Environment Canada Environnement Canada

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

## Terrestrial Species

January 2009

Canada

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

## Terrestrial Species

January 2009

Environment Canada Environnement Canada

Canada

Please submit your comments by

– **March 20**, **2009**, for species undergoing **normal** consultations

and by

– **March 19**, **2010**, for species undergoing **extended** consultations.

Please e-mail your comments to the SARA Public Registry at:

SARAregistry@ec.gc.ca

Comments may also be mailed to:

Director General
Canadian Wildlife Service
Environment Canada
Ottawa, Ontario
K1A 0H3

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

www.sararegistry.gc.ca

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

## PUBLIC CONSULTATION

### Background

As part of its strategy for protecting wildlife species at risk, the Government of Canada proclaimed the *Species at Risk Act* (SARA) on June 5, 2003. Attached to the Act is Schedule 1, the list of the species that receive protection under SARA, also called the List of Wildlife Species at Risk.

Originally, there were 233 species on Schedule 1. Since proclamation, another 192 species have been added. These 425 species make up the current List of 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

### Recent COSEWIC species assessments

On August 28, 2008, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) submitted to the Minister of the Environment 46 assessments of species that it had recently assessed or re-assessed. COSEWIC identified 39 of these as species at risk. Of the 32 that are terrestrial species, 18 were newly assessed species and 14 were re-assessments of species already on Schedule 1. COSEWIC confirmed the current status for 11 of these 14 species. The other three species are being proposed for up-listing (to a higher risk status).

This consultation concerns the 18 terrestrial species newly eligible for addition to Schedule 1 and the three terrestrial species being proposed for up-listing (Tables 1 & 2). No change is required for those species already on Schedule 1 whose status has been confirmed by COSEWIC; therefore these species are not included in the current consultations.

The Minister of Fisheries and Oceans is conducting separate consultations for the aquatic species (Table 3). For more information on the consultations for aquatic species, please visit the Fisheries and Oceans Canada website at:

http://www.dfo-mpo.gc.ca/index.htm

Approximately 56 percent of the recently assessed or re-assessed terrestrial species at risk occur in national parks or other lands administered by Parks Canada. Parks Canada shares responsibility for the recovery of these terrestrial species with Environment Canada.

### Purpose of the current consultations

COSEWIC bases its assessments solely on its evaluation of the biological status of each species. Before making informed listing recommendations, the Minister of the Environment needs to weigh the potential consequences, including the socioeconomic impacts, of accepting the COSEWIC status assessments and amending Schedule 1.

The Government of Canada designed SARA to ensure the protection and recovery of Canadian wildlife species at risk and the habitats that support them, while embracing Canadian values of participation. Of particular significance is the engagement of Aboriginal peoples, acknowledging their role in the management of the extensive traditional territories and reserve and settlement lands that contribute substantively to the support of Canada's biodiversity.

Governments cannot act alone to ensure the conservation of biodiversity. The best way to secure the survival of species at risk and their habitats is through the active participation of all those concerned. The Government of Canada is inviting and encouraging you to become involved.

To that end, this January 2009 publication includes detailed information on these terrestrial species and where they are found in Canada.

Of particular interest to Environment Canada in conducting these consultations is the identification of the benefits and costs of amending Schedule 1 according to the COSEWIC assessment for each of these species. Your comments are considered in relation to the potential impacts of listing, recognizing that Canada's natural heritage is an integral part of our national identity and history.

The involvement of those affected is integral to the process, as it is to the ultimate protection of Canadian wildlife. Your comments matter and will be given serious consideration.

## Legislative context of the consultations

The Minister of the Environment, having received the COSEWIC species assessments, will forward them to the Governor in Council for receipt. Following public consultation on the addition of species to Schedule 1, the Minister will recommend to the Governor in Council one of the following possible courses of action, as set out in SARA:

a) that the COSEWIC assessment be accepted and the species added to Schedule 1, reclassified or removed from the list accordingly;

b) that the species not be added to Schedule 1; or

c) that the species be referred back to COSEWIC for further information or consideration.

The Government of Canada is obligated to take one of these actions within nine months of the Governor in Council receiving the COSEWIC assessment. If in that time no government action has been taken, the COSEWIC species assessment must be accepted and the Minister of the Environment must make an order amending Schedule 1 accordingly.

The results of these consultations will inform the recommendation of the Minister of the Environment as to which of the three possible courses of action would be the most appropriate.

## Process of public consultations

Before the government makes decisions concerning the addition or reclassification of these terrestrial species (Tables 1 & 2), Environment Canada is inviting the public to comment.

To facilitate public consultations, Environment Canada will distribute this document to a number of identified stakeholders and post it on the SARA Public Registry. More detailed information on these species can be found in the COSEWIC status reports, which are used by COSEWIC members as a basis for discussion and for the status assignments. The status reports for each of these species are available on the SARA Public Registry.

In addition to the public, Environment Canada will consult with the governments of the provinces and territories responsible for the conservation and management of these wildlife species.

Where existing land claims agreements apply to eligible terrestrial species, such that they fall under the authority of a Wildlife Management Board, the Minister of the Environment will consult with the relevant Board. Aboriginal peoples identified as affected by the listing or delisting of these species will also be contacted.

Environment Canada will also consult with other federal departments and agencies.

Environment Canada will send notice of this consultation to recognized stakeholders, identified concerned groups and individuals who have made their interests known. These include, but are not limited to, industries, industry groups and resource users, landowners, land users and environmental non-government organizations.

## Role and impact of public consultations

The results of the public consultations are of great relevance to the process of listing species at risk. Environment Canada will carefully review and evaluate comments.

Environment Canada will document these comments in a Regulatory Impact Analysis Statement (RIAS). The RIAS, a description of the regulatory proposal, including an analysis of the expected impact, is an integral part of the federal regulatory process. A draft Order (providing notice of a decision taken by the executive arm of government) proposing to list all or some of the species under consideration will then be published, along with the RIAS, in *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 *Canada Gazette* Part I. The Minister will then recommend, for each species, that the Governor in Council accept the species assessment and amend Schedule 1 accordingly, not add the species to Schedule 1 or refer the species assessment back to COSEWIC for further information or consideration. The final decision will be published

in *Canada Gazette* Part II and on the SARA Public Registry.

### The choice of consultation period

The Minister reports on which consultation path a species will follow in the species' response statement. During normal consultations, the Minister of the Environment forwards the species assessments to the Governor in Council within a short time of the posting of the response statements on the SARA Public Registry (usually three months). Receipt by the Governor in Council starts the nine-month timeline within which the Government of Canada must act (see above under "Legislative context of the consultations").

Under some circumstances, the Schedule 1 listing of a COSEWIC species could have significant and widespread impacts on the activities of Aboriginal peoples, industry or Canadians at large. In such cases, affected citizens need to be informed of the pending decision and, to the extent possible, its potential consequences. They also need the opportunity to express their opinions and share ideas on how best to approach the protection and recovery of the species. Accordingly, extended consultations will be undertaken for some terrestrial species.

For those species undergoing extended consultations the Minister of the Environment will not forward the assessments to the Governor in Council until the consultation requirements have been met. Please refer to Tables 1 and 2 for the consultation paths for terrestrial species.

## Process of identifying and listing species at risk

SARA strengthens and enhances the Government of Canada's capacity to protect Canadian wildlife species and distinct populations that are at risk of becoming extinct or extirpated. As the Act applies only to those species and distinct populations on Schedule 1, the transparency and openness of the listing process are of paramount importance.

The species listing process under SARA is summarized in Figure 1.

### Process and role of COSEWIC

COSEWIC comprises experts on wildlife species at risk. Their backgrounds are in the fields of biology, ecology, genetics, Aboriginal traditional knowledge and other relevant fields, and they come from various communities, including academia, Aboriginal organizations, government and non-government organizations.

Initially, COSEWIC commissions a status report for the evaluation of the conservation status of a species. 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.

COSEWIC then meets to examine the status report, discuss the species, determine whether or not the species is at risk and, if so, assess the level of risk.

For more information on COSEWIC, visit:

www.cosewic.gc.ca

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

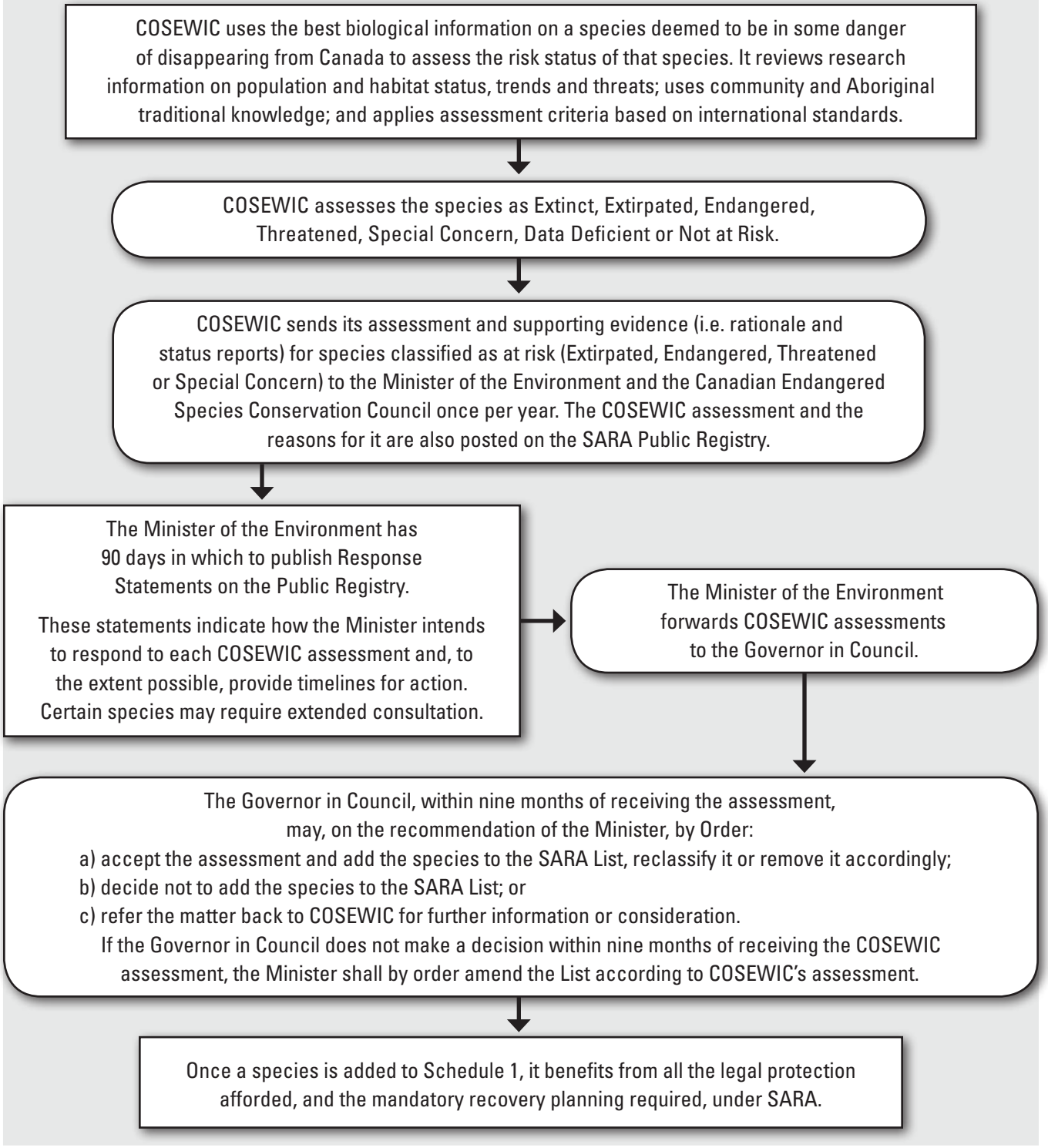
Categories for the degree of risk to a species are Extirpated, Endangered, Threatened and Special Concern. COSEWIC assesses a species as Extirpated when it no longer occurs in the wild in Canada but still exists elsewhere, and as Endangered if it is facing imminent extirpation or extinction. An assessment of Threatened means that the species is likely to become Endangered if nothing is done to reverse the factors leading to its extirpation or extinction. COSEWIC assesses a species as being of Special Concern if it may become a Threatened or Endangered species because of a combination of biological characteristics and identified threats.

### The Minister of the Environment's response to the COSEWIC assessment of a species at risk

COSEWIC, having assessed a species as being at risk, forwards the assessment to the Minister of the Environment. Upon receipt of this assessment, the Minister of the Environment has 90 days to report on how he intends to respond and, to the extent possible, provide timelines for action.

## Figure 1: The species listing process under SARA

SARA separates the scientific assessment process from the listing decision. This approach ensures that scientists can provide fully independent recommendations, and that decisions affecting Canadians are made by elected officials who can be held accountable for those decisions.



The Minister reports on which consultation path a species will follow in the species' response statement, posted on the SARA Public Registry. Those assessments that do not require extended consultations are forwarded to the Governor in Council for receipt. This step initiates the nine-month time period within which the Minister will make a recommendation to the Governor in Council on whether or not to accept the species assessment and modify Schedule 1 accordingly, or to refer the assessment back to COSEWIC. Once a species is added to Schedule 1, specific actions must be taken within specified times to help ensure its protection and recovery.

## 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 immediately when a species is listed as Threatened, Endangered or Extirpated and if it is an aquatic species, a migratory bird, as defined by the *Migratory Birds Convention Act, 1994*, or is a terrestrial species found on federal land. In the territories, this immediate legal protection applies only to federal lands under the authority of the Minister of the Environment or the Parks Canada Agency.

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 or to damage or destroy the residence of one or more individuals of an Endangered or Threatened species. 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.

Listed terrestrial species at risk that are not on federal lands and not protected under the *Migratory Birds Convention Act, 1994* do not receive immediate protection upon listing under SARA. The provinces and territories have jurisdiction for terrestrial species on non-federal land and are responsible for providing protection. Where it is determined that species typically managed by provinces and/or territories do not have effective protection, SARA provides the Governor in Council with the power to apply the SARA prohibitions to provincial or territorial lands. The federal government would consult with the jurisdiction concerned before invoking these provisions.

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 research relating to the conservation of a species conducted by qualified scientists, for activities that benefit a listed species or enhance its chances of survival or for activities that incidentally affect a listed species. They can make these exceptions only when it is established that all reasonable alternatives have been considered and the best solution has been adopted, when all feasible measures will be taken to minimize the impact of the activity and when the survival or recovery of the species will not be jeopardized. In such a case, the Minister of the Environment or the Minister of Fisheries and Oceans must include an explanation of the permit or agreement on the SARA Public Registry.

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

The addition of an Extirpated, Endangered or Threatened species to Schedule 1 triggers the requirement for the preparation of a recovery strategy and an action plan, both of which are the subject of separate consultations.

Recovery strategies for newly listed species are to be completed and made available on the SARA Public Registry (allowing for public review and comment) within one year of their addition to Schedule 1 for species assessed as Endangered and within two years of their addition to Schedule 1 for species assessed as Threatened or Extirpated.

Each recovery strategy will aim to mitigate the known threats to the species and its habitat and will set the population and distribution objectives. Depending on the situation of the species, other

appropriate objectives may 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. Should sufficient information not be available, a schedule of studies will be identified in the recovery strategy and critical habitat will be identified in a subsequent action plan. Action plans complete the identification of the critical habitat, include measures to address threats and identify any other measures necessary to implement the recovery strategy.

The recovery strategies and action plans for these species will be prepared in cooperation with Wildlife Management Boards and directly affected Aboriginal organizations, as well as with the jurisdictions responsible for the management of the species. Landowners and other stakeholders directly affected by the recovery strategy will also be consulted.

### Protection for listed species of Special Concern

The prohibitions of SARA for species listed as Extirpated, Endangered and Threatened do not apply to species of Special Concern; however, 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 SARA Public Registry within three years of their addition to Schedule 1, allowing for public review and comment. Management plans include appropriate conservation measures for the species and for its habitat.

Management plans 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.

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

To ensure that your comments are considered for the terrestrial species that are eligible for addition or up-listing to Schedule 1, they should be submitted by **March 20, 2009** for species undergoing normal consultations and by **March 19, 2010** for species undergoing extended consultations.

Please e-mail your comments to the SARA Public Registry at:

SARAregistry@ec.gc.ca

By regular mail, please address your comments to:

Director General
Canadian Wildlife Service
Environment Canada
Ottawa, Ontario
K1A 0H3

Environment Canada will review and use your comments when considering the addition of each of these species to Schedule 1.

# THE LIST OF SPECIES PROPOSED FOR INCLUSION OR RECLASSIFICATION ON SCHEDULE 1

## STATUS OF THE RECENTLY ASSESSED SPECIES AND CONSULTATION PATHS

### Schedule 1 status confirmations, status revisions and newly eligible species

Of the 32 terrestrial species assessments submitted by COSEWIC to the Minister of the Environment in August 2008, 18 are for species that are newly eligible for addition to Schedule 1. The other 14 are already listed on Schedule 1. Three of these 14 species are being considered for up-listing (to a higher risk status). The remaining 11 species have had their current Schedule 1 status confirmed and are not included in the consultations. 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.

Please refer to Tables 1 and 2 for the species, their COSEWIC status, the provinces and territories in which they occur and the consultation path they will be undergoing.

### Normal and extended consultations

For species for which the acceptance of the COSEWIC assessment could have significant and widespread impacts on the activities of Aboriginal peoples, industry or Canadians at large, an extended consultation path is indicated (Tables 1 & 2). Extended consultations provide those concerned with greater opportunity to be informed of the potential impacts of a listing decision, to express their opinions or to share ideas on how best to protect or recover the species. The Minister of the Environment will not forward the COSEWIC assessments for these select species to the Governor in Council until these extended consultation requirements have been met.

The assessments for those species undergoing normal consultations will be forwarded to the Governor in Council for receipt in 2009.

The results of the normal and extended consultations will inform the Minister of the Environment's recommendation to Governor in Council for each of these species. Once the Minister has made the recommendation, Governor in Council will decide to accept the assessment and amend Schedule 1 accordingly, to not add the species to the list or to refer the assessment back to COSEWIC.

For more information on the consultations for aquatic species, please visit the Fisheries and Oceans Canada website at:

http://www.dfo-mpo.gc.ca/index.htm

Comments for terrestrial species undergoing normal consultations must be received by **March 20, 2009**.

Comments for terrestrial species undergoing extended consultations must be received by **March 19, 2010**.

For more details on submitting comments, see above under "Public comments solicited on the proposed amendment of Schedule 1."

**Table 1: Terrestrial species on Schedule 1 recently re-assessed by COSEWIC (species status confirmation and reclassification)**

| Taxon | Species | Scientific name | Range | Consultation path |
|---|---|---|---|---|
| **Status confirmation (11)** | | | | |
| **Extirpated (1)** | | | | |
| Birds | Greater Sage-Grouse *phaios* subspecies | *Centrocercus urophasianus phaios* | BC | None; status confirmation |
| **Endangered (7)** | | | | |
| Mammals | Vancouver Island Marmot | *Marmota vancouverensis* | BC | None; status confirmation |
| Birds | Greater Sage-Grouse *urophasianus* subspecies | *Centrocercus urophasianus urophasianus* | AB, SK | None; status confirmation |
| Birds | Kirtland's Warbler | *Dendroica kirtlandii* | ON | None; status confirmation |
| Birds | Spotted Owl *caurina* subspecies | *Strix occidentalis caurina* | BC | None; status confirmation |
| Molluscs | Banff Springs Snail | *Physella johnsoni* | AB | None; status confirmation |
| Vascular Plants | Golden Paintbrush | *Castilleja levisecta* | BC | None; status confirmation |
| Vascular Plants | Wood-poppy | *Stylophorum diphyllum* | ON | None; status confirmation |
| **Threatened (2)** | | | | |
| Reptiles | Eastern Hog-nosed Snake | *Heterodon platirhinos* | ON | None; status confirmation |
| Vascular Plants | Round-leaved Greenbrier (Great Lakes Plains population) | *Smilax rotundifolia* | ON | None; status confirmation |
| **Special Concern (1)** | | | | |
| Amphibians | Coeur d'Alene Salamander | *Plethodon idahoensis* | BC | None; status confirmation |
| **Up-list from Threatened to Endangered (3)** | | | | |
| Reptiles | Eastern Foxsnake (Carolinian population)[1] | *Elaphe gloydi* | ON | Normal |
| Reptiles | Eastern Foxsnake (Great Lakes/ St. Lawrence population)[1] | *Elaphe gloydi* | ON | Normal |
| Vascular Plants | Yellow Montane Violet *praemorsa* subspecies | *Viola praemorsa praemorsa* | BC | Normal |

1. Species currently listed on Schedule 1 as a single species. Re-assessed in April 2007 and split into two populations.

**Table 2: Terrestrial species recently assessed by COSEWIC and eligible for addition to Schedule 1**

| Taxon | Species | Scientific name | Range | Consultation path |
|---|---|---|---|---|
| **Endangered (7)** | | | | |
| Arthropods | Dusky Dune Moth | *Copablepharon longipenne* | AB, SK, MB | Normal |
| Arthropods | Rapids Clubtail | *Gomphus quadricolor* | ON | Normal |
| Vascular Plants | Foothill Sedge | *Carex tumulicola* | BC | Normal |
| Vascular Plants | Fragrant Popcornflower | *Plagiobothrys figuratus* | BC | Normal |
| Vascular Plants | Lindley's False Silverpuffs | *Uropappus lindleyi* | BC | Normal |
| Vascular Plants | Muhlenberg's Centaury | *Centaurium muehlenbergii* | BC | Normal |
| Vascular Plants | Rayless Goldfields | *Lasthenia glaberrima* | BC | Normal |
| **Threatened (6)** | | | | |
| Birds | Canada Warbler | *Wilsonia canadensis* | YT, NT, BC, AB, SK, MB, ON, QC, NB, PE, NS | Normal |
| Birds | Ferruginous Hawk | *Buteo regalis* | AB, SK, MB | Normal |
| Birds | Olive-sided Flycatcher | *Contopus cooperi* | YT, NT, BC, AB, SK, MB, ON, NB, QC, PE, NS, NL | Normal |
| Amphibians | Western Chorus Frog (Great Lakes/St. Lawrence – Canadian Shield population) | *Pseudacris triseriata* | ON, QC | Normal |
| Reptiles | Wood Turtle | *Glyptemys insculpta* | ON, QC, NB, NS | Normal |
| Lichens | Seaside Bone | *Hypogymnia heterophylla* | BC | Normal |
| **Special Concern (5)** | | | | |
| Mammals | Polar Bear | *Ursus maritimus* | YT, NT, NU, MB, ON, QC, NL, Arctic Ocean | Extended |
| Birds | Great Blue Heron *fannini* subspecies | *Ardea herodias fannini* | BC | Normal |
| Birds | Short-eared Owl | *Asio flammeus* | YT, NT, NU, BC, AB, SK, MB, ON, QC, NB, PE, NS, NL | Extended |
| Arthropods | Pale Yellow Dune Moth | *Copablepharon grandis* | AB, SK, MB | Normal |
| Vascular Plants | Beach Pinweed | *Lechea maritima* | NB, PE | Normal |

**Table 3:** **Aquatic species recently assessed or re-assessed by COSEWIC with consultations conducted by Fisheries and Oceans Canada (eligible for addition to Schedule 1, species status confirmation and reclassification)**

| Taxon | Species | Scientific name | Range | Consultation path |
|---|---|---|---|---|
| **Status confirmation (3)** | | | | |
| **Extirpated (2)** | | | | |
| Fishes | Gravel Chub | *Erimystax x-punctatus* | ON | None: Status confirmation |
| Fishes | Paddlefish | *Polyodon spathula* | ON | None: Status confirmation |
| **Endangered (1)** | | | | |
| Molluscs | Hotwater Physa | *Physella wrighti* | BC | None: Status confirmation |
| **Up-list from Threatened to Endangered (1)** | | | | |
| Fishes | Western Silvery Minnow | *Hybognathus argyritis* | AB | Normal |
| **Species newly assessed and eligible for addition to Schedule 1 (3)** | | | | |
| **Endangered (2)** | | | | |
| Mammals | Harbour Seal Lacs des Loups marins subspecies | *Phoca vitulina mellonae* | QC | Extended |
| Molluscs | Fawnsfoot | *Truncilla donaciformis* | ON | Extended |
| **Threatened (1)** | | | | |
| Fishes | Canary Rockfish | *Sebastes pinniger* | Pacific Ocean | Extended |

# 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 SARA Public Registry at:

http://www.sararegistry.gc.ca/status/default_e.cfm

or contact:

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

## Beach Pinweed

*Photo: D. Mazerolle*

**Scientific name**
*Lechea maritima*

**Taxon**
Vascular Plants

**COSEWIC Status**
Special Concern

**Canadian Range**
New Brunswick and Prince Edward Island

### Reason for designation

The Canadian populations have been recognized as an endemic variety of global significance. Plants are restricted to stabilized sand dunes within localized areas of coastline in New Brunswick and Prince Edward Island. The majority of the 15 populations, including the three largest, occur at elevations under 5 m above sea level. Here they are at increased risk from the impacts of severe storm surges resulting from rising sea levels and increased storm frequency and intensity predicted to occur as a consequence of climate change. A recent storm surge has already impacted a substantial portion of potential habitat at one of the New Brunswick sites. Other impacts have also been documented as a consequence of trampling, all terrain vehicle use, and successional changes to the species' habitat.

### Species information

Beach Pinweed (*Lechea maritima*) is an herbaceous perennial in the family Cistaceae. The Canadian populations have been recognized as a unique variety, the Gulf of St. Lawrence Beach Pinweed (*Lechea maritima* var. *subcylindrica*). Since this is the only variety of *Lechea maritima* in Canada, this report documents the status of the Canadian populations at the species level and only refers to the var. *subcylindrica* when necessary for clarity. The species occurs on stable coastal sand dunes. Prostrate, densely leafy basal shoots develop from the woody base, often forming a rosette, and the fruiting stems are (10) 20–35 cm tall, usually erect and strongly branched. Plants flower in mid- to late summer and develop fruit in late summer and early fall. The numerous, inconspicuous flowers (2–4 mm wide) have three short-lived, reddish-brown petals.

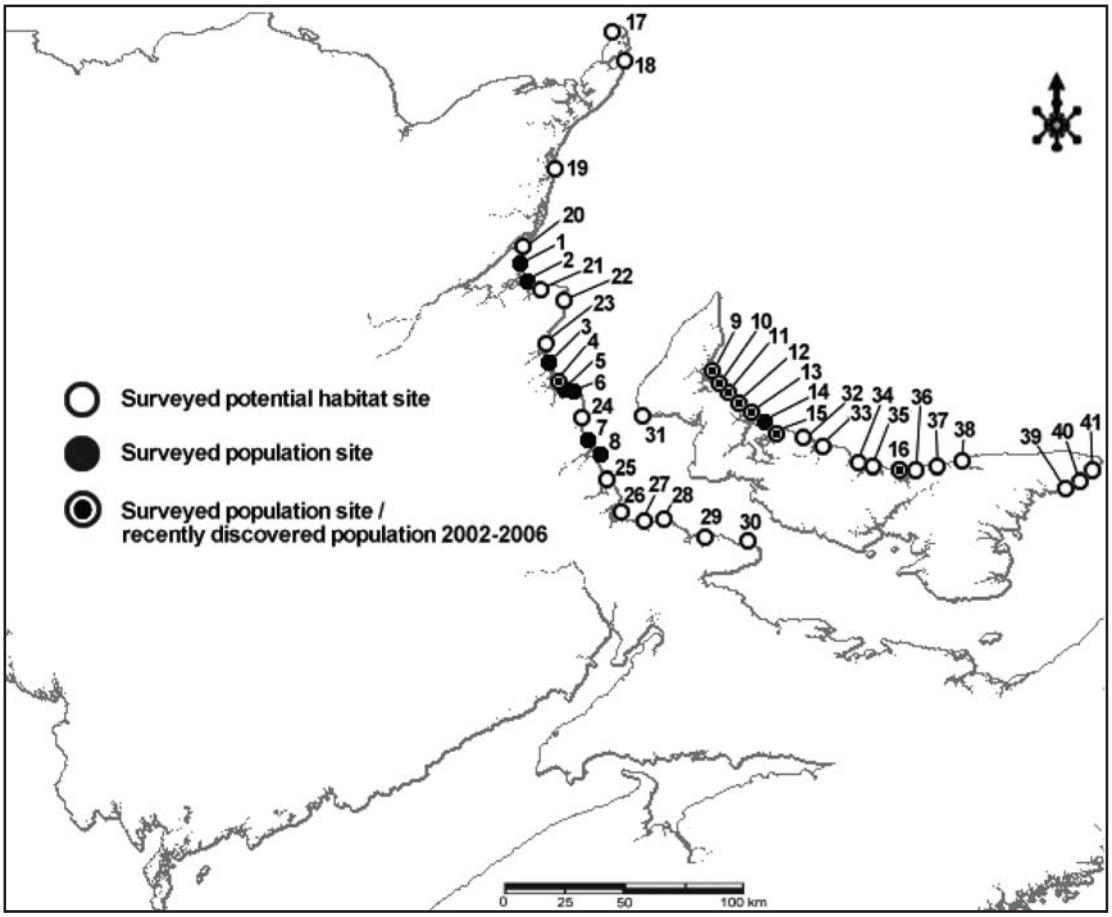
The fruit is a round, 3-valved capsule (1.8–2.1 mm long) usually shorter than the sepals, splitting open lengthwise to the base. The seeds, generally 4–5 per capsule, are smooth and 1–1.1 mm long, and without obvious adaptations for dispersal. Beach Pinweed is best distinguished from the other pinweed in its range (narrowleaf pinweed, *Lechea intermedia*) by the densely white-hairy undersides of its basal leaves and by its smooth seeds.

## Distribution

Beach Pinweed is globally secure and occurs primarily along the Atlantic coast from New Brunswick to North Carolina. Reports from Ontario and Quebec are unsupported and likely erroneous. Gulf of St. Lawrence Beach Pinweed is globally rare and endemic to New Brunswick's eastern coast and Prince Edward Island's northern shore, 370 km disjunct from the nearest occurrence of variety *maritima* in southern Maine. On Prince Edward Island, populations occur on over 41 km of shoreline, with a single occurrence 54 km west. In New Brunswick, the northern and southernmost occurrences are spread over an 87 km straight-line distance. The species' Extent of Occurrence is 176 km$^2$ (sum of distances between population extremities along coastal shorelines in NB and PE times 1 km width) and its Area of Occupancy is 71 km$^2$ based on occupied 1 km grid squares or 152 km$^2$ using a 2 x 2 km grid.

## Habitat

Beach Pinweed is restricted to large, stable barrier dune systems, usually in open, dry habitats. It is apparently unable to tolerate highly active dune sections and is typically found in comparatively sheltered sites, often with the low shrub beach




Canadian distribution of Beach Pinweed, New Brunswick and Prince Edward Island.

Source: April 2008 COSEWIC Status Report

heather (*Hudsonia tomentosa*), a strong indicator of potential habitat. It is also found locally in open jack pine-red pine woodland on old dunes but these populations are small and limited to the most open woodland, suggesting that this habitat may be suboptimal.

## Biology

The species is perennial from a stout, woody taproot, forming rosettes of prostrate basal shoots and sending up 1-5 flowering stalks. Reproduction is by seed, and dispersal is probably primarily by wind and water. Wind pollination is suspected but insect pollination is also possible. *Lechea* has been reported as primarily self-pollinating but unconfirmed suggestions of hybridization would indicate cross-pollination. Under certain conditions it can reproduce at very small sizes in its second or perhaps its first season, but most plants appear to be significantly older. Generation time is not well known, but is estimated here at 8–10 years.

## Population sizes and trends

The total population in Canada is estimated at 181 000 plants in 15 populations within five areas, with little genetic exchange likely between those five areas. There is no direct evidence on long-term trends but five historic sites, discovered between 1892 and 1932, are still extant. At least one site has experienced recent minor declines due to storm damage, and storm frequency and intensity are likely to increase with climate change. Minor losses to ATV traffic and trampling have been noted at a few sites, and succession may be an issue at the two sites with forest cover.

## Limiting factors and threats

The species is naturally limited by its highly specialized habitat. Sea-level rise and climate change-induced increases in storm frequency and intensity could be a long-term threat to the species and its habitat, given that much of the population is under 5 m elevation, and storm-caused decline in habitat quality has been noted at the lowest elevation sites supporting the majority of the population. It is not possible, however, to quantify climate change — related threats with any precision. Minor losses to ATV traffic and trampling have been noted at a few sites, and succession may be an issue at the two sites with forest cover. It is relatively well-protected from shoreline development by protected areas, provincial regulation and remoteness of occurrences.

## Special significance of the species

Beach Pinweed, when recognized as a distinct Canadian variety, is a globally rare endemic restricted to a very limited area, and is 380 km disjunct from the variety.

## Existing protection or other status designations

Beach Pinweed has no existing legal protection, although it benefits from provincial laws and regulations governing development and limiting activity in coastal areas. Seven of 15 populations are protected in Kouchibouguac and Prince Edward Island National Parks, Portage Island National Wildlife Area, Bouctouche Dune and Cabot Beach Natural Area. Four other sites are on provincial (two Conway Sandhills populations) or federal land (two Hog Island populations, on land held in trust for the Lennox Island First Nation). The species is ranked globally as G5T1 (secure as a species but the variety is critically imperiled), although revision to G5T2 could be warranted because of recent fieldwork. It is ranked S1 (critically imperiled) and May be at risk in New Brunswick and Prince Edward Island, meaning it would receive consideration in provincial and federal environmental impact assessments. In total, about 33% of the habitat containing the species is within protected areas. ■

# Canada Warbler

Photo: © Parks Canada – Jim Flynn

**Scientific name**
*Wilsonia canadensis*

**Taxon**
Birds

**COSEWIC Status**
Threatened

**Canadian Range**
Yukon, Northwest Territories, British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Quebec, New Brunswick, Prince Edward Island and Nova Scotia

## Reason for designation

Most (80%) of the breeding range of this species occurs in Canada. While regional trends may vary, overall the species has experienced a significant long-term decline. This decline is particularly evident in the case of the species' Canadian range and there is no indication that this trend will be reversed. The reasons for the decline are unclear, but loss of primary forest on the wintering grounds in South America is a potential cause.

## Species information

The Canada Warbler (*Wilsonia canadensis*) is a small, brightly coloured passerine. The males are typically more brightly coloured than the females and immatures, with blue-grey upperparts and tail contrasting with a yellow throat and breast. In both sexes, black stripes form a collar on the breast, although it is less defined in the females. The adults keep the same plumage year round. The plumage of the immatures is similar to that of the adults, but generally duller.

## Distribution

Approximately 80% of the Canada Warbler's global breeding range is located in Canada, where it breeds in all provinces and territories except Nunavut and Newfoundland and Labrador. It winters in northwestern South America.

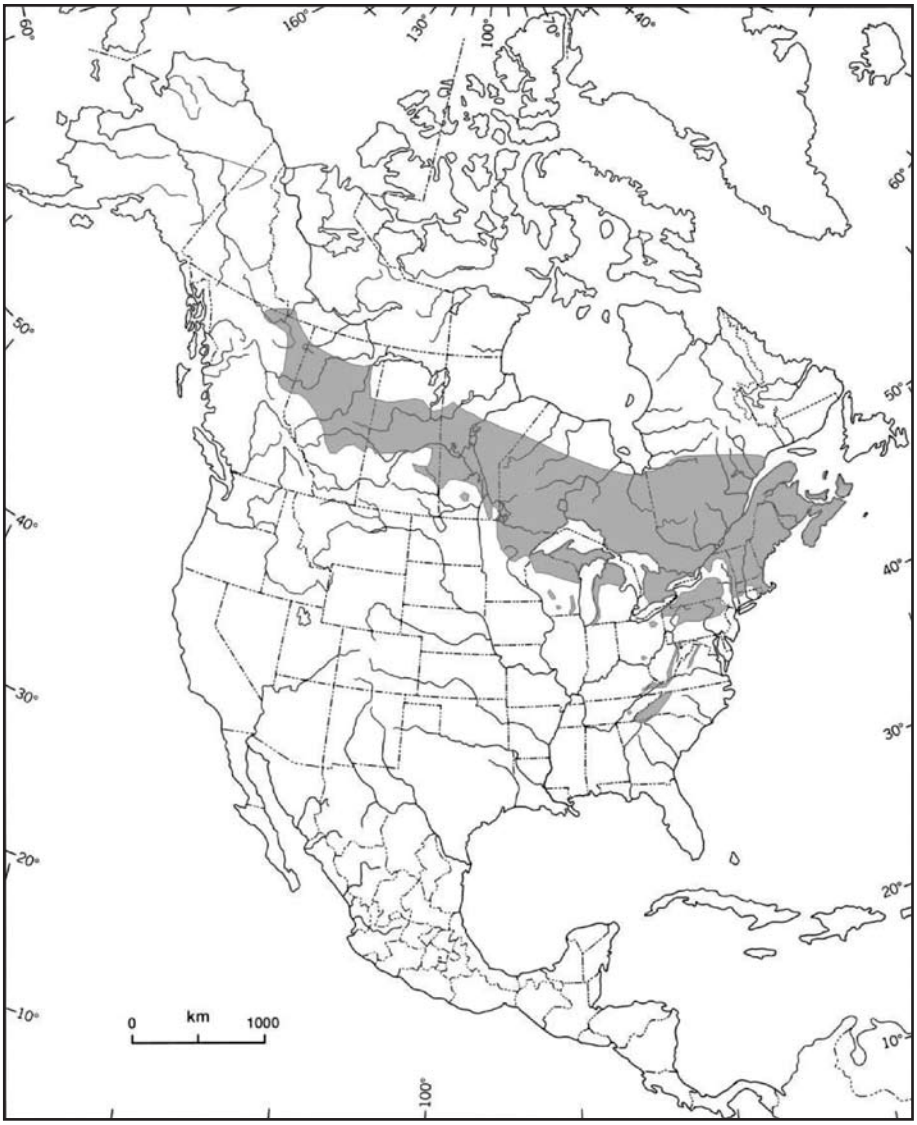
## Habitat

The Canada Warbler uses a wide range of deciduous, coniferous and mixed forests, with a well-developed shrub layer and a structurally complex forest floor. It is most abundant in moist, mixed forests. It also occurs in riparian shrub forest on slopes and in ravines, in stands regenerating after natural and anthropogenic disturbances and in old-growth forests with canopy openings and a well-developed shrub layer. In its wintering range, the Canada Warbler uses primarily mature cloud rainforests located at an altitude of 1 000 to 2 500 m, as well as second-growth forests, forest edges, coffee plantations, agricultural field edges and semi-open areas.

Canada Warbler habitat is believed to be in decline primarily in its wintering range, where up to 95% of the primary mountain forests have been converted to agriculture since the 1970s. Habitat loss has also been observed in the eastern part of its breeding range, where wet forests have been drained for urban development and forest converted to agricultural land.

## Biology

The Canada Warbler is typically monogamous and lays four to five eggs. Incubation usually lasts about 12 days. The chicks remain in the nest for 10 days, and are dependent on parents for two to three weeks after they leave the nest.




North American breeding distribution of the Canada Warbler.

Source: April 2008 COSEWIC Status Report.

## Population sizes and trends

The Canadian population of Canada Warbler is estimated at roughly 2.7 million individuals. Breeding Bird Survey (BBS) data for Canada suggest that the species has declined by 4.5%/year between 1968 and 2007, which amounts to a loss of approximately 85% of the population during that period. Between 1997 and 2007, the species declined by 5.4%/year, which corresponds to a decline of 43% of the population in the most recent 10-year period. These declines are most evident in the eastern portions of the breeding range, where the majority of the population occurs. Other survey methods also report declines in the Canada Warbler population.

## Limiting factors and threats

The factors responsible for the decline of the Canada Warbler have not been identified. Habitat loss and degradation on the wintering range are thought to be the most likely factors. In Canada, habitat loss due to conversion of swamp forests in the east, agricultural activities and road development in the boreal forest in the western part of the range and possibly a decrease in spruce budworm (*Choristoneura fumiferana*) outbreaks in eastern forests since 1970 may have also contributed to the decline.

## Special significance of the species

Eighty-five percent of the global breeding population of Canada Warbler occurs in Canada. For this reason, Canada has a major responsibility for the conservation of this species.

## Existing protection or other status designations

Canada Warbler adults, nests and eggs are protected in Canada under the *Migratory Birds Convention Act*, 1994. It is considered a high-priority species by Partners in Flight in Canada and the United States. ■

# Dusky Dune Moth

Photo: © Nick Page

**Scientific name**
*Copablepharon longipenne*

**Taxon**
Arthropods

**COSEWIC Statut**
Endangered

**Canadian Range**
Alberta, Saskatchewan and Manitoba

## Reason for designation

The species is restricted to open, active sand areas that are both fragmented and declining. Although it may be common where found, it occurs in a small proportion of the total seemingly suitable sites and has been lost from historical localities. Dispersal between dune systems is considered to be extremely unlikely. Since the 1940's, the area of suitable habitat has declined by an estimated 10–20% per decade.

## Species information

The Dusky Dune Moth (*Copablepharon longipenne* Grote 1882) is a medium-sized, light brown moth that has a line of black dots on the forewing. It occurs as two subspecies, of which only the nominate form occurs in Canada.

## Distribution

*Copablepharon longipenne* is found from southern Manitoba, Saskatchewan, and Alberta to western Texas and southern New Mexico. It is associated with the Great Plains. Its range is 1 258 285 km$^2$ globally and 164 480 km$^2$ in Canada. Since 1922, *C. longipenne* has been recorded at 12 localities in Canada: four in Alberta, seven in Saskatchewan, and one in Manitoba.

## Habitat

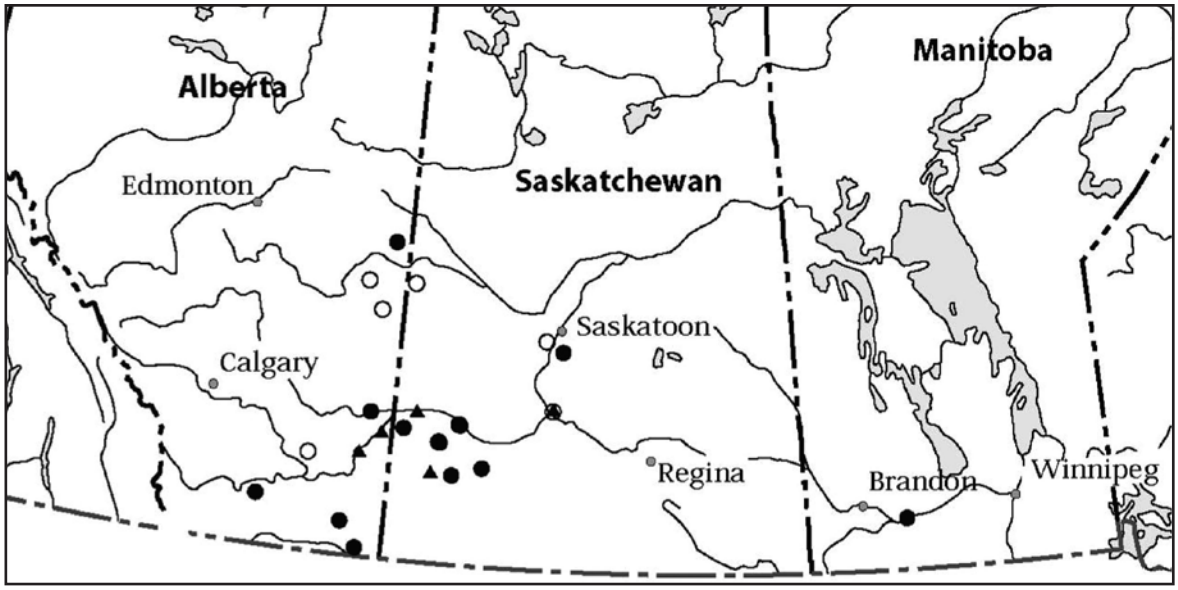
*Copablepharon longipenne* is associated with sparsely vegetated active sand dunes. It is considered a habitat specialist. Field observations suggest that the presence of open sand is important for reproduction; *C. longipenne* was observed laying eggs on the edge of active dunes. Active dunes in the Canadian prairies have declined in the past 100 years as increased precipitation has led to vegetation development. Most Canadian sites with known or suspected *C. longipenne* populations occur in publicly owned lands, primarily provincial lands that are leased for cattle grazing. Three populations or suspected populations occur in protected areas.

## Biology

Little is known about the biology of *C. longipenne*. Reproduction occurs once per year during a single flight season. In Canada, the flight season is approximately ten weeks long and extends from the middle of June to the middle of August. Adults have been observed nectaring on the flowers of dune plants during the evening. Mating has been observed to occur on plants or on the sand surface near vegetation. Eggs are deposited in a group approximately 1 cm below the sand surface. Larval feeding has not been observed except for one case where larvae were feeding on the below-ground parts of roses. Based on the variability of plant species recorded within the immediate vicinity of sampling sites, *C. longipenne* is not likely to be restricted to a single host-plant for adult nectaring, reproduction, or larval feeding. The dispersal abilities of *C. longipenne* have not been measured. There is no information that indicates it migrates.

## Population sizes and trends

There is no quantitative information on population sizes and trends for *C. longipenne*. Based on the stabilization trends of sand dunes in the Canadian




Canadian distribution of the Dusky Dune Moth. Filled points represent known localities.
Source: November 2007 COSEWIC Status Report.

prairies, it is inferred that *C. longipenne* populations are declining at a rate of 10–20% per decade.

The US population near Fort Peck, Montana, is approximately 270 km south of the closest Canadian population. The possibility of rescue over this distance is unlikely.

## Limiting factors and threats

The progressive stabilization of sand dunes caused by vegetation colonization is considered a threat to *C. longipenne*. This threat affects all populations in Canada. Development activities that result in destruction of sand dunes are considered a possible threat to *C. longipenne*. However, some disturbance associated with development may create habitat for *C. longipenne* by increasing open sand. Populations of *C. longipenne* in Canada may be at risk from demographic collapse. Populations of *C. longipenne* are spatially isolated and may have increased risk of extinction. Demographic collapse is considered a possible threat. Grazing is a possible threat to *C. longipenne*. It may initiate active sand movement in dunes and limit colonizing vegetation. However, it may cause soil compaction and browsing of vegetation that is used for larval feeding, and may also destroy eggs, larvae, or pupae.

Recreation may be intensive in some sand dunes and result in loss of vegetation, disturbance to sand substrates, and destruction of eggs, larvae, and pupae. Recreation may also maintain or create open sand habitats. Recreational activities are considered a possible threat.

## Special significance of the species

*Copablepharon longipenne* is closely associated with active sand dunes, a regionally rare habitat in the southern Canadian prairies. It can be considered one of several focal species representing the sensitivity and uniqueness of this habitat type in Canada.

There is no information to suggest that *C. longipenne* has, or had, an important cultural or economic role for First Nations.

## Existing protection or other status designations

*Copablepharon longipenne* is not protected in any jurisdiction in Canada or the United States and its conservation status has not been ranked by any provincial or federal organizations. ■

# Eastern Foxsnake, Great Lakes/St. Lawrence population

Photo: © Ryan M. Bolton

**Scientific name**
*Elaphe gloydi*

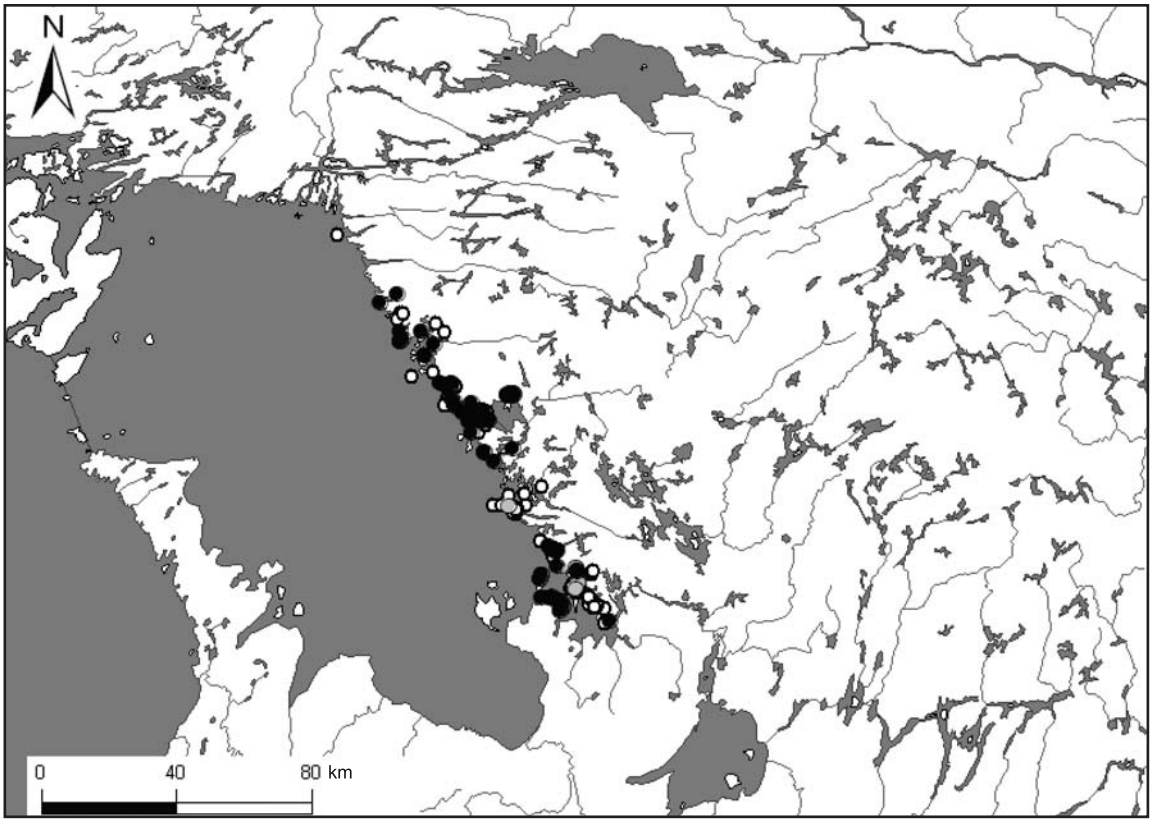
**Taxon**
Reptiles

**COSEWIC status**
Endangered

**Canadian Range**
Ontario

## Reason for designation

In this region, the species swims long distances often in cold, rough open water where it is subject to mortality due to increasing boat traffic. It is uniquely vulnerable to habitat loss because it is confined to a thin strip of shoreline where it must compete with intense road development and habitat modification due to recreational activities. The species' habitat is undergoing increasing fragmentation as development creates zones that are uninhabitable.




Canadian distribution of the Eastern Foxsnake, Great Lakes/St. Lawrence population, in Ontario on Georgian Bay. Solid circles represent the most recent observations.
Source: modified from the April 2008 COSEWIC Status Report.

# Eastern Foxsnake, Carolinian population

**Scientific name**
*Elaphe gloydi*

**Taxon**
Reptile

**COSEWIC status**
Endangered

**Canadian Range**
Ontario

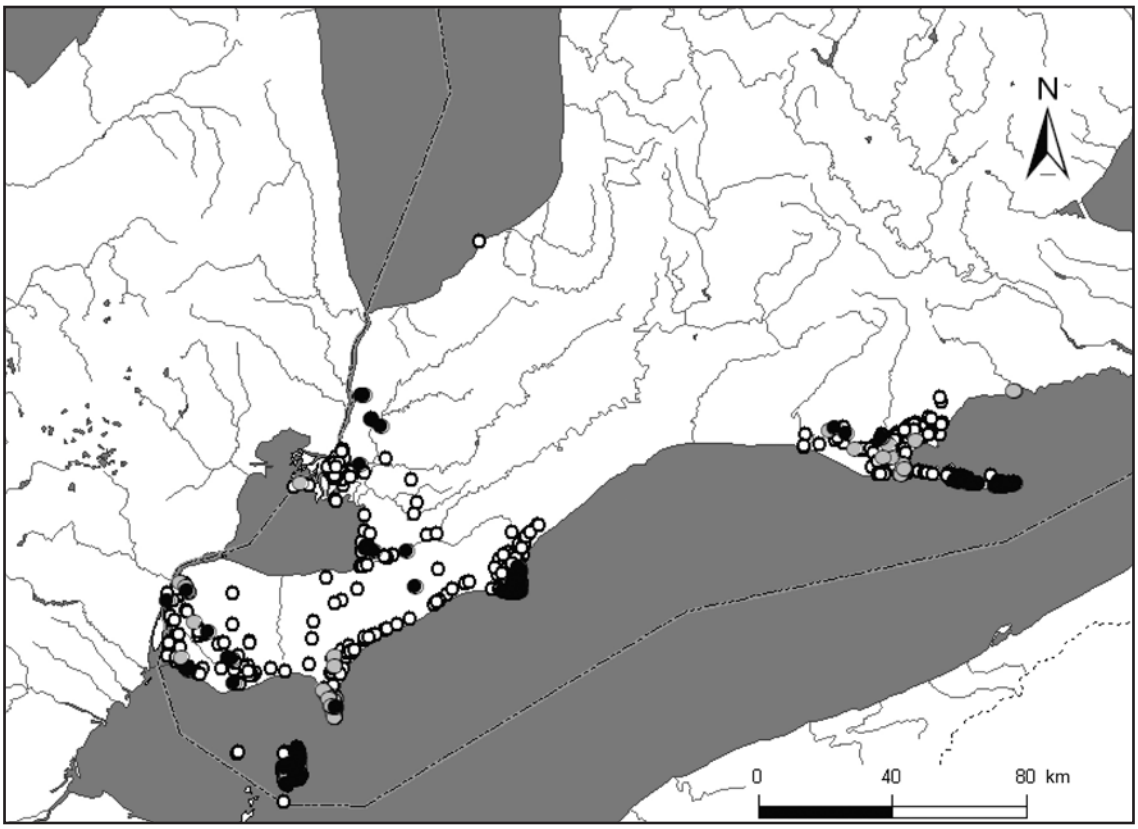
## Reason for designation

The species is confined to a few small increasingly disjunct areas that are subject to intensive agriculture, high human populations and extremely high densities of roads. Roads fragment populations leading to increased probability of extirpation. There are no large protected, roadless areas for this species in this region. The species is also subject to persecution and illegal collection for the wildlife trade.

### *Great Lakes/St. Lawrence population & Carolinian population*

## Species information

The Eastern Foxsnake commonly attains lengths of 91–137 cm. Adults usually lack any distinct patterns or conspicuous markings on the head, and head colouration varies from brown to reddish. The dorsum is patterned with bold, dark brown or black blotches on a yellowish background that alternate with smaller, dark blotches on the sides. The ventral scutes are most often yellow and strongly checkered with black.




Canadian distribution of the Eastern Foxsnake, Carolinian population, in Southwestern Ontario. Solid circles represent the most recent observations.
Source: modified from the April 2008 COSEWIC Status Report.

The scales are weakly keeled and the anal scale is divided. Juveniles have a lighter ground colour (commonly grey), lighter blotches bordered in black, a transverse line anterior to the eyes, and a dark line extending from the eye to angle of jaw on each side. The dark lines on the head of juveniles fade with age, and are usually quite faint in adults.

## Distribution

The global distribution of the Eastern Foxsnake is restricted to the Great Lakes region of North America. Approximately 70% of the species' range is in Ontario, Canada with relatively small distributions in Michigan and Ohio, USA. Within Ontario, the species' distribution is highly disjunct, occupying three discrete regions along the Lake Erie-Lake Huron waterway shoreline. The three regional populations from south to north are (1) Essex-Kent, (2) Haldimand-Norfolk, and (3) Georgian Bay Coast.

## Habitat

Eastern Foxsnakes in the Essex-Kent and Haldimand-Norfolk regions use mainly unforested, early successional vegetation communities (e.g., old field, prairie, marsh, dune-shoreline) as habitat during the active season. Hedgerows bordering farm fields and riparian zones along drainage canals are regularly used. In some areas of intensive farming, these linear habitat strips likely make up the bulk of habitat available for foxsnakes.

The populations of the Georgian Bay Coast predominantly use open habitats along shorelines (e.g., coastal rock barrens and meadow marshes) as habitat during the active season. The foxsnakes inhabiting this coastline do not venture far inland, restricting the majority of their activity to within 150 m of the water.

## Biology

Emergence from hibernation generally occurs from mid-April to mid-May, mating occurs from late May to mid-June, and egg laying occurs from late June to mid-July. Retreat into hibernacula occurs in September and October. Eastern Foxsnakes of the Georgian Bay Coast use much more space than those in Essex-Kent: on average, Georgian Bay females disperse 3.5 times farther from their hibernacula. Predators of Eastern Foxsnakes include the larger birds of prey and carnivorous mammals such as raccoon and fisher. Small mammals and birds make up the bulk of the Eastern Foxsnake's diet. Both active searching and ambush (sit-and-wait) foraging strategies are employed. Eastern Foxsnakes can adapt to limited anthropogenic disturbance, an example being their use of human-made structures for shelter during the summer despite high levels of human activity.

## Population sizes and trends

Several studies with the aim of documenting local population sizes and trends have been conducted on Eastern Foxsnake populations in Ontario. However, as is the case with other rare and cryptic snake species, obtaining reliable quantitative estimates has been difficult. Monitoring of communal hibernacula in areas where access is not restricted, and risks to the site can be minimized, probably offers the best chance of obtaining reliable estimates of population sizes and trends for specific hibernacula. Despite the lack of direct quantitative data demonstrating a decline in Eastern Foxsnake numbers, the sheer magnitude of wetland loss that has occurred in southwestern Ontario, coupled with the concomitant proliferation of roads in that region, makes the probability of range contraction and population reduction extremely high.

## Limiting factors and threats

The threats facing Eastern Foxsnakes in Ontario remain roughly the same as those identified in the previous status report: namely, habitat loss and degradation, road effects, other inadvertent effects caused by human activities, and intentional persecution by humans.

## Special significance of the species

The Eastern Foxsnake has an extremely restricted global range with approximately 70% of the species' distribution existing within Ontario, Canada. That the greatest proportion of the species' distribution is situated in Canada is unusual within the national herpetofaunal assemblage and makes the Eastern Foxsnake a distinctively Canadian species.

## Existing protection or other status designations

The Eastern Foxsnake has a global rank of G3 and sub-national ranks of S2 in Michigan, S3 in Ohio, and S3 in Ontario. The species was officially designated by COSEWIC as Threatened in April 1999 and May 2000, and subsequently designated Threatened by the Ontario Ministry of Natural Resources in 2001. In Canada, the Eastern Foxsnake is legally protected under the Ontario *Fish and Wildlife Conservation Act* which makes it illegal to harass, possess (without a permit), or kill the species. Additional protection is afforded in National Parks through the *Canada National Parks Act*, in National Wildlife Areas through the *Canada Wildlife Act*, and on all federal lands through the *Species at Risk Act* (Threatened designation; Schedule 1). Ontario's *Endangered Species Act* will provide protection for the species throughout the province. ■

# Ferruginous Hawk

Photo: © Bob Gress

**Scientific name**
*Buteo regalis*

**Taxon**
Birds

**COSEWIC Status**
Threatened

**Canadian Range**
Alberta, Saskatchewan and Manitoba

## Reason for designation

This large hawk is found primarily on natural grasslands in southern Alberta, Saskatchewan and Manitoba and is a specialist predator on Richardson's Ground Squirrels. It suffered a 64% decline in population from 1992 to 2005; since Alberta comprises the majority of the Canadian range, this implies a decline of at least 30% across the Prairies over that time period. The loss, degradation and fragmentation of its native grassland habitat are the most serious threats to the population.

## Species information

The Ferruginous Hawk (*Buteo regalis*; French: Buse rouilleuse) is a large, open-country, diurnal raptor that occurs in western North America. In many respects, the Ferruginous Hawk is similar to the Golden Eagle. The Ferruginous Hawk has broad, long wings with rounded tips and a fan-shaped tail. Two colour phases occur; a more common pale phase in which hawks have brown upper parts (with extensive orange, cinnamon and white markings on the shoulders and back), white underparts with brown streaks and a white to greyish tail. The less common dark-phased birds have dark brown plumage (some feathers are edged with cinnamon) and a white, pinkish or grey tail.

## Distribution

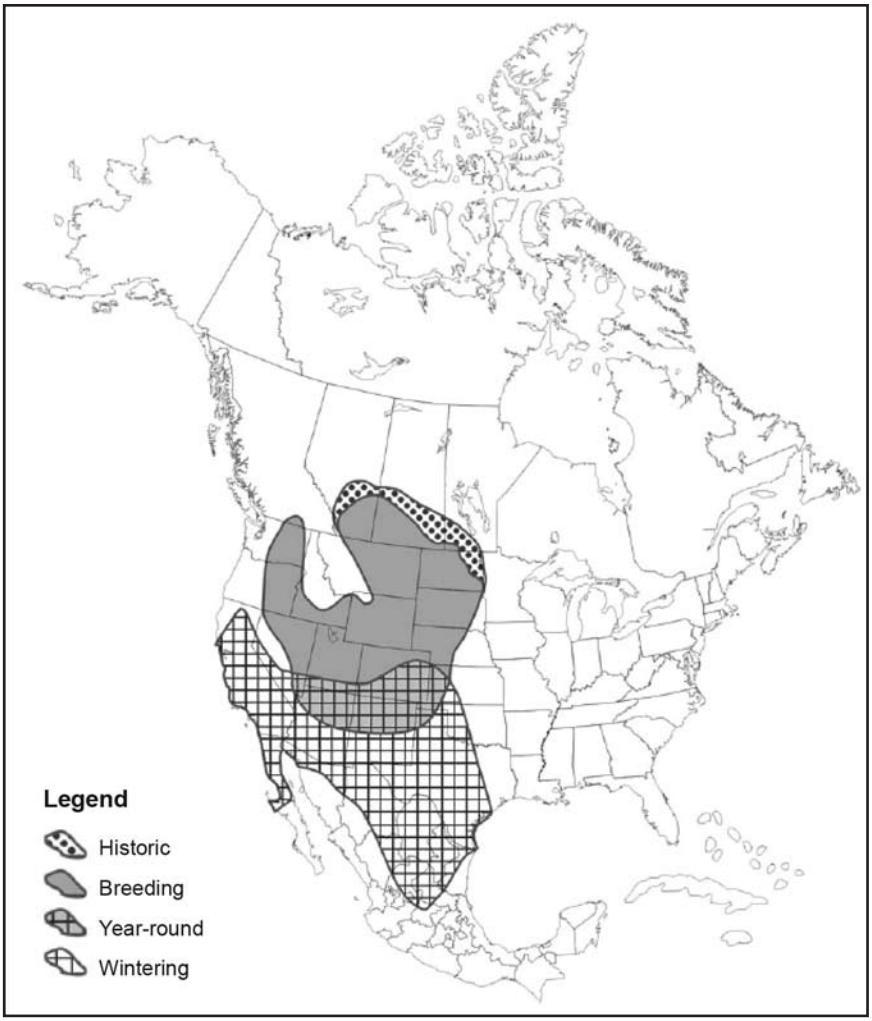
The Ferruginous Hawk is found in the grasslands, shrublands and deserts of the western United States and western Canada. In Canada it breeds in southern Alberta, southern Saskatchewan and southern Manitoba; a few pairs have nested in southern British Columbia, at least historically. Canada holds about 10% of the world's breeding distribution of the Ferruginous Hawk and that range is contracting; it now occupies only 48% of its historical range in Canada.

## Habitat

East of the Rocky Mountains, the Ferruginous Hawk is strongly dependent on native grasslands, which have been subject to degradation, conversion and fragmentation by urbanization, farming and industrial development. West of the Rockies, grasslands and shrub-steppe arid areas are heavily used by Ferruginous Hawks. On the other hand, aspen parkland, montane forests and areas of intensive agriculture are avoided. The distribution of the Ferruginous Hawk retracted at the northern edge of the range in Canada during the early 1900s because of agriculture and invasion of trembling aspen into the remaining mesic native prairie grassland due to fire suppression. Ferruginous Hawks are very sensitive to habitat loss and are considered a native grassland specialist.

## Biology

The Ferruginous Hawk is wary of humans, as well as being secretive, often roosting on the ground. Thus, it is much less conspicuous than other sympatric hawks such as Swainson's Hawk, making it more difficult to monitor its populations. The Ferruginous Hawk uses a wide variety of structures for nesting, including cliffs, trees, utility structures, farm buildings, abandoned farm machinery, haystacks and artificial platforms. Apparently monogamous (though sometimes three birds are seen together), the Ferruginous Hawk is territorial and breeds for




North American distribution of the Ferruginous Hawk.
Source: April 2008 COSEWIC Status Report.

the first time at two years of age. Clutch size ranges from 2–8 eggs. The Ferruginous Hawk is a ''sit-and-wait'' predator and up to 5–10 hawks have been observed at prairie dog towns. East of the Rockies, the Ferruginous Hawk depends on a keystone prey species, the Richardson's ground squirrel, whereas west of the Rockies, it preys on jackrabbits, prairie dogs and pocket gophers.

## Population sizes and trends

Ferruginous Hawks now occupy about half of their historical range in Canada. In Alberta, the population was estimated at 618 ± 162 pairs in 2005, substantially lower than earlier estimates. Whether this is due to an actual decline in numbers in Alberta or improvements in survey techniques is unknown but it is now thought that the population has been at a low since 2000. In Saskatchewan, the population had previously been roughly estimated at between 300-500 pairs based on known nest localities, site occupancy and extrapolation from small study areas. A 2006 survey found 278 nests in Saskatchewan in a search that covered all historical nesting sites and about 12% of the species' range there. In Manitoba, the latest population estimate (2005) is 42 pairs. The entire Canadian population is probably about 1 200 pairs, about half of what was estimated in 1998.

Evidence for recent declines in Ferruginous Hawk populations comes from hawkwatch counts while Breeding Bird Survey data suggest a stable or increasing population, although the latter have many deficiencies for monitoring trends in raptor populations. The latest analysis of migration counts from western North America (1977–2001) demonstrated significant declines at four of the six hawkwatch sites analyzed. At two of these sites passage rates increased until the early to mid-1990s, then decreased; long-term declines have occurred at the other two sites.

Like many other raptor species, population parameters (e.g., reproductive success) of Ferruginous Hawks fluctuate according to prey abundance and availability. Natural fluctuations in the populations of ground squirrels are mirrored in the breeding parameters of Ferruginous Hawks. Although populations may appear healthy in ranching areas of Alberta, habitat for the species is saturated and there is quite strong evidence that the species is declining.

## Limiting factors and threats

Limiting factors in order of importance are likely increased human disturbance (particularly at nest sites), decreased prey abundance (Richardson's ground squirrel), loss and/or declines in habitat quality of native prairie grassland, interspecific competition (from other *Buteo* hawk species), and oil and gas exploration.

## Special significance of the species

The Ferruginous Hawk is a native prairie grassland specialist and is one of the least adaptable of several other species of prairie hawks.

## Existing protection or other status designations

The Ferruginous Hawk was listed as Threatened by COSEWIC in 1980, but was downlisted to Special Concern in 1995 by COSEWIC and is on Schedule 3 of the federal *Species at Risk Act* (SARA 2002). It is listed as Threatened under the Alberta *Wildlife Act*. Within the provinces, the species is protected by provincial endangered species legislation. It is not protected by the *Wild Species at Risk Regulations* of the *Wildlife Act* in Saskatchewan. ■

# Foothill Sedge

Photo: © Matt Fairbarns

**Scientific name**
*Carex tumulicola*

**Taxon**
Vascular Plants

**COSEWIC Status**
Endangered

**Canadian Range**
British Columbia

## Reason for designation

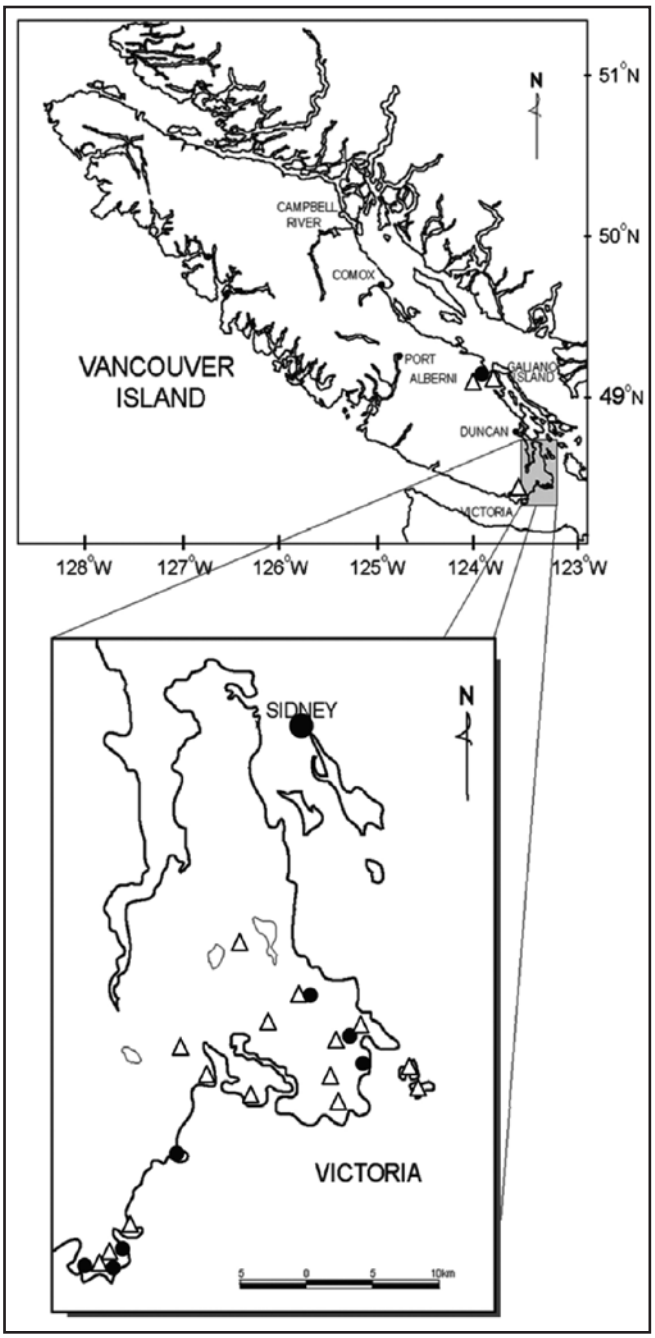
This perennial species is known from 10 localized and highly fragmented sites in southwestern British Columbia where it occurs in meadows and shrub thickets within Garry oak ecosystems, a critically imperiled habitat in Canada. The total Canadian population likely consists of fewer than 1000 mature individuals. Factors such as competition and habitat degradation from invasive alien plants, altered fire regimes, urbanization, trampling and mowing place the species at risk.

## Species information

Foothill Sedge (*Carex tumulicola*) is a grass-like plant in the sedge family that forms loose tufts up to 80 cm high, or sods.

## Distribution

The range of Foothill Sedge extends from southwest British Columbia south to Oregon and California. It has been (possibly erroneously) reported from Idaho. In Canada, it is known only from the southeast coast of Vancouver Island. The actual area of habitat occupied by the species is <<1 km$^2$; this has increased from a few m$^2$ at the original location to an estimated 100 ha. The COSEWIC Area of Occupancy for the 10 populations, if based on a 1 x 1 km grid, is 10 km$^2$ and 32 km$^2$ if a 2 x 2 km




Canadian distribution of Foothill Sedge, British Columbia. Solid circles represent extant populations.
Source: April 2008 COSEWIC Status Report.

grid is applied. The Extent of Occurrence (EO) is now estimated at 1 700 km$^2$.

## Habitat

In Canada, Foothill Sedge is known from vernally moist meadows and shrub thickets in Garry oak and associated ecosystems. Increasing urbanization around Victoria and Nanaimo, alien plant invasions, and secondary succession due to fire suppression have altered the ecology of the region to such an extent that the amount of area suitable for supporting this species may now be substantially reduced compared to historical levels.

## Biology

Foothill Sedge is a perennial that flowers and fruits in mid to late summer. The flowers are wind-pollinated and the seeds have no innate dispersal mechanism. In addition to reproducing via seed, Foothill Sedge spreads vegetatively from short rhizomes, and establishes readily from rhizome fragments. It appears able to tolerate high moisture levels in the winter and very low moisture levels in the summer, and is adapted to either sun or shade.

## Population sizes and trends

Foothill Sedge was first collected in Canada in 1990, but intensive searches for the species did not begin until 1999. By 2006, a total of ten populations had been recognized. In two cases, populations consist of just a single tussock, possibly representing a single individual. Other populations are comprised of single or scattered patches ranging in area from <1 m$^2$ to spread out over about 30 ha. Because of the species' rhizomatous habit, obtaining reliable population counts is difficult. However, the total population likely numbers less than 1 000 individuals.

## Limiting factors and threats

Foothill Sedge has only been monitored in Canada for less than a decade, thus the reasons for its present rarity are unclear. Nevertheless, several factors now appear to be threatening its persistence. These include (in approximate order of importance): competition from introduced alien species; altered fire regimes; habitat conversion (urbanization); all-terrain vehicle traffic; hydrologic alterations; trampling and mowing; and loss of habitat due to bank slumping.

## Special significance of the species

The species' present disjunct distribution in northwestern North America may be a relict of a once broader distribution that prevailed during the warm, dry, postglacial period, 4 000–6 000 years before present, called the Hypsithermal Interval. Until recently, the species was confused with the European sedge *Carex divulsa*, that has been used for horticultural purposes and some land reclamation work in the Pacific Northwest.

## Existing protection or other status designations

Foothill Sedge is Red-listed in British Columbia and has a provincial conservation rank of S1 (critically imperiled), but has no species-specific protection in Canada or elsewhere. However, it is possible that the species can be added to the list of species under the BC *Wildlife Amendment Act* (2004). Eight of the ten populations do occur in areas that receive some site protection by virtue of their location in either municipal parks or on DND (Department of National Defense) or Parks Canada Agency property. ■

# Fragrant Popcornflower

Photo: © Hans Roemer

**Scientific name**
*Plagiobothrys figuratus*

**Taxon**
Vascular Plants

**COSEWIC Status**
Endangered

**Canadian Range**
British Columbia

## Reason for designation

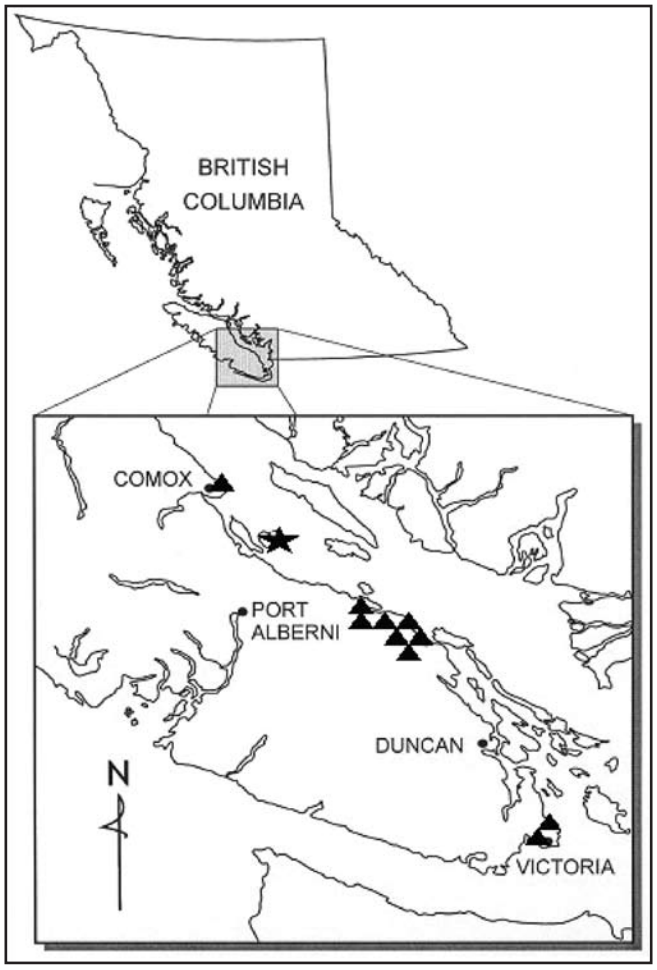
Although only a single plant was seen in 2005 and none in 2006, the species is likely extant in the form of seeds in the soil. The species' potential for continued survival is at risk from on-going threats to its habitat from such factors as loss of habitat due to urbanization/development, environmental and demographic stochasticity, and competition from native and alien plant species.

## Species information

Fragrant Popcornflower (*Plagiobothrys figuratus*) is a showy annual herb belonging to the Borage family and is native to the Pacific Northwest. It has fragrant white flowers and hairy stems. Plants range in height from 10–45 cm. The Canadian plants are recognized as ssp. *figuratus*. This is the only subspecies in Canada. A second subspecies, *Plagiobothrys figuratus* ssp. *corallicarpus*, is endemic to Oregon.

## Distribution

The native range of the species extends from southeastern Vancouver Island (Nanaimo, Victoria, and Gulf Islands) south to Oregon west of the Cascade Mountains, and east to the Columbia River Gorge in Washington. The ssp. *corallicarpus* occurs only in southwestern Oregon where it overlaps the range of the common ssp. *figuratus*. Fragrant Popcornflower occurs as an introduced species in parts of southern Alaska and the eastern U.S. The historical Extent of Occurrence (EO) in Canada was about 1 600 km$^2$. Its current confirmed EO, based on a single extant population, is << 1 km$^2$. The actual area of habitat once covered by the species is




Canadian distribution of Fragrant Popcornflower. The star represents the extant population and the triangles, historic populations.
Source: April 2008 COSEWIC Status Report.

unknown, but the single extant population covers an area of about 1 $m^2$, with its official Area of Occupancy, based on a 1 x 1 km grid being 1 $km^2$.

## Habitat

Fragrant Popcornflower prefers low-lying, wet areas and is usually found in moist fields and open meadows, occasionally also along watercourses and ditches. Increasing urbanization around Victoria and Nanaimo, combined with the draining of wetlands for agricultural uses and road construction, has altered the ecology of the region to such an extent that the amount of area suitable for supporting this species is now significantly reduced compared to historical levels.

## Biology

Fragrant Popcornflower is an annual plant that produces a coiled head of showy flowers in May or June. Each flower produces 2–4 smooth seeds. Little else is known about the ecology of this species, including its survival and recruitment rates, dispersal mechanisms, and intrinsic vulnerabilities to disturbance.

## Population sizes and trends

The first Canadian collection of Fragrant Popcornflower was made in 1885, near Victoria. It is known historically from 7–12 independent localities. The species was recently thought to have been extirpated in Canada, having last been recorded at Hornby Island, British Columbia, in the 1980s. However, in 2005, a single flowering plant was observed at Hornby Island, but no plants were seen in 2006.

## Limiting factors and threats

The ecological factors naturally limiting the abundance and distribution of this species are largely unknown. Urbanization is likely the primary reason that this species has largely disappeared from its Canadian range, as the majority of former habitats were located in what are now the cities of Nanaimo and Victoria. The greatest current threats to Fragrant Popcornflower persistence appear to be residential development, small population size, and competition from invasive alien species.

## Special significance of the species

Seeds of this attractive species are offered for horticultural use. The species has also been suggested for inclusion in a mix of herbaceous plants to be used in wetlands to control the spread of reed canary grass (*Phalaris arundinacea*). It has no known ethnobotanical uses.

## Existing protection or other designations

No protection currently exists for Fragrant Popcornflower, although it is a potential candidate for listing under the British Columbia *Wildlife Amendment Act* (2004). ■

# Great Blue Heron *fannini* subspecies

Photo: © Parks Canada – N. Boisvert

**Scientific name**
*Ardea herodias fannini*

**Taxon**
Birds

**COSEWIC Status**
Special Concern

**Canadian Range**
British Columbia

## Reason for designation

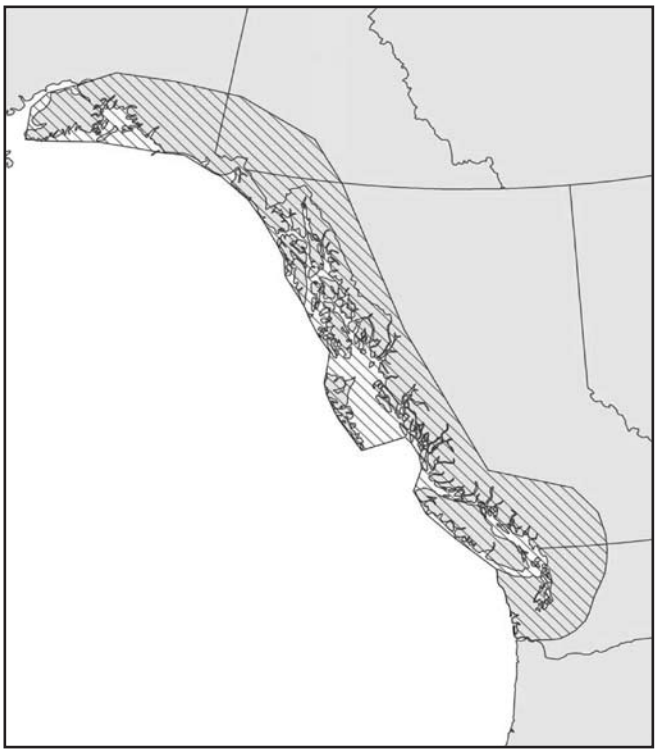
In Canada, this subspecies is distributed along the coast of British Columbia with a relatively small population that is concentrated at a few breeding colonies in southern British Columbia. There is evidence of declines in productivity and it is unclear whether the population is stable or declining. Threats from eagle predation, habitat loss and human disturbance are ongoing, particularly in the southern part of the range where concentrations of birds are highest.

## Species information

The Great Blue Heron, *Ardea herodias*, is the largest wading bird in North America, standing over 1 m in height. On the coast of British Columbia the subspecies, *Ardea herodias fannini*, referred to as the Pacific Great Blue Heron in this report, resides year round. This subspecies is non-migratory and isolated in part by high mountain ranges to the east and a slightly earlier breeding season, compared to more continental herons. The Pacific Great Blue Heron is darker plumaged, smaller in size and has a smaller clutch size than continental herons.

## Distribution

The Great Blue Heron breeds across most of North America south of Alaska, and on the Galapagos Islands. The non-breeding distribution is south of freezing areas in the north, to as far south as Panama. The distribution of the Pacific Great Blue Heron is confined to the Pacific Coast from Prince William Sound, Alaska south to Puget Sound, Washington, where it resides year-round.



North American distribution of the Great Blue Heron, *fannini* subspecies, in the Pacific Northwest.

Source: modified from the April 2008 COSEWIC Status Report.

## Habitat

The Pacific Great Blue Heron forages along the seacoast, in fresh and saltwater marshes, along rivers and in grasslands. Smaller numbers of herons forage

in kelp forests, from wharves and at anthropogenic waterbodies (e.g., ornamental ponds and fish farms). Most herons nest in woodlands near large eelgrass (*Zostera marina*) meadows, along rivers, and in estuarine and freshwater marshes. Nesting colony locations are dynamic, especially in areas of high disturbance. Some colonies are used for many years, but most colonies and especially those with fewer than 25 nests, are relocated every few years. In autumn, juvenile herons occupy grasslands on the Fraser River delta and southern Vancouver Island, and adults occupy estuarine marshes, riverine marshes and grasslands.

The size of Great Blue Heron populations is correlated with the area of foraging habitat available locally, and consequently the largest concentrations of Pacific Great Blue Herons occur around the Fraser River delta where extensive mudflats and eelgrass beds provide abundant foraging locations. Local declines in foraging habitat likely have been greatest in south-coastal British Columbia because most of the province's human population is located in this area. Further, the magnitude of use of some foraging locations currently may be limited by the amount of suitable nesting habitat that remains undeveloped.

Suitable tall trees as nesting habitat near foraging areas have declined in some parts of British Columbia over the past century due to increases in the size of human populations and industry. Especially hard hit is south-coastal British Columbia and especially the lower Fraser Valley, where the human population is large and still growing. In this region, nesting habitat might be limiting the size of the heron population. Habitat destruction in south-coastal British Columbia has resulted in the abandonment of at least 21 colonies (from 1972 to 1985 and from 1998 to 1999).

## Biology

In springtime, most herons gather in colonies where they court, nest, and raise young. The principal diet is small fish during the breeding season augmented with small mammals in winter. Typically four eggs are laid and less than two chicks on average reach the fledgling stage and leave the nest to become juveniles. Fewer than 25% of juveniles survive their first winter, after which survival increases to about 75% per year for adults. Nests are generally in trees and are made using large sticks.

## Population sizes and trends

Population size has been difficult to estimate for the Pacific Great Blue Heron because colonies are not stable and are difficult to track in a standardized fashion. The best available estimates suggest that the Pacific Great Blue Heron population size in Canada is 4000–5000 nesting adults. The global population of the Pacific Great Blue Heron is likely between 9500 and 11 000 nesting adults. Christmas Bird Count data show population declines over the past three generations, while Coastal Waterbird Surveys show increases over a recent five-year period. Colony surveys suggest that productivity has declined significantly since the1970s.

## Limiting factors and threats

Declines and other issues with productivity and population size are thought to primarily be due to Bald Eagle predation, human disturbance and destruction of nesting and foraging habitat. The projected doubling in the human population in the next 30 years in the core of the range threatens to exacerbate the human disturbance problem and habitat loss. In addition, the influence of predators may be reducing habitat quality by causing herons to move to new, and ever more limited, sites.

## Special significance of the species

The Pacific Great Blue Heron has high public appeal as a symbol of wetland conservation and environmental quality.

## Existing protection or other status designations

All Great Blue Herons are protected from hunting and molestation by the *Migratory Birds Convention Act*, *Migratory Bird Regulations* and the British Columbia *Wildlife Act*. Both subspecies of Great Blue Heron inhabiting British Columbia are at present on the provincial 'Blue List' compiled by the British Columbia Ministry of Environment. The Pacific Great Blue Heron was listed in 1997 as Special Concern by COSEWIC. ■

## Lindley's False Silverpuffs

Photo: © Neal Kramer

**Scientific name**
*Uropappus lindleyi*

**Taxon**
Vascular Plants

**COSEWIC Status**
Endangered

**Canadian Range**
British Columbia

### Reason for designation

An annual flowering plant of British Columbia restricted to only five extant locations in the Gulf Islands. The species is no longer known to occur on Vancouver Island. There are extremely small numbers of individuals known in Canada. The species is also at continued risk from habitat loss and degradation from such factors as home building and spread of invasive plants.

### Species information

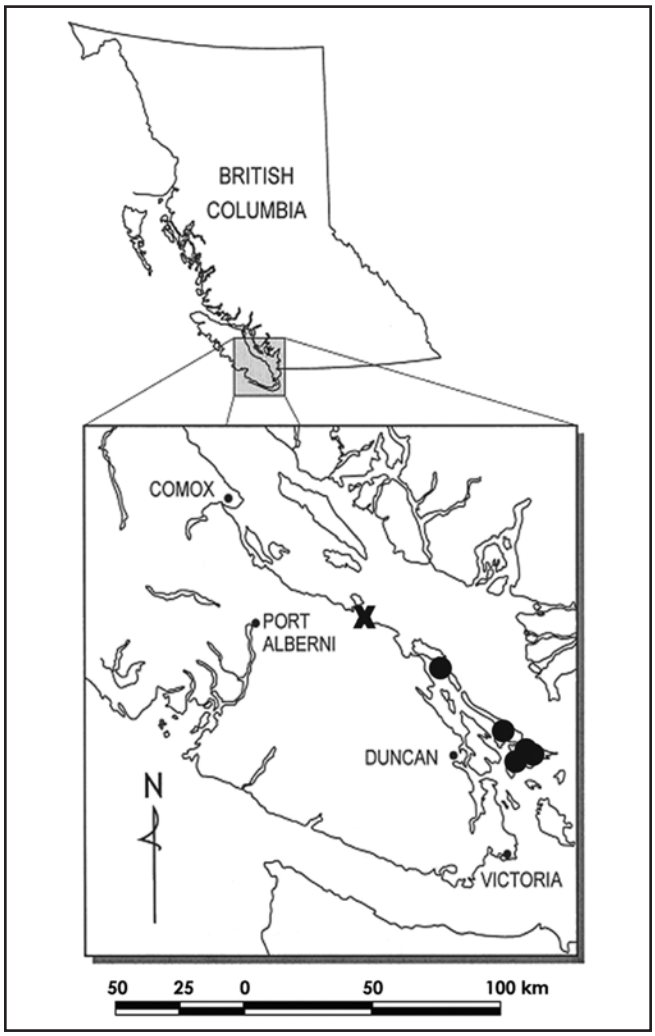
Lindley's False Silverpuffs (*Uropappus lindleyi*, formerly named *Microseris lindleyi*), a member of the aster family, is approximately 10–70 cm tall and usually has a simple stem growing from a slender taproot. The long leaves at the base of the plant are linear and pointed at the tip. The stem leaves are usually linear and occur on the bottom half of the stems. The flowering stems emerge from the base or from the axils of the stem leaves. The solitary, terminal flowering heads have strap-shaped, yellow flowers. Genetic studies of the genus *Microseris* (= *Uropappus*) have discovered numerous DNA and enzyme differences between *M. lindleyi* and other members of the genus resulting, in part, in the recognition of the genus *Uropappus*. Variation within *Uropappus lindleyi* material from the U.S. was not detected; no genetic studies have been conducted using Canadian material of the species.

### Distribution

Lindley's False Silverpuffs ranges from southwestern British Columbia disjunctly to Idaho and central Washington and south to Oregon, Utah, Texas, New Mexico, Arizona and California. A historic occurrence is known in the San Juan Islands of northwestern Washington. In Canada, Lindley's False Silverpuffs is known only from the Gulf Islands in southwestern British Columbia. Less than one percent of the species' total range occurs in Canada. The current Extent of Occurrence in Canada is approximately 150 $km^2$. The actual area of habitat occupied is about 0.01 $km^2$ but the Area of Occupancy, based on a 1 x 1 km or 2 x 2 km grid for the five localities, is a maximum of 20 $km^2$.

### Habitat

Lindley's False Silverpuffs populations in British Columbia are found in, or near, Garry oak (*Quercus garryana*) and associated ecosystems in the dry Coastal Douglas-fir zone of southeastern Vancouver Island and adjacent Gulf Islands. This area has a relatively warm and dry Mediterranean climate. The species occurs in a number of different habitats ranging from sandstone cliffs and steep grassy slopes to xeric deciduous or evergreen forests. There is no specific information on the trends of Lindley's False Silverpuffs habitats on southeastern Vancouver Island or the adjacent Gulf Islands although they almost certainly share the same threats as Garry oak ecosystems, including agricultural development, urbanization and invasion by aggressive alien weeds.




Canadian distribution of Lindley's False Silverpuffs. Solid circles represent extant populations.
Source: April 2008 COSEWIC Status Report.

## Biology

Lindley's False Silverpuffs is an annual species, with flowering typically observed in late-April to mid-May in British Columbia and seed production occurring in from mid-May to June. Compared to similar species in the genus *Microseris*, Lindley's False Silverpuffs is characterized by such features such as being self-pollinated and having smaller flowers and fewer scales (bracts) surrounding the flower heads. The bristle-tipped pappus scales attached to the top of the fruitlets could attach to bird feathers, and may possibly enable long-distance dispersal. Most seeds, however, are likely dispersed locally by wind and gravity.

## Population sizes and trends

There are five extant locations in Canada where Lindley's False Silverpuffs has been collected since 1974. One additional population was recorded in 1998, and is probably extirpated as a result of housing development. Population sizes range from approximately 20 to 1 200 plants on areas of less than 1 $m^2$ to 1 ha. The most recent survey of the populations indicates that there are probably about 2 000 individuals in Canada. The potential for immigration from the species' main range is unlikely. Even locally, exchange of seeds or pollen probably occurs only rarely due to lack of effective dispersal vectors.

## Limiting factors and threats

The most immediate threat to Lindley's False Silverpuffs in British Columbia is habitat destruction through housing development on private property. Almost all populations occur on valuable, private ocean view properties. Habitat destruction has also resulted in increased fragmentation of populations. In addition, much of the remaining habitat suitable for Lindley's False Silverpuffs has been heavily altered due to invasion by introduced species.

## Special significance of the species

In California, Lindley's False Silverpuffs seeds are collected from the wild and sold in at least one native plant nursery; other cultural, medicinal or spiritual uses are unknown. Since the Canadian population represents the northern extent of the species' range, it may be of evolutionary and ecological significance. Genetic study of *Microseris* (the genus within which Lindley's False Silverpuffs was formerly included) indicates that Lindley's False Silverpuffs (= *M. lindleyi*) has distinct differences from other members of the genus. Consequently, the recent reclassification places Lindley's False Silverpuffs in the genus *Uropappus*, consisting of a single species (*U. lindleyi*).

## Existing protection or other status designations

Globally, Lindley's False Silverpuffs has a rank of G5, indicating that it is considered "frequent to common to very common; demonstrably secure and essentially ineradicable under present conditions". The species is tracked as a rare species outside of British Columbia only by Utah, with a rank of S1 (critically imperiled) in the state or province because of extreme rarity or because of some factor(s) making it especially vulnerable to extirpation). Since the species is restricted to British Columbia in Canada, it has a national rank of N1 (critically imperiled in the nation because of extreme rarity or because of some factor(s) making it especially vulnerable to extirpation). Provincially, Lindley's False Silverpuffs is ranked by the British Columbia Conservation Data Centre as S1 and appears on the British Columbia Ministry of Environment red list. ■

# Muhlenberg's Centaury

Photo: © Carol W. Witham

**Scientific name**
*Centaurium muehlenbergii*

**Taxon**
Vascular Plants

**COSEWIC Status**
Endangered

**Canadian Range**
British Columbia

## Reason for designation

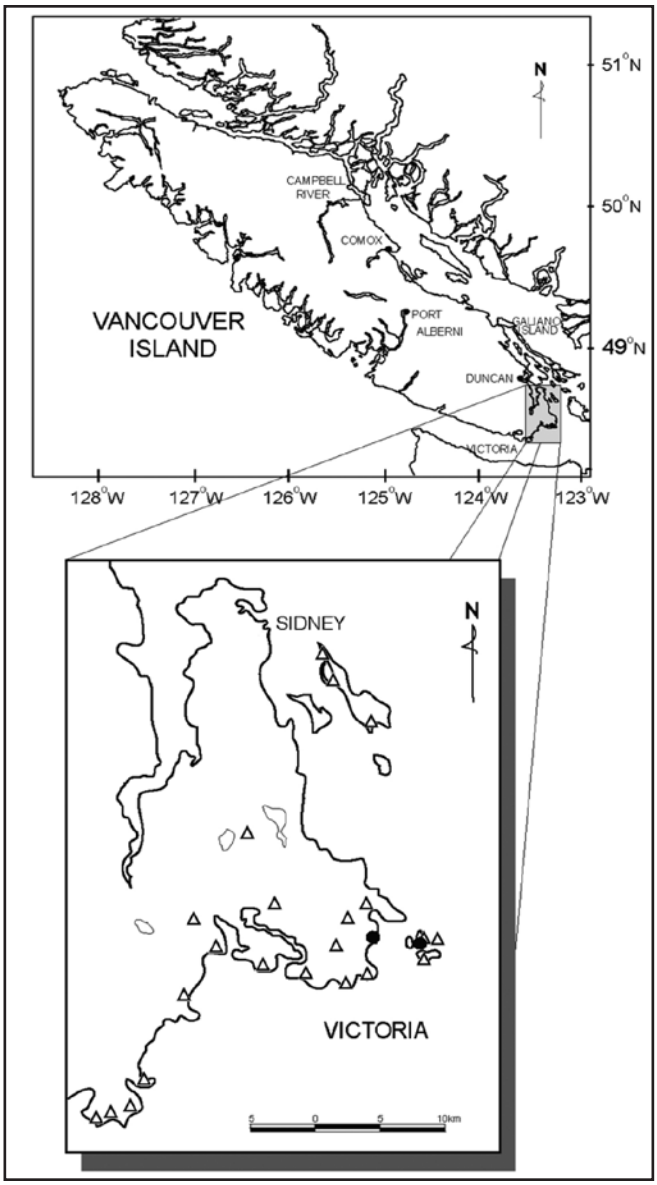
This small annual plant occurs in only three small areas of mainly wet habitat in southwestern British Columbia. Its total Canadian population consists of fewer than 1 000 plants. These are highly disjunct from the main range of the species that extends from Oregon to California and Nevada. The species is at continued risk from such factors as the spread of invasive plants and human activities including trampling in areas used for recreational activities.

## Species information

Muhlenberg's Centaury (*Centaurium muehlenbergii*) is a small annual herb in the gentian family. It has opposite leaves and pink or white tubular flowers with flaring lobes, and typically grows to 4–8 cm in its Canadian habitat.

## Distribution

The range of the species extends from British Columbia south to Oregon, Idaho, Nevada and California. Only three extant populations are known in Canada, all on or near southeastern Vancouver Island. There is a single population in Greater Victoria, one on the Gulf Islands, and one near Nanaimo. The species' Extent of Occurrence is 160 km$^2$ and its Area of Occupancy is <20 km$^2$. The actual total area of habitat occupied, however, is only about 110 m$^2$.




Canadian distribution of Muhlenberg's Centaury, British Columbia. Solid circles represent extant populations.
Source: April 2008 COSEWIC Status Report.

## Habitat

Muhlenberg's Centaury is found in the Coastal Douglas-Fir Biogeoclimatic Zone, where it occurs in habitats ranging from vernal pools (water only present in the spring) and seeps to the margins of a coastal salt marsh. Increasing urbanization around Victoria, combined with the draining of wetlands for agricultural uses and development, has altered the ecology of the region to such an extent that the amount of area suitable for supporting this species is now significantly reduced compared with historical levels.

## Biology

Muhlenberg's Centaury is an annual species; it flowers in the summer and produces several small seeds that remain dormant through the winter and germinate the following year. Some seeds probably remain dormant for longer than a year, forming a persistent seedbank, but this has not been confirmed. Little else is known about the ecology of this species, including its germination requirements, survival and recruitment rates, dispersal mechanisms, and intrinsic vulnerabilities to disturbance.

## Population sizes and trends

Total population size at the three extant sites is currently estimated to be between 500 and 1 000 individuals. The majority of these occur at a single site. There is no evidence of population declines in the last 10 years, and populations appear to be more or less stable.

## Limiting factors and threats

The ecological factors naturally limiting the abundance and distribution of this species are largely unknown. Aside from habitat loss due to urbanization, the primary threats to its persistence in Canada are: competition from introduced species, especially grasses; trampling by people, dogs, and bicycles; off-road vehicle traffic; hydrologic alterations; altered fire regimes; and disturbance from Canada geese.

## Special significance of the species

Species in the genus *Centaurium* have long been held in regard for their medicinal properties, although Muhlenberg's Centaury is not known to have any such uses in Canada.

Muhlenberg's Centaury may be of special interest genetically, insofar as peripheral populations are often genetically distinct from those in the core of the range. The British Columbia population of Muhlenberg centaury is about 300 km disjunct from the northern extent of its main range in California and Oregon.

## Existing protection or other status designations

Muhlenberg's Centaury is Red-listed in British Columbia; it has a provincial conservation rank of S1 (critically imperiled) and a national heritage rank of N1. However, there is no legal protection in place either for it or its critical habitat in Canada. The species can be added to the list of species under the B.C. *Wildlife Amendment Act* (2004) by provincial cabinet if the species is listed as extirpated, endangered or threatened in B.C. on the basis of a detailed status assessment. ■

# Olive-sided Flycatcher

Photo: © www.briansmallphoto.com

**Scientific name**
*Contopus cooperi*

**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 songbird has shown a widespread and consistent population decline over the last 30 years; the Canadian population is estimated to have declined by 79% from 1968 to 2006 and 29% from 1996–2006. The causes of this decline are uncertain.

## Species information

The Olive-sided Flycatcher (*Contopus cooperi* (Swainson), French: Moucherolle à côtés olive) is a medium-sized songbird 18–20 cm in length. Adults are a deep brownish olive-grey above and on the sides and flanks, with white on the throat, centre of breast and belly. The wings are dark with pale, indistinct wing bars, and the bill is stout. The most distinctive features of the Olive-sided Flycatcher are its tendency to conspicuously perch on the top of tall trees or snags while foraging and the song—a loud three-note whistle: *Quick, THREE BEERS!*

## Distribution

The Olive-sided Flycatcher breeds throughout much of forested Canada and in the western and northeastern United States. Approximately 54% of its breeding range is in Canada. The winter distribution is more restricted, being primarily in Panama and the Andes Mountains from Venezuela to Peru and Bolivia.

## Habitat

The Olive-sided Flycatcher is most often associated with open areas containing tall trees or snags for perching. Open areas may be forest openings, forest edges near natural openings (such as rivers, muskeg, bogs or swamps) or human-made openings (such as logged areas), burned forest or open to semi-open mature forest stands. There is evidence that birds nesting in harvested habitats experience significantly lower breeding success than those nesting in natural (e.g. burned) openings. Generally, forest habitat is either coniferous or mixed coniferous. In the boreal forest, suitable habitat is more likely to occur in or near wetland areas.

## Biology

Olive-sided Flycatchers arrive on their Canadian breeding areas between April and June but predominantly mid-late May. They are monogamous, with territories generally well spaced. Nests are typically placed in coniferous trees. Average clutch size is three and a single-brood is raised. Nest success is apparently high (approximately 65%), although no information on hatchling or fledgling success is available. Lifespan and survivorship of adults is also unknown. Birds begin fall migration in late July, with most birds travelling to the wintering grounds sometime between mid-August and early September.

## Population sizes and trends

Breeding Bird Survey (BBS) data indicate significant and widespread declines in Olive-sided Flycatcher populations throughout North America and in Canada (4.0% annual decline for the period 1968–2006, 3.3% annual decline for the period 1996–2006, total decline over that decade 29%). The checklist-based Étude des populations d'oiseaux du Québec (ÉPOQ) has

North American breeding distribution of the Olive-sided Flycatcher.

Source: Birds of North America Online (wintering range not shown).

also recorded a decline in the Olive-sided Flycatcher in Quebec. In Ontario, the Ontario Breeding Bird Atlas project has found a 7% decline in breeding range between 1981–1985 and 2001–2005.

## Limiting factors and threats

Olive-sided Flycatchers are generally associated with sparse canopy cover, suggesting that they may respond positively to forest management such as timber harvest. Indeed, their abundance is often higher in early to mid-successional stands derived from wildfire or commercial timber harvest. Their continued population declines, despite apparent increases in the amount of suitable potential habitat on the breeding grounds are therefore puzzling. Evidence from the western United States suggests that there is significantly lower nest success in harvested stands compared with fire origin stands. Resolution of the role of forest management in Olive-sided Flycatcher population decline in Canada is hampered by thinly distributed populations. Habitat alteration and loss on migration and wintering grounds may also be a contributing factor in population declines. Support for this is provided by the consistent population declines across a wide breeding range, whereas non-breeding areas are more geographically restricted. However, there are no data linking declines in a particular breeding location with specific non-breeding populations. There are no monitoring data for the Olive-sided Flycatcher from migration and wintering grounds to assess trends there.

## Special significance of the species

The Olive-sided Flycatcher is a widespread Neotropical migrant with a large portion of its breeding range in Canada.

## Existing protection or other status designations

The Olive-sided Flycatcher is classified as G4 (apparently secure) globally and in the United States, and N5 (secure) in Canada by NatureServe; provincial NatureServe rankings also range from S4 to S5 (apparently secure to secure) in all provinces except Labrador (S2S3 Imperiled or vulnerable) and Newfoundland (S3S4 Vulnerable or apparently secure). No NatureServe rankings are available for the Northwest Territories or the Yukon. In contrast, the IUCN red book lists the Olive-sided Flycatcher as 'Near Threatened', nearly qualifying as 'Vulnerable" (similar to the COSEWIC Threatened status) when assessed in 2004. The Olive-sided Flycatcher is protected in Canada by the *Migratory Birds Convention Act* (1994) and by similar pieces of legislation in Mexico and the United States. ■

# Pale Yellow Dune Moth

Photo: © Gary Anweiler

**Scientific name**
*Copablepharon grandis*

**Taxon**
Arthropods

**COSEWIC Status**
Special Concern

**Canadian Range**
Alberta, Saskatchewan and Manitoba

## Reason for designation

Although the area of occupancy is small and there is some evidence of decline in its extent of occurrence and area of occupancy, the species persists in widely separated dune systems, the declines are not well documented, and the status of threats is unclear. It requires semi-stable sand dunes which are declining.

## Species information

*Copablepharon grandis* (Strecker 1878) Pale Yellow Dune Moth is a medium-sized moth with evenly coloured pale yellow forewings and white hindwings.

## Distribution

*Copablepharon grandis* is widely distributed in western North America. It has been found from southern California in the southwest to central Texas in the southeast, and as far north as Lloydminster, Alberta. It has been found at approximately 84 localities in North America since it was described in 1878. Its range is 4 345 223 km$^2$ globally and 184 590 km$^2$ in Canada. Since 1902, *C. grandis* has been captured 36 times representing ten localities in Canada: four in Alberta, five in Saskatchewan, and one in Manitoba. Three of the ten localities were found during the 2004–2005 sampling program.

## Habitat

*Copablepharon grandis* occurs in sparsely vegetated sandy habitats. Sampling records from 2004–2005, supplemented with inferences about habitat conditions in previous sampling locations, suggest it most often occurs in semi-stable dunes with sparse grass and forb cover. Several factors affect habitats in which *C. grandis* has been found: 1) cattle grazing; 2) land development; 3) recreational disturbance; 4) sand dune stabilization; 5) reduced fire frequency.

## Biology

Little is known about the biology of *C. grandis*. It is a nocturnal moth with a short summer flight season and is difficult to observe in the field. Indeed, other than light-trap captures, it was not observed in the field in 2004–2005. The moth has one flight season per year; in Canada it is from early July to late August. Eggs are fully formed in newly emerged adults, but mating and egg laying have not been observed. Eggs are believed to be deposited in shallow sand. Larvae emerge from the eggs approximately three weeks later. Larvae likely feed nocturnally on the above-ground parts of plants and bury themselves in the sand during the day; they may also feed below ground. Larvae likely undergo a below-ground diapause between the fall and early spring, although the location and depth of burial are unknown. Spring or early summer feeding may also occur prior to pupation. Pupation occurs in an earthen cell in the soil. *Copablepharon grandis* does not appear to be limited to a single hostplant for adult feeding, reproduction, or larval feeding. Dispersal abilities of *C. grandis* have not been measured. Given that dune habitats are often patchily distributed, it is likely that short-distance dispersal occurs. However, dispersal between regionally isolated dunes systems (>10 km) is considered unlikely or is very infrequent.

## Population sizes and trends

A total of 18 *C. grandis* specimens were captured in 2004–2005 ranging from 1 per trap to 12 per trap (mean of 3 per trap where present). Because of the


Canadian distribution of the Pale Yellow Dune Moth. Filled points represent known localities.
Source: November 2007 COSEWIC Status Report.

low number of moths captured and the inherent uncertainties in measuring capture success, suitable habitat, and other factors, a reliable population estimate cannot be calculated for *C. grandis*. There is no quantitative information on population fluctuations and trends for *C. grandis*. The population of *C. grandis* near Turtle Mountain, North Dakota, USA, is approximately 250 km south of the closest Canadian population at Spruce Woods Provincial Park in Manitoba. Recolonization is unlikely over this distance.

## Limiting factors and threats

Copablepharon grandis is most threatened by the progressive stabilization of sand dunes caused by natural vegetation colonization.

Grazing is a possible threat to *C. grandis*. Grazing may maintain sparsely vegetated sandy habitats; however, it may cause soil compaction and browsing of vegetation that is used for larval feeding, and may destroy eggs, larvae, or pupae.

The spatial isolation of *C. grandis* habitats may make the species susceptible to demographic collapse, particularly with development of the landscape between suitable habitats. Demographic collapse is considered a possible threat.

Development activities, such as road building and petroleum infrastructure construction that result in direct loss or disturbance to natural habitats or mortality of moths are considered a possible threat to *C. grandis*.

Recreation may be intensive in some sandy habitats and result in loss of vegetation, disturbance to sand substrates, and destruction of eggs, larvae, and pupae. Recreation may also maintain or create open sand habitats. It is considered a possible threat.

## Special significance of the species

*Copablepharon grandis* is associated with sand dunes, a regionally rare habitat in the southern Canadian prairies. *Copablepharon* moths are of interest to entomologists and taxonomists because of their association with spatially isolated dune habitats. There is no information to suggest that *C. grandis* has an important cultural or economic role for First Nations.

## Existing protection or other status designations

*Copablepharon grandis* is not protected in any jurisdiction in North America. Portions of the populations at Wainwright (Wainwright Dunes Ecological Reserve), Suffern Lake Regional Park, and Spirit Dunes (Spruce Woods Provincial Park) are found in protected areas. ■

# Polar Bear

Photo: © Gordon Court

**Scientific name**
*Ursus maritimus*

**Taxon**
Mammals

**COSEWIC Status**
Special Concern

**Canadian Range**
Yukon, Northwest Territories, Nunavut, Manitoba, Ontario, Quebec, Newfoundland and Labrador, Arctic Ocean

## Reason for designation

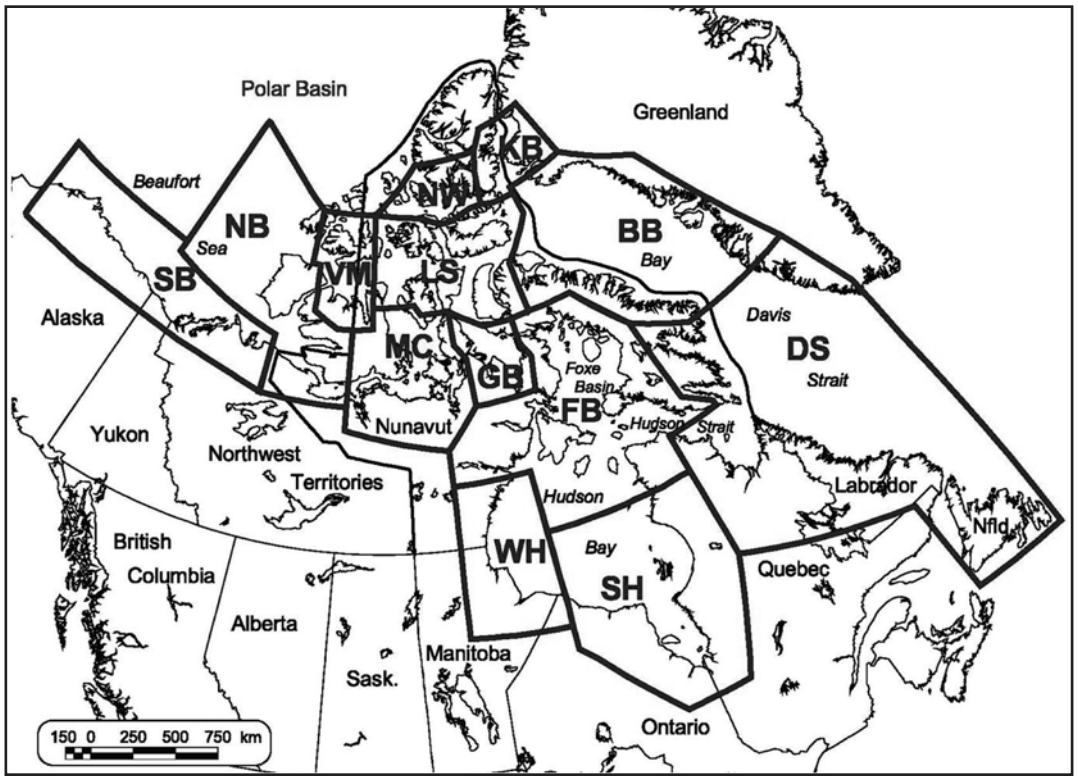
The species is an apex predator adapted to hunting seals on the sea ice and is highly sensitive to overharvest. Although there are some genetic differences among bears from different parts of the Arctic, movement and genetic data support a single designatable unit in Canada. It is useful, however, to report trends by subpopulation because harvest rates, threats, and, hence, predicted population viability, vary substantially over the species' range. Some subpopulations are overharvested and current management mostly seeks the maximum sustainable harvest, which may cause declines if population monitoring is inadequate. Until 2006, some shared subpopulations were subject to harvest in Greenland that was not based on quotas. Population models project that 4 of 13 subpopulations (including approximately 28% of 15 500 Polar Bears in Canada) have a high risk of declining by 30% or more over the next 3 bear generations (36 years). Declines are partly attributed to climate change for Western Hudson Bay and Southern Beaufort Sea, but are mostly due to unsustainable harvest in Kane Basin and Baffin Bay. Seven subpopulations (about 43% of the total population) are projected to be stable or increasing. Trends currently cannot be projected for 2 subpopulations (29% of the total population). Bears in some subpopulations show declining body condition and changes in denning location linked to decreased availability of sea ice. For most subpopulations with repeated censuses, data suggest a slight increase in the last 10–25 years. All estimates of current population growth rates are based on currently available data and do not account for the possible effects of climate change. The species cannot persist without seasonal sea ice. Continuing decline in seasonal availability of sea ice makes it likely that a range contraction will occur in parts of the species range. Decreasing ice thickness in parts of the High Arctic may provide better habitat for the bears. Although there is uncertainty over the overall impact of climate change on the species' distribution and numbers, considerable concern exists over the future of this species in Canada.

## Species information

The Polar Bear (*Ursus maritimus* Phipps) evolved within less than 400 000 years to occupy the niche of hunting seals from a sea-ice platform. Many of the physical traits of Polar Bears can be viewed as adaptations to hunting arctic seals.

## Distribution

Polar Bears are a circumpolar species that occur in Canada from Yukon to Newfoundland and Labrador, and from northern Ellesmere Island south to James Bay. The population is distributed among 13 subpopulations with some evidence for genetic separation between them. The length and frequency of seasonal movements undertaken by bears within subpopulations varies with the size of the geographic area occupied, the annual pattern of freezing and break-up of sea ice, and availability of features such as land masses, multi-year ice, and polynyas. Distinctions between subpopulations or larger-scale divisions based on ecoregions are insufficient for status to be assigned to designatable units below the species level.




Canadian distribution of Polar Bear subpopulations. Abbreviations of delineated subpopulations include Viscount Melville Sound (VM), Norwegian Bay (NW), Kane Basin (KB), Lancaster Sound (LS), Baffin Bay (BB), Davis Strait (DS) Southern Hudson Bay (SH), Western Hudson Bay (WH), Foxe Basin (FB), Gulf of Boothia (GB), M'Clintock Channel (MC), Southern Beaufort Sea (SB), and Northern Beaufort Sea (NB).
Source: April 2008 COSEWIC Status Report.

## Habitat

The productivity of Polar Bear habitat is closely linked to the physical attributes of sea ice (type and distribution) and the density and distribution of ice-dependent seals, especially ringed seals (*Pusa hispida*). From early winter until break-up of annual sea ice in spring, Polar Bears are dispersed predominantly over sea ice along the coast. They may range >200 km offshore. Maternal denning sites are generally located on land near the coast, being excavated in snowdrifts and in some places frozen ground. Offshore maternal dens on multi-year ice floes are also known to occur, particularly in the western Canadian Arctic.

## Biology

Reproductive rates vary among subpopulations of Polar Bears but all are relatively low. Females reach sexual maturity at 4–6 years and have litters of typically 1–2 cubs approximately every 3 years. Most males generally breed at 8–10 years. Few polar bears live longer than 25 years.

## Population sizes and trends

Data on survival and reproduction suggest that 4 of 13 subpopulations (Western Hudson Bay, Southern Beaufort Sea, Baffin Bay, and Kane Basin), representing approximately 27.8% of the total population of 15500 Polar Bears shared by Canada and its immediate neighbours (Greenland and the United States), are likely declining at the present time. Four subpopulations are most likely to be stable (including 1 slightly increasing and 1 possibly slowly declining) at the present time (comprising 29.3% of the total population), and 3 subpopulations are most likely to be increasing (13.5% of the total population).

Trend cannot be reported due to pending analysis or lack of data for the 2 remaining subpopulations (29.4% of the total population). Estimates of possible declines over longer periods (e.g., 3 generations) are complicated by potential changes in survival and reproduction due to climate change and/or alterations in harvest management. Current declines are due to over harvest (Baffin Bay, Kane Basin) and climate change (Western Hudson Bay, Southern Beaufort Sea). Long-term population trends will ultimately be determined by changes in extent and types of sea ice associated with a warming climate in the Arctic.

## Limiting factors and threats

The main, proximate limiting factors affecting Polar Bear distribution and numbers today are availability of food (access to and abundance of ice-dependent seals) and human-caused mortality (almost exclusively from hunting). Other potential limiting factors include intraspecific predation, pollution, especially that associated with offshore development of hydrocarbon reserves and increased ship traffic, and the accumulation of environmental contaminants (mainly organochlorines) in tissues of Polar Bears. Climate change is likely to influence all of the factors above and should thus be treated as the ultimate limiting factor to Polar Bears. If the climate continues to warm as projected by the Intergovernmental Panel on Climate Change (IPCC), all populations of Polar Bears will eventually be affected.

## Special significance of the species

The Polar Bear is the only terrestrial carnivore to occupy the highest trophic level of a marine ecosystem. The Polar Bear is an icon of Canada's wildlife heritage, and is of great cultural significance to the Canadian people. Polar Bears are also of cultural, spiritual, and economic significance to some northern native peoples. As a symbol of the pristine Arctic environment, Polar Bears are seen throughout the world as a barometer of important environmental issues, especially climate change and pollution.

Canada has national and international responsibilities with respect to the study, management, and protection of polar bears, as outlined in the international Agreement on the Conservation of Polar Bears. This obligation is particularly important to our nation because we collectively manage 55–65% of the world's polar bears.

## Existing protection or other status designations

In 2006, largely in response to the threat posed by global warming, the Polar Bear was moved from Least Concern-Conservation Dependent to the category of Vulnerable in the Red List of the Species Survival Commission (SSC) of the IUCN-The World Conservation Union, corresponding to the Threatened category of COSEWIC. This up-listing was based on an assessment of available data and the unanimous opinion of the IUCN/SSC Polar Bear Specialist Group. Polar Bears are on Appendix II of CITES (Convention on International Trade in Endangered Species). Under CITES, any international shipment of Polar Bears or parts thereof requires a permit. The US Secretary of the Interior announced on May 14, 2008, that the Polar Bear will be listed as Threatened under the U.S. *Endangered Species Act*. Management authority for this species rests with the provinces, territories, and wildlife management boards established under land claims. Hunting is largely managed through quota systems and according to Aboriginal treaty rights. Internationally, the management of Polar Bears is coordinated under the *Agreement on the Conservation of Polar Bears*, signed by the federal government on behalf of all Canadian jurisdictions in November 1973. At the time of writing, habitat of Polar Bears is formally protected only through Canada's terrestrial system of national parks and Ontario's provincial park system; these protected areas encompass approximately 2.9% of the area of occupancy of the species in Canada. The majority of Polar Bear habitat is marine, for which there are no federal, provincial, or territorial protected areas. ■

# Rapids Clubtail

Photo: © Allan Harris

**Scientific name**
*Gomphus quadricolor*

**Taxon**
Arthropods

**COSEWIC Status**
Endangered

**Canadian Range**
Ontario

## Reason for designation

This distinctive species of dragonfly has a fragmented distribution with a very small extent of occurrence and area of occupancy, and is currently only found in small portions of two southern Ontario rivers. The species is believed to be extirpated at two historic sites and there is evidence for continuing decline of habitat.

## Species information

*Gomphus* (*Gomphus*) *quadricolor* Walsh 1863, Rapids Clubtail, is a member of the family Gomphidae, the clubtail dragonflies. It is a small dragonfly, with a wingspan of 25–27 mm and a contrasting pattern of brownish-black and yellowish-green stripes on the thorax. The abdomen is slender, but in males is expanded slightly at the tip.

## Distribution

The range of *Gomphus quadricolor* includes Ontario and 25 states in the northeastern and northcentral U.S. The global maximum extent of occurrence encompasses about 1.7 million km$^2$. In Canada, it was historically known from four sites in southern and eastern Ontario, but is extant at only two sites. Its extent of occurrence in Canada is about 1 570 km$^2$ and its area of occupancy is approximately 26 km$^2$.

## Habitat

Larvae live in muddy pools in clear, cool streams. Adult males perch on rocks in rapids. Adult females inhabit forests on the riverbanks, moving to the rapids when ready to mate.

## Biology

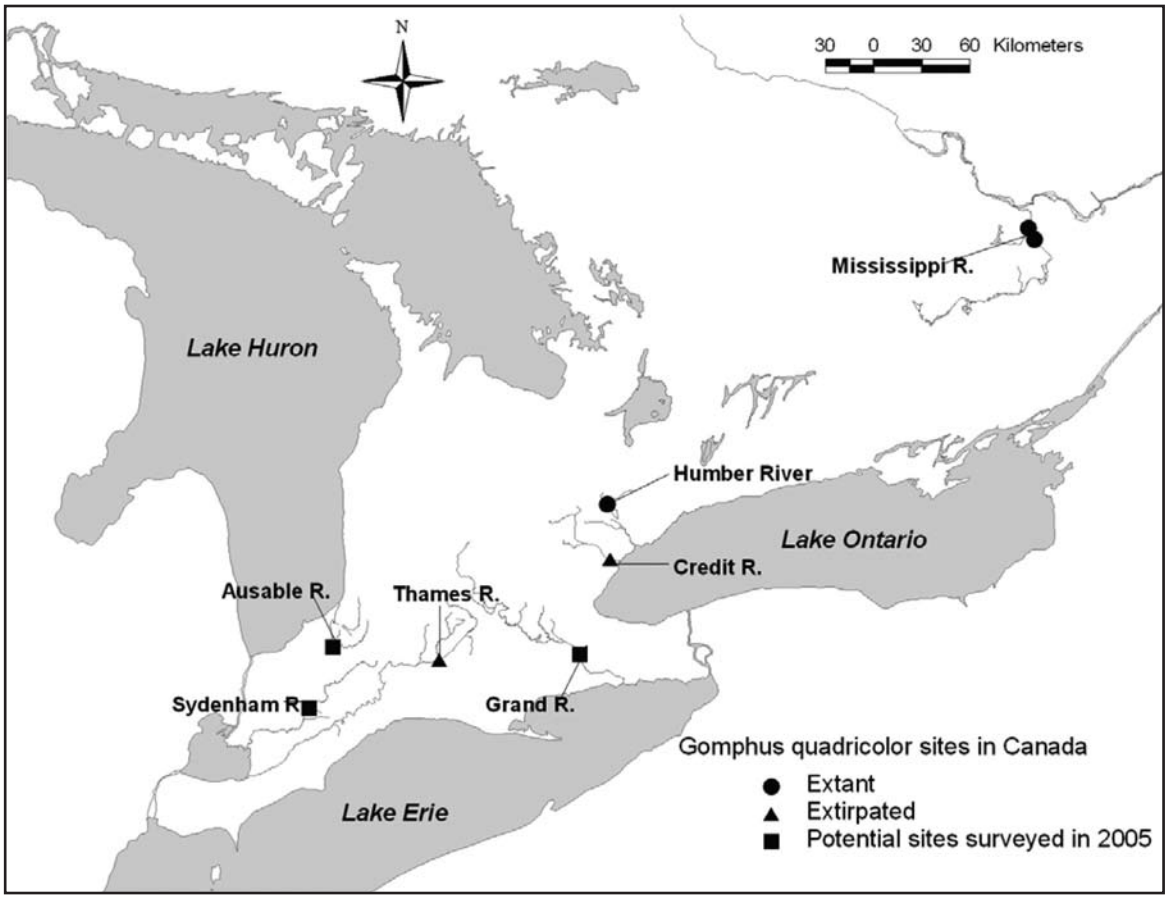
Adult *Gomphus quadricolor* fly between early June and early July in Ontario and live about three to four weeks. Mating takes place over the river and females deposit eggs on the water surface over rapids. Eggs or recently hatched larvae are carried downstream to pools. Larvae spend most of their time buried just below the surface of the sediment in the bottom of the pool, breathing through the tip of the abdomen raised above the sediments.

The duration of the larval stage of *Gomphus quadricolor* is unknown, but is probably two or more years. Before the final moult, larvae crawl onto vegetation on the edge of the stream. Newly emerged adults disperse inland to avoid predation until the exoskeleton hardens and they are able to fly swiftly.

Adults are generalist and opportunist predators, feeding on small flying insects. Larvae ambush prey from the sediments using their prehensile labium to capture it.

## Population sizes and trends

*Gomphus quadricolor* is believed extirpated at two of its four known Canadian sites. The Canadian population is estimated at a minimum of 318 individuals including 106 adults. Although only adult males were observed for population estimates at the two extant sites, equal numbers of adult males and females were assumed to be present at each site and that for every adult there were at least two larvae (based on the assumption of a three-year life cycle). The number of larvae is thus a minimum estimate.




Canadian distribution of Rapids Clubtail, Ontario.

Source: April 2008 COSEWIC Status Report.

## Limiting factors and threats

Habitat degradation is the most significant threat to *Gomphus quadricolor*, although accidental deaths through vehicle collisions may be significant. Impoundment of running waters by dams, pollution, and introduction of exotic species are potential threats in all known Canadian sites.

## Special significance of the species

Stream-dwelling gomphids in general are potential indicators of well-oxygenated, unpolluted streams. Although *Gomphus quadricolor* is too uncommon and obscure through most of its range to be known by most people, dragonflies in general are increasingly popular as indicated by increasing numbers of field guides and organized dragonfly count events.

## Existing protection or other status designations

*Gomphus quadricolor* is ranked globally as G3G4. Nationally, it is ranked as N1 in Canada and N3N4 in the U.S., but is not protected under the endangered species legislation in either country. In Ontario it is ranked as S1 and is mostly ranked as S1 or S2 in the 25 states in which it occurs and is secure (S4) only in Wisconsin. No known Canadian sites are within provincial or federal parks, but the Humber River site is surrounded by land owned by a conservation authority. River habitats in Canada are nominally protected under the federal *Fisheries Act* with respect to fish habitat. ■

# Rayless Goldfields

Photo: © Carol W. Witham

**Scientific name**
*Lasthenia glaberrima*

**Taxon**
Vascular Plants

**COSEWIC Status**
Endangered

**Canadian Range**
British Columbia

## Reason for designation

A single very small population of an annual flowering plant that is at continued risk from a number of limiting factors including the spread of exotic plants.

## Species information

Rayless Goldfields (*Lasthenia glaberrima*) is a member of the aster family (asteraceae). It is a fibrous-rooted annual herb with sprawling to erect growth form with simple to freely branched and hairless shoots. The stems may form adventitious roots from their lower nodes. The leaves are oppositely arranged, 2–10 cm long, linear and lack hairs or teeth. The flowering structure consists of numerous flowering heads, each of which is bell-shaped and contains tightly packed flowers. The pale yellow flowers are inconspicuous and may be easily overlooked. The achenes (characteristic dry fruitlets of the aster family) are less than 4 mm long, linear and hairy. The species is morphologically quite variable and is self-pollinated, so there is a significant possibility of distinct genetic composition, particularly in isolated populations like the one in Canada.

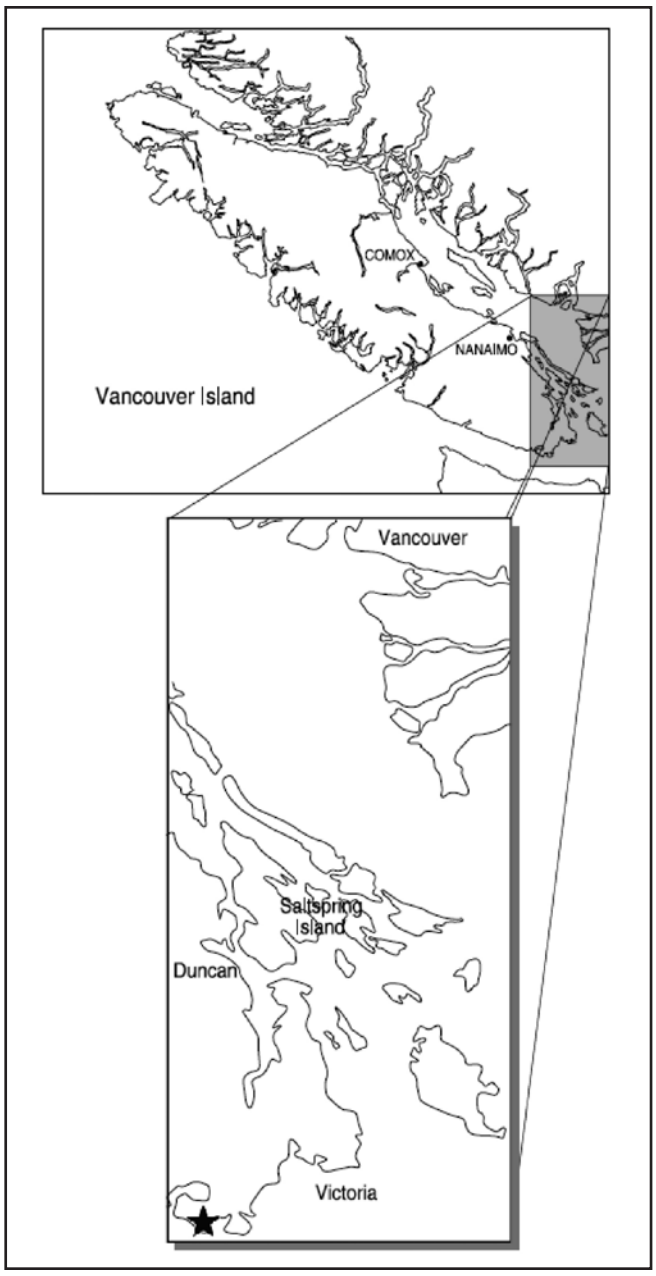
The only plants within its range that might be confused with Rayless Goldfields are brass buttons (*Cotula coronopifolia*) and fleshy jaumea (*Jaumea carnosa*). All three species may form mats, have small yellow composite flowers, and may appear superficially similar at a distance. Brass buttons is easily distinguished by its alternate leaves (which are often toothed) and separate (rather than united) floral bracts. Fleshy jaumea is easily distinguished by its thick, succulent leaves and separate floral bracts. Both brass buttons and fleshy jaumea are plants of saline, tidal areas while rayless goldfields is restricted to freshwater seeps and pools.

## Distribution

In Canada, Rayless Goldfields is known from a single site near Victoria, British Columbia. Globally, it ranges from Vancouver Island south, mostly west of the Cascade Mountains, to central California. The nearest United States record is from Klickitat County (Washington State) about 300 km to the south. The population occupies an area of less than 40 $m^2$. The Extent of Occurrence and Area of Occupancy, as per COSEWIC methodology, are each a maximum of 1 $km^2$ when determined using a 1 km square grid overlay.

## Habitat

The single British Columbia site is a rock-bound vernal pool on a shoreline rocky bluff about 15 m above sea level. The vernal pool has a thin layer of medium-textured soil above gneissic bedrock. It begins to moisten with the first rains in late summer or early fall and remains saturated or inundated for long periods throughout the winter and early spring. The soil gradually dries out with the onset of summer drought and is quite dry from mid-June to late August or early September. The amount of potential habitat has declined greatly over the past century as coastal areas in southeast Vancouver Island have been developed for residential and recreational use. Much of the remaining habitat suitable for Rayless Goldfields has been heavily altered due to invasion by alien weeds including several grasses and forbs.




Canadian distribution of Rayless Goldfields, British Columbia. The star indicates the only remaining extant population.
Source: April 2008 COSEWIC Status Report.

## Biology

The species is a short-lived annual. Germination appears to begin in April and end in early May. Plants continue to grow until they succumb to summer drought. Mortality normally occurs in late May or June and summer rainfall events appear to be too rare to trigger renewed vegetative growth, flowering and fruiting. Flowering begins in early May and peaks by mid-month. The species is self-fertilizing. Seed dispersal begins in mid-May and most plants have shed their achenes by late June.

## Population sizes and trends

Suitable sites have been surveyed repeatedly since the early 1980s in a series of projects designed to document the distribution of rare plants of seepage sites and vernal pools on southeast Vancouver Island and the Gulf Islands. Despite this, the Canadian population was not discovered until 2003. Targeted surveys in 2003, 2004, 2005 and 2006 failed to discover any further populations. The Canadian population consisted of 20 mature plants in 2006, a decline from about 200 plants when first discovered. Plants occupy an area of habitat varying between 4 and 20 $m^2$.

## Limiting factors and threats

In Canada, Rayless Goldfields is threatened by trampling, threats associated with invasive alien plants, habitat loss, demographic collapse and threats associated with altered hydrological regimes that could impact water availability and alter site characteristics.

## Special significance of the species

The British Columbia occurrence of Rayless Goldfields represents a small disjunct population separated by about 300 km from the main range of the species.

## Existing protection or other status designations

Rayless Goldfields is not covered under the Convention on International Trade in Endangered Species (CITES), the *Endangered Species Act* (USA) or the IUCN Red Data Book. NatureServe globally ranks it as G5 (secure). In British Columbia, it is currently ranked as S1 (critically imperiled). It does not occur elsewhere in Canada. British Columbia does not provide any legal protection for this species. ■

# Seaside Bone

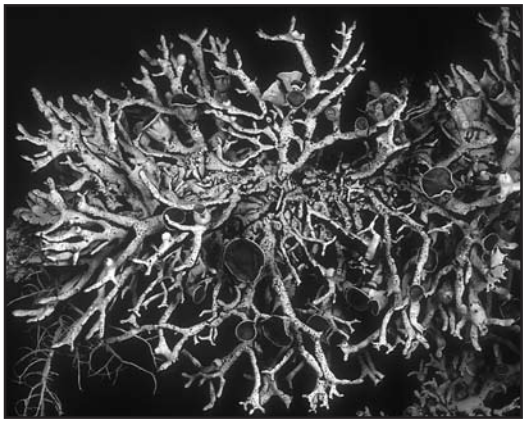


Photo: © Stephen Shamoff

**Scientific name**
*Hypogymnia heterophylla*

**Taxon**
Lichens

**COSEWIC Status**
Threatened

**Canadian Range**
British Columbia

## Reason for designation

This lichen is endemic to the Pacific Coast of North America, and southwest Vancouver Island represents the northern limit of its range. The species' survival depends on early to intermediate seral shore pine forests along the sea coast. The populations appear to be stable, but have a restricted occurrence and the species is known from only four locations. Severe winter storms, which are anticipated to increase, are the main threat to the species.

## Species information

*Hypogymnia heterophylla* L. Pike, Seaside Bone lichen, is a member of the lichen family Parmeliaceae. This foliose species has a medium sized thallus, 5–8 cm in diameter, with narrow lobes that support long, narrow lobules that are perpendicular to the lobe margins; these lobules are a distinctive feature of this lichen.

## Distribution

The global distribution of the North American endemic species *Hypogymnia heterophylla* is along the Pacific coast from the southern tip of Vancouver Island in the north to Puget Sound in Washington and the outer Pacific coast south through Oregon and California to the Santa Barbara/Los Angeles/Channel Islands coastal regions. In Canada, *H. heterophylla* is known from four coastal locations at the southwest tip of Vancouver Island.

## Habitat

*Hypogymnia heterophylla* is found in the driest subzone of the Coastal Western Hemlock biogeoclimatic zone. Locations where *H. heterophylla* occurs are typically coastal ledges at low elevation with high solar radiation, strong west-southwesterly winds, moderate precipitation and high humidity. Preferred habitat for *H. heterophylla* is coastal early to intermediate shore pine (*Pinus contorta* var. *contorta*) seaside stands. Marine aerosols from salt water spray may be habitat requirements for this species.

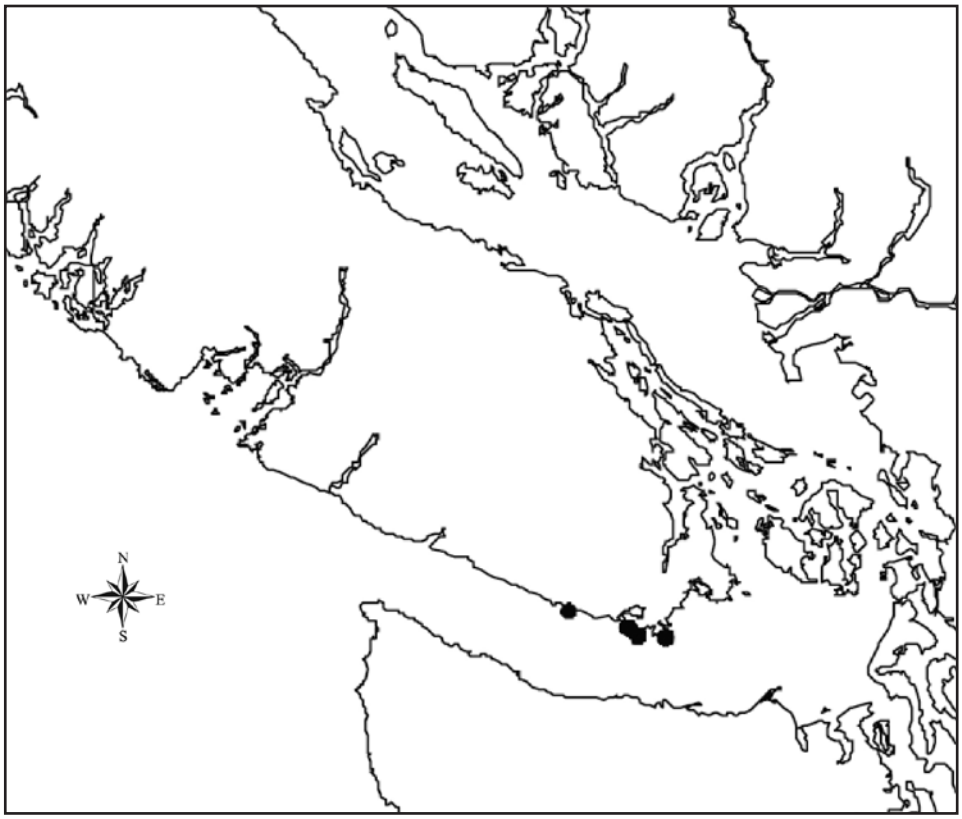
## Biology

Asexual reproduction in *Hypogymnia heterophylla* may occur by fragmentation of the lateral lobules that are perpendicular to the branch and by the production of conidiospores that act as asexual spores. Sexual reproduction in *H. heterophylla* must take place by the dispersal of sexually produced fungal ascospores that must capture compatible *Trebouxia* green algal cells before growth takes place.

## Population sizes and trends

Ten subpopulations of *Hypogymnia heterophylla* were found on the southwest tip of Vancouver Island: East Sooke Regional Park, Bentinck Island and Sheringham Point. The total number of thalli estimated is likely greater than 1 000. Lichen populations most likely remain stable in these locations.

Herbarium database searches at the University of British Columbia (UBC) and the British Columbia Conservation Data Centre (CDC) indicate no collection




Canadian distribution of Seaside Bone, Southern Vancouver Island, British Colombia.

Source: modified from the April 2008 COSEWIC Status Report.

of *H. heterophylla* has been accessioned after 1996, indicating that recent non-targeted collections have not contained *H. heterophylla* or collections may not have been accessioned.

## Limiting factors and threats

The primary factors limiting the dispersal and spread of *Hypogymnia heterophylla* are the necessity of early seral shore pine habitats located on rocky windswept ledges with southwest to western aspects. Damage caused by winter storms appears to be the major threat.

## Special significance of the species

*Hypogymnia heterophylla* is an endemic species in North America and its restricted occurrence in Canada is at the northern limit of its range. This epiphytic species is restricted to the Pacific Northwest coastal areas of North America.

## Existing protection or other designations

*Hypogymnia heterophylla* was designated a species of Special Concern by COSEWIC in 1996. Parks and federally owned land protect the existing locations on the southwest tip of Vancouver Island where *H. heterophylla* is found. British Columbia ranks *H. heterophylla* as S1 indicating that occurrences are tracked. Washington (S3) tracks *H. heterophylla* while Oregon (SNR) and California (SNR) have not ranked this species. ■

# Short-eared Owl

Photo: © Christian Artuso

**Scientific name**
*Asio flammeus*

**Taxon**
Birds

**COSEWIC Status**
Special Concern

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

## Reason for designation

This owl has suffered a continuing population decline over the past 40 years, including a loss of 23% in the last decade alone. Habitat loss and degradation on its wintering grounds are most likely the major threat, while continuing habitat loss and degradation on its breeding grounds in southern Canada and pesticide use are secondary threats. This species nearly meets the criteria for Threatened status.

## Species information

The Short-eared Owl, *Asio flammeus* (Pontoppidan), is a medium-sized owl, approximately 34–42 cm in length. Adults are cryptically coloured with a brown back and creamy-buff chest with brown streaks. The best field mark is the species' habit of flying low over open habitat with deep, moth-like wing beats.

## Distribution

Short-eared Owls are a cosmopolitan species, breeding on many continents and on many islands. In North America, they breed in arctic areas, in coastal marshes, and in interior grasslands. In winter, they generally move southward and are found in coastal areas, as well as interior grasslands, with the central Great Plains typically a centre of abundance.

## Habitat

A wide variety of unforested habitats are used, including arctic tundra, grasslands, sand-sage, fallow pastures, and occasionally fields planted with row-crops. Although Short-eared Owls clearly prefer open habitats, it is thought that the primary factor influencing local habitat choice (in summer and winter) is food abundance.

## Biology

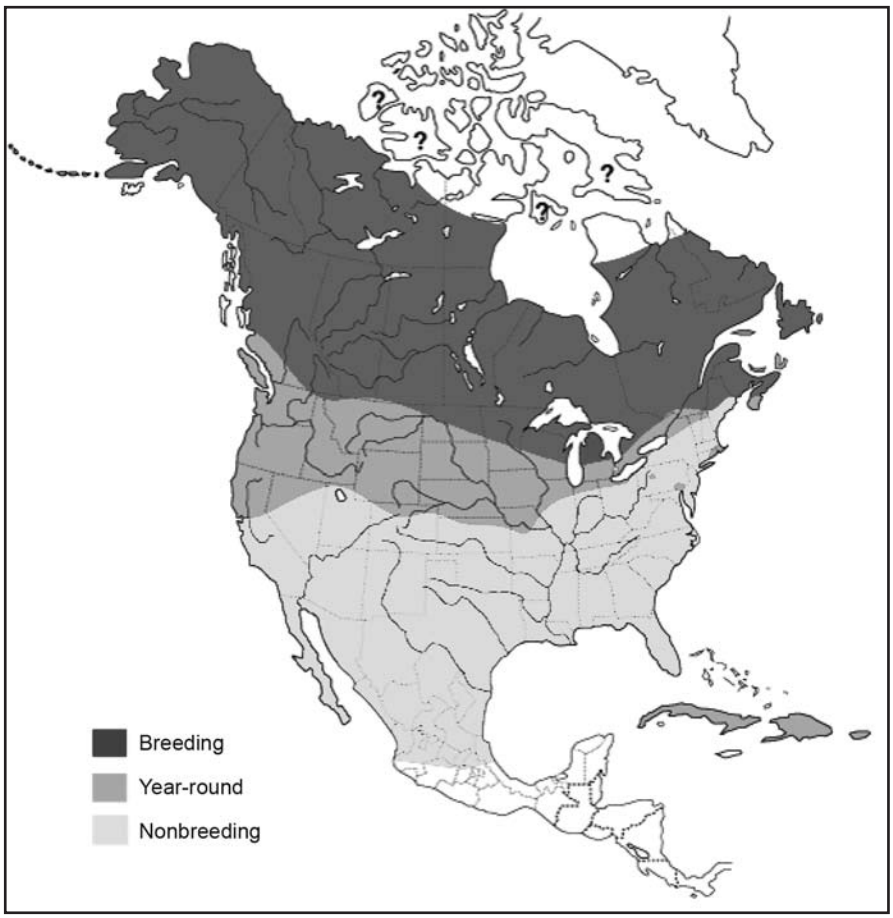
Short-eared Owls are a nomadic species, with most individuals wandering widely both seasonally and annually. Individuals on islands, however, appear to show higher philopatry to breeding sites. Concentrations of Short-eared Owls occur during breeding and non-breeding at sites where rodent (typically *Microtus*) populations are high. Nests are placed on the ground in open habitats, and clutches of 4–7 eggs are initiated from April to June. A single brood is typically raised. Before they can fly, nestling owls typically disperse short distances from the nest site, hiding in nearby vegetation.

## Population sizes and trends

The estimated global population is about 2 000 000, with 700 000 in North America and 350 000 in Canada. Christmas Bird Count data suggest that Short-eared Owls have declined at a rate of about 3% annually over the last 40 years.

## Limiting factors and threats

It is important to note that there are almost no quantitative data available on the factors affecting population declines in Short-eared Owls — rather,




North American distribution of the Short-eared Owl. Note that this species is absent from forested and mountainous areas of the map.
Source: Birds of North America Online.

## Special significance of the species

Short-eared Owls were formerly a common sight on the Canadian prairies and at various sites on both coasts — they are now uncommon to rare in these areas. Despite a recent increase in grassland habitat on the U.S. Great Plains (where many Short-eared Owls winter), no apparent increase has been detected in the Canadian breeding population.

## Existing protection or other status designations

Based on a previous COSEWIC report (Cadman and Page 1994), Short-eared Owls were assessed as Special Concern. The Short-eared Owl is currently classified as G5 (demonstrably widespread and secure) by NatureServe. However, NatureServe provincial status designations in Canada are: Alberta (S3), British Columbia (S3B,S2N), Labrador (S3S4B), Manitoba (S3S4B), New Brunswick (S3B), Newfoundland (S3B), Northwest Territories (SNRB), Nova Scotia (S1S2B), Nunavut (SNRB), Ontario (S3S4B), Prince Edward Island (S1S2B), Quebec (S3S4), Saskatchewan (S3B,S2N), Yukon Territory (S4B). NatureServe status designations are: S1 = critically imperiled, S2 = Imperiled, S3 = Vulnerable, S4 = apparently secure, and SNR = Not ranked). Short-eared Owls are protected under the *Migratory Bird Treaty Act* (Federal Register 2006) as well as under a large number of Provincial Wildlife acts (e.g., Ontario *Fish and Wildlife Conservation Act*, and the *Act Respecting the Conservation and Development of Wildlife* in Quebec). Short-eared Owls are also listed as Endangered, Threatened, or a Species of Concern in many U.S. states and as a Species of Conservation Concern by the U.S. Fish and Wildlife Service. ■

the ideas cited below are a summary of published hypotheses. The primary limiting factor appears to be habitat loss and alteration, especially coastal marshes and grasslands that were formerly heavily used by wintering owls, but also grasslands on the Canadian prairies and in southern Ontario. Other, secondary, factors that may contribute (to a much lesser degree) to population declines include 1) increased nest depredation (as a result of habitat fragmentation); 2) declines in prey abundance as a result of habitat changes; and 3) collisions with vehicles, utility lines, and barbed wire fences. Although organochlorines have been found in Short-eared Owl eggs, more data are needed on the prevalence and impacts of such contamination.

# Western Chorus Frog, *Great Lakes/St. Lawrence – Canadian Shield population*

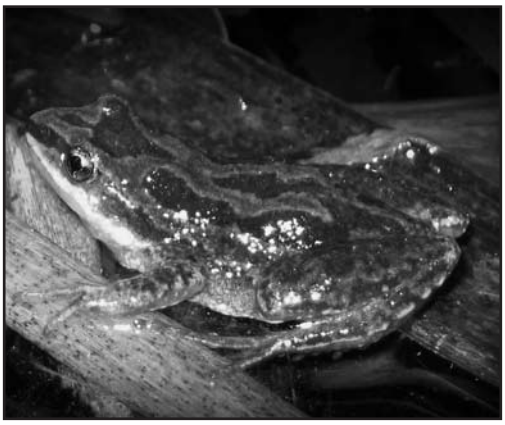


Photo: Ryan Bolton

**Scientific name**
*Pseudacris triseriata*

**Taxon**
Amphibians

**COSEWIC Status**
Threatened

**Canadian Range**
Ontario and Quebec

## Reason for designation

Ongoing losses of habitat and breeding sites for this small frog due to suburban expansion and alteration in farming practices have resulted in losses of populations and isolation of remaining habitat patches. Populations in Quebec are documented to have declined at a rate of 37% over 10 years and are expected to continue to decline. Despite there being some areas where chorus frogs remain evident, surveys of populations in Ontario indicate a significant decline in abundance of 30% over the past decade.

## Species information

The Western Chorus Frog, *Pseudacris triseriata*, is a small tree frog about 2.5 cm long and weighing about 1 g when adult. It has three dark lines along its back and one larger line on each flank. Its ground colour can range from brown to grey to olive. The species is easily detected during spring because of its creaking call that resembles the sound of a fingernail stroked along a plastic comb. It is a secretive species and thus rarely seen outside the breeding season.

## Distribution

In Canada, *P. triseriata* is found in the lowlands of southern Ontario and southwestern Quebec. A significant genetic distinction in terms of mitochondrial DNA sequences has been identified between *P. triseriata* from southwestern Ontario and those from elsewhere in Ontario and Quebec. Thus two designatable units are recognized among Canadian populations, corresponding to the Carolinian and Great Lakes/St. Lawrence – Canadian Shield faunal provinces, respectively.

## Habitat

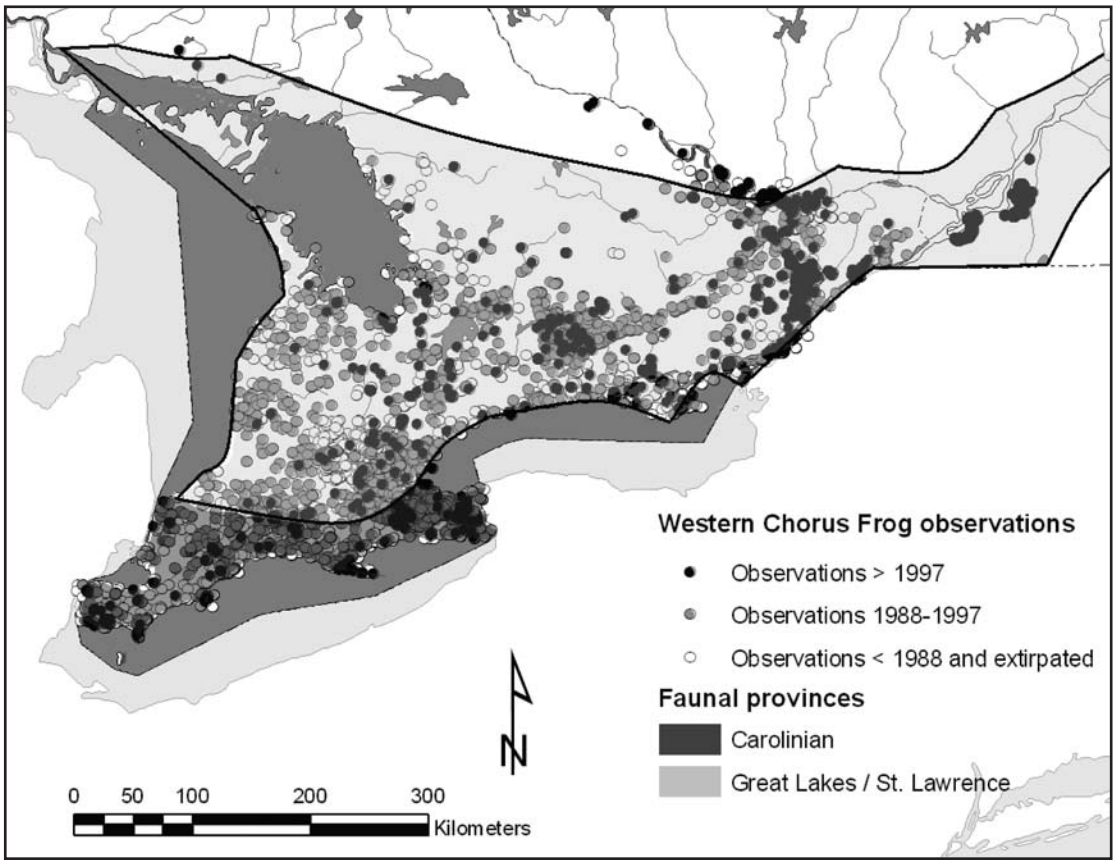
Pseudacris triseriata requires both terrestrial and aquatic habitats in close proximity. Terrestrial habitat consists mostly of humid prairie, moist woods, or meadows. For reproduction and tadpole development, this species requires seasonally dry, temporary ponds that are devoid of predators such as fish.

## Biology

*Pseudacris triseriata* generally live no more than 1 year and usually breed in the first spring after metamorphosis. The breeding season is from early-March to mid-May. It takes approximately 2 months for tadpoles to change into froglets, which grow very quickly and are mature at the end of the summer. Mortality is high at all life stages and survival of a population depends on the recruitment of new individuals through reproduction and/or immigration each year. Thus to overcome years with poor reproduction, breeding ponds must be sufficiently connected to enable immigration or emigration.

## Population sizes and trends

The sizes of *Pseudacris triseriata* populations are generally unknown though they are expected to fluctuate widely in size. One site was estimated to contain about 2 000 individuals. Losses of populations, at a rate of about 37% over 10 years, have been documented in Quebec since the 1950s.




Canadian distribution of Western Chorus Frog, Great Lakes/St. Lawrence – Canadian Shield population (the lighter region). Dark points represent the most recent observations.
Source: modified from the April 2008 COSEWIC Status Report.

From 1995 through 2006, population numbers throughout the Great Lakes/St. Lawrence – Canadian Shield faunal province in Ontario are estimated to have declined significantly at a rate of about 3.5% per year, which equals 30% decline over 10 years. In many cases when population numbers have declined due to change in land use, the populations have not recovered. There is no detectable, significant trend among Carolinian populations of this species.

## Limiting factors and threats

Most populations of Western Chorus Frogs use land that is also deemed valuable for development. For urban construction or industrial agriculture, the land is drained and filled, resulting in the direct loss of individuals in a population, eliminating the temporary ponds required for breeding, and significantly altering the quality of the remaining terrestrial habitat. This results in smaller, isolated habitat patches. *Pseudacris triseriata* has limited abilities to cope with habitat fragmentation and reduced habitat quality. The frogs have relatively low dispersal ability and relatively high site-fidelity to natal ponds. Like other pond-breeding amphibians, there are expected to be large fluctuations in population size from year to year; thus if a natural decrease in population size coincides with a reduction in habitat quality, local extinction is more likely to result. Habitat destruction is so rapid in suburban areas of southwestern Quebec that populations there may be extirpated from known sites in less than 25 years. The loss of habitat in agricultural landscape is less rapid but, as observed in southwestern Quebec between 1950 and 1990, changes that intensify agricultural practices can produce rapid and catastrophic declines in Western Chorus Frog populations.

## Special significance of the species

*Pseudacris triseriata* is a good flagship species for promoting awareness of healthy environments as it is easily heard in spring and its presence indicates the maintenance of natural habitats even in developed areas. In Quebec, it has become a symbol for protection of species at risk and their habitat, especially in suburban areas.

## Existing protection or other status designations

In 2001, COSEWIC considered *P. triseriata* as a single unit and designated the species as "Not at Risk". In Ontario, outside of wildlife protection areas, *P. triseriata* is not protected by any legislation. In Quebec, despite a legal designation of 'Vulnerable' in 2000, no Western Chorus Frog habitat is currently protected under species-at-risk legislation. ■

# Wood Turtle

Photo: © Glen Barrett

**Scientific name**
*Glyptemys insculpta*

**Taxon**
Reptiles

**COSEWIC Status**
Threatened

**Canadian Range**
Ontario, Quebec, New Brunswick and Nova Scotia

## Reason for designation

This species is declining across much of its range, and occurs in small, increasingly disjunct populations. It is more terrestrial than other freshwater turtles, which makes it extremely vulnerable to collection for the pet trade. It has a long-lived life history typical of turtles, so that almost any chronic increase in adult and juvenile mortality leads to a decrease in abundance. Such increased mortality is occurring from increased exposure to road traffic, agricultural machinery and off-road vehicles, collection for pets, commercial collection for the pet trade, and, perhaps, for exotic food/medicines. Increased level of threat is associated with new or increased access to the species' range by people.

## Species information

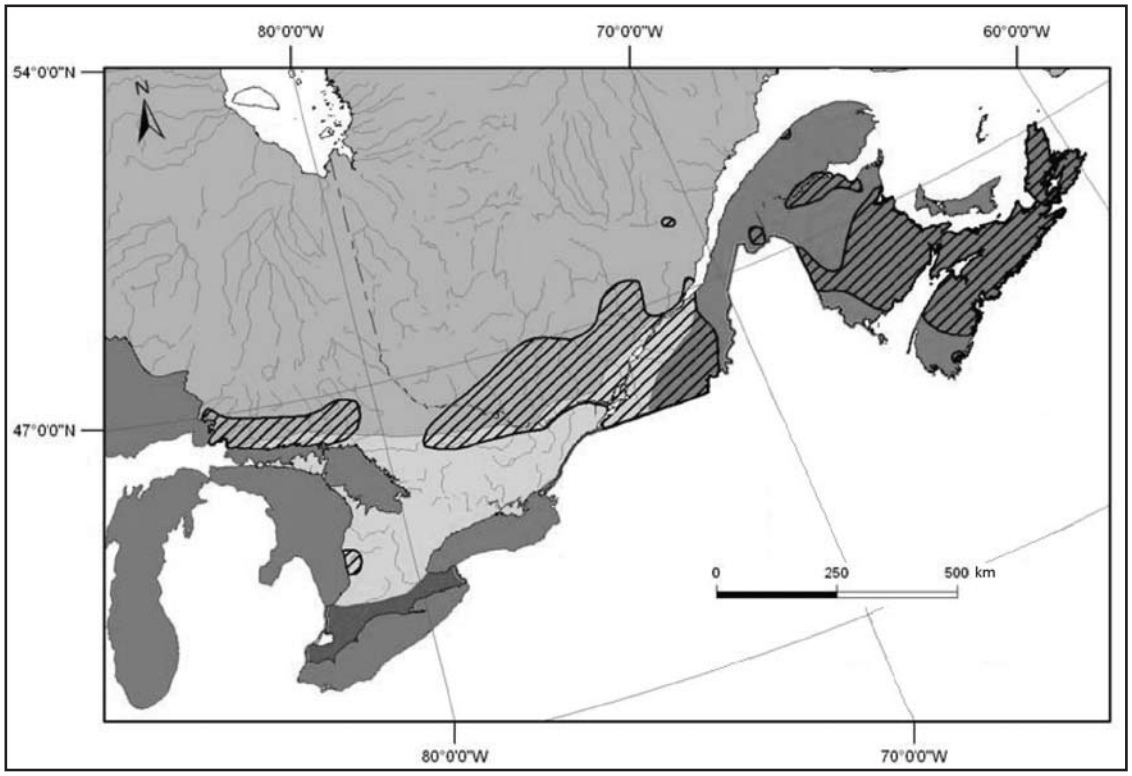
The Wood Turtle (*Glyptemys insculpta*) is a medium-sized turtle with adults weighing about 1 kg and having a carapace (upper shell) length of 16–25cm. The carapace ranges from grayish-brown to yellow and is broad and low. Each scute (scalelike section) has pyramidal concentric ridges (growth lines), giving the carapace a sculptured appearance. In older turtles, the ridges on the scutes may become worn smooth. The plastron (bottom shell) does not have a hinge, and is yellow with black splotches on the outer posterior corner of each scute. The plastron is flat in females and juveniles and becomes concave in males as they reach maturity. Males are slightly larger than females and have a broader head. The skin is generally brown but the legs and neck often have yellow, orange or reddish colouring.

## Distribution

The Wood Turtle is native to North America and has a patchy range from Nova Scotia west through New Brunswick, Quebec and Ontario to Minnesota, south to Virginia and Maryland. In Canada, the Wood Turtle occurs in Nova Scotia, New Brunswick, south-central Quebec, and south-central Ontario extending west to the district of Algoma. Approximately 30% of the global distribution is in Canada. The range is discontinuous, and populations are often isolated and small.

## Habitat

The Wood Turtle is more terrestrial than most freshwater turtles, but is still semiaquatic. It is associated with rivers and streams with sand or gravel bottoms and prefers clear, meandering streams with moderate current. Natural nesting habitat of the Wood Turtle consists of sand or gravel-sand beaches or banks of streams. The turtles also nest on anthropogenic sites such as gravel pits and roads. Riparian areas with diverse, patchy cover are generally the most commonly used or preferred terrestrial habitats across the Wood Turtle's range. Other habitats used less frequently by Wood Turtles include bogs, marshy pastures, beaver ponds, shrubby cover, meadows, coniferous forests, mixed forests, hay and agricultural fields and pastures. Quantitative data on the area of habitat available in the past and at present are not available, but suitable undisturbed habitat is declining over much of the range of the Wood Turtle.




Canadian distribution of the Wood Turtle. Background shading differences indicate various faunal provinces of terrestrial amphibians, reptiles and molluscs in Canada.
Source: modified from the November 2007 COSEWIC Status Report.

## Biology

Wood Turtles overwinter underwater in streams, rivers and ponds. They emerge in spring but remain close to water until summer, when they may range up to 500 m from water and several kilometres along a stream from their hibernation sites. Females nest between late May and early July in sand or gravel areas that receive a moderate to high amount of sunlight. Rate of embryo development varies directly with ambient temperature and hatching occurs in fall. Wood Turtles reach sexual maturity at 11–22 years of age and this range largely depends on latitude, with turtles in the northern parts of the species' range maturing later and at a larger body size. Mating occurs throughout the active season. Wood Turtles use the same areas each year, and are capable of returning to these areas from several kilometres away. The main predators of adults and juveniles are raccoons, coyotes, and foxes, and these and other mammals eat eggs as well. Various mammals, fish and birds prey on hatchlings.

## Population sizes and trends

A crude estimate of total population size of the Wood Turtle in Canada, based on quantitative estimates from researchers across its Canadian range, is ~6 000–12 000 adults. Wood Turtle populations that are in areas to which people have limited access may be stable, but where there is road access many populations are declining, and the overall trend in Wood Turtle abundance over the past three generations (~100+ years) is also one of decline.

## Limiting factors and threats

Threats to Wood Turtles across their range include: increased mortality of adults on roads (general increase in road networks and traffic volume and speed), and offroads (ATVs and modern agricultural machinery); removal of turtles for the pet trade, construction of forestry roads; destruction/alteration of riparian habitat, destruction of nests by humans in recreational vehicles such as ATVs, collection for

the exotic food trade; loss of nesting habitat and hibernacula due to stream and river bank alteration, flooding, and shoreline stabilization; and increased depredation of nests and turtles by raccoons. Lesser threats include pollution, casual collection for pets, and perhaps, increased sedimentation of waterways inhabited by Wood Turtles. Overall, this species is exceptionally vulnerable to increased access to its habitat by people.

## Special significance of the species

The Wood Turtle is endemic to North America, and approximately 30% of its range is in Canada. The four species of turtles previously included in the genus *Clemmys* (which included the Wood Turtle) are the most threatened freshwater turtles in North America. The Wood Turtle has become unusually popular for a turtle, largely because of its attractive appearance, terrestrial habits and non-aggressive response to people, all features which have been significant in putting this species at risk. The numerous threats facing Wood Turtles and the ease of capturing and handling them have made this species the focus of much recent research on conservation and given it a high profile as a species at risk. Wood Turtles also are reputed to stomp their forefeet and plastron to attract earthworms for dinner.

## Existing protection or other status designations

The Wood Turtle is currently listed under Appendix II of CITES; listed as a "Specially Protected Reptile" by the Ontario *Fish and Wildlife Conservation Act*; designated as "endangered-not regulated" under the Ontario *Endangered Species Act*; designated as "threatened?" in Quebec; protected under the Nova Scotia *Endangered Species Act* (as Vulnerable); listed as "Vulnerable" by the IUCN; listed as "Special Concern" by COSEWIC in 1996; and listed under Schedule 3 of the Canadian *Species at Risk Act* (SARA). Some small subpopulations in Canada are in National or Provincial Parks, but most are on private land. ■

# Yellow Montane Violet *praemorsa* subspecies

Photo: © Chris N. Junck

**Scientific name**
*Viola praemorsa praemorsa*

**Taxon**
Vascular Plants

**COSEWIC Status**
Endangered

**Canadian Range**
British Columbia

## Reason for designation

The subspecies is only known in Canada from southeastern Vancouver Island and the adjacent southern Gulf Islands where it occurs as 14 mainly small, localized populations that are highly fragmented. This short-lived perennial is restricted to Garry oak woodlands and maritime meadows where habitat is continuing to decline in quality due to such factors as the spread of exotic invasive grasses as well as the spread of trees and shrubs as a result of fire suppression.

## Species information

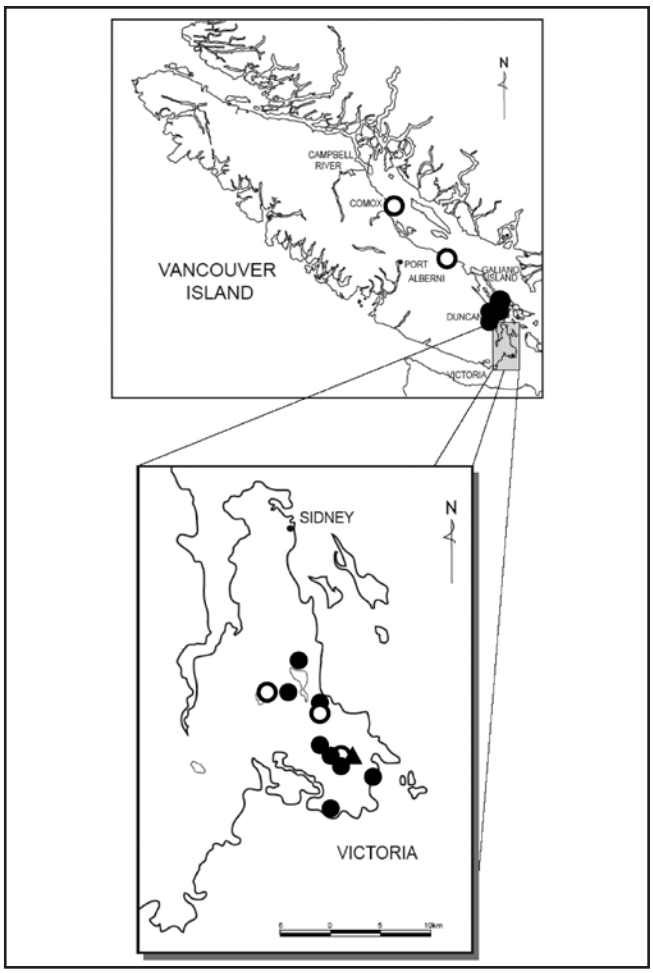
Yellow Montane Violet (*Viola praemorsa* ssp. *praemorsa*) is a hairy, perennial herb with egg-shaped to lance-shaped basal leaves and a short stem that is leafless or bears a few reduced leaves. Its showy, yellow flowers are borne singly at the end of long stalks which emerge from the axils of leaves. Yellow Montane Violet also produces less conspicuous cleistogamous flowers, which lack showy petals and are borne on short stalks near the base of the shoot. In both conventional and cleistogamous flowers, the ovary ripens into a dry, 6–11 mm long capsule containing several dark-brown seeds. Throughout this report the name Yellow Montane Violet refers specifically to the subspecies *praemorsa* found in British Columbia and only includes the entire species when considering its global range.

## Distribution

Yellow Montane Violet occurs from Vancouver Island to California, chiefly west of the Cascades. In British Columbia, Yellow Montane Violet is found only along the southeast coast of Vancouver Island and on adjacent islands in the Strait of Georgia. The nearest non-Canadian population is about 100 km to the south, on the other side of Puget Sound. The current Canadian extent of occurrence is about 450 km$^2$. The historic extent of occurrence was approximately 2 400 km$^2$. The greatest decline in extent of occurrence occurred between 1960–1990. The area of occupancy as based on a 1 x 1 km grid is 14 km$^2$ and based on a 2 x 2 km grid is 56 km$^2$. The actual area of habitat occupied is <20 ha.

## Habitat

In British Columbia, Yellow Montane Violet occurs in Garry oak woodlands and maritime meadows. Most microhabitats occupied by Yellow Montane Violet have shallow soils over bedrock, are relatively level or south-facing, have little or no shrub cover and have an abundant cover of herbaceous species. In spring, the herb layer is dominated by native forbs. In summer, the native herbaceous layer is replaced by a diverse assemblage of forbs and grasses. The amount of potential habitat has declined greatly over the past century as coastal areas in southeast Vancouver Island have been developed for residential and recreational use. Most of the remaining habitat has been heavily altered through invasion by exotic grasses and shrubs. Three populations have been lost to property development. Most of the remaining populations are secure from development, at least over the next 10 years.




Canadian distribution of Yellow Montane Violet, British Columbia. Solid circles represent extant populations.
Source: November 2007 COSEWIC Status Report.

## Biology

Shoot dormancy begins to break in March when the soil begins to warm up with the spring weather. Plants are fully leafed out by late April or early May. Foliage begins to wither by mid to late June and the shoots die back by mid to late July as the summer drought deepens. Plants often grow for several years before reaching flowering size. Fruit dispersal occurs as the desiccating capsules rupture abruptly, explosively dispersing seeds as much as 1 metre. The seeds are hard and shiny and bear pale terminal fat bodies (elaiosomes) that attract ants, that carry the seeds slightly further from the parent plant. Yellow Montane Violet is incapable of clonal growth or asexual reproduction.

## Population sizes and trends

There are 14 extant populations and, based on recent data, approximately 32 000–49 000 flowering plants in British Columbia, with about 80–90% of the population of this subspecies concentrated in the two largest populations. The actual area of habitat occupied is <1 $km^2$. The number of populations has been in slow decline — five populations have disappeared but none of these have been lost over the past 10 years.

## Limiting factors and threats

The impacts of invasive species (particularly exotic grasses) and altered fire regimes pose the greatest threats to Yellow Montane Violet. The absence of First Nations burning has shifted vegetation structure, favouring shrub and tree species that had been held in check by frequent ground fires used to stimulate production of food species. At some sites a fire-intolerant native shrub appears to have expanded into most of the habitat formerly available to Yellow Montane Violet. Trampling damage along human foot paths has affected a significant proportion of some populations. As well, several populations are so small that they are particularly vulnerable to stochastic events.

## Special significance of the species

The British Columbia populations are of scientific interest because they are disjunct from the species' main range and may be genetically distinct as a result.

## Existing protection or other status designations

Yellow Montane Violet was initially assessed by COSEWIC in 1995 as Threatened in Canada and the status was re-examined and confirmed in 2000. It was subsequently listed under schedule 1 of the federal *Species at Risk Act* (SARA). The British Columbia Ministry of Environment considers Yellow Montane Violet to be a "Red-listed" (threatened/endangered) taxon in British Columbia. Yellow Montane Violet is the subject of a multi-species recovery strategy along with other Garry oak woodland species. ■

# INDEXES

## Species by Common Name



## Species by Scientific Name

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# GLOSSARY

**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 *Canada Gazette*, Part I, and Official regulations are published in *Canada Gazette*, Part II. For more information, please visit:
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 co-ordination 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, governments 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.

**Governor in Council:**
The Governor General of Canada acting on the advice of the Queen's Privy Council for Canada (i.e. Cabinet).

**Order:**
Order in Council (OIC). An instrument that serves notice of decisions taken by the executive arm of government; for example, an Order in Council accompanies all regulations.

**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 SARA 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.

**SARA Public Registry:**
Developed as an online service, the SARA 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.sararegistry.gc.ca

**Schedule 1:**
A schedule of the *Species at Risk Act* (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.

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