                      | S2S3   |
| A Lichen                                                                      | <i>Phaeocalicium polyporaenum</i> |                      |                      | S2S3   |
| Powdery Rosette Lichen                                                        | <i>Physcia americana</i>          |                      |                      | S2S3   |
| Bottle-brush Frost Lichen                                                     | <i>Physconia leucoleiptes</i>     |                      |                      | S1S2   |
| Pale-bellied Frost Lichen                                                     | <i>Physconia subpallida</i>       | END                  | END                  | S2     |
| Sulphur Dust Lichen                                                           | <i>Psilolechia lucida</i>         |                      |                      | S2S3   |
| A Pepper-spore Lichen                                                         | <i>Rinodina pachysperma</i>       |                      |                      | S1?    |
| Can-of-worms Lichen                                                           | <i>Stictis urceolatum</i>         |                      |                      | S3     |
| A Speckled Blister Lichen                                                     | <i>Trypethelium virens</i>        |                      |                      | S2S3   |

<sup>1</sup>COSEWIC (Committee on the Status of Endangered Wildlife in Canada)

<sup>2</sup>COSSARO (Committee on the Status of Species at Risk in Ontario)

## Did you know?

There is a unique language of conservation. Elsewhere in this newsletter and in much of the conservation literature in the province you will find references to a variety of conservation status ranks and designations. The NHIC maintains a listing of all provincial status and conservation ranks for Ontario species, and is responsible for the development and maintenance of subnational ranks (S-ranks): our common currency. S-ranks are assigned to species and communities as a means of assessing their relative conservation priority and the need for inventory, protection, and management in the province. Below is a quick S-rank reference table, you can use it throughout this newsletter to de-code references to S-ranks in tables and articles.

| S-rank | Definition                                                                                                          | Tracked by NHIC |
|--------|---------------------------------------------------------------------------------------------------------------------|-----------------|
| SX     | <b>Presumed Extirpated</b><br>not located despite intensive searches                                                | Yes             |
| SH     | <b>Historical</b><br>no known extant occurrences in past 20 years                                                   | Yes             |
| S1     | <b>Critically Imperiled</b><br>typically 1 to 5 extant occurrences                                                  | Yes             |
| S2     | <b>Imperiled</b><br>typically 6 to 20 extant occurrences                                                            | Yes             |
| S3     | <b>Vulnerable</b><br>rare; typically 21 to 80 extant occurrences                                                    | Usually Yes     |
| S4     | <b>Apparently Secure</b><br>uncommon but not rare; some cause for long-term concern; usually >80 extant occurrences | Usually No      |
| S5     | <b>Secure</b><br>common; widespread and abundant; usually >> 80 extant occurrences                                  | No              |
| SNA    | <b>Status Not Applicable</b><br>not a suitable target for conservation (e.g. non-native or vagrant species)         | No              |
| SU     | <b>Unrankable</b><br>insufficient information to rank confidently                                                   | Usually No      |
| SNR    | <b>Not Ranked</b>                                                                                                   | No              |

Range ranks (e.g. S2S3) are intended to indicate uncertainty in conservation status (e.g., certainly an S2 but may be as common as S3)

Rank qualifiers (e.g. S1B,S2N) are used for some migratory or transitory species to indicate different conservation statuses at specific times of the year, such as during the breeding (B) and non-breeding (N) seasons. In some cases a "?" qualifier may be used to convey uncertainty in a numeric rank.

The NHIC, as a member of the NatureServe network, assigns conservation status ranks based on international standards and methodology. Conservation status ranks are also assigned at the global (G-rank) and national (N-rank) levels by NatureServe and NatureServe Canada following the same standards, which allow ranks to be evaluated consistently across all jurisdictions.

For more information on conservation status ranks visit:

[www.natureserve.org/explorer/ranking.htm](http://www.natureserve.org/explorer/ranking.htm).

## Ontario Butterfly Atlas Online and eButterfly launched

This past year, saw the release of two new exciting online tools related to butterflies: the Toronto Entomologists' Association (TEA) launched the Ontario Butterfly Atlas Online and eButterfly also took flight.

The Ontario Butterfly Atlas Online is an exciting new tool allowing users to generate maps for each of Ontario's 168 butterfly species; view a summary of species present in each of Ontario's 10 x 10 km squares, provincial and national parks, and counties; display all of the records in tabular format for a particular square or region; and, generate seasonal abundance charts (phenograms) for each species.

The NHIC has been a long-time partner with the TEA and has assisted in the databasing, georeferencing and development of the Ontario Butterfly Atlas. We are very happy to announce the new Ontario Butterfly Atlas Online, currently mapping nearly 200,000 records (nearly 30,000 of which were from 2012 alone!). All of the provincially tracked species data from the atlas are incorporated into the MNR's database to help inform conservation planning around the province.

eButterfly is an international, data-driven project dedicated to butterfly biodiversity, conservation and education. It allows users to enter their butterfly observations and photos from sites across Canada and the United States, prepare checklists of the butterflies they have seen, explore dynamic distribution maps and view the virtual photo library. All records contributed to eButterfly are incorporated into the Ontario Butterfly Atlas.

*Colin D. Jones*

**Check out the Ontario Butterfly Atlas Online:**

[http://www.ontarioinsects.org/atlas\\_online.htm](http://www.ontarioinsects.org/atlas_online.htm)

**and eButterfly:**

<http://www.ebutterfly.ca/>

White-M Hairstreak (*Parrhasius m-album*)  
at Point Pelee National Park on  
September 7, 2012. Photo: P. S. Burke.



## Arthropod collection and conservation

Arthropods (insects, arachnids and their relatives) represent the most diverse group of species on the face of the planet. They can be found in nearly every habitat and represent one of the best groups of organisms we have for acquiring information on biological diversity. Currently there is in excess of 20,000 known species of insects, spiders and mites in Ontario, and their ecological and economic importance should not be underestimated.

The reproductive abilities of many arthropods are extraordinary, and their populations can number in the billions. There is no comparison against vertebrates in terms of population size and diversity amongst species. Indeed, it has been estimated that there are at least 10 times as many known species of beetles in the world as all vertebrates (birds, mammals, reptiles, amphibians, and fish) combined (Pohl 2007). It is not surprising, due to the level of diversity among these often very tiny organisms, that most arthropods are poorly known. Scientists, educators and amateur enthusiasts do not yet have enough collective knowledge required to build a strong and comprehensive taxonomic base, often resulting in large scientific gaps for most arthropod groups.

These challenges often make it difficult to apply science toward arthropod conservation. However, the importance of conserving insects and their relatives is receiving an increasing amount of attention by today's resource and natural heritage managers. Their biological importance in our ecosystems is undeniable, and often, arthropod conservation receives a spotlight due to ecological associations with other sensitive vertebrates and their habitats (Pohl 2009). The more we understand these associations, the better chance we have at protecting not only specific species, but the habitat and associated ecological community as well. Of course, sensitive arthropods can only be conserved if there is sufficient taxonomic and population dynamic information available for analysis.

Garden Cross Spider (*Araneus diadematus*). Photo: R.M. Craig.



Big Poplar Sphinx Moth (*Pachysphinx modesta*). Photo: R.M. Craig.



Essentially, the only way we can reliably obtain the necessary data is through the collection, identification and cataloguing of insects and their kin. Although access to resources continues to improve, current limitations on availability (i.e., field guides, on-line keys, etc.) and lack of a strong taxonomic base, ultimately means that appropriate conservation and management planning is reliant upon the collection, and inherently, the expiring of arthropod specimens. Understandably, the notion of killing a living organism in order to conserve it may at first seem a contradictory argument; however it is important to note that if collection is conducted ethically the benefits far outweigh the negative impacts too often associated with the entomological sciences.

There are many good and reasonable claims regarding the importance of collecting arthropods. Following this article are some resources which provide information on the importance of collecting specimens and arthropod conservation in general. Hopefully this information will help instil a greater interest in our unique arthropod communities.

*Robert M. Craig*

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### Resources

Biological Survey of Canada (<http://www.biology.ualberta.ca/bsc/english/insectfauna.htm>)

Canadian Journal of Arthropod Identification  
(<http://www.biology.ualberta.ca/bsc/ejournal/ejournal.html>)

Entomological Society of Canada (<http://esc-sec.ca/>)

Entomological Society of Ontario (<http://www.entsocont.ca/index.php>)

University of Guelph Insect Collection (<http://www.uoguelph.ca/debu/>)

Smithsonian National Museum of Natural History (Dept. of Entomology)  
(<http://entomology.si.edu/>)

Get permission before you collect!

Photo: R.M. Craig.



## Arthropod collection and conservation

Education  
is the key to  
conservation

Photo: R.M. Craig.





Albany River with Tufted Vetch (*Vicia cracca*) in the foreground. Photo: S.R. Brinker.

## Far North Natural Heritage Inventories 2012

A successful collaboration between the NHIC, Far North Branch, and the Far North Biodiversity Project (Northeast Science and Information Section and Wildlife Research and Development Section) to do life science inventory work in the Far North planning area continued in 2012. This year our work built upon surveys completed in 2009 in areas within approximately 200 km of the community of Fort Albany (Figure 1). The purpose of this work was to continue to gather information on the natural heritage features of the southern James Bay region of Ontario to support community-based land use planning. A complementary component of terrestrial biodiversity monitoring was undertaken the same time, at different sites. Survey teams shared transportation and other logistics, greatly reducing costs of running the project.

The project schedule involved two phases: one from July 1-10 and the next from July 11-20. The survey team in the first phase included Alex Howard and Shannon Page of the Wildlife Research and Development Section, and Mike Oldham and Mike McMurtry of the NHIC. The phase two survey team consisted of Sam Brinker of the NHIC, Chris Lewis of the Species at Risk Branch, as well as Alex and Shannon.

Our field protocol was the same as in previous field seasons, consisting of plot-based soil and vegetation sampling, arthropod sampling (malaise traps, pit traps, sweep netting), avian point counts, and opportunistic vascular plant, lichen, bryophyte and animal surveys. Voucher specimens were collected to document rare or noteworthy species, and to confirm the identity of difficult groups. Ten study sites were visited:

- Surveys covered a broad range of habitats from coastal beach and dune systems, inland sedge marshes, mixed woodlands on former beach ridges, poor fens, ice-scoured gravel river banks and mineral bluffs, to conifer forests and karst formations along the Attawapiskat River.

## Far North Natural Heritage Inventories 2012

### What we found

Over 100 observations of 62 provincially tracked species, most of them new Element Occurrences, were documented during fieldwork (Table 1). Based on additional records gathered during recent Far North Natural Heritage project fieldwork, three vascular plants have been found to be more common and widespread than previously believed and re-ranked (to S4 or S4?) and are no longer tracked by the NHIC: Vanilla Sweetgrass (*Anthoxanthum nitens*), Mountain Firmoss (*Huperzia appressa*), and Blue-leaved Willow (*Salix myricoides*). Some of the more outstanding findings from 2012 Far North fieldwork this year include five lichen species not previously reported from Ontario, plus the possibility of additional new lichen species that are being reviewed by taxon experts. Subarctic Dock (*Rumex subarticus*), a species not observed in Ontario in more than 20 years, was found on a coastal beach ridge in the Albany River Estuary study site.

Most of our observations are now databased and will reside in the OPIAM (Ontario Parks Inventory and Monitoring) database and the NHIC Biotics database. Some vascular plant, bryophyte, lichen, and insect specimens are still being identified by experts, so there may be even more interesting or significant findings.

Table 1. New species to Ontario and species of provincial conservation concern documented during Far North 2012 fieldwork.

| Taxon     | Scientific Name                                    | Common Name             | S-rank         | Study Site                   |
|-----------|----------------------------------------------------|-------------------------|----------------|------------------------------|
| bird      | <i>Contopus cooperi</i>                            | Olive-sided Flycatcher  | S4B            | CHPO                         |
| bird      | <i>Coturnicops noveboracensis</i>                  | Yellow Rail             | S4B            | ARES                         |
| bird      | <i>Euphagus carolinus</i>                          | Rusty Blackbird         | S4B            | KILA                         |
| bird      | <i>Haliaeetus leucocephalus</i>                    | Bald Eagle              | S2N, S4B       | EAPO, FCDB, KILA             |
| butterfly | <i>Papilio machaon</i>                             | Old World Swallowtail   | S2S3           | ARES                         |
| lichen    | <i>Abrothallus parmeliarum</i>                     | A Lichen                | S1S3           | FCDB, KERF                   |
| lichen    | <i>Acrocordia cavata</i>                           | A Lichen                | S1S3           | ATKA                         |
| lichen    | <i>Arthrophaphis citrinella</i>                    | A Lichen                | new to Ontario | ESTR                         |
| lichen    | <i>Aspicilia contorta</i>                          | A Lichen                | S2S3           | ATKA                         |
| lichen    | <i>Bacidia rubella</i>                             | A Lichen                | S2S3           | ATKA                         |
| lichen    | <i>Bryoria trichodes</i> ssp. <i>trichodes</i>     | A Lichen                | S3             | ARES, ESTR, FCDB, KERF, KILA |
| lichen    | <i>Caloplaca chlorina</i>                          | A Lichen                | S1S3           | ARES                         |
| lichen    | <i>Cetraria islandica</i> ssp. <i>islandica</i>    | A Lichen                | S3             | ATKA                         |
| lichen    | <i>Chaenotheca trichialis</i>                      | A Lichen                | S3             | ATKA                         |
| lichen    | <i>Collema furfuraceum</i>                         | A Lichen                | S2S3           | ARES, ATKA, ESTR, KERF       |
| lichen    | <i>Collema occultatum</i>                          | Crusted Tarpaper Lichen | new to Ontario | KERF                         |
| lichen    | <i>Collema parvum</i>                              | A Lichen                | new to Ontario | ATKA                         |
| lichen    | <i>Collema undulatum</i> var. <i>granulosum</i>    | A Lichen                | S1             | ATKA, FCDB                   |
| lichen    | <i>Cryptothele granuliformis</i>                   | A Lichen                | S1S2           | ESTR                         |
| lichen    | <i>Diploschistes muscorum</i> ssp. <i>muscorum</i> | A Lichen                | S3             | ATKA                         |
| lichen    | <i>Hypogymnia austrodes</i>                        | Varnished Tube Lichen   | S1             | FCDB, KILA                   |
| lichen    | <i>Japewia tornøensis</i>                          | A Lichen                | S1S2           | ESTR, KILA                   |
| lichen    | <i>Lecanora appalachensis</i>                      | A Lichen                | new to Ontario | ARES                         |

## Far North Natural Heritage Inventories 2012

Table 1 continued. New species to Ontario and species of provincial conservation concern documented during Far North 2012 fieldwork.

| Taxon          | Scientific Name                                       | Common Name              | S-rank         | Study Site                 |
|----------------|-------------------------------------------------------|--------------------------|----------------|----------------------------|
| lichen         | <i>Lecanora argopholis</i>                            | A Lichen                 | S2S3           | ESTR                       |
| lichen         | <i>Lempholemma polyanthes</i>                         | A Lichen                 | S1?            | ATKA                       |
| lichen         | <i>Leptogium burnetiae</i>                            | A Lichen                 | S2S3           | ARES                       |
| lichen         | <i>Leptogium tenuissimum</i>                          | A Lichen                 | S1S3           | ARES, ATKA                 |
| lichen         | <i>Lichenodiplis rinodinicola</i>                     | A Lichenicolous fungus   | new to Ontario | KERF                       |
| lichen         | <i>Lobaria scrobiculata</i>                           | A Lichen                 | S1S2           | ARES                       |
| lichen         | <i>Melanelia panniformis</i>                          | A Lichen                 | S3             | ESTR                       |
| lichen         | <i>Micarea prasina</i>                                | A Lichen                 | S2S3           | KERF                       |
| lichen         | <i>Ochrolechia pseudopallescens</i>                   | A Lichen                 | S2             | ESTR, KERF, KILA           |
| lichen         | <i>Pannaria conoplea</i>                              | A Lichen                 | S1S2           | KILA                       |
| lichen         | <i>Parmeliella triptophylla</i>                       | A Lichen                 | S1S3           | ATKA                       |
| lichen         | <i>Phaeocalicium polyporaum</i>                       | A Lichen                 | S2S3           | KERF                       |
| lichen         | <i>Placynthium stenophyllum</i> var. <i>isidiatum</i> | Pale-bellied Ink Lichen  | new to Ontario | ATKA                       |
| lichen         | <i>Ramalina farinacea</i>                             | A Lichen                 | S1S2           | KERF, KILA                 |
| lichen         | <i>Rinodina bischoffii</i>                            | A Lichen                 | S1             | ATKA                       |
| lichen         | <i>Sarcosagium campestre</i>                          | A Lichen                 | S1S2           | ATKA                       |
| lichen         | <i>Sphinctrina anglica</i>                            | A Lichen                 | S3             | KILA                       |
| lichen         | <i>Toninia sedifolia</i>                              | A Lichen                 | S2S3           | ATKA                       |
| lichen         | <i>Xanthoria soorediata</i>                           | A Lichen                 | S2S3           | ATKA                       |
| lichen         | <i>Xylopezia inclusa</i>                              | A Lichenicolous fungus   | new to Ontario | FCDB                       |
| lichen         | <i>Zwackhiomyces coepulonius</i>                      | A Lichenicolous fungus   | new to Ontario | EAP0                       |
| liverwort      | <i>Lophozia badensis</i>                              | A Liverwort              | S3?            | ATKA                       |
| liverwort      | <i>Pellia neesiana</i>                                | A Liverwort              | S3?            | FCDB                       |
| mammal         | <i>Delphinapterus leucas</i>                          | Beluga                   | S2             | south of Cockispenny Point |
| mollusc        | <i>Stagnicola arctica</i>                             | Arctic Pondsnaail        | S3             | ARES                       |
| moss           | <i>Hennediella heimii</i> var. <i>arctica</i>         | A Moss                   | S1             | ARES                       |
| moss           | <i>Mnium thomsonii</i>                                | Thomson's Leafy Moss     | S3             | KILA                       |
| vascular plant | <i>Artemisia tilesii</i>                              | Tilesius Wormwood        | S3             | ARES, NEPO                 |
| vascular plant | <i>Atriplex dioica</i>                                | Thick-leaved Orache      | S2S3           | ARES                       |
| vascular plant | <i>Blysmopsis rufa</i>                                | Red Bulrush              | S3             | ARES, EAP0                 |
| vascular plant | <i>Bolboschoenus maritimus</i>                        | Saltmarsh Bulrush        | S3             | ARES, EAP0, NEPO           |
| vascular plant | <i>Botrychium spathulatum</i>                         | Spatulate Moonwort       | S2             | ARES                       |
| vascular plant | <i>Eleocharis macrostachya</i>                        | Long-headed Spike-rush   | S2S3           | ARES                       |
| vascular plant | <i>Eleocharis uniglumis</i>                           | Single-glumed Spike-rush | S3?            | ARES                       |
| vascular plant | <i>Juncus longistylis</i>                             | Long-styled Rush         | S3             | FCDB, STRI                 |
| vascular plant | <i>Juncus subtilis</i>                                | Creeping Rush            | S3             | KILA                       |
| vascular plant | <i>Ligusticum scoticum</i>                            | Scotch Lovage            | S3             | ARES, EAP0, NEPO           |
| vascular plant | <i>Lysimachia maritima</i>                            | Sea Milkwort             | S3             | EAP0, NEPO                 |
| vascular plant | <i>Muhlenbergia richardsonis</i>                      | Mat Muhly                | S3             | FCDB, STRI                 |
| vascular plant | <i>Polygonum hudsonianum</i>                          | Hudsonian Knotweed       | S2?            | ARES, EAP0, NEPO           |
| vascular plant | <i>Rumex subarcticus</i>                              | Subarctic Dock           | S1             | ARES                       |
| vascular plant | <i>Salix maccalliana</i>                              | Mccalla's Willow         | S3             | CHPO                       |

## Far North Natural Heritage Inventories 2012

The lichen, *Cryptothele granuliformis*, a rare lichen in Ontario, was observed at the Escarpment Transition site south of Moosonee. Photo: C.J. Lewis.



Shannon Page and Alex Howard on the shore of Kinoje Lake. Photo: M.J. McMurtry.



## Note of thanks

Funding to support this work came from Far North Branch. We would like to thank Ken Abraham, Rod Brook and Sarah Hagey of the Wildlife Research and Development Section for providing accommodations at the Waterfowl Research Station in Moosonee and for assisting with flight planning and other logistics. Dean Phoenix, of the Wildlife Assessment Program, served as our primary contact in case of emergency, arranged flights and supported the project in many other ways. We were pleased to have Alex Stevens, a member of the Fort Albany First Nations community, accompany the crew for a day of fieldwork. We also thank our helicopter pilots, Jeff Manger and Dan Ireland, who transported us safely from site to site. James Lendemer and John Sheard identified some of our lichen collections, Linda Ley identified bryophyte collections, and Robert Forsyth identified mollusc specimens. Dean Phoenix and Shannon Page reviewed a draft of our article.

The ongoing collaboration on northern studies is a stimulating, productive and logistically efficient partnership between the various groups with an interest and expertise in the natural heritage of the Far North in Ontario. There is still a need for further studies on the biodiversity of the Far North in Ontario to support planning, protect the biodiversity of Ontario and minimize the impacts of resource-based development in the north.

*Michael J. Oldham, Michael J. McMurtry, Sam R. Brinker, and Chris J. Lewis*

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Subarctic Dock (*Rumex subarcticus*), a species that had not been seen in Ontario for more than 20 years, was observed at the Albany River Estuary Important Bird Area. Photo: M.J. Oldham.

## Did you know?

84% of all provincially tracked species observations are accurate to 1km or better.

As a Conservation Data Centre, the NHIC captures and manages provincially tracked observation data. This information dates back to as early as 1812, and offers invaluable clues to changes in the status and distribution of species over time. An artefact of maintaining older records is that many predate modern methods of location capture and vague location details are commonplace. As a result, many of these records are represented by large areas. These areas reflect the best available spatial information and incorporate any known uncertainty in the actual location of the observation.

Today, due to increases in observation submissions with more precise locations and efforts to refine existing observations, the large majority of observations (84 per cent) are accurate to within 1km. This is an encouraging number, but the work doesn't stop here. While older, lower accuracy data add an important historical perspective to conservation planning, our goal is for all new incoming observations to be as precise as possible.

### You can help

- In order to help maximize the accuracy and utility of your contribution, observers are encouraged to include where possible:
  - coordinates (the Zone/Easting/Northing/Datum or Latitude/Longitude) for the location where the species was observed
  - a description of how these coordinates were derived (e.g., from a paper or digital map or directly from a GPS unit)
  - directions to the location where the observation was made, as well as any uncertainty in the provided location. For example: "GPS coordinates accurate to 7 metres", "Species seen 250 metres north of provided coordinates", "Point estimated, within 100 metres of the recorded coordinates".



Fiery Skipper (*Hylephila phyleus*) at Point Pelee National Park on September 7, 2012. Photo: R.M. Craig.

## Epic butterfly migration of 2012

2012 may go down as the biggest butterfly migration in Ontario records or could be just a glimpse of things to come. Regardless, everyone can agree that the butterfly migration documented during 2012 was very impressive.

With the unprecedented heat wave in mid-March bringing 10 straight days of 20° C temperatures to some parts of Ontario and breaking almost 250 temperature records around the province (Environment Canada 2012) the 2012 butterfly season got off to an early start. By the end of March three migrant species (Question Mark (*Polygonia interrogationis*; S5), American Lady (*Vanessa virginiensis*; S5) and Red Admiral (*Vanessa atalanta*; S5)) had arrived in southern Ontario earlier than normal. The first couple weeks of April cooled down but continued to see those three species moving into the province in good numbers. The flood gates really opened on April 15 when the extreme southwestern part of Ontario saw massive numbers of mainly Red Admirals arrive. By the next day people everywhere from North Bay to Cornwall to Windsor couldn't help but notice the thousands of Red Admirals virtually everywhere; some NHIC staff counted 40 Red Admirals passing overhead in just 5 minutes of counting in a suburban backyard during their lunch break in Peterborough. The butterflies were so ubiquitous that they made the news in many popular outlets across the province.

## Epic butterfly migration of 2012

### An impressive show in April...

After the huge push in mid-April things quieted down for a time but by the beginning of May another wave had hit Ontario. This time not only were impressive numbers of Red Admirals involved but many other species appeared in good numbers as well, such as:

- Common Checkered Skipper (*Pyrgus communis*; SNA)
- Fiery Skipper (*Hylephila phyleus*; SNA)
- Little Yellow (*Pyrisitia lisa*; SNA)
- Sleepy Orange (*Abaeis nicippe*; SNA)
- Dainty Sulphur (*Nathalis iole*; SNA)
- Gray Hairstreak (*Strymon melinus*; S4)
- American Snout (*Libytheana carinenta*; SNA)
- Variegated Fritillary (*Euptoieta claudia*; SNA)
- Painted Lady (*Vanessa cardui*; S5)
- Common Buckeye (*Junonia coenia*; SNA)
- Monarch (*Danaus plexippus*; S2N, S4B; Special Concern)

It was full steam ahead for most of those species for the rest of the year in Ontario. Late May and early June brought another push of new species. The most impressive numbers were of Pipevine Swallowtail (*Battus philenor*; SNA) but a Zebra Swallowtail (*Eurytides marcellus*; SNA) was also found at Point Pelee and the first Cloudless Sulphurs (*Phoebis sennae*; SNA) and White-M Hairstreaks (*Parrhasius m-album*; SNA) showed up. In addition, a record early Sachem (*Atalopedes campestris*; SNA) was found in Arthur north of Guelph, well away from the normal migrant hotspots such as Point Pelee.

### ...Continued on into the summer

As the summer progressed migrant species that are normally rare even in the extreme southwestern part of the province spread throughout southern Ontario. Fiery Skippers and Common Buckeyes were common along the lower Great Lakes and made it all the way to places like Algonquin Provincial Park, Ottawa, and Parry Sound. Common Buckeyes were even seen on the shores of James Bay north of Moosonee! Variegated Fritillaries were also much more common and widespread

Common Buckeye (*Junonia coenia*) at Leamington on September 7, 2012.  
Photo: P.S. Burke.



Common Checkered Skipper (*Pyrgus communis*) at Leamington on September 17, 2011. Photo: M.V.A. Burrell.



## Epic butterfly migration of 2012

Gray Hairstreak (*Strymon melinus*) at Pelee Island on May 10, 2012.  
Photo: M.V.A. Burrell.



## Why SNA?

- The subnational (provincial) conservation status rank (S-rank) SNA is used in a variety of cases where other conservation status ranks are “not applicable” due to the species not being a suitable target for conservation.
- In the case of many migrant and vagrant species of butterflies in Ontario, SNA is the most appropriate rank because these species appear in the province only occasionally and often unpredictably and either do not establish breeding populations or these are ephemeral usually persisting no more than one or only a few breeding seasons.
- Most of these species cannot survive the winter in Ontario and their presence in the province is dependent on repeated immigration.

than usual and were recorded as far north as the Bruce Peninsula. Question Marks, both ladies and Red Admirals were all commonly encountered this year even in Ontario’s Far North.

The parade of normally exceptional species also continued with Sachem being found throughout southern Ontario, as far north and east as the Kingston area, and White-M Hairstreak being found at several sites along both Lake Erie and Lake Ontario.

Stand-out rarities included:

- Long-tailed Skipper (*Urbanus proteus*; SNA) (in Hamilton and Toronto)
- Horace’s Duskywing (*Erynnis horatius*; SNA) (Point Pelee and Port Burwell)
- Funereal Duskywing (*Erynnis funeralis*; SNA) (Point Pelee and Burlington)
- Ocola Skipper (*Panoquina ocola*; SNA) (Toronto)

## The benefit of partnerships

Needless to say it was a summer to remember for Ontario’s butterfly watchers. What’s even more exciting is that there are tools in place now that can monitor these huge events like never before. Traditionally we relied on surveys like butterfly counts as a good way to get a snap-shot of what is happening with a group of animals. But more and more organizations are relying on large-scale, ongoing surveys like the Toronto Entomologists’ Association’s Ontario Butterfly Atlas and eButterfly which allow us to gather immense amounts of data on the distribution and abundance patterns through the course of a season or year (see announcement on page 9).

Mike V. A. Burrell

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Question Mark (*Polygonia interrogationis*) at Pelee Island on April 29, 2012. Photo: M.V.A. Burrell.



## Summer Experience Program 2012



**Jonathan Blanchard** used his ArcGIS, programming and database skills to develop solutions to automate some NHIC tasks, including bulk imports of natural areas and observations. These efforts will save NHIC staff time normally required to manually do these imports. Jonathan also accompanied NHIC staff on a couple of field trips to practice and develop his biology skills. Jonathan showed strong initiative throughout the summer and independently raised several technical solutions to increase efficiency of NHIC data management processes. Jonathan worked very well with NHIC staff, and was a valuable member of the team; we wish him the best in the future.

*Peter J. Sorrill,  
Sandy Gemmiti*



**Meagan Robson** was involved in digitizing rare vegetation types using ArcMap and digital orthophotos. Her digitizing focussed on dunes and beaches along the lower Great Lakes, as well as some prairie sites on Rainy Lake. She also spent a portion of her time working in the NHIC herbarium. This involved mounting, labelling, accessioning, and filing plant specimens into herbarium cabinets. Meagan also worked on the NHIC Digital Documents Archive (DDA) scanning, organizing and renaming various digital documents. In addition she accompanied NHIC staff on several fieldtrips to sites with alvar vegetation, including properties owned by the Nature Conservancy of Canada, where data was gathered on plant and animal species, as well as plant communities. Meagan worked with cheerful efficiency and we wish her the best in her future endeavours.

*Michael J. Oldham,  
Wasyl D. Bakowsky*



## Hastings flora initiated

Regional compilations of vascular plant observations make an important contribution to our understanding of the distribution and abundance of plants in Ontario. They shed light on the characteristic plants and environments of particular regions and on the factors that influence the distribution and composition of plants. Regional floras can be helpful in assessing the rarity of species at provincial as well as regional scales, especially when the number of occurrences at various sites or townships is documented. They also provide an incentive for botanists to contribute their observations towards a worthwhile product. Floras are completed or in progress for several south-central Ontario counties/municipalities such as Ottawa, the City of Kawartha Lakes, Renfrew and Lanark, and there is a recent compilation for Peterborough County, but there has never been a thorough inventory and accounting of the flora of Hastings County. The NHIC is participating in a recently initiated flora of Hastings County and encouraging other botanists to submit their observations for the project.

## A broad range of habitats

Hastings County extends right from the Bay of Quinte on Lake Ontario to the southern tip of Algonquin Provincial Park. It encompasses a broad range of habitats, from lakes and rivers, to alvars, riparian prairies and rock barrens, to forests and wetlands. It includes some of the largest road-free areas in southern Ontario. There are excellent inventory data for some sites in the county, for example Egan Chutes Provincial Nature Reserve (White 2002), Lake St. Peter Provincial Park (White 2004), Salmon River Alvar (Norris 1994) and Stoco Fen Provincial Nature Reserve (The Landplan Collaborative 1986), but other parts of the county are as yet poorly known. There is an interesting historical aspect to this project, as one of Canada's best known field botanists, John Macoun, lived in Belleville and taught at Albert College (Macoun 1979). Macoun was appointed as botanist to the Geological Survey of Canada and completed botanical surveys across Canada. He did some collecting in Hastings County and his records will be included in the flora.

## You can help

We're hoping that this project will be a collaborative effort and we encourage you to contact the project lead, Mike McMurtry, if you have Hastings County plant records, if you know of other relevant reports or if you wish to take an active role in inventory work. Public lands are few in the county so if any readers can assist with access to private properties,

Bayonet Rush (*Juncus militaris*), Tangamong Lake. Photo: M.J. McMurtry.

## Hastings flora initiated

please let us know. We can provide a spreadsheet formatted to indicate the information we are seeking and to facilitate data entry. The minimum information required is scientific name, observer, contact information for the observer, date and coordinates of the site (lat/long in decimal degrees or UTM acceptable). The accuracy of the coordinates, a description of the location, habitat, local abundance and township would also be much appreciated. We will be collecting voucher specimens for less common and hard-to-identify species where permission has been granted and where it poses no threat to the local population. Collections will be transferred to a recognized herbarium. The final products of the flora will include an electronic compilation and written report; there may or may not be a hardcopy version, since any flora is a work in progress and can be added to periodically.

Michael J. McMurtry

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Below: Crowe River, Hasting's County.  
Photo: M.J. McMurtry.



Right: Gray Dogwood (*Cornus foemina*),  
Hasting's County. Photo: M.J. McMurtry.





## Old growth hardwood tree study

A recent publication (Pedersen 2010) listed a number of external characteristics exhibited by hardwood trees that indicated they were old (over 250 years). Typical characteristics include:

- Smooth or balding bark, where the typical bark patterning along the lowest section of the trunk has sloughed off, due to the extreme age of the tree.
- Low stem taper. Over long periods of time, the upper portion of the trunk grows radially such that it is almost the same diameter as the base of the trunk.
- High stem sinuosity. Sinuosity refers to bending in a tree trunk, which is a result of a tree growing towards light in a partly shaded environment (phototropism). The tree will have grown toward more than one light source due to changes in canopy gaps over centuries of growth, creating a crooked stem.
- Large, thick and gnarled branches. Such branches indicate that the tree has experienced numerous disturbance events over its long life, and numerous adjacent canopy gaps which have led to the large size of the branches.
- Broken tree crowns. Damaged tree crowns, with a 'celery' top appearance (a stout stem with few leaves), result in a canopy with few branches and consequently small crown volume, leading to slow growth over time. They are damaged by lightning, treefall or other disturbance events which have occurred over a long period of time.

While any single character does not necessarily indicate that a tree is old, a combination of the above indicators provides strong evidence.

Note that very large trunk diameter is not included as a characteristic of old trees. Old trees typically have diameters that are near the average of trees at a site. Larger diameter trees often have larger crowns, and likely larger root systems, which gives them a competitive advantage and leads to faster growth rates (Pederson 2010).

Mark S. Burnham Provincial Park, located on the southeastern outskirts of the City of Peterborough, has often been cited as an example of "old growth forest" (Henry and Quinby 2010). Numerous trees in the park have many of the external features described above, including balding bark, low stem taper, and broken crowns.

Sugar Maple exhibiting old growth features, including balding lower trunk, low trunk taper and broken crown, Mark S. Burnham Provincial Park. Photo: W.D. Bakowsky.

## Old growth hardwood tree study

In 2012, eleven trees exhibiting all three of these characters were cored by NHIC staff members using an increment borer. An 18" long borer was used to ensure it could reach the centre of the trunk. Once extracted, cores were inserted into labelled large diameter straws to prevent breakage.

Tree cores were glued to pieces of wood, then sanded prior to counting the annual growth rings using a stereoscopic microscope. Note that all determined tree ages were underestimates, as they were taken at breast height (162 cm/5 feet 4 inches), and the trees had already been growing for a number of years before they reached that height. All cores were incomplete, since the cores did not reach the exact center. Also, in some cases the whole core was not successfully extracted, with some of the older centre portions crumbling and falling out of the extraction tube in the process of being retrieved.

Additional information collected included the tree species, tree height, GPS co-ordinates, and diameter at breast height using a diameter tape. A sequence of photos covering the whole tree was also taken, and these were photo-stitched to create an image of the entire tree.

The oldest tree recorded was a Sugar Maple (*Acer saccharum*), aged at 330 years. This would mean it began growing sometime before 1682! This compares well with the Merlau Maple from the Kitchener area, which died in 1990. A ring count of this tree revealed it to be 380 years old, the oldest documented age ever recorded for Sugar Maple (<http://whaton.uwaterloo.ca/waton/climate.html>). So it appears that the Burnham tree is the oldest known living Sugar Maple.

Additionally, a number of Sugar Maples from Burnham were determined to be over 2 centuries old (235, 218, 211 and 208 years of age).

In all cases where trees were very old, portions of the cores exhibited extremely tight growth rings; in some cases 5mm of core represented 10 years of growth.

Meagan Robson and Sam Brinker assisted with the fieldwork.

Wasył D. Bakowsky

### References

- Henry, M. and P. Quinby. 2010. Ontario's Old-Growth Forests: A Guidebook Complete with History, Ecology and Maps. Fitzhenry and Whiteside Ltd., Markham, Ontario. 224 pp.
- Pedersen, N. 2010. External Characteristics of Old Trees in the Eastern Deciduous Forest. *Natural Areas Journal* 30: 396-407.

## Did you know?

A toppled Eastern Hemlock in Burnham Woods had a section removed, because it blocked the main trail. A ring count of the cut trunk revealed it to be 439 years old, making it the oldest Eastern Hemlock known from Ontario!

## Lake Erie Biodiversity Conservation Strategy

A biodiversity conservation strategy (Pearsall et al. 2012) has recently been completed for Lake Erie, adding to those for lakes Ontario, Michigan and Huron. An initiative to develop a similar strategy for Lake Superior is also underway. This is a significant accomplishment as the completion of biodiversity conservation strategies for each of the Great Lakes is a key commitment in the recently signed Great Lakes Water Quality Agreement.

The Lake Erie strategy project was jointly led by The Nature Conservancy (US), the Michigan Natural Features Inventory and the Nature Conservancy of Canada, with the majority of funding provided through the United States Environmental Protection Agency Great Lakes Restoration Initiative. Environment Canada provided additional financial support and MNR's COA (Canada-Ontario Agreement Respecting the Great Lakes Basin Ecosystem) program provided funding for travel for MNR participants.

Many agencies and stakeholders in both Canada and the United States contributed to developing the strategy in a process strongly supported by the Lake Erie Management Committee. A number of MNR representatives participated in the steering committee for the project: Bruce Hawkins, Khahy Ho, Brian Locke, Mike McMurtry, Kurt Oldenburg and Jenn Richards.

Common Hoptree, (*Ptelea trifoliata*; S3)  
a threatened species in Ontario, on the  
shore of Lake Erie. Photo: M.J. McMurtry.



We are currently seeking a suitable internet host for the digital version of the strategy. In the mean-time, if you are interested in obtaining a copy, please send an email request to [nhicrequests@ontario.ca](mailto:nhicrequests@ontario.ca). We anticipate that this strategy will help inform future actions to conserve the biodiversity of Lake Erie.

*Michael J. McMurtry*

### Reference

Pearsall, D., P. Carton de Grammont, C. Cavalieri, C. Chu, P. Doran, L. Elbing, D. Ewert, K. Hall, M. Herbert, M. Khoury, D. Kraus, S. Mysorekar, J. Paskus and A. Sasson. 2012. Returning to a Healthy Lake: Lake Erie Biodiversity Conservation Strategy. Technical Report. A joint publication of The Nature Conservancy, Nature Conservancy of Canada, and Michigan Natural Features Inventory. 340 pp. with Appendices



Wetland community dominated by European Common Reed (*Phragmites australis* ssp. *australis*), an invasive plant threatening biodiversity in the Lake Erie watershed. Photo: M.J. McMurtry.

## First annual Ontario herp workshop

In May 2012 NHIC assisted with a two-day training workshop on "Inventory and Identification Methods for Ontario's Reptiles and Amphibians" hosted by the Nature Conservancy of Canada (NCC). The workshop was held at the Elbow Lake NCC Reserve, an outdoor education facility used by Queen's University and located north of Kingston.

Workshop participants were exposed to both classroom lectures and local field trips which covered topics including reptile and amphibian biology, behaviour, habitats and conservation, how to identify species by sight and sound, and survey techniques for snakes, skinks, turtles, frogs and salamanders. Instructors for the workshop included biologists from Queen's University (Steve Loughheed), University of Ottawa (Gabriel Blouin-Demers), Seburn Ecological Services (David Seburn), Ministry of Natural Resources (Shaun Thompson and Joe Crowley), Eastern Ontario Biodiversity Museum (Fred Schueler and Aleta Karstad), Natural Heritage Information Centre (Mike Oldham), Ontario Nature (James Paterson and John Urquhart), and the Nature Conservancy of Canada (Jennifer McCarter).

The Elbow Lake NCC Reserve contains a mosaic of diverse wetland and upland habitats and workshop participants encountered eight amphibian and ten reptile species in the field including several species at risk (Blanding's Turtle, Snapping Turtle, Eastern Ribbonsnake, Milksnake and Gray Ratsnake). The 2012 workshop was fully booked almost as soon as it was advertised and had a long waiting list. Two workshops are in the planning stage for 2013.

For further information on these workshops contact NCC's Jennifer McCarter ([Jennifer.McCarter@natureconservancy.com](mailto:Jennifer.McCarter@natureconservancy.com)).

Michael J. Oldham

American Toad (*Anaxyrus americanus*) is a widespread amphibian in Ontario. This male is giving his breeding call from a shallow wetland to attract a mate.

Photo: M.J. Oldham.



Eastern Ribbonsnake (*Thamnophis sauritus*), a Special Concern species in Ontario, was encountered during the workshop. Photo: M.J. Oldham.





Parks Canada and NHIC staff on Middle Island; left to right – Mike Oldham, Tammy Dobbie, Heidi Brown, Rachel Thorndyke, Emily Gonzales, Valerie Minelga, Kelly Scott. Photo: V. Minelga.

## NHIC assists Parks Canada with botanical fieldwork in Point Pelee National Park

During 2012, the NHIC assisted Point Pelee National Park with several botanical studies in the park. NHIC Botanist, Mike Oldham, worked closely with Point Pelee National Park biologists Tammy Dobbie and Valerie Minelga on the project, with support from Parks Canada Species Conservation Specialist, Gary Allen. One component of this work involved botanical surveys and vegetation monitoring of Lake Erie Sand Spit Savannah (LESSS) habitats at Point Pelee. This rare vegetation community type is found at only a few sites in Lake Erie shoreline areas. At Point Pelee the habitat is being degraded by vegetation succession due to the absence of disturbance (e.g. fire) and invasion by invasive exotic plants. Parks Canada has begun restoring LESSS habitats to ensure they continue to support a characteristic assemblage of plants and animals. This management has included localized controlled burns, removal of exotic plant species, and the reintroduction of LESSS species. Vegetation monitoring plots have been established to document changes in the vegetation as a result of management efforts.

## Special habitat

Many of the park's most imperilled plant and animal species, including some federally and provincially listed Species At Risk, occur in LESSS habitats. Populations of these species were located to ensure that they weren't inadvertently damaged during habitat management work and to use them as seed sources for re-planting efforts. Populations of Species At Risk plants documented included:

- Dwarf Hackberry (*Celtis tenuifolia*; Threatened; S2)
- Blue Ash (*Fraxinus quadrangulata*; Special Concern; S3)
- Kentucky Coffee-tree (*Gymnocladus dioica*; Threatened; S2)
- Butternut (*Juglans cinerea*; Endangered; S3?)
- Eastern Prickly Pear Cactus (*Opuntia humifusa*; Endangered; S1)
- Common Hoptree (*Ptelea trifoliata*; Threatened; S3)

Many other rare plants tracked by NHIC were encountered during fieldwork in Point Pelee LESSS habitats including:

- Green Milkweed (*Asclepias viridiflora*; S2)
- Carolina Whitlow-grass (*Draba reptans*; S3)
- White-tinged Sedge (*Carex albicans* var. *albicans*; S3)
- Hairy Bedstraw (*Galium pilosum*; S3)
- Eastern Few-fruited Sedge (*Carex oligocarpa*; S3)
- Big-rooted Morning Glory (*Ipomoea pandurata*; S1)
- Yellow Corydalis (*Corydalis flavula*; S2)
- Golden Puccoon (*Lithospermum caroliniense*; S3)
- Hoary Tick-trefoil (*Desmodium canescens*; S2)
- Narrow-leaved Puccoon (*Lithospermum incisum*; S1)
- Six-weeks Fescue (*Vulpia octoflora*; S2)

## New finds!

Eleven plant species not previously known from Point Pelee were documented through fieldwork in 2012. Two of the additions are native species:

- Umbellate Sedge (*Carex umbellata*)
- False Pimpernell (*Lindernia dubia*)

## Field work at Point Pelee

A sandy savannah opening on the west side of Point Pelee. This is a rare and declining habitat in the park and the focus of management activities. Several species at risk (Eastern Prickly-pear Cactus, Common Hoptree) and tracked species (Golden Puccoon) are visible in the photo. Photo: M.J. Oldham.



Golden Puccoon (*Lithospermum caroliniense*) a species of provincial conservation concern (S3) found in Point Pelee savannah habitats. Photo: M.J. Oldham.



## Field work at Point Pelee

Great Blue Heron is one of several species of colonial waterbirds nesting on Middle Island. Photo: M.J. Oldham.



and the remaining nine are non-native:

- Dense Silky Bentgrass (*Apera interrupta*)
- Three-leaved Black-eyed-Susan (*Rudbeckia triloba*)
- Skeleton-weed (*Chondrilla juncea*)
- Giant Foxtail (*Setaria faberi*)
- Bermuda Grass (*Cynodon dactylon*)
- Little Hop Clover (*Trifolium dubium*)
- Sprangletop (*Leptochloa fusca*)
- Spring Speedwell (*Veronica verna*)
- Virginia Plantain (*Plantago virginica*)

## Middle Island

Another component of the Point Pelee National Park project involved fieldwork on Middle Island, Canada's most southerly land mass and now part of the national park. Middle Island and the other islands in western Lake Erie are well known for significant populations of rare flora and fauna. Many native plant species on Middle Island have declined in recent years due to dramatically increasing numbers of Double-crested Cormorants nesting on the island. Droppings from the nesting cormorants are changing the soil chemistry on Middle Island as well as directly killing plants beneath nesting trees and the nesting trees themselves. Opening of the forest canopy and changes in soil chemistry have enabled a number of large, aggressive invasive alien plants to dominate portions of the island, excluding native species.



Young Double-crested Cormorant in its nest. More than 3,500 pairs of cormorants nest on Middle Island. Photo: M.J. Oldham.

## Field work at Point Pelee

Parks Canada has been controlling nesting cormorant numbers on the island since 2008 to protect and recover the significant populations of rare native plants.

Parks Canada has established vegetation monitoring plots on Middle Island to monitor the effects of changing cormorant numbers on the island's vegetation and flora. Populations of several plant Species At Risk occur on Middle Island and during 2012 fieldwork the following were encountered:

- Wild Hyacinth (*Camassia scilloides*; Threatened; S2)
- Blue Ash
- Kentucky Coffee-tree
- Red Mulberry (*Morus rubra*; Endangered; S2)
- Common Hoptree

Other significant plant species encountered during fieldwork on Middle Island included:

- Short's Rockcress (*Boechera dentata*; S2; rediscovered on the island after not being seen for more than a decade)
- Smooth Clustered Sedge (*Carex aggregata*; S1; known in Canada only from Middle Island)
- Eastern Few-fruited Sedge (first record for Middle Island)
- Yellow Corydalis
- Appendaged Waterleaf (*Hydrophyllum appendiculatum*; S2)
- Large-seeded Forget-me-not (*Myosotis macrosperma*; S1)
- Miami-mist (*Phacelia purshii*; S1)

Point Pelee National Park biologists on the south shore of Middle Island.  
Photo: M.J. Oldham.



Eastern Prickly-pear Cactus is an endangered species in Canada and Ontario and is protected under federal and provincial species at risk legislation.  
Photo: M.J. Oldham.



## Field work at Point Pelee

A one-day workshop on plant identification, surveying and monitoring techniques was conducted for park staff as part of this project. A number of enthusiastic participants found the experience helpful in understanding the sometimes overwhelming diversity of flora in the park. At one point, a staff member, so happy upon making a successful identification, jumped up and down screaming: “GIANT YELLOW HYSSOP!” as if her team had just won the Superbowl. The project was very successful and NHIC looks forward to future collaborative work with Parks Canada.

Thanks to Tammy Dobbie, Valerie Minelga, and Mike McMurtry for helpful comments on a draft of this article and to Valerie for providing the survey group photo.

*Michael J. Oldham*

Big-rooted Morning Glory (*Ipomoea pandurata*; S1) at Point Pelee National Park. Photo: M.J. Oldham.



## Notable natural history publications of 2012

Over the past year, there have been a number of excellent publications related to the natural history of Ontario. The following list highlights these new resources of particular interest to the NHIC, the conservation community and readers like you:

| Title                                                                                                                                                                                                       | Author(s)                                                                                              | Format |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|--------|
| Peterson Field Guide to Moths of Northeastern North America                                                                                                                                                 | David Beadle, Seabrooke Leckie                                                                         | Print  |
| Hawks in Flight                                                                                                                                                                                             | Pete Dunne, David Sibley, Clay Sutton                                                                  | Print  |
| A Field Guide to the Ants of New England                                                                                                                                                                    | Aaron M. Ellison, Nicholas J. Gotelli, Elizabeth J. Farnsworth, Gary D. Alpert                         | Print  |
| North American Freshwater Mussels: Natural History, Ecology, and Conservation                                                                                                                               | Wendell R. Haag                                                                                        | Print  |
| The Eastern Alpine Guide: The Natural History and Conservation of Mountain Tundra East of the Rockies                                                                                                       | Mike T. Jones, Liz L. Willey, editors                                                                  | Print  |
| Flies: The Natural History and Diversity of Diptera                                                                                                                                                         | Stephen A. Marshall                                                                                    | Print  |
| The Natural History of Canadian Mammals                                                                                                                                                                     | Donna Naughton                                                                                         | Print  |
| Dragonflies and Damselflies of the East                                                                                                                                                                     | Dennis Paulson                                                                                         | Print  |
| The Snakes of Ontario: Natural History, Distribution, and Status                                                                                                                                            | Jeffrey C. Rowell                                                                                      | Print  |
| Field Manual of Michigan Flora                                                                                                                                                                              | Edward G. Voss, Anton A. Reznicek                                                                      | Print  |
| Owlet Caterpillars of Eastern North America                                                                                                                                                                 | David L. Wagner, Dale F. Schweitzer, J. Bolling Sullivan, Richard C. Reardon                           | Print  |
| Recent contributions to the Canadian Journal of Arthropod Identification: <a href="http://www.biology.ualberta.ca/bsc/ejournal/ejournal.html">http://www.biology.ualberta.ca/bsc/ejournal/ejournal.html</a> |                                                                                                        |        |
| Bees of the Genus <i>Dufourea</i> Lepeletier (Hymenoptera: Halictidae: Rophitinae) of Canada, CJA 20 May 11, 2012                                                                                           | Sheila Dumesh, Cory S. Sheffield                                                                       | Online |
| Cluster flies (Calliphoridae: Polleniinae: Pollenia) of North America, CJA 19 February 15, 2012                                                                                                             | Adam Jewiss-Gaines, Stephen A. Marshall, Terry L. Whitworth                                            | Online |
| Siricidae (Hymenoptera: Symphyta: Siricoidea) of the Western Hemisphere, CJA 7 July 6, 2012                                                                                                                 | Nathan M. Schiff, Henri Goulet, David R. Smith, Caroline Boudreault, A. Dan Wilson, Brian E. Scheffler | Online |

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