



# Consultation on Amending the List of Species under the *Species at Risk Act*

## Terrestrial Species

December 2013



Cat. No.: En1-36/2013E-PDF  
ISSN: 1713-0948

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**Consultation on Amending  
the List of Species under the  
*Species at Risk Act***

**Terrestrial Species**

**December 2013**

Please submit your comments by

**March 23, 2014**, for terrestrial species undergoing **normal** consultations

and by

**October 23, 2014**, for terrestrial species undergoing **extended** consultations.

For a description of the consultation paths these species will undergo, please see

**[www.registrelep-sararegistry.gc.ca/default.asp?lang=En&n=F0CDBF0B-1](http://www.registrelep-sararegistry.gc.ca/default.asp?lang=En&n=F0CDBF0B-1)**

Please email your comments to the Species at Risk Public Registry at:

**[sararegistry@ec.gc.ca](mailto:sararegistry@ec.gc.ca)**

Comments may also be mailed to:

Director General  
Canadian Wildlife Service  
Environment Canada  
Ottawa ON K1A 0H3

For more information on the *Species at Risk Act*, please visit the Species at Risk Public Registry at:

**[www.sararegistry.gc.ca](http://www.sararegistry.gc.ca)**

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## ADDITION OF SPECIES TO THE *SPECIES AT RISK ACT*

### The *Species at Risk Act* and the List of Wildlife Species at Risk

The Government of Canada is committed to preventing the disappearance of wildlife species at risk from our lands. As part of its strategy for realizing that commitment, on June 5, 2003, the Government of Canada proclaimed the *Species at Risk Act* (SARA). Attached to the Act is Schedule 1, the list of the species provided for under SARA, also called the List of Wildlife Species at Risk. Endangered or Threatened species on Schedule 1 benefit from the protection of prohibitions and recovery planning under SARA. Special Concern species benefit from its management planning. Schedule 1 has grown from the original 233 to 518 wildlife species at risk.

The complete list of species currently on Schedule 1 can be viewed at: [www.sararegistry.gc.ca/species/schedules\\_e.cfm?id=1](http://www.sararegistry.gc.ca/species/schedules_e.cfm?id=1)

Species become eligible for addition to Schedule 1 once they have been assessed as being at risk by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). The decision to add a species to Schedule 1 is made by the Governor in Council following a recommendation from the Minister of the Environment. The Governor in Council is the formal executive body that gives legal effect to decisions that are to have the force of law.

### COSEWIC and the assessment process for identifying species at risk

COSEWIC is recognized under SARA as the authority for assessing the status of wildlife species at risk. COSEWIC comprises experts on wildlife species at risk. Its members have backgrounds in the fields of biology, ecology, genetics, Aboriginal traditional knowledge and other relevant fields. They come from various communities, including academia, Aboriginal organizations, government and non-governmental organizations.

COSEWIC gives priority to those species more likely to become extinct, and then commissions a status report for the evaluation of the species' status. To be accepted, status reports must be peer-reviewed and approved by a subcommittee of species specialists. In special circumstances, assessments

can be done on an emergency basis. When the status report is complete, COSEWIC meets to examine it and discuss the species. COSEWIC then determines whether the species is at risk, and if so, then assesses the level of risk and assigns a conservation status.

### Terms used to define the degree of risk to a species

The conservation status defines the degree of risk to a species. The terms used under SARA are Extirpated, Endangered, Threatened and Special Concern. Extirpated species are wildlife species that no longer occur in the wild in Canada but still exist elsewhere. Endangered species are wildlife species that are likely to soon become extirpated or extinct. Threatened species are likely to become endangered if nothing is done to reverse the factors leading to their extirpation or extinction. The term Special Concern is used for wildlife species that may become threatened or endangered due to a combination of biological characteristics and threats. Once COSEWIC has assessed a species as Extirpated, Endangered, Threatened or Special Concern, it is eligible for inclusion on Schedule 1.

For more information on COSEWIC, visit: [www.cosewic.gc.ca](http://www.cosewic.gc.ca)

On September 24, 2013, COSEWIC sent to the Minister of the Environment its newest assessments of species at risk. Environment Canada is now consulting on changes to Schedule 1 to reflect these new designations for these terrestrial species. To see the list of the terrestrial species and their status, please refer to tables 1 and 2.

### Terrestrial and aquatic species eligible for Schedule 1 amendments

The Minister of Fisheries and Oceans conducts separate consultations for the aquatic species. For more information on the consultations for aquatic species, visit the Fisheries and Oceans Canada website at [www.dfo-mpo.gc.ca](http://www.dfo-mpo.gc.ca).

The Minister of the Environment is conducting the consultations for all other species at risk.



Approximately 48% of the recently assessed terrestrial species at risk also occur in national parks or other lands administered by Parks Canada; Parks Canada shares responsibility for these species with Environment Canada.

## Public comments solicited on the proposed amendment of Schedule 1

The conservation of wildlife is a joint legal responsibility: one that is shared among the governments of Canada. But biodiversity will not be conserved by governments that act alone. The best way to secure the survival of species at risk and their habitats is through the active participation of all those concerned. SARA recognizes this, and that all Aboriginal peoples and Canadians have a role to play in preventing the disappearance of wildlife species from our lands. The Government of Canada is inviting and encouraging you to become involved. One way that you can do so is by sharing your comments concerning the addition or reclassification of these terrestrial species.

Your comments are considered in relation to the potential consequences of whether or not a species is included on Schedule 1, and they are then used to draft the Minister's proposed listing recommendations for each of these species. To ensure that your comments are considered in time, they should be submitted before the following deadlines.

For terrestrial species undergoing normal consultations, comments should be submitted by **March 23, 2014**.

For terrestrial species undergoing extended consultations, comments should be submitted by **October 23, 2014**.

To find out which consultation paths these species will undergo (extended or normal), please see [www.registrelep-sararegistry.gc.ca/default.asp?lang=En&n=F0CDBF0B-1](http://www.registrelep-sararegistry.gc.ca/default.asp?lang=En&n=F0CDBF0B-1)

Comments received by these deadlines will be considered in the development of the listing proposal.

Please email your comments to the Species at Risk Public Registry at: [sararegistry@ec.gc.ca](mailto:sararegistry@ec.gc.ca)

By regular mail, please address your comments to:

Director General  
Canadian Wildlife Service  
Environment Canada  
Ottawa ON K1A 0H3

## THE *SPECIES AT RISK* ACT LISTING PROCESS AND CONSULTATION

The addition of a wildlife species at risk to Schedule 1 of SARA strengthens and enhances the federal government's capacity to provide for its protection and conservation. To be effective, the listing process must be transparent and open. The species listing process under SARA is summarized in Figure 1.

### The purpose of consultations on amendments to the List

When COSEWIC assesses a wildlife species, it does so solely on the basis of the best available information relevant to the biological status of the species. COSEWIC then submits the assessment to the Minister of the Environment, who considers it when making the listing recommendation to the Governor in Council. These consultations are to provide the Minister with a better understanding of the potential social and economic impacts of the proposed change to the List of Wildlife Species at Risk, and of the potential consequences of not adding a species to the List.

### Legislative context of the consultations: the Minister's recommendation to the Governor in Council

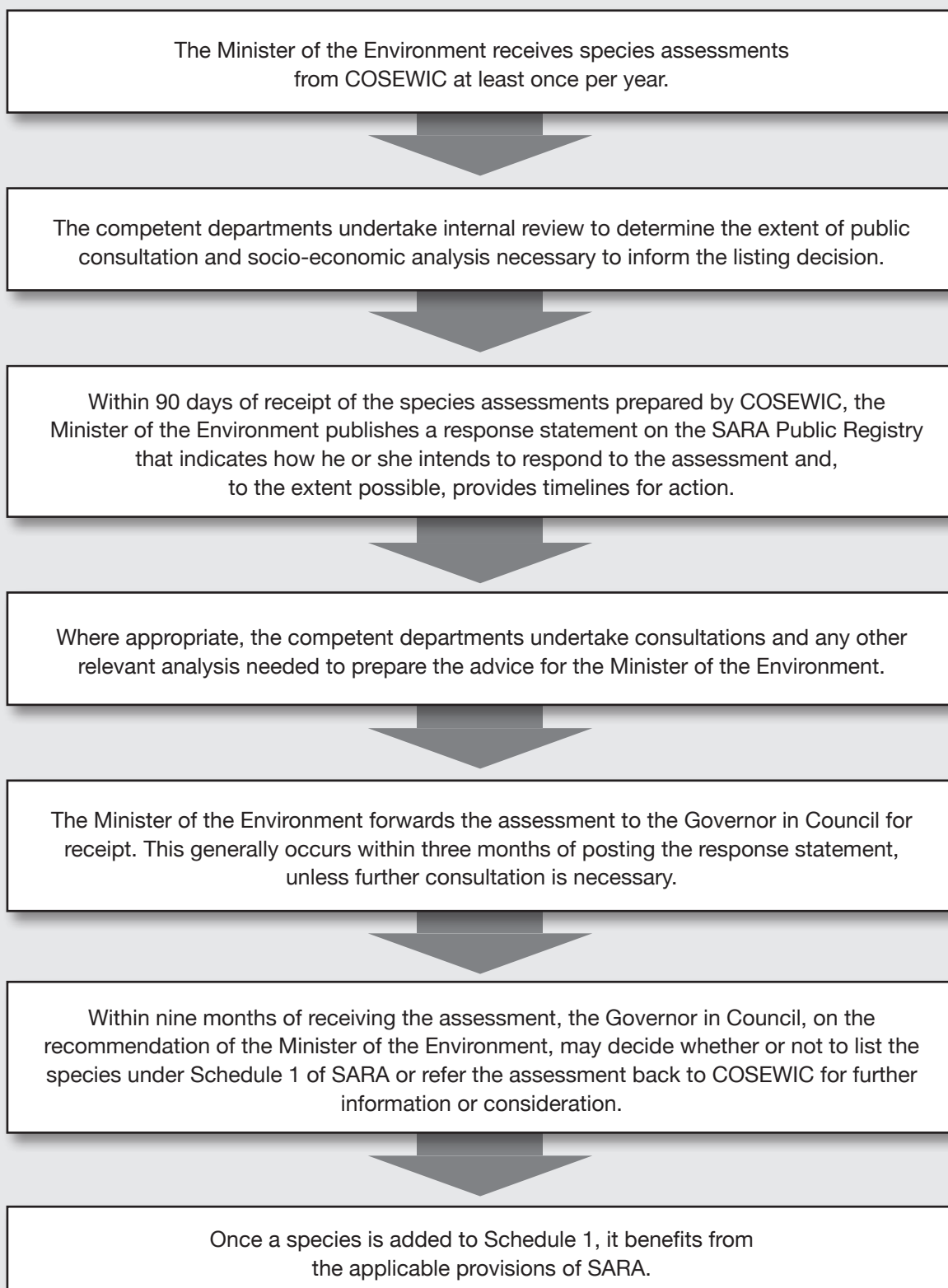
The comments collected during the consultations are used to inform the Minister's recommendations to the Governor in Council for listing species at risk. The Minister must recommend one of three courses of action. These are for the Governor in Council to accept the species assessment and modify Schedule 1 accordingly, not to add the species to Schedule 1, or to refer the species assessment back to COSEWIC for its further consideration (Figure 1).

### The Minister of the Environment's response to the COSEWIC assessment: the response statement

After COSEWIC has completed its assessment of a species, it provides it to the Minister of the Environment. The Minister of the Environment then has 90 days to post a response on the Species at Risk Public Registry, providing information on the scope of any consultations and the timelines for

**Figure 1**

**The species listing process under SARA**





action, to the extent possible. This is known as the response statement. It identifies how long the consultations will be (whether they are “normal” or “extended”) by stating when the Minister will forward the assessment to the Governor in Council. Consultations for a group of species are launched with the posting of their response statements.

## Normal and extended consultation periods

Normal consultations meet the consultation needs for the listing of most species at risk. They usually take two to three months to complete, while extended consultations take approximately one year.

The extent of consultations needs to be proportional to the expected impact of a listing decision and the time that may be required to consult appropriately. Under some circumstances, whether or not a species will be included on Schedule 1 could have significant and widespread impacts on the activities of some groups of people. It is essential that such stakeholders be informed of the pending decision and, to the extent possible, its potential consequences. They also need to have the opportunity to provide information on the potential consequences of the decision and to share ideas on how best to approach threats to the species. A longer period may also be required to consult appropriately with some groups. For example, consultations can take longer for groups that meet infrequently but that must be engaged on several occasions. For such reasons, extended consultations may be undertaken.

For both normal and extended consultations, once they are complete, the Minister of the Environment forwards the species assessments to the Governor in Council for the government’s formal receipt of the assessment. The Governor in Council then has nine months to come to a listing decision. Thus, listing decisions for species in normal consultations are usually made about one year after the publication of their response statements. Listing decisions for species in extended consultations are usually made about two years after the response statements are published.

The consultation paths (normal or extended) for the terrestrial species listed in Table 1 will be announced when the Minister publishes the response statements. These will be posted by **December 23, 2013**, on the Species at Risk Public Registry at: [www.registrelep-sararegistry.gc.ca/default.asp?lang=En&n=F0CDBF0B-1](http://www.registrelep-sararegistry.gc.ca/default.asp?lang=En&n=F0CDBF0B-1)

No consultations will be undertaken for species listed in Table 2, as no change is being proposed for these species.

## Who is consulted and how

It is most important to consult with those who would be most affected by the proposed changes. There is protection that is immediately in place when a species that is Extirpated, Endangered or Threatened is added to Schedule 1. It prohibits killing or harming the species or destroying a residence. For terrestrial species, this applies to migratory birds protected by the *Migratory Birds Convention Act, 1994* (which already provides similar protection for the migratory birds and their nests). The immediate protection also applies to other terrestrial species where they are on federal land (for more details, see below, “Protection for listed Extirpated, Endangered and Threatened species”). This immediate protection does not apply to species of Special Concern. Therefore, Environment Canada considers the type of species, its conservation status and where the species is found. Those who may be affected by the impacts of the automatic protections are contacted directly; others are encouraged to contribute through a variety of approaches.

Aboriginal peoples known to have species at risk on their lands, for which changes to Schedule 1 are being considered, will be contacted. Their engagement is of particular significance, acknowledging their role in the management of the extensive traditional territories and the reserve and settlement lands.

A Wildlife Management Board is a group that has been established under a land claims agreement and is authorized by the agreement to perform functions in respect of wildlife species. Some eligible species at risk are found on lands where existing land claims agreements apply that give specific authority to a Wildlife Management Board. In such cases, the Minister of the Environment will consult with the relevant board.

To encourage others to contribute and make the necessary information readily available, this document is distributed to known stakeholders and posted on the Species at Risk Public Registry. More extensive consultations may also be done through regional or community meetings or through a more targeted approach.

Environment Canada also sends notice of this consultation to identified concerned groups and individuals who have made their interests

known. These include, but are not limited to, industries, resource users, landowners and environmental non-governmental organizations.

In most cases, Environment Canada is not in a position to examine the potential impacts of recovery actions when species are being considered for listing. The reason is that recovery actions for terrestrial species are not usually automatic upon listing; in fact, usually these actions are not yet defined, so their impact cannot be fully understood. Once they are defined, efforts are made to minimize adverse social and economic impacts of listing and to maximize the benefits. SARA requires that recovery measures be prepared in consultation with those considered to be directly affected by them.

In addition to the public, Environment Canada consults on listing with the governments of the provinces and territories responsible for the conservation and management of these wildlife species. Environment Canada also consults with other federal departments and agencies.

### **Role and impact of public consultations in the listing process**

The results of the public consultations are of great significance to the process of listing species at risk. Environment Canada carefully reviews the comments it receives to gain a better understanding of the benefits and costs of changing the List.

The comments are then used to inform the Regulatory Impact Analysis Statement (RIAS). The RIAS is a report that summarizes the impact of a proposed regulatory change. It includes a description of the proposed change and an analysis of its expected impact, which incorporates the results from the public consultations. In developing the RIAS, the Government of Canada recognizes that Canada's natural heritage is an integral part of our national identity and history and that wildlife in all its forms has value in and of itself. The Government of Canada also recognizes that the absence of full scientific certainty is not a reason to postpone decisions to protect the environment.

A draft Order (see Glossary) is then prepared, providing notice that a decision is being taken by the Governor in Council. The draft Order proposing to list all or some of the species under consideration is then published, along with the RIAS, in the *Canada Gazette*, Part I, for a comment period of 30 days.

The Minister of the Environment will take into consideration comments and any additional information received following publication of the draft Order and the RIAS in the *Canada Gazette*, Part I. The Minister then makes a listing recommendation for each species to the Governor in Council. The Governor in Council next decides either to accept the species assessment and amend Schedule 1 accordingly; or not to add the species to Schedule 1; or to refer the species assessment back to COSEWIC for further information or consideration. The final decision is published in the *Canada Gazette*, Part II, and on the Species at Risk Public Registry. If the Governor in Council decides to list a species, it is at this point that it becomes legally included on Schedule 1.

## **SIGNIFICANCE OF THE ADDITION OF A SPECIES TO SCHEDULE 1**

The protection that comes into effect following the addition of a species to Schedule 1 depends upon a number of factors. These include the species' status under SARA, the type of species and where it occurs.

### **Protection for listed Extirpated, Endangered and Threatened species**

Responsibility for the conservation of wildlife is shared among the governments of Canada. SARA establishes legal protection of individuals and their residences as soon as a species is listed as Threatened, Endangered or Extirpated, if they are considered federal species or if they are found on federal land.

Federal species include migratory birds, as defined by the *Migratory Birds Convention Act, 1994*, and aquatic species covered by the *Fisheries Act*. Federal land means land that belongs to the federal government, and the internal waters and territorial sea of Canada. It also means land set apart for the use and benefit of a band under the *Indian Act* (such as reserves). In the territories, the protection for species at risk on federal lands applies only where they are on lands under the authority of the Minister of the Environment or the Parks Canada Agency.

Migratory birds are protected by the *Migratory Birds Regulations*, under the *Migratory Birds Convention Act, 1994*, which strictly prohibits the harming of migratory birds and the disturbance or destruction of their nests and eggs.

Protection under SARA makes it an offence to kill, harm, harass, capture or take an individual of a species listed as Extirpated, Endangered or Threatened. It is also an offence to damage or destroy the residence of one or more individuals of an Endangered or Threatened species or an Extirpated species whose reintroduction has been recommended by a recovery strategy. The Act also makes it an offence to possess, collect, buy, sell or trade an individual of a species that is Extirpated, Endangered or Threatened.

Species at risk that are neither aquatic nor protected under the *Migratory Birds Convention Act, 1994*, nor on federal lands, do not receive immediate protection upon listing under SARA. Instead, in most cases, the protection of terrestrial species on non-federal lands is the responsibility of the provinces and territories where they are found. The application of protections under SARA to a species at risk on non-federal lands requires that the Governor in Council make an order defining those lands. This can only occur when the Minister is of the opinion that the laws of the province or territory do not effectively protect the species. To put such an order in place, the Minister would then need to recommend the order be made to the Governor in Council. If the Governor in Council agreed to make the order, the prohibitions of SARA would then apply to the provincial or territorial lands specified by the order. The federal government would consult with the province or territory concerned before making such an order.

The Minister of the Environment or the Minister of Fisheries and Oceans may authorize exceptions to the prohibitions under SARA. These ministers can enter into agreements or issue permits only for one of three reasons: for research, for conservation activities or if the effects to the species are incidental to the activity. Research must relate to the conservation of a species and be conducted by qualified scientists. Conservation activities must benefit a listed species or be required to enhance its chances of survival. All activities, including those that incidentally affect a listed species, must also meet certain conditions. First, it must be established that all reasonable alternatives have been considered and the best solution has been adopted. It must also be established that all feasible measures will be taken to minimize the impact of the activity, and finally that the survival or recovery of the species will not be jeopardized. Having issued a permit or agreement, the Minister of the Environment or the Minister of Fisheries and Oceans must then include an explanation on the Species at Risk Public Registry of why the permit or agreement was issued.

## Recovery strategies and action plans for Extirpated, Endangered and Threatened species

Recovery planning results in the development of recovery strategies and action plans for Extirpated, Endangered or Threatened species. It involves the different levels of government responsible for the management of the species, depending on what type of species it is and where it occurs. These include federal, provincial and territorial governments as well as Wildlife Management Boards. Recovery strategies and action plans are also prepared in cooperation with directly affected Aboriginal organizations. Landowners and other stakeholders directly affected by the recovery strategy are consulted.

Recovery strategies must be prepared for all Extirpated, Endangered and Threatened species. They include measures to mitigate the known threats to the species and its habitat and set the population and distribution objectives. Other objectives can be included, such as stewardship (to establish protection for an existing population) or education (to increase public awareness). Recovery strategies must include a statement of the time frame for the development of one or more action plans. To the extent possible, recovery strategies must also identify the critical habitat of the species. If there is not enough information available to identify critical habitat, the recovery strategy includes a schedule of studies required for its identification. This schedule outlines what must be done to obtain the necessary information and by when it needs to be done. In such cases, critical habitat is identified in a subsequent action plan.

Proposed recovery strategies for newly listed species are posted on the Species at Risk Public Registry to provide for public review and comment. For Endangered species, proposed recovery strategies are posted within one year of their addition to Schedule 1, and for Threatened or Extirpated species within two years.

Action plans state the measures necessary to implement the recovery strategy. These include measures to address threats and achieve the population and distribution objectives. Action plans also complete the identification of the critical habitat where necessary, and to the extent possible state measures that are proposed to protect it.

## **Protection for listed species of Special Concern**

While immediate protection under SARA for species listed as Extirpated, Endangered and Threatened do not apply to species listed as Special Concern, any existing protections and prohibitions, such as those provided by the *Migratory Birds Convention Act, 1994* or the *Canada National Parks Act*, continue to be in force.

## **Management plans for species of Special Concern**

For species of Special Concern, management plans are to be prepared and made available on the Species at Risk Public Registry within three years of species' addition to Schedule 1, allowing for public review and comment. Management plans include appropriate conservation measures for the species and for its habitat. They are prepared in cooperation with the jurisdictions responsible for the management of the species, including directly affected Wildlife Management Boards and Aboriginal organizations. Landowners, lessees and others directly affected by a management plan will also be consulted.

## THE LIST OF SPECIES ELIGIBLE FOR AN AMENDMENT TO SCHEDULE 1

### Status of the recently assessed species and consultation paths

In September 2013, COSEWIC submitted 27 assessments of species at risk to the Minister of the Environment for species that are newly eligible to be added to Schedule 1 of SARA. Sixteen of these are terrestrial species. COSEWIC also reviewed the classification of species already on Schedule 1, in some cases changing their status. Two terrestrial species are now being considered for down-listing on SARA (to a lower risk status), and 3 terrestrial species are now being considered for up-listing on SARA (to a higher risk status). In all, there are 21 terrestrial species that are eligible to be added to Schedule 1 or to have their current status on Schedule 1 changed (Table 1).

COSEWIC also submitted the reviews of species already on Schedule 1, confirming their classification. Twenty-three of these reviews were for terrestrial species. These species are not included in the consultations because there is no regulatory change being proposed (Table 2).

For more information on the consultations for aquatic species, visit the Fisheries and Oceans Canada website at [www.dfo-mpo.gc.ca](http://www.dfo-mpo.gc.ca).

### Providing comments

The involvement of Canadians is integral to the process, as it is to the ultimate protection of Canadian wildlife. Your comments matter and are given serious consideration. Environment Canada reviews all comments it receives by the deadlines provided below.

Comments for terrestrial species undergoing normal consultations must be received by **March 23, 2014**.

Comments for terrestrial species undergoing extended consultations must be received by **October 23, 2014**.

Most species will be undergoing normal consultations. For the final consultation paths, please see [www.registrelep-sararegistry.gc.ca/default.asp?lang=En&n=F0CDBF0B-1](http://www.registrelep-sararegistry.gc.ca/default.asp?lang=En&n=F0CDBF0B-1) after **December 23, 2013**.

For more details on submitting comments, see page 5, “Public comments solicited on the proposed amendment of Schedule 1.”



Table 1:

## Terrestrial species recently assessed by COSEWIC eligible for addition to Schedule 1 or reclassification

| Taxon   | Species   | Scientific Name                     | Range                                  |
|---|---|-------------------------------------|--|
| <b>Newly Assessed Species (16)</b>            |   |                                     |  |
| <b>Endangered (4)</b>                         |   |                                     |  |
| Vascular Plants                               | Hairy Braya   | <i>Braya pilosa</i>                 | NT                                     |
| Arthropods                                    | Mottled Duskywing (Boreal population)                               | <i>Erynnis martialis</i>            | MB                                     |
| Arthropods                                    | Mottled Duskywing (Great Lakes Plains population)                   | <i>Erynnis martialis</i>            | ON QC                                  |
| Arthropods                                    | Riverine Clubtail (Great Lakes Plains population)                   | <i>Stylurus amnicola</i>            | ON                                     |
| <b>Threatened (6)</b>                         |   |                                     |  |
| Vascular Plants                               | Silky Beach Pea   | <i>Lathyrus littoralis</i>          | BC                                     |
| Vascular Plants                               | Spiked Saxifrage  | <i>Micranthes spicata</i>           | YT                                     |
| Arthropods                                    | Gibson's Big Sand Tiger Beetle                                      | <i>Cicindela formosa gibsoni</i>    | AB SK                                  |
| Arthropods                                    | Island Tiger Moth   | <i>Grammia complicata</i>           | BC                                     |
| Birds   | Bank Swallow  | <i>Riparia riparia</i>              | YT NT BC AB SK MB<br>ON QC NB NS PE NL |
| Birds   | Wood Thrush   | <i>Hylocichla mustelina</i>         | ON QC NB NS                            |
| <b>Special Concern (6)</b>                    |   |                                     |  |
| Arthropods                                    | Georgia Basin Bog Spider  | <i>Gnaphosa snohomish</i>           | BC                                     |
| Arthropods                                    | Greenish-white Grasshopper  | <i>Hypochlora alba</i>              | AB SK MB                               |
| Molluscs                                      | Haida Gwaii Slug  | <i>Staala gwaii</i>                 | BC                                     |
| Amphibians                                    | Western Tiger Salamander (Prairie / Boreal population) <sup>1</sup> | <i>Ambystoma mavortium</i>          | AB SK MB                               |
| Birds   | Eastern Wood-pewee  | <i>Contopus virens</i>              | SK MB ON QC NB<br>NS PE                |
| Mammals                                       | American Badger <i>taxus</i> subspecies                             | <i>Taxidea taxus taxus</i>          | AB SK MB ON                            |
| <b>Up-lists (3)</b>                           |   |                                     |  |
| <b>From Threatened to Endangered (3)</b>      |   |                                     |  |
| Vascular Plants                               | Fernald's Braya   | <i>Braya fernaldii</i>              | NL                                     |
| Vascular Plants                               | Plymouth Gentian  | <i>Sabatia kennedyana</i>           | NS                                     |
| Reptiles                                      | Massasauga (Carolinian population) <sup>2</sup>                     | <i>Sistrurus catenatus</i>          | ON                                     |
| <b>Down-lists (2)</b>                         |   |                                     |  |
| <b>From Threatened to Special Concern (2)</b> |   |                                     |  |
| Vascular Plants                               | Crooked-stem Aster  | <i>Symphyotrichum prenanthoides</i> | ON                                     |
| Reptiles                                      | Eastern Musk Turtle   | <i>Sternotherus odoratus</i>        | ON QC                                  |

1. The Tiger Salamander was formerly considered by COSEWIC as three populations. In November 2012, COSEWIC split it into the Western Tiger Salamander and the Eastern Tiger Salamander, each with two populations. The two populations of the Western Tiger Salamander were assessed in November 2012. The assessment of one of the two populations of the Eastern Tiger Salamander was deferred; therefore, the report for the Eastern Tiger Salamander will be presented to the Minister at a later time.

2. The Massasauga is currently listed on Schedule 1 as a single species. COSEWIC reassessed it in November 2012 and split it into two populations.



Table 2:

**Terrestrial species recently reassessed by COSEWIC  
(no consultations – species status confirmation)**

| Taxon                           | Species  | Scientific Name                        | Range       |
|---------------------------------|--|--|-------------|
| <b>Status Confirmation (23)</b> |  |  |             |
| <b>Extirpated (1)</b>           |  |  |             |
| Molluscs                        | Puget Oregonian  | <i>Cryptomastix devia</i>              | BC          |
| <b>Endangered (11)</b>          |  |  |             |
| Vascular Plants                 | Pink Coreopsis   | <i>Coreopsis rosea</i>                 | NS          |
| Vascular Plants                 | Slender Bush-clover  | <i>Lespedeza virginica</i>             | ON          |
| Arthropods                      | Five-spotted Bogus Yucca Moth  | <i>Prodoxus quinquepunctellus</i>      | AB          |
| Arthropods                      | Non-pollinating Yucca Moth   | <i>Tegeticula corruptrix</i>           | AB          |
| Arthropods                      | Yucca Moth   | <i>Tegeticula yuccasella</i>           | AB          |
| Molluscs                        | Oregon Forestsnail   | <i>Allogona townsendiana</i>           | BC          |
| Amphibians                      | Western Tiger Salamander<br>(Southern Mountain population) <sup>1</sup>            | <i>Ambystoma mavortium</i>             | BC          |
| Birds                           | Northern Bobwhite  | <i>Colinus virginianus</i>             | ON          |
| Mammals                         | American Badger <i>jacksoni</i> subspecies   | <i>Taxidea taxus jacksoni</i>          | ON          |
| Mammals                         | American Badger <i>jeffersonii</i> subspecies<br>(Eastern population) <sup>2</sup> | <i>Taxidea taxus jeffersonii</i>       | BC          |
| Mammals                         | American Badger <i>jeffersonii</i> subspecies<br>(Western population) <sup>2</sup> | <i>Taxidea taxus jeffersonii</i>       | BC          |
| <b>Threatened (6)</b>           |  |  |             |
| Vascular Plants                 | Soapweed   | <i>Yucca glauca</i>                    | AB SK       |
| Arthropods                      | Dun Skipper <i>vestris</i> subspecies  | <i>Euphyes vestris vestris</i>         | BC          |
| Reptiles                        | Eastern Ribbonsnake (Atlantic population)  | <i>Thamnophis sauritus</i>             | NS          |
| Reptiles                        | Great Basin Gophersnake  | <i>Pituophis catenifer deserticola</i> | BC          |
| Reptiles                        | Massasauga<br>(Great Lakes / St. Lawrence population) <sup>3</sup>                 | <i>Sistrurus catenatus</i>             | ON          |
| Birds                           | Northern Goshawk <i>laingi</i> subspecies  | <i>Accipiter gentilis laingi</i>       | BC          |
| <b>Special Concern (5)</b>      |  |  |             |
| Molluscs                        | Warty Jumping-slug   | <i>Hemphillia glandulosa</i>           | BC          |
| Amphibians                      | Western Toad (Calling population) <sup>3</sup>                                     | <i>Anaxyrus boreas</i>                 | BC AB       |
| Amphibians                      | Western Toad (Non-calling population) <sup>3</sup>                                 | <i>Anaxyrus boreas</i>                 | YT NT BC AB |
| Reptiles                        | Eastern Ribbonsnake (Great Lakes population)                                       | <i>Thamnophis sauritus</i>             | ON QC       |
| Reptiles                        | Northern Map Turtle  | <i>Graptemys geographica</i>           | ON QC       |

1. The Tiger Salamander was formerly considered by COSEWIC as three populations. In November 2012, COSEWIC split it into the Western Tiger Salamander and the Eastern Tiger Salamander, each with two populations. The two populations of the Western Tiger Salamander were assessed in November 2012. The assessment of one of the two populations of the Eastern Tiger Salamander was deferred; therefore, the report for the Eastern Tiger Salamander will be presented to the Minister at a later time.

2. Currently listed on Schedule 1 as a single subspecies. Subspecies re-assessed by COSEWIC in November 2012 and split into two populations.

3. Currently listed on Schedule 1 as a single species. Re-assessed by COSEWIC in November 2012 and split into two populations.

## THE COSEWIC SUMMARIES OF TERRESTRIAL SPECIES ELIGIBLE FOR ADDITION OR RECLASSIFICATION ON SCHEDULE 1

The following section presents a brief summary of the reasons for the COSEWIC status designation of individual species, and their biology, threats, distribution and other information. For a more comprehensive explanation of the conservation status of an individual species, please refer to the COSEWIC status report for that species, also available on the Species at Risk Public Registry at: [www.sararegistry.gc.ca](http://www.sararegistry.gc.ca)

or contact:

COSEWIC Secretariat  
c/o Canadian Wildlife Service  
Environment Canada  
Ottawa ON K1A 0H3

### American Badger *taxus* subspecies



Photo: © Richard Klafki

Female.

#### Scientific name

*Taxidea taxus taxus*

#### Taxon

Mammals

#### COSEWIC status

Special Concern

#### Canadian range

Alberta, Saskatchewan, Manitoba, Ontario

#### Reason for designation

In the Prairies, this mammal is subject to furbearer harvest but also unmonitored and unregulated mortality by landowners, and the

application of rodenticides. The lack of monitoring of total mortality, the limited amount of habitat in cultivated areas, ongoing threat of roadkill, and the projected use of strychnine leads to concern for the species in a large part of its range.

#### Wildlife Species Description and Significance

The American Badger (*Taxidea taxus*) is a medium-sized fossorial (burrowing) carnivore in the weasel (Mustelidae) family. They are well-adapted to digging, possessing a dorso-ventrally flattened body with a robust pectoral girdle and broad front paws used to excavate burrows and dig out prey. Four subspecies of American Badger are recognized, three of which occur in Canada. Mitochondrial DNA work found multiple distinct genetic groups in Canada. Four designatable units are recommended (Jeffersonii East and West, Taxus, and Jacksoni), each corresponding with the existing subspecies distribution of *T. t. taxus* and *jacksoni*, with *T. t. jeffersonii* divided into two DUs.

#### Distribution

American Badgers occur throughout the southern regions of the western and central Canadian provinces, from the east slopes of the Coast mountains in British Columbia, eastward to the boreal forest of south-eastern Manitoba. A disjunct population exists in south-western Ontario, largely centred on Norfolk County. In north-western Ontario, American Badgers are occasionally reported from the agricultural lands of the Rainy River and Fort Frances area, but these are considered non-residents from the United States. The Jeffersonii subspecies exists as two isolated subpopulations.



Canadian range of American Badger – *taxus* subspecies. The stippled area in south-western Ontario occasionally has badger of the same subspecies. The *jeffersonii* subspecies (diagonal lines) begins at the Rocky Mountains.

Source: November 2012 COSEWIC Status Report.

## Habitat

American Badgers occur in non-forested grassland and shrubland biomes. Recent work has identified soil and prey availability to be the key defining features of habitat; coherent soils that can be burrowed into without collapsing are preferred. Closed-canopied forested areas generally are not used but early seral habitats along forest corridors can support prey populations that attract American Badgers into forest areas. Badgers are also known from alpine areas and wetlands. Agricultural areas support badgers provided there are sufficient hedgerows, fencerows and field edges. Cultivated fields are largely avoided. Habitat trends are generally declining across most of the species' Canadian range.

## Biology

American Badgers breed in July and August with polygynous males often ranging widely to find females. Litter sizes average one to two kits. American Badgers do not hibernate, but movements are reduced in the winter and they may enter torpor for brief periods during extreme cold. Diet is highly varied, but usually focuses on fossorial (ground-burrowing) rodents, such as ground squirrel. Home ranges in Canada

typically are much greater than those reported from the species' core range in the mid-western United States. In British Columbia, males range from 33 to 64 km<sup>2</sup>, and females from 16 to 18 km<sup>2</sup>.

## Population Sizes and Trends

Population estimates are based on aerial and ground surveys and expert opinion associated with field research and public observations. The *jeffersonii* West and East DUs contain fewer than 250 and 160 mature individuals, respectively, but the overall population trend is stable. No estimate or trend is available for the *taxus* DU; fur returns between 1999 and 2010 average 734/yr but fluctuate widely with no clear overall trend. The *jacksoni* DU is estimated to contain fewer than 200 adults; its population trend is unknown.

## Threats and Limiting Factors

The main threats facing American Badgers throughout their range are road-kill and decline in habitat. Habitat loss and degradation result from housing development, forest in-growth and encroachment, orchards and vineyards, and cultivation (row-crop) agriculture. American Badgers are highly susceptible to road-kill. Persecution by landowners likely contributed to historic declines, and likely is an important ongoing mortality factor in the *taxus* DU. American Badgers in the *taxus* DU are trapped for their fur and incidentally killed by rodenticides.

## Protection, Status, and Ranks

American Badgers in Ontario and British Columbia are currently considered Endangered by COSEWIC and are included on Schedule 1 of the federal *Species at Risk Act*. The *T. t. taxus* subspecies, occurring in Alberta, Saskatchewan and Manitoba, is considered Not at Risk. Federal land with suitable habitat occurs in British Columbia and Ontario. In Ontario, American Badgers are protected under the provincial *Endangered Species Act 2007*, which also has habitat regulations that protect some badger and Woodchuck (*Marmota monax*) burrows. In British Columbia, some badger habitat is managed under the provincial *Forest and Range Practices Act* as Wildlife Habitat Areas. American Badgers receive the highest conservation priority under the province's Conservation Framework. The province of Alberta considers American Badgers as Data Deficient. No rankings exist for the provinces of Saskatchewan and Manitoba. ■

## Bank Swallow



Photo: © Charles M. Francis

### Scientific name

*Riparia riparia*

### Taxon

Birds

### COSEWIC status

Threatened

### Canadian range

Yukon, Northwest Territories, British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Quebec, New Brunswick, Prince Edward Island, Nova Scotia, Newfoundland and Labrador

### Reason for designation

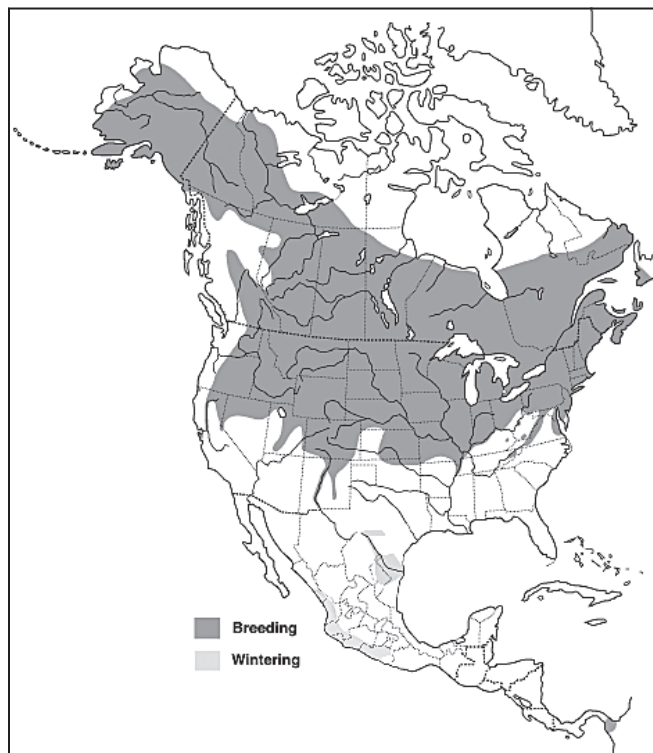
This widespread species has shown a severe long-term decline amounting to a loss of 98% of its Canadian population over the last 40 years. As with many other aerial insectivores, the decline continues, albeit at a slower rate since the 1980s. Breeding Bird Survey data from 2001-2011 indicate a potential loss of 31% of the population during that 10-year time period. The reasons for these declines are not well understood, but are likely driven by the cumulative effects of several threats. These include loss of breeding and foraging habitat, destruction of nests during aggregate excavation, collision with vehicles, widespread pesticide use affecting prey abundance, and impacts of climate change, which may reduce survival or reproductive potential.

## Wildlife Species Description and Significance

The Bank Swallow is a small insectivorous songbird with brown upperparts, white underparts and a distinctive dark breast band. It is distinguishable in flight from other swallows by its quick, erratic wing beats and its almost constant buzzy, chattering vocalizations. The species is highly social at all times of year and is conspicuous at colonial breeding sites where it excavates nesting burrows in eroding vertical banks.

### Distribution

The Bank Swallow has an extensive distribution, occurring on every continent except Antarctica and Australia. In North America, it breeds widely across the northern two-thirds of the U.S., north to the treeline. It breeds in all Canadian provinces and territories, except perhaps Nunavut. The Bank Swallow winters primarily in South America.



North American and Mesoamerican breeding and wintering distribution of Bank Swallow.

Source: "Birds of North America Online" <http://bna.birds.cornell.edu/bna> maintained by the Cornell Lab of Ornithology, Ithaca, NY.



## Habitat

The Bank Swallow breeds in a wide variety of natural and artificial sites with vertical banks, including riverbanks, lake and ocean bluffs, aggregate pits, road cuts, and stock piles of soil. Sand-silt substrates are preferred for excavating nest burrows. Breeding sites tend to be somewhat ephemeral due to the dynamic nature of bank erosion. Breeding sites are often situated near open terrestrial habitat used for aerial foraging (e.g., grasslands, meadows, pastures, and agricultural cropland). Large wetlands are used as communal nocturnal roost sites during post-breeding, migration, and wintering periods.

## Biology

The Bank Swallow breeds in colonies ranging from several pairs to a few thousand. In North America, the Bank Swallow is single-brooded and nest success is often relatively high. The average age of individuals in the breeding population likely ranges between 1.7 and 2 years old.

## Population Sizes and Trends

Long-term Breeding Bird Survey (BBS) data showed a significant annual rate of decline of 8.84% between 1970 and 2011. At this rate, the population will have decreased by approximately 98% over the last 41 years. Data from the most recent 10-year period (2001–2011) showed a non-significant decline of 3.69% per year, amounting to a potential loss of 31% of the population over the last 10 years. These declines are supported by provincial Breeding Bird Atlases that show substantial declines in area of occupancy and probability of observation.

## Threats and Limiting Factors

Although no single threat appears responsible for the decline of the Bank Swallow, cumulative effects from several sources may be driving declines. Loss of breeding and foraging habitat is apparent, especially through erosion control projects, flood control (dams), aggregate management activities, conversion of pastureland to cropland and afforestation. The destruction of nests during aggregate excavation may also pose a significant threat in some areas. Climatic changes may reduce overwinter survival or reproductive potential, while widespread pesticide use may cause decreases in the abundance or diversity of flying insects. Threats during migration and on the wintering grounds are largely unknown, but may be critical in understanding the species' decline.

## Protection, Status, and Ranks

In Canada, the Bank Swallow is federally protected under the *Migratory Birds Convention Act*, 1994. It is considered "Least Concern" by the IUCN Red list (2011) of Threatened Species, "Secure" in Canada and the U.S. by NatureServe, although it is ranked as "may be at risk" in Nova Scotia and "sensitive" in New Brunswick and Ontario by the Canadian Endangered Species Conservation Council. ■

## Crooked-stem Aster



Photo: © Allan Harris

### Scientific name

*Symphyotrichum prenanthoides*

### Taxon

Vascular Plants

### COSEWIC status

Special Concern

### Canadian range

Ontario

### Reason for designation

This perennial aster is restricted in Canada to a small area of the Carolinian forest near the shore of Lake Erie in Ontario. The species has experienced historic declines, but no recent losses have been documented and overall numbers appear to be stable. Invasive plants occur at a number of sites and have the potential to negatively impact the species in the future. Additional threats include indirect impacts of Emerald Ash Borer and roadside maintenance. The species has a restricted distribution in Canada, and its persistence will likely require ongoing monitoring and management of invasive species.

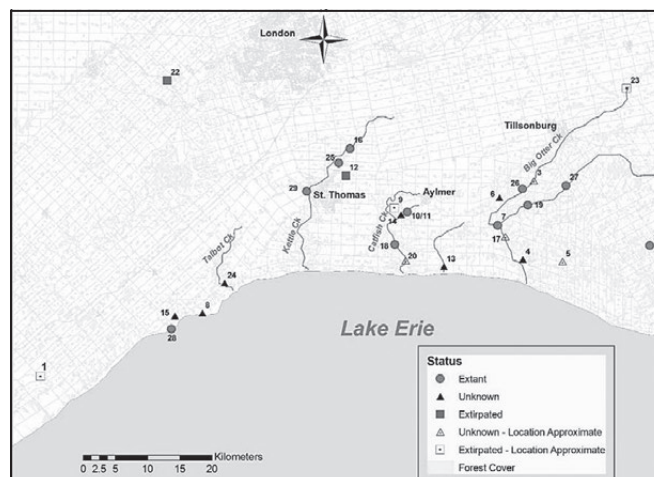
### Wildlife Species Description and Significance

Crooked-stem Aster (*Symphyotrichum prenanthoides*) is a perennial wildflower up to 90 cm tall with pale blue flower heads and zigzagging stems. The leaves become narrowed in the lower

third but expand at the base to clasp the stem. The species grows in colonies, with multiple stems arising from creeping rhizomes (horizontal underground stems). Each flower head consists of a yellow disc, surrounded by 17 to 30, pale blue rays. Canadian populations of Crooked-stem Aster occur in the Carolinian Forest Region at the northern limit of the species' range. They may be genetically isolated from other populations and have unique adaptations that contribute to their significance for conservation.

### Distribution

Crooked-stem Aster occurs in Ontario and in the U.S. in 20 states from New York to Tennessee and west to Wisconsin. It is most common in the Appalachian region through western Pennsylvania, West Virginia, Virginia, Kentucky, and Tennessee. In Canada, the species is distributed along the north shore of Lake Erie in southwestern Ontario, mainly in Elgin County. A Middlesex County population is apparently extirpated. Less than 1% of the global range is in Canada.



Canadian range of Crooked-stem Aster. Numbers designate sites; location of site 2 is unknown.

Source: May 2013 COSEWIC Status Report.

### Habitat

Crooked-stem Aster is found on the floodplains of streams and creeks draining into the north shore of Lake Erie. It tends to occur in rich sandy, loamy, or clayey soil, commonly at the edge of woods and usually in partial to full shade. These stands often have a dense layer of graminoids, goldenrods and asters. The species occurs less commonly on roadsides



and in old fields. In the U.S., Crooked-stem Aster inhabits moist woods, rocky stream banks, wet fields, and ditches. It often occurs in fairly young or disturbed forest habitat in Wisconsin and Iowa.



Photo: © Allan Harris

Crooked-stem Aster habitat.

## Biology

Crooked-stem Aster reproduces both by seed and vegetatively, by means of its elongated rhizomes. In southwestern Ontario, it blooms from late August to early October. Crosses between genetically identical individuals (clones) typically produce little or no seed, indicating that the species is self-incompatible.

## Population Sizes and Trends

The total Canadian population size of Crooked-stem Aster is unknown and difficult to estimate because the species forms dense colonies, in which numbers of individual plants are difficult to determine. The number of sites has apparently been relatively stable since 2002. Eleven sites were surveyed and confirmed extant in 2007 or 2010, and another 11 are known from surveys reported in the previous assessment in 2002. The extant sites include three new sites discovered in 2007 and one population not surveyed in 2002 that has been relocated. No sites are known to have been extirpated since 2002, although 11 are not confirmed extant. The index of area of occupancy and extent of occurrence are unchanged since the previous assessment.

## Threats and Limiting Factors

Invasive species are probably the greatest threat facing Canadian populations of Crooked-stem Aster, although their impact appears to be limited to date. Invasive species in and near Crooked-stem Aster habitat include Common Reed, Glossy Buckthorn, Garlic Mustard, Reed Canary Grass, Dame's Rocket, and Amur Honeysuckle. Three populations are on road right-of-ways and are potentially threatened by mowing, herbicides, road maintenance and construction. Other populations occur on the floodplains of streams and are potentially threatened by recreational use, logging and livestock grazing. One site is potentially threatened by cottage development. Crooked-stem Aster is self-incompatible, and therefore requires pollination from a genetically distinct, compatible pollen donor in order to achieve full seed set. This could limit its ability to reproduce through seeds and colonize new sites.

## Protection, Status, and Ranks

Crooked-stem Aster was assessed by COSEWIC as Special Concern in 2012, and as Threatened in 2002, and is listed on Schedule 1 of the *Species at Risk Act*. As such, it is protected on federal lands through the general prohibitions under SARA. A recovery team has been formed, but a draft recovery strategy is not yet available. In Ontario, the species is listed as Threatened under the *Endangered Species Act, 2007*. The act legally protects individuals of Crooked-stem Aster on all lands in Ontario. It is ranked globally by Nature Serve as apparently secure to secure (G4G5; last reviewed in 1988), nationally as imperiled (N2) in Canada, and as imperiled (S2) in Ontario. ■

## Eastern Musk Turtle



Photo: © Marie-Andrée Carrière

### Scientific name

*Sternotherus odoratus*

### Taxon

Reptiles

### COSEWIC status

Special Concern

### Canadian range

Ontario, Quebec

### Reason for designation

This species occupies shallow waters of lakes, rivers, and ponds. In southwestern Ontario, the species has declined substantially and is now restricted to a few tiny, scattered populations. Throughout its Canadian range, this species is vulnerable to increased mortality of adults and juveniles from recreational boating, development and loss of shoreline habitat, and fisheries by-catch. The species has delayed maturity and a low reproductive rate with a small clutch size. Since the previous assessment in 2002, increased survey effort has found more populations in eastern Ontario and adjacent areas of Quebec. The species distribution range remains unchanged, but losses in the southern half of its range make it near Threatened.

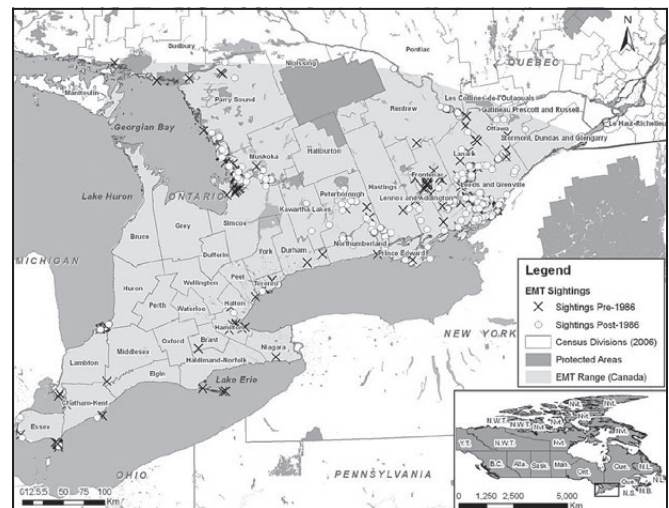
### Wildlife Species Description and Significance

The Eastern Musk Turtle, *Sternotherus odoratus*, is a small freshwater turtle with a narrow, domed

carapace, and a large head with a pointed snout. Two yellow/white stripes extend from the nose, above and below the eyes, and along the sides of the head and neck. These stripes are not always apparent on older individuals. The plastron is small and cross-shaped. There are two or more pointed barbels present on the chin and throat. Individuals may strike defensively when handled and are often called 'Stinkpots' because of the musky odour they exude. The Eastern Musk Turtle was first described in 1802 by P.A. Latreille and it is the only representative of the family Kinosternidae in Canada.

### Distribution

The Eastern Musk Turtle is restricted to eastern North America. The species ranges from Florida, north to Ontario and Québec, and west to Wisconsin and central Texas. Approximately 5 % of the global range of the Eastern Musk Turtle extends into Canada. In Canada, the Eastern Musk Turtle is found in southern Ontario, the southeastern edge of northeastern Ontario and the southwestern edge of Québec.



Canadian range and sightings of the Eastern Musk Turtle (EMT).

Source: November 2012 COSEWIC Status Report (map produced by Catherine Millar).

### Habitat

The Eastern Musk Turtle is a highly aquatic species inhabiting littoral zones of waterways such as rivers, lakes, bays, streams, ponds, canals, and swamps with slow to no current and soft bottoms. During their active season, Eastern Musk Turtles prefer shallow water (depth < 2 m) with abundant floating and

submerged vegetation. Individuals are most often found close to shore and usually do not venture onto land except to nest or to access adjacent wetlands. Nest sites are generally located 3 to 11 m from shore and eggs are typically laid in shallow excavations in sand, at the base of dune grasses, decaying vegetable matter, rotting wood, and in the walls of Muskrat or Beaver lodges. Suitable Eastern Musk Turtle habitat is abundant across Central and Eastern Ontario, especially in the Canadian Shield Region.

## Biology

The Eastern Musk Turtle is chiefly crepuscular and, in Canada, is active from late April to early October. They often bask near the water's surface under lily pads, other floating vegetation, and debris and rarely venture or bask out of water.

Longevity in wild populations is >30 years and generation time is 14-20 years. In Canada, sexual maturity is reached between 5 and 6 years by males and 8 and 9 years by females. Mating activity peaks in spring (April – May) and fall (September – October) when turtles congregate at hibernation sites. Multiple paternity is possible and typically, a clutch has 3 to 7 eggs. Eggs are laid in June and July and hatchlings emerge in August and September. Females may exhibit year-to-year nest site fidelity and, generally, more than one female will nest in the same area. The temperature regime in the nest determines the sex of the offspring.

The Eastern Musk Turtle is a bottom-feeding omnivore. Eggs, hatchlings, juveniles and adults of Eastern Musk Turtles are eaten by many predators, including Raccoons, Striped Skunks, herons, crows, foxes, predatory fish, predatory birds, American Bullfrogs, Northern Watersnakes, Snapping Turtles and Fishers.

In general, daily movements are limited to 25-131 m per day. Annual home ranges at Canadian sites range from 0.08 to 430 ha. Long-distance travel (> 1 km) usually occurs overnight and dispersal is most likely achieved via aquatic corridors. Populations are considered isolated if they are separated by more than 10 km of riverine habitat, 5 km of other aquatic habitat, and 1 km of land. Furthermore, roads, locks and dams, rugged terrain, salt water and inhospitable land uses limit movement between habitat fragments.

## Population Sizes and Trends

The Canadian population of Eastern Musk Turtles occurs in over 100 sites scattered across southern and central Ontario and southwestern Québec. Population size estimates have been carried out on only five sites in Canada: Grenadier Island (St. Lawrence River), Loon Island (Georgian Bay), Massasauga Provincial Park (Georgian Bay), Norway Bay (Ottawa River) and Point Pelee National Park (Lake Erie). Eastern Musk Turtle population size estimates for these sites vary from 84 to over 1400 individuals.

In Ontario, declines in some Eastern Musk Turtle populations have been observed and, in more remote locations, are inferred based on known threats (e.g., fisheries bycatch). Of the 32 census divisions in Ontario and Québec that have recorded sightings, 8 (28 %) have had no reported sightings since 1986. Historical populations mostly in southern Ontario (e.g., Thames River, Rondeau Bay, Long Point) that have survey efforts yielding no sightings plus high habitat conversion rates in surrounding areas are likely extirpated or non-viable. However, lack of recent sightings may not reflect decline or extirpation in areas with limited recent survey efforts, abundant habitat and no major threats.

## Threats and Limiting Factors

The most significant threats to Eastern Musk Turtle populations in Canada are fisheries bycatch and habitat destruction and alteration (e.g., land conversion, shoreline development, dam placement, dredging and draining of waterways and wetlands). Given this species' low adult recruitment and delayed sexual maturity, chronic added mortality of juveniles and adults (particularly females) could eliminate local populations. Added sources of juvenile and adult mortality can stem directly and indirectly from human recreational activities (i.e., fishing, power boating) and urbanization (i.e., roads, subsidized predators). Due to the aquatic nature of Eastern Musk Turtles, most added anthropogenic sources of mortality are linked to aquatic activities. Other long-term threats to Eastern Musk Turtles are illegal collection, habitat alteration by non-native species, and, potentially, decreased reproductive success due to environmental contamination.

## Protection, Status, and Ranks

In Canada, the Eastern Musk Turtle is ranked 'Vulnerable' (N3) by NatureServe and was assessed as 'Threatened' by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) in 2002. In Ontario, the Eastern Musk Turtle is ranked 'Vulnerable' (S3) by NatureServe and was assessed as 'Threatened' by the Committee on the Status of Species at Risk in Ontario (COSSARO). In Québec, the Eastern Musk Turtle is ranked 'Critically Imperiled' (S1) in NatureServe and was assessed as 'Threatened' by the 'Ministère des ressources naturelles et de la Faune' (MRNF). The General Status of Species in Canada gives it a rank of 'At Risk' nationally and for each of Ontario and Quebec.

Persecution and habitat destruction are regulated under the federal *Species at Risk Act* (2003), the Ontario *Endangered Species Act* (2007), the 'Loi sur les espèces menacées ou vulnérables' (1989) in Québec, and the 'Loi sur la conservation et la mise en valeur de la faune' (2002) in Québec. Hunting and trapping of this species are regulated under the Ontario *Fish and Wildlife Conservation Act* (1997) and the 'Loi sur la conservation et la mise en valeur de la faune' (2002) in Québec. Approximately 17% of areas where Eastern Musk Turtles are known to occur in Canada are in protected areas. ■



## Eastern Wood-pewee



Photo: © Charles M. Francis

### Scientific name

*Contopus virens*

### Taxon

Birds

### COSEWIC status

Special Concern

### Canadian range

Saskatchewan, Manitoba, Ontario, Quebec, New Brunswick, Prince Edward Island, Nova Scotia

### Reason for designation

This species is one of the most common and widespread songbirds associated with North America's eastern forests. While the species is apparently resilient to many kinds of habitat changes, like most other long-distance migrants that specialize on a diet of flying insects, it has experienced persistent declines over the past 40 years both in Canada and the United States. The 10-year rate of decline (25%) comes close to satisfying the criteria for Threatened. The causes of the decline are not understood, but might be linked to habitat loss or degradation on its wintering grounds in South America or changes in availability of insect prey. If the population declines continue to persist, the species may become Threatened in the foreseeable future.

## Wildlife Species Description and Significance

The Eastern Wood-pewee is a small forest bird about the same size as a House Sparrow. Both sexes have similar plumage, being generally greyish-olive on the upperparts and pale on the underparts. This species is often observed perched in an upright position typical of flycatchers. It is distinguished from its 'confusing' *Empidonax* flycatcher cousins by its larger size, lack of an eye-ring, and longer and more pointed wings. During the breeding season, the most reliable way to detect and identify the Eastern Wood-pewee is by hearing its distinctive, clear, three-phrased whistled song, often paraphrased as "pee-ah-wee."

## Distribution

The breeding range of the Eastern Wood-pewee covers much of south-central and eastern North America. It breeds from southeastern Saskatchewan to the Maritime provinces, south to southeastern Texas and east to the U.S. Atlantic coast. About 11% of its global breeding range is in Canada, which accounts for about 8% of the breeding population.

It winters primarily in northern South America, mainly from northwestern Colombia and northeastern Venezuela south to southern Peru, northern Bolivia and Amazonian Brazil.



Canadian breeding range of the Eastern Wood-pewee.

Source: November 2012 COSEWIC Status Report.

## Habitat

In Canada, the Eastern Wood-pewee is mostly associated with the mid-canopy layer of forest clearings and edges of deciduous and mixed forests. It is most abundant in forest stands of intermediate age and in mature stands with little understory vegetation.

During migration, a variety of habitats are used, including forest edges, early successional clearings, and primary and secondary lowland (and submontane) tropical forest, as well as cloud forest. In South America in the winter, the species primarily uses open forest, shrubby habitats, and edges of primary forest. It also occurs in interior forests where tree-fall gaps are present.

## Biology

The Eastern Wood-pewee is considered monogamous, but polygyny sometimes occurs. In Canada, adults arrive on the breeding grounds mostly from mid-May to the end of May. Pair formation and nest building start soon after arrival. Nests are usually located on top of a horizontal limb in a living tree at heights between 2 and 21 m. Clutch size averages 3 eggs. Incubation lasts about 12 to 13 days, and nestlings fledge after about 16 to 18 days. Up to two broods can be produced per year. Generation time is estimated to be 2-3 years.

## Population Sizes and Trends

In Canada, the current Eastern Wood-pewee population is estimated to be about 217,500 breeding pairs or 435,000 mature individuals. Breeding Bird Survey (BBS) data for Canada indicate a significant population decline of 2.9% per year for the period 1970-2011, which yields an overall decline of 70% over the last 42 years. In the most recent 10-year period (2001 to 2011), BBS data show a significant decline of about 2.8% per year, which represents a 25% decline over the period. Populations declined significantly in Manitoba, Ontario, Québec, New Brunswick, and Nova Scotia/Prince Edward Island for the period of 1970-2011, with pronounced declines in Québec and New Brunswick. A pattern of widespread decline is also apparent for much of the United States.

The BBS trend generally conforms to the direction of results from two other monitoring programs (Study of Québec Bird Populations and Ontario Forest Bird Monitoring Program), but contrasts with those from other monitoring programs in Ontario (Ontario Breeding Bird Atlas and Long Point Bird Observatory migration monitoring), which suggest stable or increasing populations. Despite discrepancies across monitoring programs, the BBS is judged to represent the most reliable trend estimate at this time.

## Threats and Limiting Factors

Threats and limiting factors affecting Eastern Wood-pewees have not been clearly identified and are poorly known, largely because of a lack of research. Possible threats and limiting factors have been suggested as including: 1) loss and degradation of habitat quality on the breeding grounds due to urban development and/or changes in forest management; 2) loss and/or degradation of habitat on the wintering grounds; 3) large-scale changes in the availability of flying-insect prey due to unknown causes; 4) high rates of mortality during migration and/or on the wintering grounds; 5) high rates of nest predation from increasing numbers of avian predators; and 6) changes in forest structure due to White-tailed Deer over-browsing.

## Protection, Status, and Ranks

The Eastern Wood-pewee was ranked as 'globally secure' (G5) in 1996 by NatureServe and is considered 'Least concern' according to the IUCN Red List. In Canada, its nests and eggs are protected under the *Migratory Birds Convention Act*. Similar protection is afforded under various kinds of provincial legislation. It is considered 'secure and common' nationally; 'apparently secure' in Saskatchewan, Manitoba, Ontario, and Prince Edward Island; 'secure' in New Brunswick; and 'vulnerable' to 'apparently secure' in Québec. ■



## Fernald's Brayas



Photo: © Susan E. Squires

### Scientific name

*Braya fernaldii*

### Taxon

Vascular Plants

### COSEWIC status

Endangered

### Canadian range

Newfoundland and Labrador

### Reason for designation

This small perennial plant, endemic to the limestone barrens of the Great Northern Peninsula of Newfoundland, is at increased risk over its limited range due to numerous threats. Ongoing habitat loss and degradation, combined with a non-native agricultural moth, result in low rates of survival and reproduction. These threats and the additional impact of climate change lead to the prediction that the species will go extinct in the wild within the next 80 years.

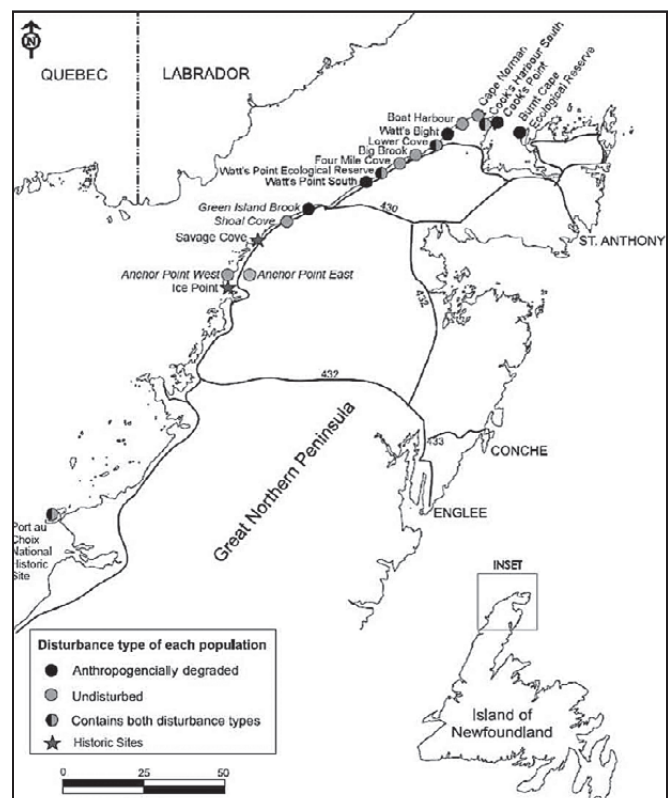
### Wildlife Species Description and Significance

Fernald's Braya (*Braya fernaldii*) is a small (10 cm tall) herbaceous perennial in the mustard family Brassicaceae. It has fleshy, dark green to purplish, linear spatulate (spoon-shaped) leaves arranged in rosettes and four-petaled white to pinkish or purplish flowers. Fernald's Braya is very similar morphologically to Long's Braya (listed as Endangered under the *Species at Risk Act*) but it

is shorter and has narrower petals, smaller and more purplish sepals, and pubescent leaves and fruit. It is one of four vascular plants endemic (only known from) to the island of Newfoundland.

### Distribution

Fernald's Braya is endemic to the Limestone Barrens ecosystem on the island of Newfoundland, Canada. It is known from 16 populations that span about 150 km of coastline. It is likely that Fernald's Braya occurs sparsely throughout the almost continuous strip of limestone barrens at the northern (70 km) end of its range.



Global distribution of Fernald's Braya populations and their level of disturbance.

Source: November 2012 COSEWIC Status Report. Used and modified with permission, from Squires 2010.

### Habitat

Fernald's Braya is a calciphile (requires calcium-rich soils) that inhabits the Limestone Barrens—a mosaic of patches of shallow nutrient-poor calcium-rich soils in frost-shattered barrens, bedrock outcrops, fine-grained substrate, and tundra-like heaths within 1.5 km of the coast, and situated 13 to 15 m above sea level. Frost action, soil erosion from heavy precipitation,

and wind erosion maintain open areas in which Fernald's Braya seedlings germinate. Fernald's Braya is also capable of inhabiting undisturbed limestone barrens where frost action has formed patterned substrate, such as sorted stripes and polygons, or anthropogenically degraded limestone barrens, such as abandoned limestone quarries and roadways, and levelled areas of land around utility lines. These areas consist of homogeneous gravel substrates with no patterned substrate and low species diversity.

## Biology

Fernald's Braya is a long-lived (likely 20+ years) perennial whose life cycles can be divided into eight stages: seeds, four seedling stages (year one to four), and three adult stages (vegetative, single rosette flowering, and multiple rosette flowering). Flowering begins in mid-June and plants produce fruit by mid-August. Each flower produces on average 10-16 small (1-1.5 mm), round seeds that need to undergo a period of cold stratification and be scarified before they will germinate. Fernald's Braya growing on anthropogenically degraded habitat move more quickly through their life cycle and have a higher reproductive output than individuals growing on undisturbed habitat, but they also have higher mortality rates. Fernald's Braya are not known to reproduce asexually.

## Population Sizes and Trends

A survey between 1996 and 2000 estimated that there were 3,434 flowering Fernald's Braya. The same 15 populations counted 8-12 years later contained only 1,242 mature plants (a 64% decline). An additional population not known during the first survey (Green Island Brook) contained 2,056 mature plants, increasing the current estimate of the global Fernald's Braya population to 3,282 mature plants. However, the Green Island Brook population is an anthropogenically disturbed population and, as a result of its very different life history, may only persist by immigration from outside populations. The population size of Fernald's Braya continues to decline, based on permanent monitoring plots. Population viability models provide additional evidence that the population size is declining. Two historical sites, Savage Cove and Ice Point, named in the *National Recovery Plan for Long's Braya and Fernald's Braya* still do not contain Fernald's Braya and are considered historically extirpated. Rescue effect is not possible because Fernald's Braya is endemic to the island of Newfoundland.

## Threats and Limiting Factors

Past habitat loss through quarrying, road construction, and community expansion was the most significant and widespread threat to Fernald's Braya, but currently it is the maintenance of that infrastructure that is a threat. These large-scale disturbances left some areas heavily degraded but still capable of supporting Fernald's Braya (i.e., represent anthropogenically disturbed populations). Populations on such anthropogenically degraded habitat may threaten the viability of undisturbed populations by acting as reservoirs for pests and pathogens. Fernald's Braya populations are negatively affected by an introduced, pesticide-resistant, agricultural insect pest and two pathogens, all of which decrease seed set and increase mortality rates in each population. Summer and winter air temperatures on the limestone barrens increased from 1991 to 2002 and mean annual air temperature is predicted to increase another 4°C by 2080. These climatic changes could reduce winter snow cover, alter the frost-sorting processes characteristic of the limestone barrens, and affect the population distribution and abundance of pests and pathogens.

Surveys conducted within the distribution of Fernald's Braya found that 59-76% of respondents thought off-road vehicles were causing more damage than any other human activity. Dumping garbage, piling and cutting wood, and drying fishing nets can cause Fernald's Braya mortality and decrease habitat quality, but these activities are more localized and less frequent. Hybridization with the closely related Long's Braya is possible but considered rare. Until roads degraded the landscape, these species did not co-occur and there was no indication of hybridization; however, recent research suggests hybridization is possible in populations on anthropogenically degraded habitat where these species co-occur.

## Protection, Status, and Ranks

Fernald's Braya is listed as Threatened in the federal *Species at Risk Act* and the Newfoundland and Labrador *Endangered Species Act*. Fernald's Braya is ranked by NatureServe as critically imperilled globally (G1), nationally (N1), and provincially (S1). Fernald's Braya is protected within the Port au Choix National Historic Site, the Watts Point Ecological Reserve, and the Burnt Cape Ecological Reserve—the latter of which was established shortly after the last COSEWIC assessment of Fernald's Braya. ■

## Georgia Basin Bog Spider

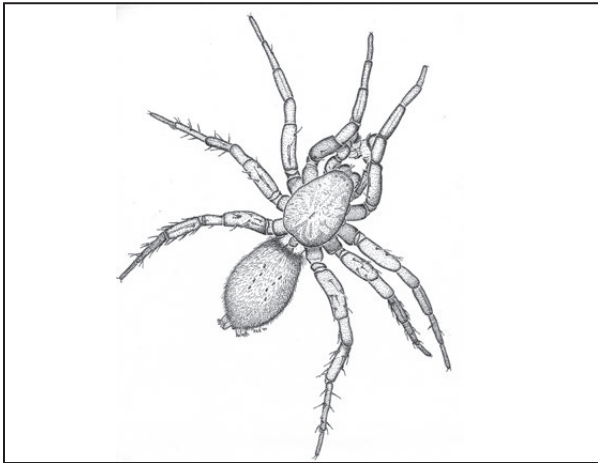


Illustration: © Robb Bennett and the Journal of the Entomological Society of Ontario

### Scientific name

*Gnaphosa snohomish*

### Taxon

Arthropods

### COSEWIC status

Special Concern

### Canadian range

British Columbia

### Reason for designation

This small (1 cm) wetland spider has a very limited global distribution, occurring in the Georgia Basin and western Washington State. In Canada, it is known from only 4 sites in southern British Columbia. These populations may become threatened over a very short time period. The greatest threat is inundation by sea water since three of the four known sites are less than 3 m above sea level and are at risk from projected increases in the frequency and severity of storms.

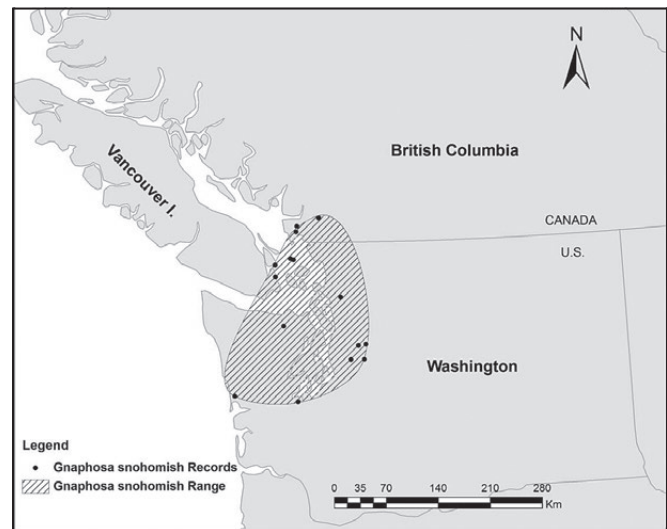
### Wildlife Species Description and Significance

Georgia Basin Bog Spider (*Gnaphosa snohomish*) is a member of the ground spider family (Family Gnaphosidae). Ground spiders are 2-clawed spiders with enlarged, cylindrical, separated anterior lateral spinnerets and modified posterior median eyes. *Gnaphosa* spiders are characterized by a serrated keel on the posterior margin of the mouthparts. Georgia Basin Bog Spider is similar to other species in the

genus and is distinguished by details of the genitalia. The body is 7.5 to 12 mm long. The abdomen is covered with short hairs. The legs are relatively stout with numerous large hairs. The carapace, abdomen, and legs are light brown to dark chestnut brown. The species is endemic to the Puget Sound and Georgia Basin area and about half of the known occurrences are in Canada.

### Distribution

The global distribution of Georgia Basin Bog Spider is restricted to the southern Gulf Islands, Puget Sound and Georgia Basin area of extreme southwestern British Columbia and adjacent Washington. In Canada, it occurs in three bogs and one marsh. Sites on the Gulf Islands (other than Tumbo Island) and adjacent Vancouver Island are believed to be transient and the result of wind dispersal of single individuals.



Global and Canadian range of Georgia Basin Bog Spider. All known records of the species are shown.

Source: November 2012 COSEWIC Status Report.

### Habitat

Georgia Basin Bog Spider is primarily associated with bogs throughout its Canadian and US range. With few exceptions the non-bog occurrences of this spider are of single specimens, likely the result of random ballooning events rather than being an indication of established populations. A cattail marsh on the Gulf Islands is the only known Canadian location for an established population associated with a wetland other than a bog. Five of the six sites in Washington State where this species occurs are bogs. Typical bog habitat is open heath with *Sphagnum* moss cover and ericaceous shrubs.

## Biology

Most species in the genus are ground-dwelling nocturnal hunters that actively pursue their prey at night and remain under cover during the day. They are generalist predators on a range of prey including insects and other spiders. Georgia Basin Bog Spider overwinters in the subadult stage and matures in early spring. Life span is probably one year. In addition to simple localized wandering, dispersal of young spiders may occur by ballooning, involving climbing to an elevated perch and extruding a silk thread, which is caught in an updraft and carries the spider away. This method of dispersal is random and success for individual Georgia Basin Bog Spiders depends upon landing in suitable habitat. Ballooning by Georgia Basin Bog Spiders is supported by occurrences of single individuals in non-bog habitat in the Gulf Islands and adjacent Vancouver Island 20 to 30 km from known populations.

## Population Sizes and Trends

Population size and trends are unknown but the species is likely declining due to continuing deterioration and loss of habitat. Most collections have occurred relatively recently (<25 years) and known populations have not been monitored.

## Threats and Limiting Factors

Saltwater flooding resulting from rising sea levels (due to climate change), winter storms, and tsunamis could impact all but one site; this is considered to be the most serious threat. Natural system modification, in particular destruction of wetland habitat and succession of native and exotic invasive plant species, currently or potentially impacts all sites of Georgia Basin Bog Spider. Agricultural impacts such as recent and historical peat extraction, cranberry farm development, and related changes to hydrological processes as well as pollution from agriculture, industry, and garbage disposal are important at two sites at least. Overall threat impact is calculated to be “very high” based on NatureServe’s Threat Calculator and seven categories of threat that are relevant.

## Protection, Status, and Ranks

COSEWIC assessed the Georgia Basin Bog Spider as Special Concern in November 2012. Currently, Georgia Basin Bog Spider is not protected by any endangered species legislation in Canada or the United States. It has been ranked as globally and nationally imperiled in Canada. ■



## Gibson's Big Sand Tiger Beetle



Photo: © Robert Foster

### Scientific name

*Cicindela formosa gibsoni*

### Taxon

Arthropods

### COSEWIC status

Threatened

### Canadian range

Alberta, Saskatchewan

### Reason for designation

This very restricted subspecies, with most of its populations in Canada, requires open sand dune areas. This habitat is declining throughout the Prairies as a result of a dune stabilization trend. Loss of historical ecological processes such as bison-induced erosion, fire, and activities of native people, as well as possible accelerators such as increase in atmospheric CO<sub>2</sub>, nitrogen deposition, and invasive alien plant species, may also be important factors in open sand reduction. There are believed to be fewer than 73 sites and a 10% possibility of extinction within 100 years based on rates of decline of open sand dunes.

### Wildlife Species Description and Significance

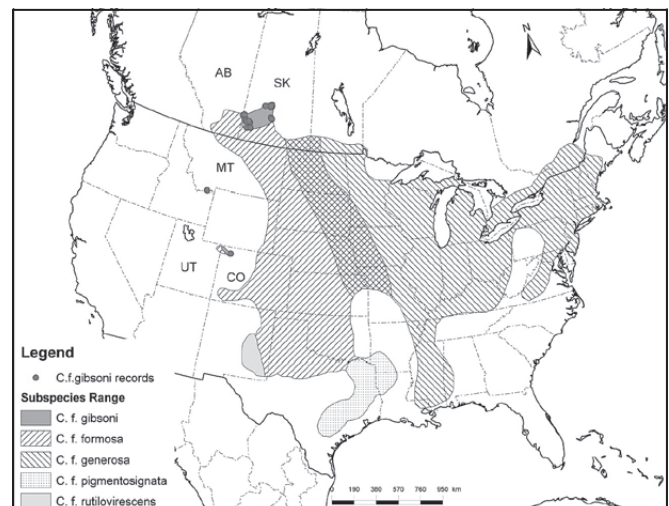
Gibson's Big Sand Tiger Beetle, *Cicindela formosa gibsoni*, is one of five subspecies of *Cicindela formosa*. It has long, narrow legs and antennae, large mandibles, and is one of the largest tiger beetles in North America. Adult Gibson's Big Sand Tiger

Beetles can be distinguished from other subspecies of *C. formosa* by the expanded pale maculations covering over 60% of the elytra (hardened front wings) and bluish-green colour underneath. Like other species of *Cicindela*, the larvae are grub-like with an armoured head capsule and large mandibles.

Nearly all of the Gibson's Big Sand Tiger Beetle's range is found in Canada and they are emblematic of imperilled sand dune flora and fauna. *Cicindela formosa* and its subspecies are significant models for ecological and evolutionary studies.

### Distribution

The global distribution of the Gibson's Big Sand Tiger Beetle is centred on southwestern Saskatchewan with two small disjunct populations in Colorado and Montana. Its Canadian distribution is associated with large dune complexes particularly the Great Sand Hills, Pike Lake and Dundurn sand hills near Saskatoon, and the Elbow Sand Hills near Douglas Provincial Park. The western edge of its range is in the Empress Sand Hills along the Alberta/Saskatchewan border.



Global and Canadian range of Gibson's Big Sand Tiger Beetle.

Source: November 2012 COSEWIC Status Report.

### Habitat

Preferred adult and larval habitat is sparsely vegetated, dry, sandy areas of blowouts, sand hills, and the margins of larger sand dunes. This open sandy habitat has declined due to dune stabilization over the past several decades and further declines are projected.

## Biology

Like other tiger beetles, the Gibson's Big Sand Tiger Beetle undergoes complete metamorphosis with an egg, larval, pupal, and adult stage. In Canada, their life span is three years, with two years spent in the larval stage. Gibson's Big Sand Tiger Beetles are predators in both the adult and larval stages. Adults are active during the day hunting small arthropods. Larvae reside in a vertical tunnel with a small pit-like opening at its mouth. They are active during the day and night and ambush ants and other small arthropods that fall into their tunnel.

## Population Sizes and Trends

Population size is unknown but may be declining due to declining habitat. Gibson's Big Sand Tiger Beetle has been recorded from 20-25 sites in Saskatchewan and adjacent Alberta, but population estimates are not available for most sites.

## Threats and Limiting Factors

The main threat to Gibson's Big Sand Tiger Beetle in Canada is the loss of suitable habitat due to continued stabilization of dunes by vegetation. The sand dunes with which it is associated in Canada are derived from glacial deposits, which have been stabilizing with vegetation during the last 200 years or so. Less than 1% of the dunes within the Canadian range of Gibson's Big Sand Tiger Beetle are currently bare sand.

## Protection, Status, and Ranks

COSEWIC assessed the Gibson's Big Sand Tiger Beetle as Threatened in November 2012. Currently, the Gibson's Big Sand Tiger Beetle is not protected by any endangered species legislation in Canada or the United States. The subspecies is ranked by NatureServe as critically imperiled globally (G5T1), in Canada (N1), and in Colorado (S1). The species *C. formosa* is listed as critically imperiled (S1) in Alberta and secure (S5) in Saskatchewan, Montana, and Colorado. Some of its Canadian habitat is in protected areas, but dune stabilization presents a continuing threat to populations even within parks and reserves. ■



## Greenish-white Grasshopper



Photo: © Dr. Dan Johnson

### Scientific name

*Hypochlora alba*

### Taxon

Arthropods

### COSEWIC status

Special Concern

### Canadian range

Alberta, Saskatchewan, Manitoba

### Reason for designation

This distinctive grasshopper is restricted to dry mixed grass prairie in southernmost Saskatchewan and southwestern Manitoba. Most of the Canadian population is found in only a few sites with many sites having very small populations. There is evidence that there has been a decline in the western part of the range. A number of threats have been documented including conversion to tame pasture, pesticide use and overgrazing. Re-establishment of lost populations and rescue effect are limited by the fact that this species is mostly flightless, although some Canadian habitat is continuous across the border.

### Wildlife Species Description and Significance

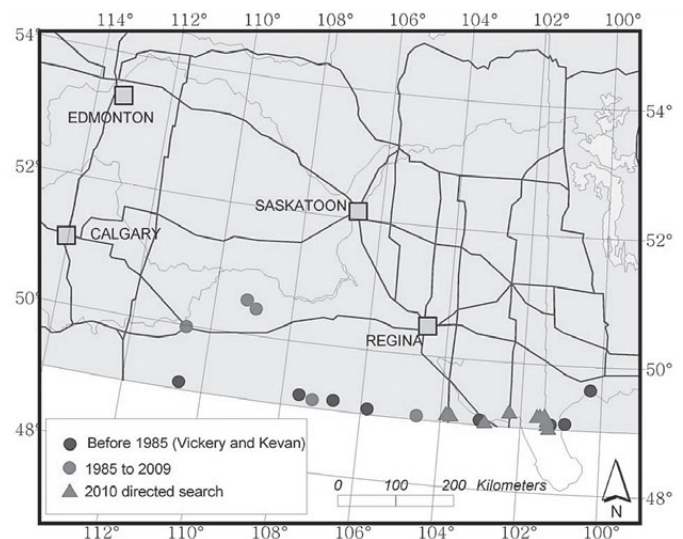
*Hypochlora alba* is usually referred to as the Greenish-white Grasshopper in Canada. In the United States its common name is the Sagebrush

Grasshopper, Cudweed Sagewort Grasshopper, or Cudweed Grasshopper, because it is found in close proximity to its principal foodplant, White Sagebrush. It is a small, flightless grasshopper, with late instars and adult males typically 1.1 to 1.5 cm in length and adult females up to 2.0 cm. The Greenish-white Grasshopper is in the spur-throated (also called spine-breasted) subfamily of the short-horned grasshoppers. The body is a light, milky green colour with small green spots (speckles), and pale white longitudinal stripes.

### Distribution

The Greenish-white Grasshopper inhabits relatively undisturbed dry mixed grass prairie of the Great Plains of North America. Its distribution extends in a narrow grassland area from the southern Canadian Prairies to northern Texas, apparently restricted to the areas within the distribution of its food plant, White Sagebrush, but only at lower elevations where it can complete its life cycle and survive to reproduce.

The distribution of the Greenish-white Grasshopper in Canada historically includes southeastern Alberta, southern Saskatchewan north to the Great Sand Hills, and extreme southwestern Manitoba. After 1980, a decline was noticed in number of sites in the west.



Canadian distribution of the Greenish-white Grasshopper. Historical sites reported near the cities of Winnipeg and Brandon are not shown on this map, which otherwise includes all Canadian locations.

Source: November 2012 COSEWIC Status Report.

## Habitat

The habitat of the Greenish-white Grasshopper consists mainly of pastures and grassland in the mixed grass or dry mixed grass ecoregions where the principal food plant, White Sagebrush (and in some cases secondary food plants) occur; usually such sites are found in locations throughout the northern Great Plains and southern Canadian Prairies. Habitats may include livestock pastures and uncultivated sites along roadsides, fencelines, streams, disturbed land, or shelterbelts. White Sagebrush is a terpenoid-containing forb (Family Asteraceae), and is very rarely used as food by other insects. Plants typically reach about 20 to 50 cm high, with blue flowers and silver foliage and stems. The plant is used as food for all stages of the Greenish-white Grasshopper, and is therefore a critical requirement for breeding. An analysis of threats suggests a continuing decline in habitat.

## Biology

Greenish-white Grasshoppers overwinter as eggs in small egg pods laid near the surface of soil, near the food plant. The embryo overwinters with an incomplete degree of development, and continues growth when soil warms. It hatches later than most other grasshoppers, typically appearing in mid-July in Canada. Growth proceeds through 5 immature stages, and adults generally appear in August. By mid-August, populations are generally around 80% adult. As with other grasshopper species, behavioural adaptations have apparently allowed some expansion of geographic distribution. For example, in late instar and adult stages, Greenish-white Grasshoppers may sun themselves by sitting on the food plant perpendicular to incoming sunlight, often raising hind legs away from the body, thus raising the body temperature.

## Population Sizes and Trends

By comparison with other species with similar range and based on the literature, Greenish-white Grasshopper was thought to be common at its sites in Canada until 1980, after which it was rarely seen, and after which a decline is thought to have occurred. This decline is well documented in some areas. For example, it was previously found in Onefour, Alberta, according to collections taken in the late 1970s and early 1980s; however, it was not found in these same locations during sampling between 1984 and 2002. During 2000-2006, in a large rangeland area near Onefour, a sample of over 10,000 grasshoppers was studied but contained no Greenish-white Grasshoppers. During 2003-2007, collections indicated a general decline in Canada. However, field sampling in August 2010 suggested that this species has recovered to discernable levels in some eastern portions of the range. The increase of the population in Canada may have resulted from relatively cool and moist conditions.

## Threats and Limiting Factors

An analysis of six poorly documented minor threats (including: 1) Conversion to tame pasture with Crested Wheatgrass; 2) Warmer and moister conditions; 3) Pesticide use and drift; 4) Dams, reservoirs, irrigation; 5) Oil and gas exploration; and 6) Heavy grazing leading to takeover by invasive plants) suggests a continuing medium-level threat impact on the habitat.

## Protection, Status, and Ranks

COSEWIC assessed this species as Special Concern in November 2012. Currently, this insect species and the food plant habitat have no protection or conservation status. ■

## Haida Gwaii Slug



Photo: © Kristina Ovaska

### Scientific name

*Staala gwaii*

### Taxon

Molluscs

### COSEWIC status

Special Concern

### Canadian range

British Columbia

### Reason for designation

This small slug is a relict of unglaciated refugia on Haida Gwaii and on the Brooks Peninsula of northwestern Vancouver Island. It represents a recently described species and genus, and is found nowhere else in the world. It lives mostly in cool, moist microhabitats in the subalpine zone, but it has also been found in a few forested sites. Grazing and browsing by introduced deer on Haida Gwaii have greatly modified the species' habitat and have probably reduced its population; this grazing is apparently increasing at higher elevations. Climate change also threatens to reduce the extent of the slug's preferred subalpine habitat.

### Wildlife Species Description and Significance

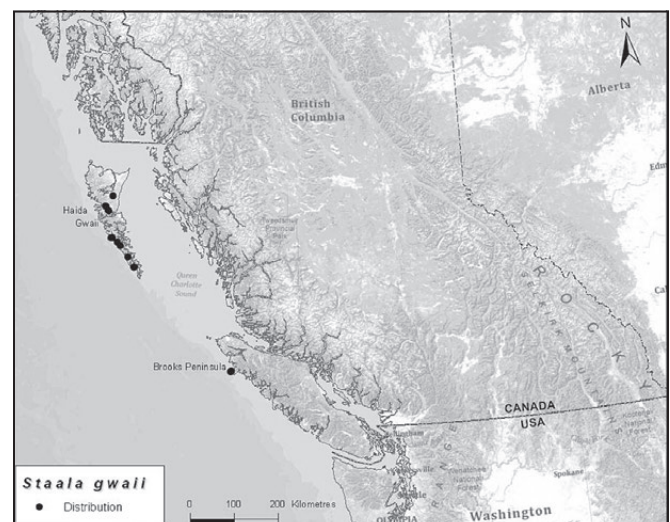
The Haida Gwaii Slug (*Staala gwaii*) was discovered in 2003 in Haida Gwaii (Queen Charlotte Islands) and has subsequently been found also on Brooks

Peninsula, Vancouver Island, British Columbia.

Both areas harbour unique ecosystems and contain many rare species and subspecies as a result of the glacial history of the islands. The Haida Gwaii Slug is the only known terrestrial gastropod in western North America that is a relict of pre-glaciation times and has not expanded its range outside restricted areas. This small slug with adult size of only 1 – 2 cm has a distinctive appearance. The mantle is raised into a pronounced hump, and the entire body, including the tail, neck and mantle, is covered with small, often black-tipped projections or papillae. The colour ranges from jet black to grey or tan; darker mottling is often present on the mantle.

### Distribution

The Haida Gwaii Slug is known from Moresby and Graham islands, the two main islands of the Haida Gwaii archipelago, and from Brooks Peninsula on northwestern Vancouver Island. In Haida Gwaii, there are records from 11 sites, which may represent six populations, three on each island. Much of the potentially suitable habitat on the islands, especially in alpine – subalpine areas and montane forests, has not been surveyed for gastropods, and additional sites and populations probably exist.



Global and Canadian distribution of the Haida Gwaii Slug.

Source: May 2013 COSEWIC Status Report.



## Habitat

The slugs are found most commonly in open, subalpine-type habitats with krummholtz formations. The habitat is characterized by scattered stunted trees, swales of low shrubs and grasses, and near-saturated ground, often with a moss cover. The slugs also occur in higher elevation forests but have been found only sporadically in lowland forests in Haida Gwaii, where most search effort has taken place. Humid microhabitat conditions, together with coarse woody debris, rocks, or a deep moss mat that provide cover from predators and harsh conditions, are thought to be important habitat features.

## Biology

The life history and habits of the Haida Gwaii Slug are poorly known. Very small, recently hatched juveniles have been found from July – September, and adults appear in the samples in autumn. The generation time is probably 1 year. The slugs are poor dispersers, as shown by their extremely patchy distribution in lowland forests in Haida Gwaii. Their patchy distribution may also be indicative of their inability to persist in areas that contain a relatively high diversity of invertebrate predators and competitors, including other gastropods.

## Population Sizes and Trends

Population sizes and trends are unknown. The slugs were readily found in subalpine and alpine habitats on Moresby Island, suggesting relatively high abundance. The Alpine Tundra and adjacent Mountain Hemlock biogeoclimatic zone, however, together consist of only 6% of the land area of the archipelago. In Haida Gwaii, the species has been found only rarely and in low numbers in the coastal Western Hemlock biogeoclimatic zone, which covers much of the islands.

## Threats and Limiting Factors

The Haida Gwaii Slug is associated with cool, moist microhabitats and may be particularly sensitive to modifications in temperature and moisture regimes. The main threats to this species are predicted to stem from climate change and in Haida Gwaii, habitat

alteration from browsing by introduced Sitka Black-tailed Deer. Logging is a threat at some sites on Graham Island. Climate change is predicted to result in habitat loss and alteration in alpine-subalpine habitats, where two-thirds of known sites for the species are located, as the tree line moves upwards. Alpine and subalpine zones in Haida Gwaii and Brooks Peninsula occur at relatively low elevations and would therefore experience rapid shrinking. Introduced deer occur throughout Haida Gwaii, including alpine-subalpine areas, and have profoundly altered understory vegetation, but their specific effects on this slug have not yet been measured. Deer browsing can decrease litter accumulation and increase exposure of the ground to sun and wind, resulting in lower humidity in micro-sites used by the slugs. Depressed abundance of terrestrial gastropods in response to ungulate browsing has been documented on small outer islands of Haida Gwaii and in northern Europe.

## Protection, Status, and Ranks

As of May 2013, the Haida Gwaii Slug has no legal protection or status under the federal *Species at Risk Act*, *BC Wildlife Act*, or other legislation. In British Columbia, it is on the provincial Blue-list of species at risk.

On Vancouver Island, the Haida Gwaii Slug occurs in Brooks Peninsula Provincial Park. Haida Gwaii contains large tracts of protected areas, including Gwaii Haanas National Park Reserve and Haida Heritage Site on Moresby Island, which encompasses six of 11 known sites of the Haida Gwaii Slug on the archipelago. The remaining five sites in Haida Gwaii are on BC Crown lands on Graham Island. The Duu Guusd Heritage Site/Conservancy protects a large area in northwestern Graham Island but has not been surveyed for gastropods. Legal establishment of land use objectives through the Haida Gwaii Land Use Objectives Order in December 2010 includes ecosystem-based management on forestry lands. The implementation of the Order may benefit the Haida Gwaii Slug through objectives for Biodiversity and Wildlife and through objectives pertaining to riparian zone and watershed protection under Aquatic Habitat. ■

## Hairy Braya



Photo: © James G. Harris

### Scientific name

*Braya pilosa*

### Taxon

Vascular Plants

### COSEWIC status

Endangered

### Canadian range

Northwest Territories

### Reason for designation

This plant is restricted globally to a very small area in the Northwest Territories. It is endangered by the loss of habitat through very rapid coastal erosion and saline wash resulting from storm surges, and by permafrost melting. These events appear to be increasing in frequency and severity as a consequence of a significant reduction in sea ice cover on the Beaufort Sea and changes in weather patterns. These indirect impacts of climate change are expected to continue into the foreseeable future.

### Wildlife Species Description and Significance

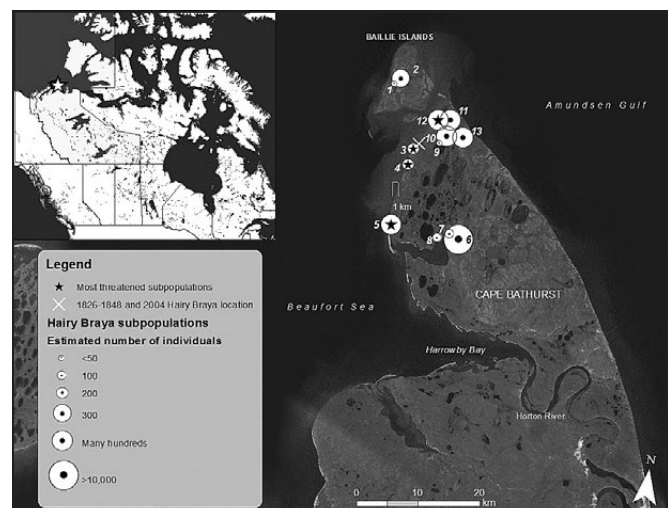
Hairy Braya (*Braya pilosa*) is a long-lived perennial mustard with one to many stems 4.0-12 cm long, erect to ascending to almost prostrate and moderately to densely hairy. It is distinguished from other *Braya* species by its large flowers and globose (nearly spherical) fruits with very long persistent styles.

Hairy Braya is a narrow endemic of arctic Canada that likely played a crucial role in the evolution of other *Braya* species.

### Distribution

Hairy Braya is only known to occur on Cape Bathurst in the Northwest Territories of Canada. There are 13 populations on the northern portion of Cape Bathurst and on the nearby Baillie Islands.

Hairy Braya is restricted to an area that remained ice-free during the Pleistocene and it has apparently been unable to move into surrounding glaciated areas over the millennia since the ice receded.



Global and Canadian distribution of Hairy Braya in the Northwest Territories.

Source: Species at Risk Committee, 2012. Species Status Report for Hairy Braya (*Braya pilosa*) in the Northwest Territories. Species at Risk Committee, Yellowknife, NT. Map created by Michelle Henderson (NWT Species at Risk Secretariat).

### Habitat

Hairy Braya grows on bluffs and dry uplands on patches of bare, calcium-rich sandy or silty soils. It typically grows with Arctic Willow, Entire-leaved Mountain-avens, and various grass species including Richardson's Fescue, Arctic Wheatgrass, Arctic Bluegrass, and Alkali Grass. These habitats appear to be quite limited on Cape Bathurst. Patches of suitable habitat are often separated by large areas of wet tundra, or by eroded cliffs or salinized soils. Coastal areas southwest of Cape Bathurst are rapidly eroding, and a decrease in arctic sea ice is likely hastening the erosion of Hairy Braya habitat along the coast.





Photo: © James G. Harris

Hairy Braya habitat.

## Biology

Hairy Braya was lost to science from 1850 to 2004. As a result, very little is known about the biology of the species. However, the large, fragrant flowers suggest that the plant is insect-pollinated, and seeds germinate readily.

There is some genetic and morphological evidence that two related species, Smooth Braya and Greenland Braya may have arisen from Hairy Braya, and it is possible that hybridization between these species, both of which overlap in distribution with Hairy Braya, may be ongoing.

## Population Sizes and Trends

Precise counts of the number of individuals have not been made, but estimates of the number of mature individuals observed in 2011 range from about 12,000 to 16,000. Populations on coastal bluffs subject to rapid erosion are clearly at risk of declining. The total number of individuals in one coastal population plummeted between 2004 and

2011. It can be expected that similar populations on eroding shorelines will be similarly affected. Trends and fluctuations in population sizes on protected sections of the coast and on inland bluffs have not been determined, but population sizes appear to be stable.

## Threats and Limiting Factors

The most obvious threat to Hairy Braya is a loss of habitat due to rapid erosion and saline wash of coastline habitat resulting from storm surges and permafrost melting. These events appear to be increasing in frequency and severity as a consequence of a substantial reduction in ice cover on the Beaufort Sea over the past few decades. These impacts of anthropogenic climate change are expected to continue into the foreseeable future, and therefore it is unlikely that coastal erosion rates will decrease.

## Protection, Status, and Ranks

Hairy Braya is ranked as critically imperilled globally (G1) and nationally (N1) by NatureServe, and has been assessed as Threatened in the Northwest Territories. Due to the remoteness of Cape Bathurst, Hairy Braya faces little direct threat from human activities. Cape Bathurst includes the calving grounds of the Cape Bathurst caribou herd and a local conservation plan recommends that the area be managed so as to eliminate, to the greatest extent possible, potential damage and disruption. ■

## Island Tiger Moth

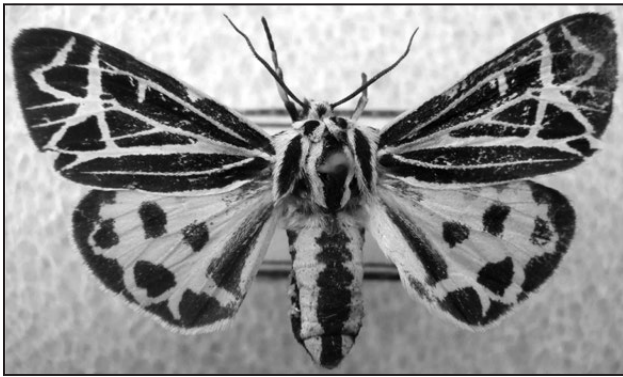


Photo: © Jennifer Heron

### Scientific name

*Grammia complicata*

### Taxon

Arthropods

### COSEWIC status

Threatened

### Canadian range

British Columbia

### Reason for designation

This near endemic moth has a small distribution and is restricted to only 5 locations in the Georgia Basin in British Columbia. Much of its habitat has been destroyed and the quality of what remains is declining due to ongoing residential and commercial development, recreational activities, invasive or non-native species, and vegetation succession that has changed due to disruption of former fire regimes.

### Wildlife Species Description and Significance

Island Tiger Moth (*Grammia complicata* Walker) is a medium sized moth (wingspan 32 mm to 40 mm) in the family Erebiidae, subfamily Arctiinae. The upper wing surfaces vary from dark brown-black interlaced with whitish to pale orange patterns along the wing veins; to the converse, with an orange-peach background with dark brown-black vein-like patterns. The hind wings are typically lighter than the forewings, pale orange, with brown dots towards the outer wing margins which are also brown. The head, thorax and abdomen are dark brown-black with peach-orange

markings. In general, Tiger moth (*Grammia* spp.) larvae are up to 6 cm long, have black - orange lateral stripes and are densely covered in dark hairs. This species was recently (2009) separated from the Ornate Tiger Moth based on morphological and genetic evidence.

### Distribution

Island Tiger Moth is endemic to the Georgia Basin. With the exception of one record from Orcas Island, Washington State, the moth is a Canadian endemic. On Vancouver Island, Island Tiger Moth ranges from the Greater Victoria area north to Comox and there are records from Thetis, Sandy and Savary Islands. Based on historical and current records, the species' Canadian range is 3600 km<sup>2</sup>.

Island Tiger Moth is considered extant at five sites in B.C.: Goose Spit, Sandy Island, Nanoose Hill, Savary Island and Thetis Island. The habitat at some sites span multiple landowners. The record on Thetis Island is considered old (1975) although there is much potential habitat on the island and the moth may be present. Based on the threat of land development (due to land ownership), there are 5 – 8 locations.

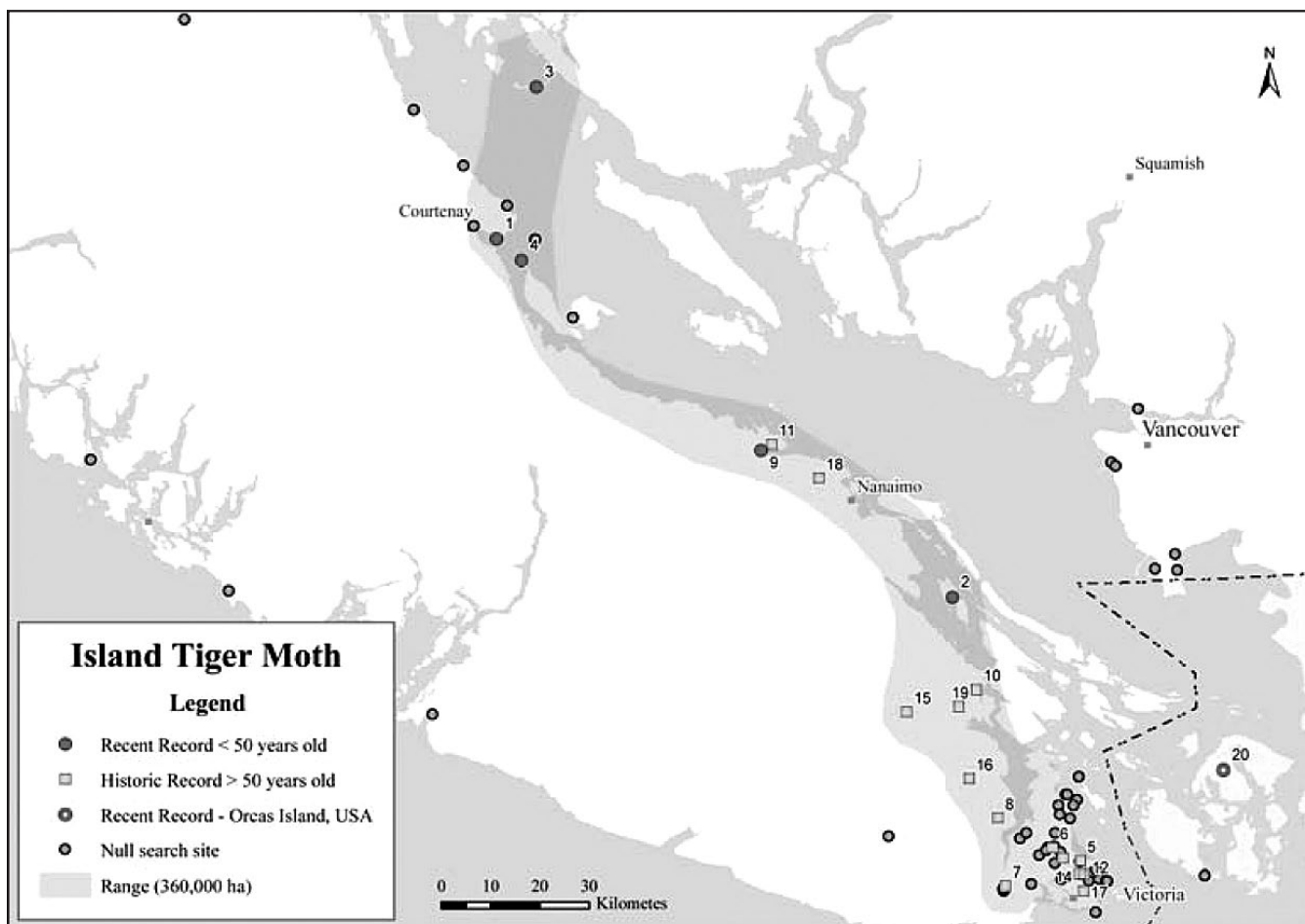
### Habitat

Island Tiger Moth has been recorded from a variety of habitat types including open and grassy Garry Oak forest; open moist to dry meadows; grassy shoreline sandy areas and in more stabilized, sparsely vegetated areas in sand dunes. The Moths of the genus *Grammia* typically do not inhabit closed forest habitats. The larval host plants for Island Tiger Moth are unknown, although tiger moths are known to be generalist herbivores. There is an early record of larvae being collected on introduced English Plantain.



Photo: © Jennifer Heron

Island Tiger Moth habitat.



Global range (Site Numbers 1–20) and Canadian range extent (shaded) of Island Tiger Moth.

Source: May 2013 COSEWIC Status Report.

## Biology

According to museum and collection records Island Tiger Moth adults are active from May through late July. Larvae have been collected in both early March and late July. Females have heavy bodies and comparatively small wings: they are incapable of more than short distance dispersal.

## Population Sizes and Trends

Information on Island Tiger Moth population sizes and trends in B.C. is minimal. Most records are historical or a single individual at one site on one date.

## Threats and Limiting Factors

Threats to Island Tiger Moth and its associated habitat include residential and commercial development, recreational activities, and vegetative succession from both invasive and native species.

## Protection, Status, and Ranks

Island Tiger Moth is not protected by any existing legislation. Within provincial parks and protected areas, lands managers are aware of the moth's records within parks, although detailed provisions in park management planning have yet to be addressed. The B.C. Conservation Data Centre has not assigned the moth a conservation status rank, although preliminary status ranking places the moth at S1 Red-listed (Critically Imperilled). The global status rank is G1G2 (critically imperilled). The Canadian and B.C. general status rank is "May Be At Risk". ■



## Massasauga (Carolinian population)



### Scientific name

*Sistrurus catenatus*

### Taxon

Reptiles

### COSEWIC status

Endangered

### Canadian range

Ontario

### Reason for designation

The population is reduced to two highly isolated and restricted areas surrounded by intense threats from neighbouring development and subject to illegal exploitation. The sub-populations are small and subject to genetic and demographic stochasticity that endangers future growth. Habitat quality also continues to decline.

### Wildlife Species Description and Significance

The Massasauga (*Sistrurus catenatus*) is a relatively small, thick-bodied rattlesnake with a segmented rattle on its tail tip. It is grey, tan or light brown with dark brown, bow-tie shaped blotches on its back and is often confused with other banded or blotched Ontario snakes. The Massasauga has elliptical pupils and a pair of heat-sensitive pits between the eyes and nostrils. The Massasauga is Ontario's only remaining venomous snake and provides a unique

opportunity for us to respect and co-exist with a creature that can cause us harm. Despite widespread persecution, Massasaugas pose little threat to public safety. In First Nations traditions, Massasaugas are the medicine keepers of the land, a reminder to tread lightly and to take only what we need.

### Distribution

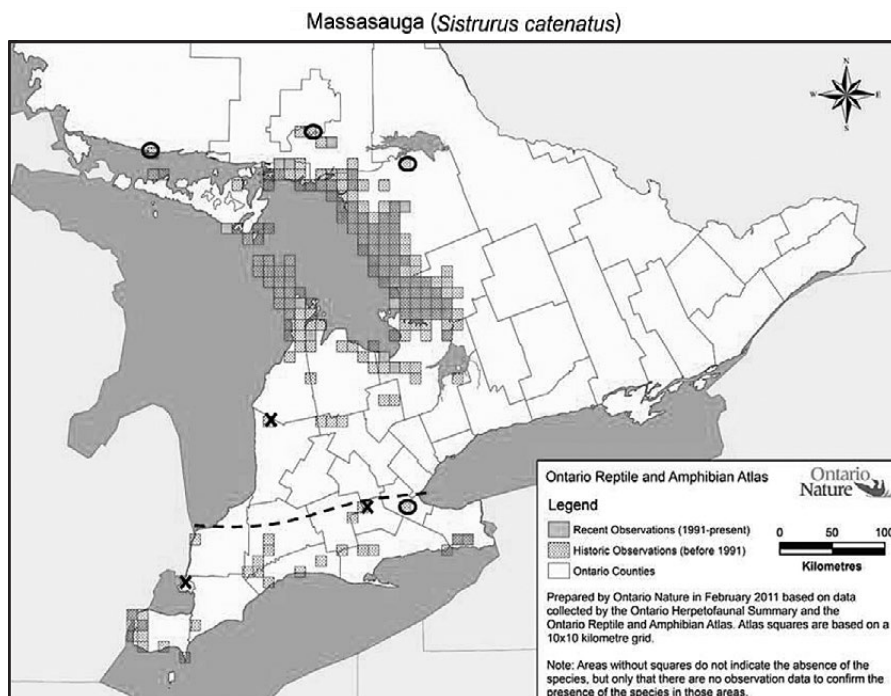
The Massasauga ranges from Canada (Ontario) south into northern Mexico, but only the eastern subspecies (*S. catenatus catenatus*) is found in Canada. In Ontario, the Massasauga occurs as two designatable units: (1) in the Georgian Bay region, mostly on the northern Bruce Peninsula and along the eastern shore of Georgian Bay, and (2) in the Carolinian region of southwestern Ontario, at Ojibway Prairie in Windsor/LaSalle and at Wainfleet Bog near Port Colborne. The size of the Canadian range of the Massasauga has decreased considerably in comparison to its historical range and continues to shrink.

### Habitat

Massasauga habitat in Canada varies from wet prairie and old fields to peatlands, bedrock barrens, and coniferous forests. Massasaugas require a semi-open habitat or small openings in forest to provide both cover from predators and opportunities for thermoregulation. Hibernation sites are often damp or water-saturated, and include mammal or crayfish burrows, rock fissures and other depressions that allow access below the frost line. Quantity and quality of Massasauga habitat in the Carolinian region continue to decline. Habitat surrounding Georgian Bay, although relatively widespread and intact, is subject to moderate levels of degradation and loss.

### Biology

In Ontario, Massasaugas are active for half of the year (spring to fall) and hibernate for the other half. They are sit-and-wait predators and feed almost exclusively on small mammals. They are prey for a variety of raptors and medium-sized mammals. The Massasauga is shy, preferring to retreat or rely on camouflage and shrub cover to avoid detection by predators or people. Depending on the population, Massasaugas may cover distances as great as a few kilometres or exhibit limited dispersal and small daily movements. Mating occurs in late summer and young



Historical and contemporary occurrence records of Massasauga. Approximate northern boundary of the Carolinian faunal province is depicted by the dashed line (COSEWIC 2009b). Symbols depict historical "locations" that have either been rejected (X) or accepted (O) for the purposes of discussing historical and contemporary "locations" and for estimating range size. Atlas grid squares are 10 x 10 km.

Source: November 2012 COSEWIC Status Report; used with permission of Ontario Nature.

are born live the following summer. Females become sexually mature at 3-5 years of age and give birth every other year. Massasaugas can live over 10 years in the wild and have a generation time of about 8 years. Natural adult mortality rates are 25% - 40% per year.

## Population Sizes and Trends

Some of the most secure populations of the Eastern Massasauga in all of North America occur in the Georgian Bay region. Population size is estimated at roughly 10 000 adults, mostly concentrated along the upper Bruce Peninsula and on the eastern shore of Georgian Bay. Although the number of subpopulations in the region appears stable, an overall long-term decline in total population size is suspected and probable. In the Carolinian region, Massasaugas are limited to several dozen adults at two small, isolated sites. The total Carolinian population size is in decline, and the range of each subpopulation has contracted significantly over the last 25 years. The Ojibway Prairie subpopulation is no longer viable and is projected to become extinct in the near future.

## Threats and Limiting Factors

Historical range-wide decline of the Massasauga in Canada is attributed to habitat loss from agriculture, resource extraction and massive road expansion in combination with widespread eradication efforts. Contemporary declines in the number of mature

individuals are suspected in the Great Lakes / St. Lawrence region due to a combination of habitat loss and degradation, persecution, collection, recreational development and road mortality. Habitat loss and degradation due to natural succession and urban sprawl are the greatest threats to the Carolinian population. A slow rate of reproduction and delayed maturity reduce this species' resilience to unnaturally high levels of adult mortality, and low dispersal rates dictate that extirpated subpopulations are unlikely to be recolonized naturally. The Carolinian subpopulations face the additional threat of stochastic extinction due to their small size and high degree of isolation.

## Protection, Status, and Ranks

The Massasauga was assessed as 'Threatened' in Canada by COSEWIC in 1991 and 2002, and as 'Threatened' in Ontario by COSSARO in 1998. Currently, this species is listed as 'Threatened' under both the Ontario *Endangered Species Act* (ESA), 2007 and the federal *Species at Risk Act*, 2002. It is also considered a 'Specially Protected Reptile' under the Ontario *Fish and Wildlife Conservation Act*, 1999. The Massasauga is listed as 'Least Concern' by the International Union for the Conservation of Nature (IUCN), but has been assessed by NatureServe (2011) as 'Vulnerable' globally, nationally and provincially (G3G4,N3,S3). Nine of 10 states with the Eastern Massasauga designate it as S1 or S2. ■



## Mottled Duskywing (Boreal population and Great Lakes Plains population)



Photo: © Jessica E. Linton

### Scientific name

*Erynnis martialis*

### Taxon

Arthropods

### COSEWIC status

Endangered (Boreal population and Great Lakes Plains population)

### Canadian range

Manitoba (Boreal population)  
Ontario, Quebec (Great Lakes Plains population)

### Reason for designation

#### Boreal population:

This butterfly is declining throughout its North American range. In Canada, this particular population is restricted to a small area of pine woodland in southeastern Manitoba. All locations are under threat. One location is predicted to become flooded within ten years and the other four are expected to experience substantial population declines due to natural forest succession. The species' habitat at all locations is at risk of Btk spraying to control Gypsy Moth. Any currently undocumented sites are likely to be experiencing a similar range of threats.

#### Great Lakes Plains population:

The population has disappeared from Quebec and now occupies a few, isolated locations in southern Ontario that continue to decline in number. Population numbers are also declining. The species is primarily threatened by habitat fragmentation,

but also by habitat loss and degradation through, for example, development, natural succession, fire suppression, and extensive deer browsing.

### Wildlife Species Description and Significance

Mottled Duskywing (*Erynnis martialis*) is a butterfly in the skipper family (Hesperiidae). It is a medium-sized (wingspan 23-29mm) dark grey skipper with a very mottled appearance and a characteristic purplish hue. Yellow-brown spots create the mottled hindwing pattern, which distinguishes the Mottled Duskywing from other duskywing butterflies.

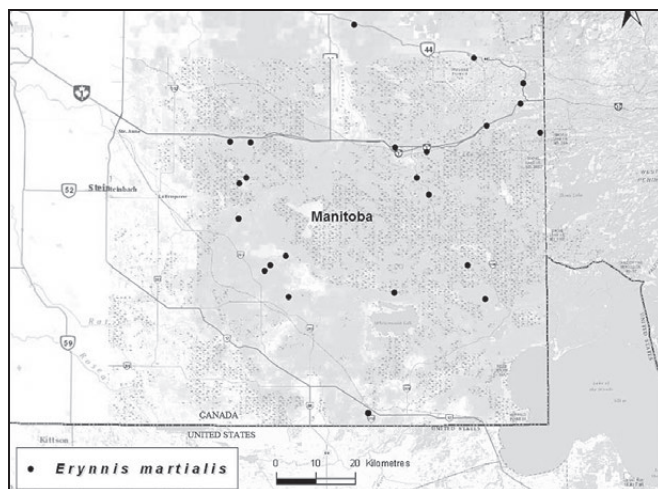
Mottled Duskywing is taxonomically distinct with no known subspecies. It is also genetically distinct from its closest relatives. The Mottled Duskywing is a butterfly representative of some of the rarest ecosystems in Canada, such as oak woodlands, pine woodlands, tall grass prairies and alvars with dry or sandy soils and early successional habitat. The Mottled Duskywing is experiencing declines similar to other butterfly species that occupy similar habitats such as the Karner Blue, Frosted Elfin, and Eastern Persius Duskywing, all assessed as extirpated in Canada.

### Distribution

The present day range of Mottled Duskywing is from the eastern United States from Pennsylvania to Minnesota, south to Georgia and eastern and central Texas. The species extends into Canada in southeastern Manitoba and southern Ontario with populations in each region being separate designatable units (DU): the Boreal population (southern Manitoba) and Great Lakes Plains population (southern Ontario and historically Québec).

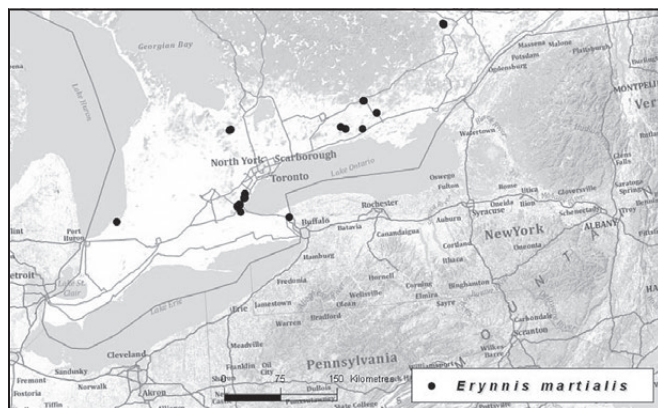
### Habitat

The Mottled Duskywing requires its host plants, New Jersey Tea (Great Lakes Plains DU) and Prairie Redroot (Boreal DU), during its life cycle. In Canada, these plants grow in dry, well-drained soils or alvar habitat within oak woodland, pine woodland, roadsides, riverbanks, shady hillsides and tall grass prairies. The butterfly is frequently absent from apparently suitable host plant patches, suggesting additional limiting factors play a role in the species' site occupancy. The host plants also appear to be declining throughout most of the butterfly's range and the habitats may also be imperiled.



Records of Mottled Duskywing – Boreal population (Manitoba).

Source: November 2012 COSEWIC Status Report.



Recent records (1998–2008) of Mottled Duskywing – Great Lakes Plains population (Ontario). Likely extirpated in Quebec.

Source: November 2012 COSEWIC Status Report.

## Biology

Females oviposit single eggs on flower pedicels or other parts of the host plant. Larvae emerge and construct silk leaf-nests. The species overwinters as mature larvae, which pupate in April and emerge as adults from mid-May to late June throughout most of their Canadian range. In southwestern Ontario, a second brood pupates in early July and a second flight period occurs from mid-July to late August.

## Population sizes and trends

The Mottled Duskywing has always been reported as small colonies. It has experienced widespread declines across most of its known global range. Within Ontario, the species appears to have become extirpated from many historic

sites in the past 20 years. At some sites where the butterfly has been recently recorded, surveys within the past five years have failed to record it. In Manitoba, the Mottled Duskywing also appears to be declining in both abundance and habitat quality. The species is considered extirpated from Québec.

## Threats and limiting factors

Almost all current sites are under some threat. Urban development, natural succession, inappropriate fire management (for the butterfly and its host plant), Btk spray to control the non-native defoliator Gypsy Moth, natural flooding and the planting of Jack Pines are the primary threats to one or more sites.

There appear to also be unknown biological limiting factors contributing to the decline of Mottled Duskywing. Compounding the threats is the species' metapopulation structure, which likely makes it sensitive to habitat fragmentation. When sites are simultaneously impacted by one or more threats, and populations become extirpated from one of an interconnected series of sites, it is unlikely the site will be recolonized through natural dispersal, especially in southern Ontario.

## Protection, Status and Ranks

The Mottled Duskywing is not protected by federal legislation. In Ontario, the butterfly is protected under two provincial statutes: the *Fish and Wildlife Conservation Act* and the *Provincial Parks and Conservation Reserves Act*. In Manitoba, the species is not listed under the provincial Endangered Species Act. The species' habitat is protected within Manitoba provincial forests and parks; however timber production and Mottled Duskywing habitat management objectives potentially conflict.

The provincial conservation status ranks are imperiled (S2) in Ontario, imperiled in Manitoba (S2) and presumed extirpated in Québec (SH). The Canada national status rank is imperiled/vulnerable (N2N3). Host plants are apparently secure (S4) in Ontario, vulnerable (S3) in Manitoba and imperiled (S2) in Québec.

In Ontario five historic sites are within protected areas: Bronte Creek Provincial Park, Glenorchy Conservation Area, Karner Blue Sanctuary (private conservation area), Pinery Provincial Park and St. Williams Forestry Conservation Reserve. In Manitoba, all sites where the butterfly has been recorded in recent years are in Provincial Parks or Forests. ■

## Plymouth Gentian



Photo: © Sean Blaney

### Scientific name

*Sabatia kennedyana*

### Taxon

Vascular Plants

### COSEWIC status

Endangered

### Canadian range

Nova Scotia

### Reason for designation

This showy perennial lakeshore plant has a restricted global range with a disjunct distribution limited to southernmost Nova Scotia. There is a concern regarding potential widespread and rapid habitat degradation due to recent increases

in levels of phosphorus in lakes, tied to a rapidly growing mink farming industry. Though the population size is now known to be larger than previously documented due to greatly increased survey effort, the species is also at risk due to the continuing impacts associated with shoreline development, and historical hydro-development.

### Wildlife Species Description and Significance

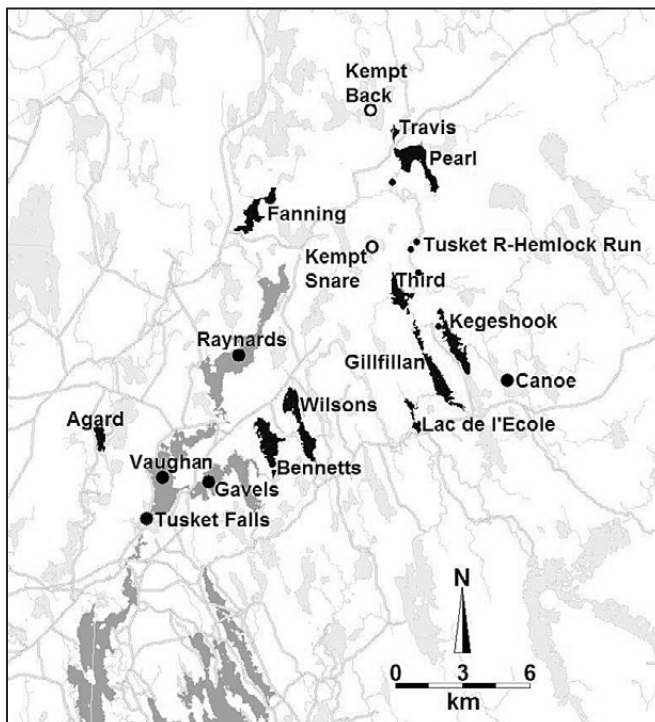
Plymouth Gentian is an herbaceous perennial with single, erect, flowering stems 30 to 50 cm tall arising from a basal rosette of narrow (oblanceolate) leaves 3 to 8 cm long. Basal rosettes produce short green stolons which form new rosettes at their tips. Clusters of interconnected rosettes are frequently produced. Erect stems have opposite leaves and one to three (rarely up to five) 5 cm-wide flowers of 7-13 pink petals with yellow bases.

Plymouth Gentian is a globally rare species, co-occurring in southern Nova Scotia with a suite of rare, disjunct species of the Atlantic Coastal Plain. Nova Scotia populations are 400+ km from the nearest sites in Massachusetts. An investigation of genetic diversity suggests that Nova Scotia populations may have a disproportionate significance to the species. The attractive flowers provide cottagers and the public with an easily appreciated reason for good stewardship of habitats supporting rare Atlantic Coastal Plain species.

### Distribution

Plymouth Gentian has a very limited global range with three highly disjunct areas of occurrence: 1) along the North Carolina – South Carolina border near the Atlantic Coast; 2) in coastal regions of Massachusetts and Rhode Island; and 3) in extreme southwestern Nova Scotia on the shores of ten lakes in three river systems (Annis, Carleton and Tusket rivers), all of which flow into the Tusket River estuary. Roughly 10% of its global range is in Canada.





Distribution of Plymouth Gentian within the lower Tusket River valley, Nova Scotia. A reported occurrence at Little Tusket Lake (30 km north of Travis Lake) that was likely actually from Tusket Falls is not shown. Black shaded lakes support extant populations. Small dots between Pearl and Third lakes are isolated occurrences. Large filled dots are historical occurrences with imprecise localities. Large, unfilled dots (Kempt Snare and Kempt Back lakes) represent a single historical record from "Kempt Lake" reported from these lakes but likely actually from Travis Lake at Kemptville. Grey shaded water downstream from Raynards and Gavels lakes is unsuitable habitat (saline or brackish waters below Tusket Falls and dam-controlled reservoirs above Tusket Falls).

Source: November 2012 COSEWIC Status Report.

## Habitat

In Nova Scotia, Plymouth Gentian occurs on lakeshores (rarely river shores) on sand, gravel and peat substrates, within the zone annually or semi-annually exposed in summer but where winter flooding protects plants from freezing. Plymouth Gentian is associated with lakes having especially large upstream catchment areas because the greater fluctuations in water level, wave action and ice scour limit shoreline fertility and inhibit more competitive species. In New England, Plymouth Gentian is mostly found on sandy, gravelly or muddy shores of small kettle ponds. In the Carolinas, the species occurs on river and pond shores and in acidic swamps.



Photo: © Sean Blaney

Plymouth Gentian habitat.

## Biology

Plymouth Gentian is a clonal perennial that reproduces by seed, by stolons producing daughter rosettes, and by vegetative fragments moved by ice and water. In Canada, it flowers from mid-July to late September. It is pollinated by a range of generalist pollinators and is self-compatible. Each flower can produce 300-1,400 tiny seeds released in early fall. Dispersal is likely largely by water as seeds can float for at least a day. Seed banks of unknown longevity are reported as very important for persistence in Massachusetts and are present in Nova Scotia, but may be less important there because of more stable habitats. Rosettes grow for two to five or more years and die after flowering, but longevity of genetic individuals is unknown. Generation time, factoring in reproduction by seed and by vegetative means, may be approximately five years.

## Population Sizes and Trends

The total Canadian population is estimated at 73,400 to 90,700 flowering stems and 771,400 to 971,500 rosettes, with number of mature individuals in between those totals. There are four extant populations on ten lakes. Two populations on the main branch of the Tusket River are spread over two and six interconnected lakes respectively and support 98% of the total.

Ongoing shoreline development has caused minor declines (<<2.8% total). Eutrophication is likely also causing declines on one lake. Aside from these impacts, populations are believed to have been relatively stable over the past 15 years (three generations).

## Threats and Limiting Factors

Eutrophication is the most serious threat to Plymouth Gentian. One small population (Lake Fanning) appears to already be stressed by competition induced by eutrophication associated with mink farming. The nutrient-demanding invasive exotic Reed Canary Grass is established on this lake and is an imminent threat to Plymouth Gentian. Eutrophication (600-800% increases in total phosphorus between 2002 and 2011, possibly from a single mink farm) was detected throughout the Tusket River system in 2011, affecting lakes containing 98% of the Canadian population. No impacts on Plymouth Gentian in Tusket system lakes have yet been observed, but phosphorus levels in some Tusket lakes are approaching those at Lake Fanning.

Shoreline development is a widespread, ongoing threat affecting a small portion of the population. The species occurs on the shorelines of 200+ cottage or residential properties. About 27% of the population is on undeveloped private shorelines. New development continues, including within the densest Canadian population. Population losses from cottage development in the past 15 years

(three generations) are likely significantly less than 2.8%. About 38% of occupied habitat and 32% of the population is now in protected areas, somewhat mitigating development threats.

Hydroelectric dams on the lower Tusket River significantly reduced populations around 1929 and may be limiting recovery in affected lakes, but new dams are not a threat. Off-highway vehicles are locally affecting plants but do not appear to have major population effects.

## Protection, Status, and Ranks

Plymouth Gentian was assessed by COSEWIC as Endangered in November 2012, and as Threatened in May 2000. It is currently listed on Schedule 1 as Threatened under the *Species at Risk Act*, and provincially under the *Nova Scotia Endangered Species Act*. It is legally protected in Rhode Island (State Endangered), Massachusetts (Special Concern) and North Carolina (Special Concern), and is globally vulnerable (G3) and critically imperilled (N1, S1) and at risk nationally and provincially. It is also a species of regional concern in South Carolina, where there is no legal protection for rare plants. ■



## Riverine Clubtail (Great Lakes Plains population)



Photo: © Deanna Dodgson

### Scientific name

*Stylurus amnicola*

### Taxon

Arthropods

### COSEWIC status

Endangered

### Canadian range

Ontario

### Reason for designation

This dragonfly population is restricted to two small creeks that flow into Lake Erie. The impact of a variety of threats was determined to be very high, suggesting that there may be a substantial decline over the next decade. The threats include water withdrawal from the streams, pollution, and invasive alien species of fish that would feed on dragonfly larvae.

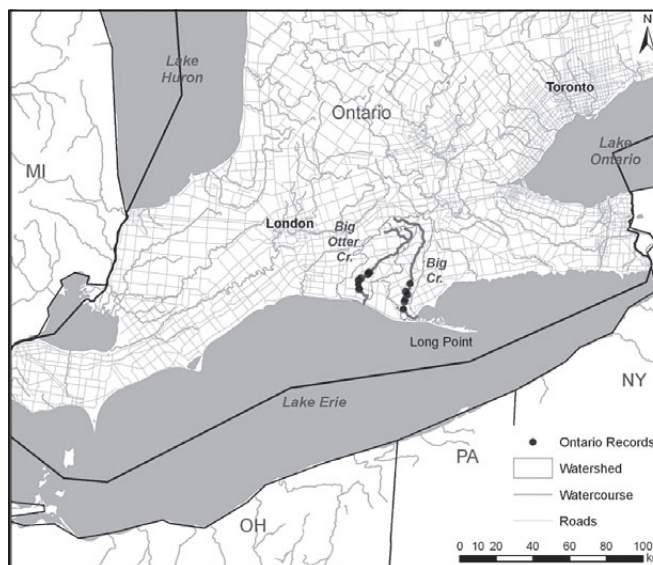
### Wildlife Species Description and Significance

Riverine Clubtail (*Stylurus amnicola*) is a dragonfly in the clubtail family. Members of the genus *Stylurus* are referred to as “hanging clubtails” for their habit of hanging vertically when perched on streamside vegetation. It is a small (47-49 mm long), slender dragonfly, with a prominent club at the end of the abdomen. The front of the thorax has a distinctive three-pointed star that distinguishes this species

from other hanging clubtails. The abdomen is blackish with small yellow spots along the top and prominent yellow spots on the sides near the tip. Females have yellow patches along the sides of the abdomen. The hind legs are mostly black. The larvae are distinguished by their small size and shape of the abdominal segments and mouth parts. This species may serve as a useful environmental indicator.

### Distribution

Riverine Clubtail occurs in eastern North America from southern Quebec and southern Manitoba south to southern Louisiana. The Canadian range of Riverine Clubtail may be divided into three separate regions: (1) the Ottawa River and St. Lawrence River valleys of Quebec; (2) Central north shore of Lake Erie in Ontario and (3) southeastern Manitoba.



Canadian distribution of Riverine Clubtail (Great Lakes Plains population) in Ontario.

Source: November 2012 COSEWIC Status Report.

### Habitat

Riverine Clubtail larvae inhabit a wide variety of riverine habitats ranging in size from the St. Lawrence River to small creeks. Larvae are typically found in microhabitats with slow to moderate flow and fine sand or silt substrates where they burrow into the stream bed. Adults disperse from the river after emerging and feed in the forest canopy and other riparian vegetation. As with other dragonfly species that inhabit rivers and streams, water regulation, pollution and invasive species may be impairing their habitat.

## Biology

Larvae spend most of their time buried just below the surface of the sediment in the bottom of the stream, breathing through the tip of the abdomen raised above the sediments. The larval stage probably lasts for two or more years prior to emergence in late June or early July. Newly emerged adults disperse inland to avoid predation until their exoskeleton hardens and they are able to fly well. Adults fly between mid July and early August, with peak numbers in mid July. Males cruise swiftly over the stream until they find a female. After mating, the female deposits eggs in the current of the open stream. Larvae obtain prey from the sediments using their prehensile labium. Adults are probably generalist and opportunist predators, feeding on small flying insects. Predators on Riverine Clubtail probably include fishes, birds, frogs, various mammals and insects including other dragonflies.

## Population Sizes and Trends

The population size and trends are unknown.

## Threats and Limiting Factors

The major threats to the Riverine Clubtail in Ontario, where threats are best understood, include water withdrawal for irrigation, water pollution, and invasive species. There is also increasing development

resulting in habitat loss and increasing susceptibility to predators which are supported by human population including raccoons, and many kinds of birds for which human occupation provides both nesting and foraging sites. Some of these threats are also present in Quebec and Manitoba, but to a lesser extent.

## Protection, Status, and Ranks

COSEWIC assessed both the Boreal population and the Prairie population of Riverine Clubtail as Data Deficient, and the Great Lakes population as Endangered in November 2012. The Riverine Clubtail is not currently protected under the *U.S. Endangered Species Act* or Canada's *Species at Risk Act*, or under provincial legislation in Quebec, Ontario, or Manitoba. No known Canadian sites are within provincial or federal parks.

In the NatureServe system, the Riverine Clubtail is ranked globally as G4 (Apparently Secure). Nationally, it is ranked as N3 (Vulnerable) in Canada and N4 in the US, S3 (Vulnerable) in Quebec, S1 (Critically Imperiled) in Ontario, and is unranked in Manitoba. In adjacent states it is ranked SX (Apparently Extirpated) to S3; it is rare but unranked in Minnesota. ■

## Silky Beach Pea



Photo: © Matt Fairbairns

### Scientific name

*Lathyrus littoralis*

### Taxon

Vascular Plants

### COSEWIC status

Threatened

### Canadian range

British Columbia

### Reason for designation

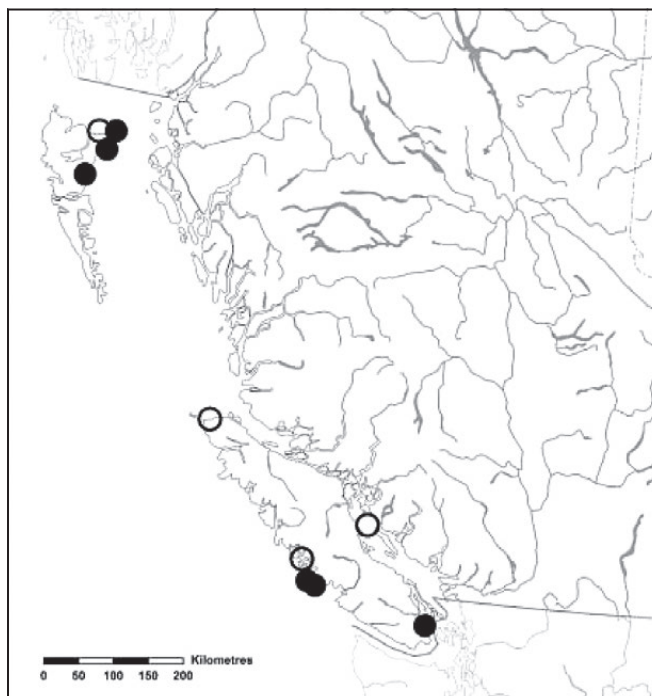
This plant of coastal dunes, which has much of its global range in Canada, is threatened because of competition with invasive alien plants, off-road vehicles, trampling, herbivory, and a decline in suitable habitat associated with more extreme and frequent storm surges due to climate change. The species' restricted distribution, the very small number of individuals, and the small number of subpopulations make the species at risk.

### Wildlife Species Description and Significance

Silky Beach Pea (*Lathyrus littoralis*) is a rhizomatous perennial herb that grows 10-60 cm tall. It has branched and densely grey-silky shoots bearing alternate and pinnately compound leaves with 4-8 leaflets and no tendrils. The pea-type flowers have smaller white lower and side petals but the larger upper petals are pink, red or purple. The pods are about 3 cm long and 1 cm wide, grey-silky, and contain 1-5 seeds.

### Distribution

Silky Beach Pea occurs in coastal regions from central California to British Columbia. In Canada, Silky Beach Pea is restricted to Vancouver Island, nearby islands, and Haida Gwaii. The Canadian populations occupy about 40% of the global range of the species.



Canadian distribution of Silky Beach Pea. Solid circles show extant populations. Hollow circles show transient populations or long-established populations that no longer exist. Several of the hollow circles indicate the former sites of multiple populations.

Source: May 2013 COSEWIC Status Report.

### Habitat

Silky Beach Pea is restricted to rapidly-drained dunes, sand plains and sandy beaches along Pacific Ocean shores. It does not tolerate shading and only occurs in open areas dominated by low grasses and forbs with little or no cover of native trees or shrubs. Since 1930, there has been a 50-90% decline in the areal extent of the sparsely-vegetated habitats favoured by the Silky Beach Pea.

### Biology

Silky Beach Pea reproduces by seeds and by rhizomes. Most seeds are shed in the immediate vicinity of the parent plant, but rhizome fragments may be dislodged by winter storms and carried to new beaches along ocean currents. Long-distance

transport very rarely results in the establishment of new populations. Plants growing on exposed beaches tend to be killed by winter storm surges. However, rhizome fragments may be occasionally carried into backshore areas above the reach of all but the most violent storms, where they may establish stable populations. As with many species in the pea family, Silky Beach Pea plants form a symbiotic relationship with bacteria; this facilitates nitrogen uptake in the otherwise nitrogen-poor sandy habitat environment where the species occurs. Silky Beach Pea plants produce chemicals that discourage most, but not all, invertebrate herbivory. Silky Beach Pea may be heavily grazed by deer.

### **Population Sizes and Trends**

The most recent estimation of the size of the Canadian population, derived from detailed surveys (2009-2011), is between 325 and 956 mature individuals.

### **Threats and Limiting Factors**

Invasive alien grass species (primarily European Beachgrass) pose the greatest threat to Silky Beach Pea. Several populations of Silky Beach Pea are threatened by off-road vehicle use and/or trampling by hikers. Silky Beach Pea is threatened by habitat loss as the result of storm surges associated with climate change. In areas where deer have been introduced, or occur in high numbers as the result of human actions, Silky Beach Pea is also threatened by herbivory.

### **Protection, Status, and Ranks**

At the time of assessment in April 2013, Silky Beach Pea was not protected by federal or provincial species at risk legislation. All or much of each of the six extant populations occurs in National Park Reserves, Provincial Parks, Provincial Ecological Reserves or Municipal Parks, which affords some measure of protection under general provisions affecting native plants. Silky Beach Pea has a NatureServe global rank of G3G4 (vulnerable to apparently secure, last reviewed 2013), a national rank of N2 (imperilled) in Canada, and is ranked as S2 (imperilled) in British Columbia. It has a General Status Rank of 2 (may be at risk). The national rank is not yet assessed (NNR) for the United States or in Oregon and Washington. In California it is ranked as S3S4 (vulnerable to apparently secure). ■



## Spiked Saxifrage

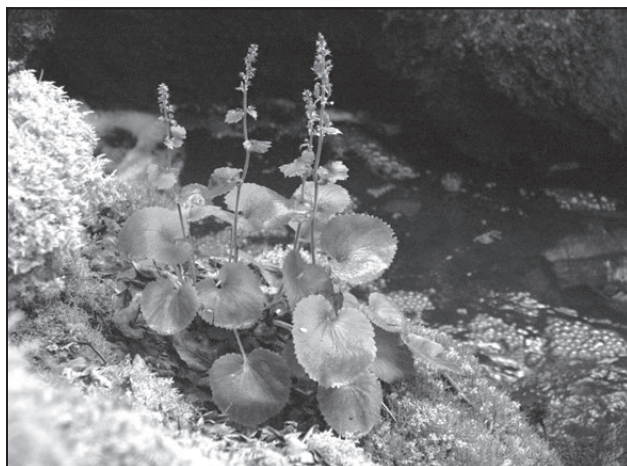


Photo: © Syd Cannings

### Scientific name

*Micranthes spicata*

### Taxon

Vascular Plants

### COSEWIC status

Threatened

### Canadian range

Yukon

### Reason for designation

This tall wildflower is one of a group of species found only in unglaciated areas of Yukon and Alaska. It lives along creek margins and is prone to the historical and current effects of habitat disturbance, such as placer mining. In addition, habitat is increasingly affected by natural disturbances such as flash flooding, forest fires, and landslides that may be increasing in frequency and severity due to climate change.

### Wildlife Species Description and Significance

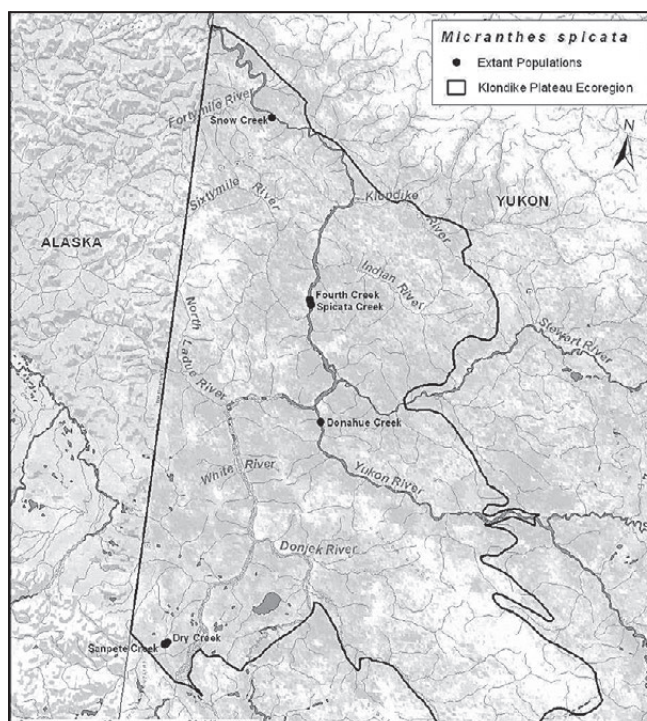
Spiked Saxifrage is a large, showy perennial herb, growing singly or in tufts from short, thick rhizomes. The inflorescence is borne on a stalk 15-70 cm tall.

Spiked Saxifrage is an eastern Beringian endemic, one of a small group of species known globally only from unglaciated areas in Alaska and western Yukon. The six known Canadian sites are at the eastern edge

of the species' range. In Yukon, Spiked Saxifrage appears to occupy a narrow ecological niche, with very specific habitat conditions and a short growing season.

### Distribution

Spiked Saxifrage is endemic to Yukon and Alaska. In Alaska it occurs throughout much of the central part of the state; in Canada it is known from six creeks in the Klondike Plateau Ecoregion in western Yukon. Approximately 10% of its global range is in Canada. The combined area of occupancy (coverage on the ground) of all sites is <3 ha, or 0.03 sq. km.



Potential Canadian range of Spiked Saxifrage showing the extant populations and the Klondike Plateau Ecoregion.

Source: May 2013 COSEWIC Status Report.

### Habitat

In Canada, Spiked Saxifrage grows on the banks and rocky shelves along creeks, on the moist ledges of adjacent outcrops, and on the narrow floodplain bordering the creeks. It grows in small piles of silt and moss-covered substrate, and on exposed soil near the creek. Plants may grow singly but often form dense clusters of up to several dozen plants. Alaskan populations of Spiked Saxifrage occupy a greater variety of habitats than do the Canadian populations found to date.



Creeks supporting populations of Spiked Saxifrage in Yukon share a number of characteristics: year-round flow of clear, cold water in narrow, rocky creeks that are subject to “glaciering” (i.e., *aufeis* ice that forms in winter as spring-fed water constantly flows over the frozen creek that may persist into July) or permafrost, which helps to maintain a humid, cold microclimate; with rock outcrops bordering the creeks, and abundant shade from forests of Alaska Paper Birch and/or White Spruce, alders and willows. One extant population has been heavily disturbed by placer mining, so its original condition is not known.

## Biology

Little is known of the biology of Spiked Saxifrage. Reproduction is by seeds and by rhizomes; conditions for germination are unknown. Self-fertilization is common among Saxifragaceae and may occur with Spiked Saxifrage. Longevity of the plants and possible seed banks are unknown.

The plant’s ability to withstand and repopulate after disturbance is unknown. It apparently can survive flooding, but severe flood events (e.g. a flash flood) may scour the floodplain and eliminate existing populations and possibly seed banks. However, plants growing on the outcrops above flood level may provide a seed source for repopulation, if essential habitat characteristics have not been altered.

## Population Sizes and Trends

The six populations totalled 3678+ plants in 2012, with counts of 132, 1682, 6, 652, 502, and 700+ for individual populations. Approximately 2500 of the total are considered to be mature.

Despite over a century of botanical collecting in the region, Spiked Saxifrage was only reported once in Canada (in 1899) until it was rediscovered in 2009, so it seems the species was uncommon or rare even during the gold rush era of the late 1800s and early 1900s. Although no population trends can be derived directly from data at hand, much of the species’ habitat was likely altered or destroyed by placer mining, road-building, and wood cutting since the late 1800s. These activities are continuing.

## Threats and Limiting Factors

Placer mining is the most extensive and destructive human cause of habitat loss for Spiked Saxifrage in Yukon. Placer mining activity fluctuates in rate and scope as a result of the changes in gold prices. Populations can be destroyed or diminished as a direct result of mining, or by upstream activities that affect its habitat, such as siltation (sediment build-up), damming, stream realignment, etc. As well, natural processes such as flash flooding, forest fires, and landslides may be increasing in frequency and severity due to human-induced climate change.

## Protection, Status, and Ranks

Spiked Saxifrage has a NatureServe Global rank of G3G4 (Vulnerable to Probably Secure). Its National Rank in the U.S. is N3N4 (Vulnerable to Probably Secure), and in Canada is N2 (Imperilled). Its Subnational Rank in Alaska is S3S4 (Vulnerable to Probably Secure), and in Yukon is S2 (Imperilled). The National General Status ranks for Canada and Yukon are both May Be at Risk.

Spiked Saxifrage currently has no legal protection in Canada (as of April 2013), and is not listed under the U.S. Endangered Species Act or the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

Active placer and/or quartz mining claims occur on or upstream of the plant’s habitat on five of the six creeks. While there are restrictions on how operations are conducted on those claims, these are mainly for the protection of fish habitat, and there is no legal obligation to protect the habitat or existing populations of Spiked Saxifrage. ■

## Western Tiger Salamander (Prairie / Boreal population)



Photo: © Kyle Welsh

### Scientific name

*Ambystoma mavortium*

### Taxon

Amphibians

### COSEWIC status

Special Concern

### Canadian range

Alberta, Saskatchewan, Manitoba

### Reason for designation

This large salamander remains widely distributed in the Prairie provinces, but it faces numerous threats from habitat loss and fragmentation, fish stocking, and emerging diseases, such as the *Ambystoma tigrinum* virus that can decimate local populations. Salamander habitats are becoming increasingly fragmented by agricultural and oil and gas developments and associated infrastructures and roads. The disruption of migration routes, mortality through roadkill, and deterioration and loss of breeding and upland habitat for terrestrial adults and juveniles lead to concern for the species in a large part of its Canadian range.

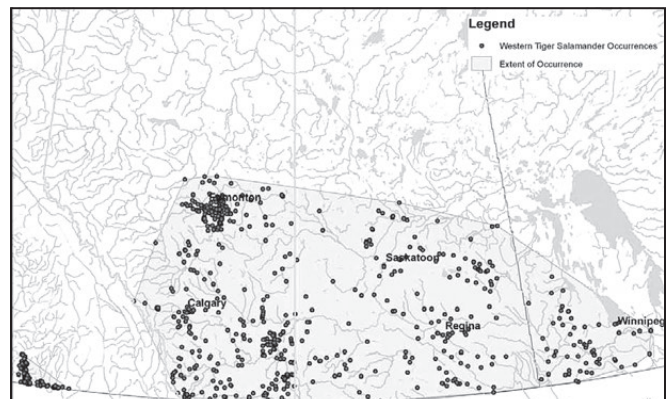
### Wildlife Species Description and Significance

Western Tiger Salamanders are among the largest salamanders in North America and are top predators in the largely fishless ponds and lakes where they occur. Terrestrial adults have a blotched, barred or reticulate pattern of yellow or off-white on a dark background. Genetic and morphological evidence indicates that

the Western Tiger Salamander, consisting of several subspecies, is a separate species from the Eastern Tiger Salamander, *Ambystoma tigrinum*, with which it was previously combined as a single species. Much of the older literature does not necessarily distinguish the Western Tiger Salamander from the Eastern Tiger Salamander, as currently recognized.

### Distribution

Western Tiger Salamanders have a wide distribution in arid interior regions of western North America. They occur along the border of the Prairie ecozone in Alberta, east to the Red River in Manitoba, south into western Minnesota and down to Texas, west along the border of Mexico and then north through Arizona and along the eastern slopes of the Rocky Mountains north to Alberta. There is a disjunct distribution in northern Oregon, Idaho and through Washington into the southern Okanagan region of British Columbia. Tiger salamanders in British Columbia are disjunct from populations in the remainder of Canada and occur in the Southern Mountain ecozone, whereas the remainder of the Canadian distribution occurs in the Prairie ecozone in Alberta, Saskatchewan and Manitoba. This distribution is likely the result of post-glacial expansion into Canada from at least two points on either side of the Rocky Mountains.



Canadian distribution of all occurrences of Western Tiger Salamander, showing the Southern Mountain DU in the west and Prairie DU in the east. Shading indicates the total extent of occurrence (572 490 km<sup>2</sup>).

Source: November 2012 COSEWIC Status Report. Map prepared by Arthur Whiting.

### Habitat

Western Tiger Salamanders occupy a variety of open habitats, including grasslands, parkland, subalpine meadows, and semi-deserts. Key habitat

features include sandy or friable (crumbly) soils surrounding semi-permanent to permanent water bodies lacking predatory fish. Terrestrial Western Tiger Salamanders burrow actively into soil or utilize small mammal burrows for refuges and over-wintering. Breeding habitats must hold water for the 3 to 7 months required to complete larval development. Populations of completely aquatic neotenic adults (animals that retain larval form after sexual maturity) are occasionally found in cool, fishless lakes.

## Biology

Western Tiger Salamanders migrate to breeding sites in wetlands or lakes following spring rains soon after ice-off. Females lay eggs singly or in small clusters attached to twigs or stems of emergent plants below the water's surface. Juveniles migrate *en mass* from breeding sites into terrestrial habitats in late summer. Males may reach sexual maturity in their second year, while females mature a year or two later. Generation time is approximately 5 – 6 years.

Both larvae and adults are carnivorous and feed on a wide range of small prey. Western Tiger Salamanders do not fare well where predaceous fish have been introduced, or are naturally occurring, as all life stages are preyed upon.



Larval stage.

## Population Sizes and Trends

Population sizes and trends are poorly known, and numbers of adults may vary considerably among sites and years. There is an inferred decline in the number and size of populations in the Southern Mountain region in British Columbia, where continued habitat loss, habitat alteration, and introduced species threaten the persistence of populations.

Outside of British Columbia, little is known about the occurrences of Western Tiger Salamanders. Anecdotal reports suggest that the species persists over relatively wide areas of the prairie provinces. Mass mortalities, primarily due to disease and road kill, are reported sporadically in localized areas.

## Threats and Limiting Factors

Tiger salamanders face the same pressures and threats as other amphibian species with separate requirements for terrestrial adults and aquatic larvae. Over much of the species' Canadian range, there are immense pressures from loss, degradation and fragmentation of habitat. In the Prairies, a change has occurred in land use from grazing and low-scale agriculture to large-scale farming and conversion of habitat to accommodate growing urban populations and expansion of oil and gas developments. Within the core area of the species' distribution in British Columbia, in the Okanagan Valley, there has been rapid habitat loss due to housing and vineyard developments with associated pollutant run-off. The introduced American Bullfrog poses an additional threat in this region. Increasing human populations and road densities have greatly increased the potential for road mortality during seasonal migrations between breeding sites and terrestrial overwintering and foraging habitats. Fish stocking for recreational fishing, aquaculture, and mosquito-control can have severe impacts on tiger salamander populations and continue to occur throughout the species' Canadian range. The emergence of infectious diseases, specifically the widespread *Ambystoma tigrinum* virus, can decimate local populations.

## Protection, Status, and Ranks

The Southern Mountain population of the Western Tiger Salamander in British Columbia is listed federally as Endangered and is on Schedule 1 under the *Species at Risk Act*. Approximately 16% of breeding sites of this population are within protected areas, and an additional 27% receive some protection through voluntary stewardship efforts; the majority of the sites, however, are on unprotected private lands.

Tiger salamanders in Alberta, Saskatchewan and Manitoba, as the Prairie / Boreal population, were previously assessed by COSEWIC as Not at Risk, but this assessment included Eastern Tiger Salamanders in Manitoba. There is no specific protection for tiger salamander habitat, but there are records of tiger salamanders from various parks and protected areas. ■



## Wood Thrush



Photo: © Harold Stiver

### Scientific name

*Hylocichla mustelina*

### Taxon

Birds

### COSEWIC status

Threatened

### Canadian range

Ontario, Quebec, New Brunswick, Nova Scotia

### Reason for designation

In Canada, this forest-nesting species has shown significant long- and short-term declines in population abundance. The species is threatened by habitat loss on its wintering grounds and habitat fragmentation and degradation on its breeding grounds. It also suffers from high rates of nest predation and cowbird parasitism associated with habitat fragmentation on the breeding grounds.

### Wildlife Species Description and Significance

The Wood Thrush is a medium-sized Neotropical migrant, slightly smaller than the American Robin. Sexes are similar; adults are generally rusty-brown on the upperparts with white underparts and large blackish spots on the breast and flanks. Juveniles are similar to adults, but have tawny streaks and spots on the back, neck, and wing coverts. Overall, the plumage is quite distinctive and the Wood Thrush is not likely

to be confused with other thrush species or the Brown Thrasher. The Wood Thrush has become a symbol of declining Neotropical migrants due to significant declines over much of its range since the late 1970s.

### Distribution

The Wood Thrush breeds in southeastern Canada from southern Ontario east to Nova Scotia. It also nests across the eastern United States, south to northern Florida and the Gulf Coast. In the west, it ranges from eastern Texas to southeast South Dakota and west-central Minnesota. Wood Thrushes winter in Central America mainly in lowland and tropical forests along the Atlantic and the Pacific slopes from southern Mexico south to Panama.



Current Canadian breeding range of the Wood Thrush. The species is considered an occasional visitor to Manitoba.

Source: November 2012 COSEWIC Status Report.

### Habitat

In Canada, the Wood Thrush nests mainly in second-growth and mature deciduous and mixed forests, with saplings and well-developed understory layers. This species prefers large forest mosaics, but may also nest in small forest fragments. Wintering habitat is characterized primarily by undisturbed to moderately disturbed wet primary lowland forests.

### Biology

The Wood Thrush is typically socially monogamous, but does engage in extra-pair matings. In Canada, most breeding adults arrive on the breeding grounds from mid-late May. Nests are located in living saplings, trees or shrubs, usually in Sugar



Maple or American Beech. Clutches contain an average of 4 eggs and double brooding is frequent. Incubation lasts 10-12 days; young are tended by both parents and fledge after 12–15 days. Fledglings remain on their natal home range for 24-33 days before departing to the wintering range between mid-August and mid-September. Age of first reproduction for the Wood Thrush is one year.

### Population Sizes and Trends

The Canadian population of Wood Thrush is estimated at between 260,000 and 665,000 mature individuals.

Breeding Bird Survey (BBS) results show a significant annual rate of decline of 4.29% between 1970 and 2011, which amounts to a population loss of 83% over the last 41 years. Over the most recent 10-year period (2001 to 2011) and approximately three generations, BBS data show a significant decline of 4.69% per year amounting to a loss of 38% of the population over this period.

### Threats and Limiting Factors

Several threats are currently known to affect the Wood Thrush. On the breeding grounds the main threats include habitat degradation and fragmentation due to development and over-browsing by White-tailed Deer. High rates of nest predation and Brown-headed Cowbird nest parasitism associated with habitat fragmentation also threaten the Wood Thrush. On the wintering grounds the main threats are habitat loss and degradation.

### Protection, Status, and Ranks

In Canada, the Wood Thrush and its nests and eggs are protected under the *Migratory Birds Convention Act*. In Québec, it is also protected under the *Loi sur la conservation et la mise en valeur de la faune*. General Status ranks for Wood Thrush consider the species secure in Canada, Ontario and Québec, may be at risk in New Brunswick, and undetermined in Nova Scotia. ■

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## GLOSSARY

**Aquatic species:** A wildlife species that is a fish as defined in section 2 of the *Fisheries Act* or a marine plant as defined in section 47 of the Act. The term includes marine mammals.

**Canada Gazette:** The *Canada Gazette* is one of the vehicles that Canadians can use to access laws and regulations. It has been the “official newspaper” of the Government of Canada since 1841. Government departments and agencies as well as the private sector are required by law to publish certain information in the *Canada Gazette*. Notices and proposed regulations are published in the *Canada Gazette*, Part I, and official regulations are published in the *Canada Gazette*, Part II. For more information, please visit [canadagazette.gc.ca](http://canadagazette.gc.ca).

**Canadian Endangered Species Conservation Council:** The Council is made up of federal, provincial and territorial ministers with responsibilities for wildlife species. The Council’s mandate is to provide national leadership and coordination for the protection of species at risk.

**COSEWIC:** The Committee on the Status of Endangered Wildlife in Canada. The Committee comprises experts on wildlife species at risk. Their backgrounds are in the fields of biology, ecology, genetics, Aboriginal traditional knowledge and other relevant fields. These experts come from various communities, including, among others, government and academia.

**COSEWIC assessment:** COSEWIC’s assessment or re-assessment of the status of a wildlife species, based on a status report on the species that COSEWIC either has had prepared or has received with an application.

**Federal land:** Any land owned by the federal government, the internal waters and territorial sea of Canada, and reserves and other land set apart for the use and benefit of a band under the *Indian Act*.

**Governor in Council:** The Governor General of Canada acting on the advice of the Queen’s Privy Council for Canada, the formal executive body which gives legal effect to those decisions of Cabinet that are to have the force of law.

**Individual:** An individual of a wildlife species, whether living or dead, at any developmental stage, and includes larvae, embryos, eggs, sperm, seeds, pollen, spores and asexual propagules.

**Order:** Order in Council. An order issued by the Governor in Council, either on the basis of authority delegated by legislation or by virtue of the prerogative powers of the Crown.

**Response statement:** A document in which the Minister of the Environment indicates how he or she intends to respond to the COSEWIC assessment of a wildlife species. A response statement is posted on the Species at Risk Public Registry within 90 days of receipt of the assessment by the Minister, and provides timelines for action to the extent possible.

**RIAS:** Regulatory Impact Analysis Statement. A description of a regulatory proposal that provides an analysis of the expected impact of each regulatory initiative and accompanies an Order in Council.

**Species at Risk Public Registry:** Developed as an online service, the Species at Risk Public Registry has been accessible to the public since proclamation of the *Species at Risk Act* (SARA). The website gives users easy access to documents and information related to SARA at any time and location with Internet access. It can be found at [www.registrelep-sararegistry.gc.ca](http://www.registrelep-sararegistry.gc.ca).

**Schedule 1:** A schedule of SARA; also known as the List of Wildlife Species at Risk, the list of the species protected under SARA.

**Up-listing:** A revision of the status of a species on Schedule 1 to a status of higher risk. A revision of the status of a Schedule 1 species to a lower risk status would be down-listing.

**Wildlife Management Board:** Established under the land claims agreements in northern Quebec, Yukon, Northwest Territories, British Columbia and Nunavut, Wildlife Management Boards are the “main instruments of wildlife management” within their settlement areas. In this role, Wildlife Management Boards not only establish, modify and remove levels of total allowable harvest of a variety of wildlife species, but also participate in research activities, including annual harvest studies, and approve the designation of species at risk in their settlement areas.

**Wildlife species:** A species, subspecies, variety, or geographically or genetically distinct population of animal, plant or other organism, other than a bacterium or virus. To be eligible for inclusion under SARA, a wildlife species must be wild by nature and native to Canada. Non-native species that have been here for 50 years or more can be considered eligible if they came without human intervention.