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Canada

Consultation document part 3 for batch 23: Species summaries

Valley Grasshopper

Photo: © James Miskelly

Scientific Name
Oedaleonotus enigma

Taxon
Arthropods

COSEWIC status
Endangered

Canadian Range
BC

Reason for designation
This grasshopper is known from one very small area near Osoyoos, British Columbia, where it occurs in some of the hottest and driest grassland habitat in Canada. The species is at risk from potential housing developments and there is a continuing decline in the quality of its habitat due to recreational activities (unregulated camping and all-terrain vehicle use) and garbage accumulation.

Wildlife Species Description and Significance
Valley Grasshopper is identified at the adult life stage by three distinguishing features: a narrow, conspicuously white to cream-coloured band or collar on the anterior edge of the pronotum; the hindleg femur with distinct dark brown chevrons separated by tan lines; and blue hindleg tibia. Adults show wing dimorphism; the hard leathery front wings can be short (individuals cannot fly) or long (individuals can fly). The proportion of these wing forms varies between years.
Valley Grasshopper is of interest to entomologists due to its rarity and close association with the Antelope-brush and sagebrush ecological communities of the south Okanagan.

Distribution
Valley Grasshopper ranges in western North America from southern British Columbia (B.C.), south through eastern Washington, Oregon, Idaho, Montana and Nevada, and southwest to southern California and northern Mexico, with a potentially disjunct subpopulation in Utah. In Canada, Valley Grasshopper has a restricted range and occurs in extreme southern B.C. There is one known resident subpopulation on untitled provincial land (Osoyoos West Bench) adjacent to the international border.
Valley Grasshopper was first recorded in Canada from pitfall traps in 2010, and the most recent records are from hand collections in 2023. Pitfall trapping (2013, 2023), grasshopper specific hand-collection wandering transect surveys (2021, 2023), and incidental collections throughout the species' potential range and habitat in Canada have not revealed additional subpopulations. There is partially surveyed habitat adjacent to Osoyoos West Bench in the South Okanagan Grasslands Protected Area and Sage and Sparrow Conservation Area where there are likely additional subpopulations.

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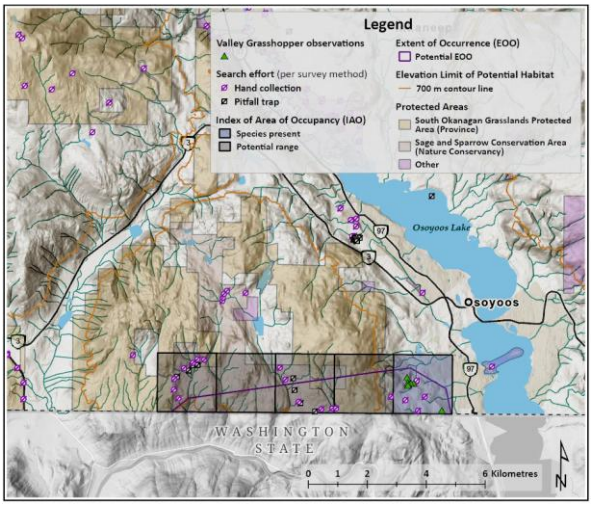

Known and potential Canadian range of Valley Grasshopper (*Oedaleonotus enigma*), showing 2 km X 2 km index of area of occupancy squares (IAO) and the potential EOO (extent of occurrence). Map prepared by Alain Filion (COSEWIC secretariat).

Source: COSEWIC. 2024. IN PRESS. COSEWIC assessment and status report on the Valley Grasshopper *Oedaleonotus enigma* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 47 pp.

Habitat

Valley Grasshopper inhabits the lower elevation (< 700 m) areas of the Bunchgrass (BG) Okanagan Very Dry Hot (BGxh1) biogeoclimatic variant, which includes some of the hottest and driest habitats in the country. The dominant shrubs are Big Sagebrush and Antelope-brush, with some Common Rabbit-bush. The dominant forbs and grasses are Bluebunch Wheatgrass, Prickly Pear Cactus, Needle-and-thread-grass, June Grass, Sandberg's Bluegrass, and Low Pussytoes.

Biology

Valley Grasshopper has an annual life cycle. The species overwinters as an egg (Aug/Sept - April) and hatches as a nymph in the early spring (April/May). Nymphs grow by gradual metamorphosis through the six nymphal instars from May through August before becoming adults in August. Adults are active from early August through to late September and mating and oviposition occurs during this time. Valley Grasshopper nymphs hatch from overwintering eggs earlier than most other grasshopper species. They grow slowly (likely due to cooler spring temperatures) and have more nymphal instars than most other grasshoppers (grasshoppers typically have five instars). Warmer temperatures yield more short-winged adults and cooler temperatures yield more long-winged adults. The species is a polyphagous herbivore, feeding on forbs, shrubs, and to a lesser extent on grasses.

Population Sizes and Trends

There is no information on the Canadian population size or trends. Fewer than ten specimens have been collected and deposited as museum vouchers. Surveys from 2010 to present have focused on recording new subpopulations, natural history, and habitat information; these methods do not allow for population estimates.

Threats and Limiting Factors

The most serious and plausible threat to Valley Grasshopper is the potential for Osoyoos West Bench to be lost to urban development within the next ten years. Other threats include drought resulting from climate change, ongoing cumulative loss, degradation and fragmentation of this property and adjacent habitats from intensive all-terrain vehicle use, long-term camping, and garbage accumulation. Threats to the private lands adjacent to and within 1 km of Osoyoos West Bench include habitat loss to agricultural land conversion (e.g., the conversion of natural habitat) or intensification (e.g., conversion of tree fruit crops to vineyards).

Protection, Status, and Ranks

Valley Grasshopper is not listed or protected under provincial or federal legislation. It is known from the Osoyoos West Bench, a large parcel of untitled provincial land. The entire Osoyoos West Bench is within a Notation of Interest and Section 16 Map Reserve, which are land tenures (under the B.C. *Land Act*) indicating to government and other tenure holders (or would be tenure holders or developers) of the interest in this parcel for environmental and conservation purposes. However, this does not protect the land from being sold, leased, or developed. The Osoyoos West Bench is also within the working boundaries of the South Okanagan National

Park Reserve, but until the park is formally established this offers no formal protection. The global status is G5 (Secure) and the Canadian national and B.C. status ranks are N1 and S1, respectively (both Critically Imperilled). It is not part of any species-specific conservation activities.

Source: COSEWIC. 2024. IN PRESS. COSEWIC assessment and status report on the Valley Grasshopper *Oedaleonotus enigma* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 47 pp.

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Short-billed Dowitcher *caurinus* subspecies

Photo: © Samuel Denault

Scientific Name
Limnodromus griseus caurinus

Taxon
Birds

COSEWIC status
Endangered

Canadian Range
YT, BC

Reason for designation
In Canada, this medium-sized shorebird breeds only in southern Yukon and the northwestern corner of British Columbia. There it nests almost exclusively in calcareous string fens, and migrates south to winter along the Pacific coast from California to South America. This species faces a number of threats, including increasing loss of wintering habitat from several causes; disturbance by dogs and recreational activities at migratory stopover sites and on the wintering grounds; impacts of pollution on birds and their prey; and effects of climate change and increased forest fires on the breeding grounds. The Canadian population estimate is 1,000 to 3,000 mature individuals, or fewer, and monitoring suggests steep population declines exceeding 50% over the past three generations.

Wildlife Species Description and Significance
Short-billed Dowitcher is a chunky, medium-sized shorebird, with generally brown-mottled upperparts speckled with cream, and an orangey-rufous breast in the breeding season. Its bill, almost twice as long as the head, is straight and dark grey, and its stout yellowish legs are relatively short. Short-billed Dowitcher is a long-distance migrant, travelling as far as 15,000 km in a round trip between its breeding and non-breeding grounds. It is harvested as a game bird in the Caribbean and northern South America.
Spatial segregation in the breeding, migrating, and non-breeding ranges of known populations provide evidence for subdivision of Short-billed Dowitcher into two designatable units (DUs), the *caurinus* and *hendersoni/griseus* populations, following the subspecies or subspecies complexes of *L. g. caurinus* and *L. g. hendersoni/griseus*, respectively. There is strong inference that each of the *caurinus* and *hendersoni/griseus* populations have distinctly heritable traits, in the form of strongly differentiated migration routes and separate breeding and non-breeding grounds. Therefore, the two populations of Short-billed Dowitcher that occur in Canada are considered to be discrete and evolutionarily significant, and they are assessed as two separate DUs.

Distribution
Short-billed Dowitcher breeds primarily in the boreal forest of Canada and Alaska. In Canada, it occurs from British Columbia and Northwest Territories eastward to Newfoundland and Labrador. The *caurinus* DU breeds in southwestern Yukon and northwestern British Columbia; this population is associated with wintering (non-breeding) sites located along the Pacific coast from California to southern Peru.

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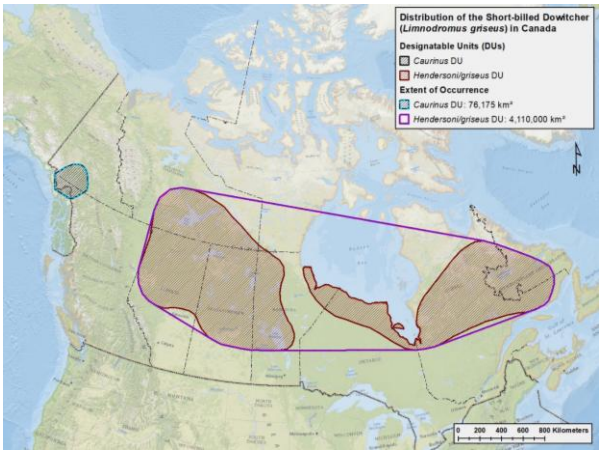

Map of breeding range in Canada, used for calculation of extent of occurrence (EOO) for each DU of Short-billed Dowitcher in Canada (see legend; estimated distribution based on Consortium Gauthier et Guillemette – G.R.E.B.E. 1991; Smith 1996; Sinclair *et al*. 2003; Burke and Sutherland 2007; FAN 2007; Fraser 2015; Artuso 2018; Quebec Breeding Birds Atlas 2020; Saskatchewan Breeding Bird Atlas 2020; Fink *et al*. 2023; eBird 2024; Hache unpubl. data). Breeding range in the northern part of the boreal forest in most provinces and territories is suggestive due to the limited information available.

Source: COSEWIC. 2024. IN PRESS. COSEWIC assessment and status report on the Short-billed Dowitcher *Limnodromus griseus, caurinus* subspecies (*Limnodromus griseus caurinus*) and *hendersoni/griseus* (*Limnodromus griseus hendersoni/griseus*) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xv + 83 pp.

Habitat

Short-billed Dowitcher nests principally in fens of the boreal forest, particularly in large fens with expanses of emergent aquatic vegetation (e.g., sedges) and numerous shallow ponds and pools, interspersed with shrubs and small conifers. In winter, it prefers coastal wetlands such as estuaries, lagoons, mudflats, and the edges of mangrove forests.

Biology

Short-billed Dowitcher is socially monogamous and defends only a small area around the nest, and around the brood once the young have left the nest. Adults arrive on their breeding grounds in mid-May and incubation begins in early June. The nest is a simple depression on dry ground. Four eggs are usually laid, with a three-week incubation period beginning between mid-May and mid-June. The precocial young leave the nest shortly after hatching and the male is responsible for brood rearing, which generally lasts 14 days. Short-billed Dowitcher produces only one brood a year. Age at first breeding is one year, and generation length is estimated to be four years. On the breeding, migrating, and non-breeding grounds, the species feeds primarily on aquatic invertebrates such as molluscs, worms, and crustaceans.

Population Sizes and Trends

Published population estimates of the *caurinus* DU suggest it comprised 15,000 mature individuals in Canada. However, these estimates are based on surveys conducted in the 1980s and '90s. Based on recent unpublished surveys from the 2020s, the Canadian population of *caurinus* is thought to be much smaller and is now estimated as being from 1,000 to 3,000 mature individuals, or fewer.

Only one site surveyed under the ISS, on the north coast of Washington state near the Canadian border, provides trend data for the *caurinus* DU. From 2007 to 2019, this DU showed a decline exceeding 7% per year, or a 3-generation decline of at least 59%. This is consistent with other studies conducted on the *caurinus* DU, e.g., birds in Alaska showed a decline of over 90% between 1990 and 2010, and migrating dowitchers (Long-billed and Short-billed combined) along the Pacific coast declined by 4% per year from 2013 to 2023, equivalent to a 3-generation decline of 39%.

Threats and Limiting Factors

Multiple, interacting threats and limiting factors are likely responsible for Short-billed Dowitcher's population decline. With a maximum clutch size of four eggs and a single brood, the species has limited annual reproductive output. For both DUs, important threats are considered to be loss and degradation of wetlands and other habitat at migratory stopover sites, on the non-breeding grounds, and, increasingly, on the breeding grounds; and the threat of climate change and severe weather, which affects the species on its breeding and non-breeding grounds as well as during migration.

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Protection, Status, and Ranks

In 2024, the IUCN uplisted Short-billed Dowitcher from Least Concern to Vulnerable. In Canada, NatureServe considers the Short-billed Dowitcher Vulnerable as a breeder and Apparently Secure as a migrant (N3N4B, N4N5M). Its status as a breeder in Yukon and British Columbia (S1 and S1S2, respectively) is Critically Imperilled, and Vulnerable (S3) in most other provinces where ranked. In Alaska, *caurinus* is listed as II Red in the Alaska Species Ranking System. Short-billed Dowitcher and its nests and eggs are protected under the Canadian *Migratory Birds Convention Act*, and the species is also safeguarded under similar laws in a number of provinces. A small portion (~3%) of suitable breeding habitat (i.e., boreal wetlands and coastal mudflats) in Canada is protected by national or provincial parks, migratory bird sanctuaries, or national wildlife areas. Outside the species' breeding range, a network of important stopover sites in the Americas deemed to be of national or international significance for shorebirds including Short-billed Dowitcher are identified through various conservation designations such as the Western Hemisphere Shorebird Reserve Network (WHSRN) and BirdLife International's Important Bird and Biodiversity Areas (IBBA) programme.

Source: COSEWIC. 2024. IN PRESS. COSEWIC assessment and status report on the Short-billed Dowitcher *Limnodromus griseus, caurinus* subspecies (*Limnodromus griseus caurinus*) and *hendersoni/griseus* (*Limnodromus griseus hendersoni/griseus*) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xv + 83 pp.

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Cupped Fringe Lichen

Photo: © Samuel Brinker

Scientific Name
Heterodermia hypoleuca

Taxon
Lichens

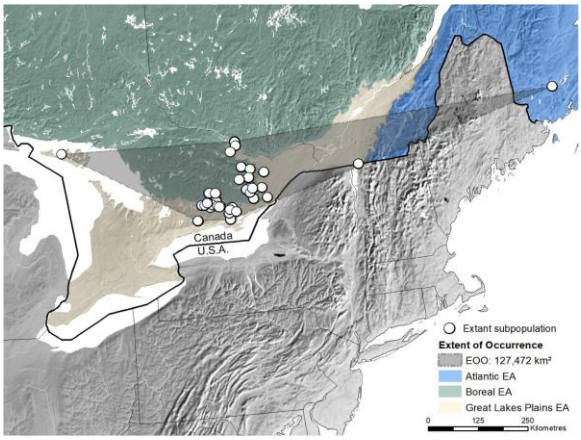
COSEWIC status
Endangered

Canadian Range
ON, QC, NB

Reason for designation
This rare arboreal lichen occurs in southern Canada in the provinces of Ontario, Quebec, and New Brunswick, and is closely associated with the alkaline bark of several broadleaf tree species, including ashes, elms, maples, and oaks. Ash trees in humid forests, its preferred habitat, are suffering from severe mortality associated with a non-native insect, the Emerald Ash Borer. As a result, there is a past and future decline of this lichen reducing the size of the population by more than 70% over the next three generations.

Wildlife Species Description and Significance
Cupped Fringe Lichen, *Heterodermia hypoleuca*, is a leafy lichen that grows in grey to blue-grey rosettes, usually to 10 cm in size, but sometimes reaching up to 25 cm across. It typically grows on the trunks of mature hardwood trees. The rosettes are made up of 1-3 mm wide branching lobes that are loosely attached to tree bark by a network of pale to dark root-like structures (rhizines) that cover the white undersides of the lichen. The fruit bodies (apothecia) on the upper surface are typically cup-shaped, with abundant marginal lobules.

Distribution
Cupped Fringe Lichen is a temperate to subtropical species with a widely disjunct global distribution. It is found throughout portions of eastern and western North America, as well as low-lying and montane regions of Central and South America, Africa, and eastern Asia. In the United States, it ranges mainly from the Appalachian Mountains west to the Ozark Ecoregion and north to the Great Lakes Basin. In Canada, the species occurs at its northern limit in portions of Ontario, Québec, and New Brunswick.



Map of extant *Heterodermia hypoleuca* subpopulations (white circles ○) in Canada (excluding extirpated subpopulations and historical collections with vague or questionable localities) used to determine the extent of occurrence (gray polygon) in relation to National Ecological Areas (EAs; Atlantic, Boreal, and Great Lakes Plains).

Source: COSEWIC. 2025. IN PRESS. COSEWIC assessment and status report on the Cupped Fringe Lichen *Heterodermia hypoleuca* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 61 pp.

Habitat
Cupped Fringe Lichen is entirely dependent on the host trees on which it grows. In Canada, these are usually large, long-lived hardwood

species in areas with productive, mature hardwood forests that overlay circum-neutral to alkaline substrates. Individuals occur on the trunks (and rarely the thick branches) of living trees from a few centimetres above ground up to at least 10 m, although typically occur from 1 to about 5 metres. Ash trees are the primary host substrate, supporting 74% of the population, followed by oak trees, which host 21%. Habitat includes humid, mature to old calcareous swamps, hardwood forests with vernal ponds or areas with persistent standing water, and rarely, Bur Oak alvar savannah near the Great Lakes coasts.

Biology

Cupped Fringe Lichen can reproduce in two ways: sexually, through ascospores, or asexually, by breaking apart and growing from fragments. The ascospores, which contain only fungal DNA, are released from the fruiting bodies (apothecia) and are carried by wind, water, and animals. If the conditions are right, the ascospores grow fungal strands (hyphae). For a new lichen to form, these fungal strands must encounter a compatible green alga on a suitable bark surface. If the habitat and conditions are suitable, the fungal strands surround the alga, and along with other microorganisms like bacteria and other fungi, grow together to create a new lichen.

Population Sizes and Trends

The enumerated Canadian population identified by field sampling is 476 thalli on 144 trees. For the assessment we use the number of host trees as individual equivalents. A total of 46 subpopulations have been documented, 36 of which are considered extant. Of these, 34 are in Ontario, one is in Québec, and one is in New Brunswick. About 98% of mature individuals occur in Ontario, 2% in Québec, and less than 1% in New Brunswick. A 21% decline in mature individuals and a 35% decline in host trees is expected within 5 years where thalli and dead host trees will be lost as bark substrates deteriorate. Over the next three generations (30-90 years) a 78% decline in mature thalli and 74% decline of host trees (individual equivalents) is projected due to host tree mortality. The estimated Canadian population is likely higher than current counts suggest. Estimates suggest there could be an additional 580-900 thalli on 190-270 ash trees (individual equivalents) on private land between Peterborough and the Ottawa River, extending north to Pembroke. However, mortality rates for these individuals would likely near 100% within three generations.

Threats and Limiting Factors

The overall threat impact to the survival of Cupped Fringe Lichen was assessed as very high – high. Cupped Fringe Lichen is completely dependent on its host trees for continued survival. A total of 107 ash trees sustaining 351 mature individuals will be lost due to the impacts of Emerald Ash Borer (EAB), representing a 72% loss of all occupied host trees and a 74% decline in the number of mature individuals. Only five extant subpopulations occur exclusively on non-ash substrates and are not threatened by EAB. Logging and wood harvesting, road construction, and drought and severe storms caused by climate change are other significant threats.

Protection, Status, and Ranks

Cupped Fringe Lichen has a global rank of G5 (secure). It has a national rank and General Status rank of N3 (Vulnerable) in Canada which will likely change to N2 following a current revision in Quebec. The Natural Heritage Information Centre (Ontario) has assigned the species a rank of S2 (Imperiled), and the Québec Conservation Data Centre has assigned it a rank of S3 (Vulnerable), however it is being revised to S1-S2. It is not yet ranked in New Brunswick. It is not explicitly protected by any federal or provincial laws, nor by any international agreements or conventions. Thirteen extant subpopulations occur in provincial parks and conservation reserves, or in privately owned/managed protected areas.

Source: COSEWIC. 2025. IN PRESS. COSEWIC assessment and status report on the Cupped Fringe Lichen *Heterodermia hypoleuca* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 61 pp.

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Big-tooth Whitelip

Photo: © Alison Smith

Scientific Name
Neohelix dentifera

Taxon
Molluscs

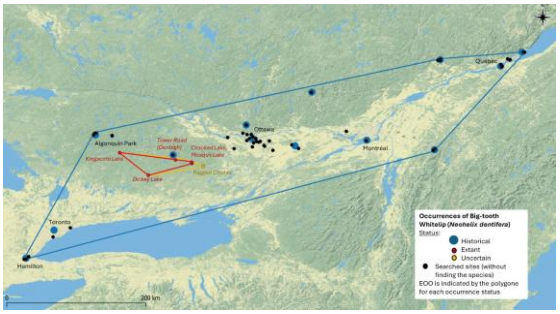
COSEWIC status
Endangered

Canadian Range
ON, QC

Reason for designation
In Canada, this large (2–2.5 cm shell diameter) land snail is known to occur in at least six sites within mature mixed-wood forest from Perth to south of Algonquin Provincial Park in southern Ontario. It is extirpated from the rest of its historical Canadian range, which extended south to Hamilton, around Ottawa, and eastward to Quebec City where it was found in large numbers in the 1890s. It typically lives near boulders on slopes and ravines but is also found under logs in thick leaf litter. The main threats are climate change (particularly droughts and changes in freeze-thaw cycles) and logging but it is also susceptible to ecosystem modifications from invasive species (including exotic earthworms and slugs) and wildfire. The species' restricted distribution, limited dispersal, low abundance at known sites, and continuing threats make it vulnerable to extirpation from Canada.

Wildlife Species Description and Significance
Big-tooth Whitelip (*Neohelix dentifera*) is a large land snail with an olive-brown coloured shell (2–2.5 cm in diameter) and a pearly-white body. Only two species in the genus are found in Canada. It was historically described as one of the rarest eastern North American large land snails. Big-tooth Whitelip is a member of the litter community and involved in litter degradation and subsequent soil formation.

Distribution
In the eastern US, Big-tooth Whitelip occurs in the Appalachian Mountains and the Adirondacks. In Canada, Big-tooth Whitelip is at the northern limit of its global range. This heterogeneously distributed species historically occurred in low-abundance subpopulations along the upper St. Lawrence River and the Great Lakes region from Île d'Orléans, Quebec, westward to Toronto, Ontario. Recent records are from in and near Algonquin Provincial Park, Ontario. Only two live individuals and four shells were found in five sites in 2024 despite a large recent search effort within the historical range. The continued existence of the species at one occurrence in southern Ontario based on a record from the 1990s is uncertain because it was not found in searches of this site in 2023.



Canadian range of Big-tooth Whitelip (*Neohelix dentifera*) encompassing historical sites (black dots) where the species was not recently found despite searches in numerous sites in the vicinity of historical localities (see Tables 1 and 2). Because the precise coordinates of historical records is unknown, the general area is indicated by a larger blue dot with black centre. One site (Ragged Chutes record from 1992) is currently considered as an UNCERTAIN occurrence (yellow dot). There are currently five sites where the

species is EXTANT (red dots, two overlap). The polygons indicate extent of occurrence (EOO) based on historical records (blue polygon) and on current EXTANT records (red polygon), including the one UNCERTAIN occurrences (yellow polygon). Map created by Annegret Nicolai.

Source: COSEWIC. 2025. IN PRESS. COSEWIC assessment and status report on the Big-tooth Whitelip *Neohelix dentifera* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 50 pp.

Habitat

In the US, Big-tooth Whitelip is associated with acidic, low-density soils in talus in high-elevation exposed non-oak-hickory forests. It usually lives between rocks but is also found under logs in thick leaf litter. The species was found in recent searches in Canada in mature mixed-wood forest on neutral to calcareous soils, mostly near boulders on slopes and ravines but never in floodplains.

Biology

Big-tooth Whitelip is an egg-laying land snail. Mating and egg laying probably occur twice a year, in spring and late summer. Hibernation extends from early October until April–May. Sexual maturity may be reached after two years and the species may live for 5–10 years. Generation time is estimated to be 5–6 years. Active dispersal for colonization of new areas is slow.

Population Sizes and Trends

Current population size is unknown. Notable abundances of Big-tooth Whitelip were reported from near Quebec City at the end of the 19th century; despite numerous surveys at that time, it appeared in low numbers elsewhere. Although the species' range in Canada appears large, it has always been rare, with few past occurrences. In most of the recently searched historically occupied sites, habitat has been altered (logged in the past and now secondary forest), disturbed (past and/or current human activity), or completely lost (urbanized or converted into agricultural land) all of which most likely resulted in loss of subpopulations and decline in numbers. Currently the species is only found in a few sites within a restricted range in Ontario.

Threats and Limiting Factors

The main threats include Climate Change & Severe Weather (IUCN threat #11) with more frequent droughts and extreme weather events in winter (e.g., freezing, storms) that increase mortality and Biological Resource Use (IUCN #5, logging). Another low-impact threat is Natural System Modifications (IUCN #7) through wildfire, with invasive species (IUCN #7.3) having an unknown impact.

Protection, Status, and Ranks

Big-tooth Whitelip is not protected by any legislation, regulations, customs, or conditions. According to NatureServe, the species is Apparently Secure to Secure globally (G4G5) and in the US (N5) but Critically Imperilled (N1) in Canada. Based on historical records the subnational rank in Quebec is "no status" (SNR) while it is Critically Imperilled (S1) in Ontario. Many states in the US with records have not assessed the species or have ranked it as "no status" despite recent data.

Source: COSEWIC. 2025. IN PRESS. COSEWIC assessment and status report on the Big-tooth Whitelip *Neohelix dentifera* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 50 pp.

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Circular-leaved Peat Moss

Photo: © Marion Barbé

Scientific Name
Sphagnum cyclophyllum

Taxon
Mosses

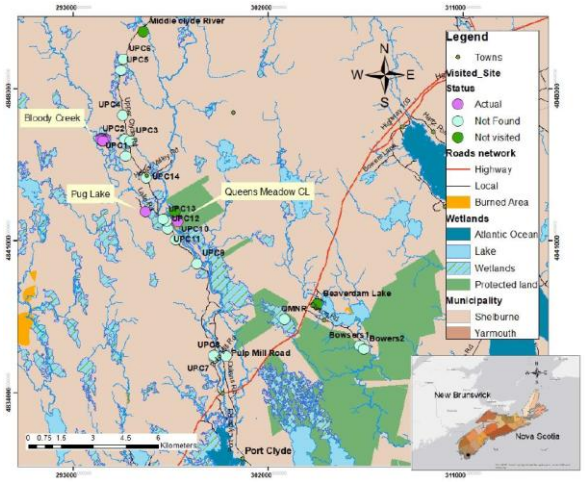
COSEWIC status
Endangered

Canadian Range
NS

Reason for designation
This medium-sized peat moss is known in Canada only from three sites within 10 km from each other in a single watershed of southwestern Nova Scotia; these sites are 700 km from the nearest ones in the United States. Dispersal ability of the species is poor because sexual reproduction is rare and asexual reproduction by fragmentation has never been observed. Fewer than 250 individuals have so far been found in Canada. The species grows in shallow depressions in three open peatlands, each of which supports few individuals. The most important threats include climate change-induced drought and increased fire frequency. The unexpected recent fire that affected one site highlights the importance of the latter threat.

Wildlife Species Description and Significance
Sphagnum cyclophyllum Sullivant, Circular-leaved Peat Moss is significant for its rarity in Canada where the species is at the extreme northern edge of its geographical range and known from only three close occurrences. Their impressive ability for water retention greatly influences hydrology. They also play an important role in the carbon cycling, chemistry and microbiology of the habitat they live in.

Distribution
Circular-leaved Peat Moss is virtually endemic to the Americas with only one questionable mention reported outside the Americas in Russia. Apart from the Russian occurrence, the species has a disjunct range with populations found in North America mostly along the east coast and the Gulf of Mexico and in South America in Columbia and Brazil. Some inland disjunct subpopulations are found in Tennessee and in the northern parts states of Alabama and New York.
In Canada, Circular-leaved Peat Moss is known only from a single population in Nova Scotia. Although herbarium specimens and observations are from almost the entire Atlantic coast of the United States, they are sporadic, and the species is considered rare in many US states.



Map of the current and historical distribution of Circular-leaved Peat Moss in Canada. Middle Clyde River and Beaverdam Lake sites are approximated localities of specimens collected by Maass and found in the NSMH herbarium, but these sites were not visited during the 2021 field survey. Note that the specimen 10930 of NSPM mentions the Middle Clyde River as the locality but the description does not match this locality. QMNR, UPC 7 and UPC8 are approximate localities of historical mentions that were visited but the species was not found. Created by Maurane Bourgouin and Marion Barbé from herbarium data (UBC, Duke and Wolfgang Maass [New Brunswick Museum] and Atlantic Canada Conservation Data Centre herbariums) and fieldwork in 2021. Note: At the time of Listing consultations, this map predates the 2023 fire (considered by COSEWIC during their assessment) but it is expected that its effects on the population are minimal and that this map remains accurate.

Source: COSEWIC. 2024. IN PRESS. COSEWIC assessment and status report on the Circular-leaved Peat Moss *Sphagnum cyclophyllum* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 52 pp.

Habitat

Across its distribution, Circular-leaved Peat Moss prefers open grassy savannahs, pine barrens and other pinelands, as well as the edges of ditches along sandy roads that are submerged for part of the year. It also occurs in depressions in open to semi-open peatlands that dry up in summer. In Canada, it has been collected in dried depressions of open bog habitat and in submerged ditches.
In the main part of its range, this *Sphagnum* seems to be dependent on small substrate disturbances and is found on recently exposed soil, and in vegetation types subject to fire such as grassy savannahs and pinelands.

Biology

Sphagnum, also known as peat moss, is a group of mosses that are common species inhabiting wet areas, and are considered the "engineers" of bogs and fens. They are perennial species with an indeterminate apical growth and live tightly appressed together in low hummocks or mats. Circular-leaved Peat Moss is dioicous, meaning male and female reproductive structures are found on separate plants. The capsules are immersed in the leaves and therefore less effective in dispersal. However, sexual reproduction is rare, and few fertile individuals have been observed throughout its range. Vegetative fragmentation appears to be its main mode of reproduction.
Dispersal of vegetative fragments in Circular-leaved Peat Moss is presumed to be mainly passive, occurring by wind or water. It is possible that the species could also be dispersed by animals, however there are no mentions in the literature.

Population Sizes and Trends

There is no information on population trends on Circular-leaved Peat Moss in North America. The Canadian population consists of three occurrences, all located in Shelburne County, Nova Scotia, covering an area from 0.2 to 124 m² depending on the site. At each occurrence, colonies are found in one or more depressions, where the species represents variable amounts of cover, ranging from abundant (85% cover) to only a few stems in the depression. Circular-leaved Peat Moss typically grows in small patches that do not extend further than the depression in which they are found.

Threats and Limiting Factors

Climate change is the most important threat to Circular-leaved Peat Moss, either through decreasing abundance of peatlands due to regional drought or via large high intensity fires that could destroy all of the colonies in Canada,

considering their clustered distribution. Recreational activities may threaten and, at the most impacted sites, destroy Circular-leaved Peat Moss colonies. Intensive ATV use has been recorded in two of three known sites in Canada.
Limiting factors include the species' narrow habitat tolerance, limited environmental tolerance, the rarity with which it sexually reproduces, and its limited dispersal ability.

Protection, Status, and Ranks

Circular-leaved Peat Moss is not protected internationally nor in most states where it occurs. Globally it is ranked Vulnerable (G3). Of the 12 states where it is found in the United States it is considered to be Vulnerable in New Jersey (S3), Georgia (S3), and Mississippi (S3), and apparently secure in Virginia (S4?). In Canada and in the province of Nova Scotia, where the only known population is found, it is designated Critically Imperiled (N1?S1?).

Source: COSEWIC. 2024. IN PRESS. COSEWIC assessment and status report on the Circular-leaved Peat Moss *Sphagnum cyclophyllum* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 52 pp.

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Canada

Short-fruited Rush

Photo: © Ryan Morin

Scientific Name
Juncus brachycarpus

Taxon
Vascular Plants

COSEWIC status
Endangered

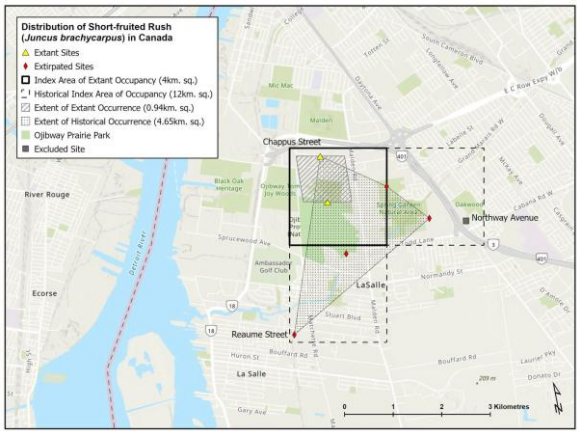
Canadian Range
ON

Reason for designation
This large perennial rush has a very restricted range in Canada where it is known only from remnant patches of tallgrass prairie in Windsor, Ontario. The Canadian population has declined to 130 flowering stems at only two extant sites.

Historically, the plant has lost habitat to agriculture, housing, and transportation infrastructure, and continues to be threatened with habitat degradation due to invasive plants and fire suppression.

Wildlife Species Description and Significance
Short-fruited Rush (*Juncus brachycarpus*) is a comparatively large perennial rush with a highly localized distribution in Canada. The inflorescence is a panicle of 1-10 densely spherical heads, with 30 to100 flowers per head. The capsules resulting from fertilized flowers are brown and do not exceed the length of the tepals. The seeds do not have a tail-like appendage, which separates this species from some others in the genus.
The species is part of a remnant assemblage of vascular plants that occur within tallgrass prairie, a formerly more extensive ecosystem in southern Ontario that has declined significantly as a result of agriculture and urban development.

Distribution
Short-fruited Rush occurs throughout much of the eastern United States, but in Canada is only found in Windsor, Ontario. The species requires specific habitat and has only been identified in remnant tallgrass prairie habitats that historically dominated the region but have been reduced to a fraction of their previous extent. The current distribution of the species is within small remnant patches of suitable habitat, with the largest habitat being the Ojibway Prairie Complex in the City of Windsor.



EOO and IAO of extant sites (created by the COSEWIC Secretariat 2024).

Source: COSEWIC. 2024. IN PRESS. COSEWIC assessment and status report on the Short-fruited Rush *Juncus brachycarpus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 28 pp.

Habitat

In Canada, Short-fruited Rush is a habitat specialist, only being found in wet mesic to mesic prairie habitat.

Across the US, Short-fruited Rush is reported to occur within a variety of open habitat types including lake plain wet prairies, or sandy depressions that are seasonally inundated, often associating with rare species.

Biology

Short-fruited Rush is a perennial rush that reproduces both asexually through rhizomes as well as sexually by seed. The seeds are contained within a capsule-like fruit. The fruit often persists through the winter.

Population Sizes and Trends

Field work undertaken during 2022 resulted in 154 individuals counted in three sites. One site (Northway) arose from sod moved from a prairie site as part of a restoration project and, following COSEWIC guidelines, is not included in the quantitative criteria in this assessment. Currently, 130 individuals are known within the other two extant sites. Four previously reported sites were not found and are considered extirpated. The abundance of Short-fruited Rush prior to European contact or prior to the largescale conversion of tallgrass prairie and savannah habitats to agricultural lands across southern Ontario is unknown. Most verified reports for this species in Canada do not include species counts beyond a rough estimate. There has been no population estimate in Canada historically for Short-fruited Rush.

Threats and Limiting Factors

Invasive species are considered to be the serious and plausible threat to the persistence of Short-fruited Rush in Canada. Several sites where the species was known to occur have been lost through encroachment of the European Common Reed. Autumn Olive is increasing in the area and is believed to be negatively altering the habitat of this species. Fire suppression is also a major threat, because the sites are surrounded by suburban development. Controlled burns have occurred at all of extant sites and assist in maintaining the integrity of the tallgrass ecosystem. Housing in the area limits the burns due to proximity. Thus continuous human intervention may be required to support the existing habitat.

Human impacts through recreational activities are considered a low impact threat that persists in some of the sites: where there is ATV use and impacts through trampling are possible.

Protection, Status, and Ranks

The status of Short-fruited Rush has not previously been assessed by the Committee on the Status of Species at Risk in Ontario (COSSARO). The species has a NatureServe conservation rank of N1 (Critically Imperilled) in Canada and S1 (Critically Imperilled) in Ontario. The species is ranked S1 in New York, New Jersey, Pennsylvania, and West Virginia, S1S2 (Critically Imperilled to Imperilled) in Michigan where it is afforded some measures of protection, and S2? (Imperilled?) in North Carolina.

The Ojibway Prairie Provincial Park is designated as a Nature Reserve Class under the *Provincial Parks and Conservation Reserves Act* (2006) and will continue to provide habitat for this species. The other sites occur on public lands administered by the Ontario Ministry of Transportation.

Source: COSEWIC. 2024. IN PRESS. COSEWIC assessment and status report on the Short-fruited Rush *Juncus brachycarpus* in Canada.

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Canada

Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 28 pp.

For more information, please visit
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Canada

Short-billed Dowitcher *hendersoni / griseus*

Photo: © Samuel Denault

Scientific Name

Limnodromus griseus hendersoni/griseus

Taxon

Birds

COSEWIC status

Threatened

Canadian Range

NT, NU, AB, SK, MB, ON, QC, NB, NS, PE, NL

Reason for designation

This medium-sized shorebird is endemic to Canada, where it breeds from Northwest Territories and Alberta to northwestern Quebec and Labrador. Individuals migrate through eastern and central North America, and winter along the Atlantic and Gulf coasts of the United States and the Caribbean coast of Central and South America. The greatest threat is sport and subsistence hunting in the southern portion of the wintering range; other threats include increasing loss of non-breeding habitat; disturbance by dogs and recreational activities at migratory stopover sites and on non-breeding grounds; impacts of pollution on birds and their prey; and effects of increased forest fires and climate change on the breeding grounds. The population is estimated at about 78,000 mature individuals, although this estimate is at least 25 years out of date. Data from the International Shorebird Survey suggest 3-generation declines approaching 60%, although these surveys only partially cover the centre of the continent where trends may differ. Because the species does not meet the definition of Endangered (i.e., at immediate risk of extinction), it is designated as Threatened.

Wildlife Species Description and Significance

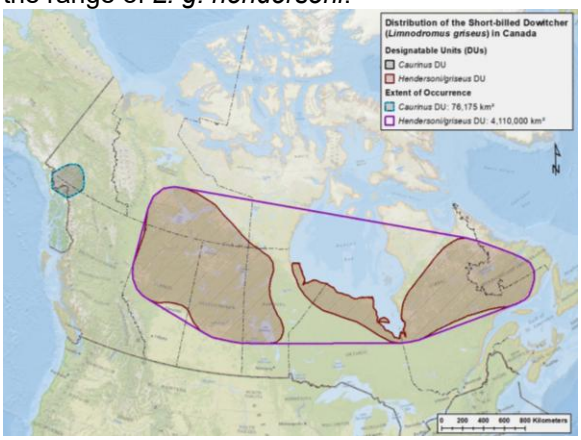
Short-billed Dowitcher is a chunky, medium-sized shorebird, with generally brown-mottled upperparts speckled with cream, and an orangey-rufous breast in the breeding season. Its bill, almost twice as long as the head, is straight and dark grey, and its stout yellowish legs are relatively short. Short-billed Dowitcher is a long-distance migrant, travelling as far as 15,000 km in a round trip between its breeding and non-breeding grounds. It is harvested as a game bird in the Caribbean and northern South America.

Spatial segregation in the breeding, migrating, and non-breeding ranges of known populations provide evidence for subdivision of Short-billed Dowitcher into two designatable units (DUs), the *caurinus* and *hendersoni/griseus* populations, following the subspecies or subspecies complexes of *L. g. caurinus* and *L. g. hendersoni/griseus*, respectively. There is strong inference that each of the *caurinus* and *hendersoni/griseus* populations have distinctly heritable traits, in the form of strongly differentiated migration routes and separate breeding and non-breeding grounds. Therefore, the two populations of Short-billed Dowitcher that occur in Canada are considered to be discrete and evolutionarily significant, and they are assessed as two separate DUs.

Distribution

Short-billed Dowitcher breeds primarily in the boreal forest of Canada and Alaska. In Canada, it occurs from British Columbia and Northwest Territories eastward to Newfoundland and Labrador. The *hendersoni/griseus* DU breeding range extends east from the south-central Northwest Territories, as far south as Edmonton in Alberta, central Saskatchewan, possibly as far southeast as the northern end of Lake Winnipeg in Manitoba and north along the Hudson Bay lowlands, and from Manitoba as far east in

Ontario as James Bay. This DU also breeds in Nunavut along James Bay, and from Hudson Bay and James Bay in northwestern Quebec and east into Labrador. Individuals described as *L. g. hendersoni* migrate through eastern and Central North America, east of the Rocky Mountains, and winter primarily along the Atlantic and Gulf coasts of the United States, but southward as far as the Caribbean coast of Central America. Birds considered to be *L. g. griseus* migrate along the Atlantic coast, and winter in the Caribbean and along the northern coast of South America, where they overlap with the range of *L. g. hendersoni*.



Map of breeding range in Canada, used for calculation of extent of occurrence (EOO) for each DU of Short-billed Dowitcher in Canada (see legend; estimated distribution based on Consortium Gauthier et Guillemette – G.R.E.B.E. 1991; Smith 1996; Sinclair *et al*. 2003; Burke and Sutherland 2007; FAN 2007; Fraser 2015; Artuso 2018; Quebec Breeding Birds Atlas 2020; Saskatchewan Breeding Bird Atlas 2020; Fink *et al*. 2023; eBird 2024; Hache unpubl. data). Breeding range in the northern part of the boreal forest in most provinces and territories is suggestive due to the limited information available.

Source: COSEWIC. 2024. IN PRESS. COSEWIC assessment and status report on the Short-billed Dowitcher *Limnodromus griseus, caurinus* subspecies (*Limnodromus griseus caurinus*) and *hendersoni/griseus* (*Limnodromus griseus hendersoni/griseus*) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xv + 83 pp.

Habitat

Short-billed Dowitcher nests principally in fens of the boreal forest, particularly in large fens with expanses of emergent aquatic vegetation (e.g., sedges) and numerous shallow ponds and pools, interspersed with shrubs and small conifers. In winter, it prefers coastal wetlands such as estuaries, lagoons, mudflats, and the edges of mangrove forests.

Biology

Short-billed Dowitcher is socially monogamous and defends only a small area around the nest, and around the brood once the young have left the nest. Adults arrive on their breeding grounds in mid-May and incubation begins in early June. The nest is a simple depression on dry ground. Four eggs are usually laid, with a three-week incubation period beginning between mid-May and mid-June. The precocial young leave the nest shortly after hatching and the male is responsible for brood rearing, which generally lasts 14 days. Short-billed Dowitcher produces only one brood a year. Age at first breeding is one year, and generation length is estimated to be four years. On the breeding, migrating, and non-breeding grounds, the species feeds primarily on aquatic invertebrates such as molluscs, worms, and crustaceans.

Population Sizes and Trends

The published population size in Canada is 78,000 mature individuals for the *hendersoni/griseus* DU, the entirety of which breeds in Canada. However, these estimates are based on surveys conducted in the 1980s and '90s. There is no more recent information on *hendersoni/griseus*.

Long-term trend analysis (1980-2019) of International Shorebird Survey (ISS) data showed a decline of 85.24% (95% CIs: -93.14, -66.89) for the *hendersoni/griseus* DU. The short-term ISS trend (2007-2019), equivalent to three generations, was -7.19% (-13.21, -1.32) per year, corresponding to an overall three-generation decline of 58.94% (-81.93, -14.74).

Threats and Limiting Factors

Multiple, interacting threats and limiting factors are likely responsible for Short-billed Dowitcher's population decline. With a maximum clutch size of four eggs and a single brood, the species has limited annual reproductive output. For the *hendersoni/griseus* DU specifically, the greatest threat is sport and subsistence hunting occurring in the Caribbean and South America. For both DUs, important threats are considered to be loss

and degradation of wetlands and other habitat at migratory stopover sites, on the non-breeding grounds, and, increasingly, on the breeding grounds; and the threat of climate change and severe weather, which affects the species on its breeding and non-breeding grounds as well as during migration.

Protection, Status, and Ranks

In 2024, the IUCN uplisted Short-billed Dowitcher from Least Concern to Vulnerable. In Canada, NatureServe considers the Short-billed Dowitcher Vulnerable as a breeder and Apparently Secure as a migrant (N3N4B, N4N5M). Its status as a breeder is Vulnerable (S3) in most provinces where ranked. Short-billed Dowitcher and its nests and eggs are protected under the Canadian *Migratory Birds Convention Act,* and the species is also safeguarded under similar laws in a number of provinces. A small portion (~3%) of suitable breeding habitat (i.e., boreal wetlands and coastal mudflats) in Canada is protected by national or provincial parks, migratory bird sanctuaries, or national wildlife areas. Outside the species' breeding range, a network of important stopover sites in the Americas deemed to be of national or international significance for shorebirds including Short-billed Dowitcher are identified through various conservation designations such as the Western Hemisphere Shorebird Reserve Network (WHSRN) and BirdLife International's Important Bird and Biodiversity Areas (IBBA) programme.

Source: COSEWIC. 2024. IN PRESS. COSEWIC assessment and status report on the Short-billed Dowitcher *Limnodromus griseus, caurinus* subspecies (*Limnodromus griseus caurinus*) and *hendersoni/griseus* (*Limnodromus griseus hendersoni/griseus*) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xv + 83 pp.

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Canada

Snowy Owl

Photo: © Audrey Robillard

Scientific Name
Bubo scandiacus

Taxon
Birds

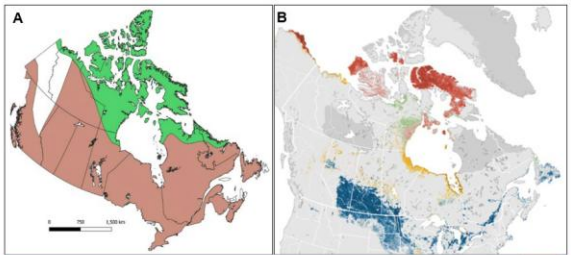
COSEWIC status
Threatened

Canadian Range
YT, NT, NU, BC, AB, SK, MB, ON, QC, NB, NS, PE, NL

Reason for designation
An estimated 90-95% of the North American population of this Arctic owl breeds in Canada. In 1995 the species was assessed by COSEWIC as Not at Risk because it was widespread, with no evidence of decline. Since then, improved estimation techniques have revised the population size downward by an order of magnitude. Data from the North American Christmas Bird Count (CBC), which capture trends in the southern portion of the wintering range, show a decline of 42.6% (2.3% annually) over the last 3 generations or 24 years. Indigenous knowledge from Baffin Island and the Yukon coast reports that this species is observed less frequently than before, likely due to warming conditions. Ongoing threats to the species include avian influenza, poisoning with anticoagulant rodenticides, collisions, electrocution, and, although specific impacts over the next three generations are uncertain, changes on breeding and wintering grounds brought about by climate change.

Wildlife Species Description and Significance
A large, unmistakable white owl from the Arctic, Snowy Owl (*Bubo scandiacus*) is a highly mobile species showing irruptive patterns of abundance on both its breeding and non-breeding ranges. As a top predator of tundra ecosystems, its numbers vary tremendously (0 to 0.12 nest/km^2) from year to year in a given location according to the abundance of prey.
Snowy Owl has significant importance in both Indigenous and non-Indigenous legends and cultures across Canada, including as Quebec's provincial bird.

Distribution
Snowy Owl breeds across the circumpolar world, within the tundra ecosystems of Greenland, Norway, Finland, Russia, Sweden, USA (Alaska), and Canada. While breeding (May – September) is limited to these ecosystems, Snowy Owl occurs in every province and territory in Canada during the non-breeding season (October – April).



Snowy Owl distribution in Canada and globally. (A) year-round (green); non-breeding (brown; Canada); (B) breeding (red), migration (green: pre-breeding; yellow: post-breeding), and non-breeding (blue) range, Canada and USA (light grey = modelled area, and dark grey = no prediction). Caution should be taken when interpreting distribution of this species (especially in the Arctic and interior British Columbia) because of the localised distribution of observers, non-systematic survey coverage, and the species' patchy breeding distribution and irruptive movements.

Source: COSEWIC. 2025. IN PRESS. COSEWIC assessment and status report on the Snowy Owl *Bubo scandiacus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xv + 44 pp.

Habitat

Snowy Owl uses a variety of habitats throughout its annual cycle. During the breeding season, it typically nests on mesic to dry tundra. During the non-breeding season, it can be found inland in open country (tundra or temperate grasslands), but also often uses coastlines, ice-covered lakes (e.g., Great Lakes), and even sea ice.

Biology

Snowy Owl is a long-lived bird (annual adult survival rate between 85 and 93%) with a high reproductive potential (average clutch size = 7.1 eggs) and annual reproductive rate of >85%. The juvenile survival rate is low (~68%). Breeding can begin at 2 years of age, but average age of first breeding is likely around 4 years. Across its range, breeding location and success are tightly linked with the local abundance of the preferred prey, lemmings (subfamily Microtinae), which represent as much as 95% of Snowy Owl diet during the breeding season. With lemming populations exhibiting large fluctuations in abundance annually and the owl 's high mobility potential, Snowy Owl is highly dispersive, showing very low fidelity to breeding sites. It exemplifies an irruptive species (those that show large-scale irregular movements related to food availability).

Population Sizes and Trends

It is very difficult to estimate the population size of Snowy Owl; however, several lines of evidence suggest there are between 13,000 and 16,000 mature individuals in Canada. This estimate is broadly consistent with previous ones made using mtDNA (14,000 adult females worldwide) or measured via nesting density on the breeding grounds and extrapolated across available tundra ecosystems (ranging from a minimum of 7,000–8,000 pairs to a maximum of 25,000 pairs worldwide). These revised estimates are far lower than the 290,000 individuals estimated worldwide in 2004, with the current estimates the result of a combination of new (e.g., genetics) and more accurate (e.g., modelling for irruptive behaviour) methods instead of a population decline of an order of magnitude.

Nonetheless, various indices suggest a continuing decline in Canada. Data from the North American Christmas Bird Count (CBC) capture trends in the southernmost portion of the wintering population, and are thought to represent the Canadian population well, as 90-95% of the Snowy Owls in North America breed in Canada. These data show a decline of 42.6% over the last 24 years (3 generations), based on a long-term decline of 2.3% annually. For the Prairie Potholes region, where a high proportion of adults are thought to overwinter, CBC data show a decline of 38.9% over the same timeframe.

Threats and Limiting Factors

Although impacts of climate change are assessed as Unknown because they are hard to quantify over the 3-generation period of a threats assessment, this is the single most serious plausible threat to the species overall because of current and anticipated changes to breeding and wintering habitat in rapidly changing tundra ecosystems. Warming temperatures in breeding habitat could be affecting lemming populations (the main food item) via formation of ice crusts in the snowpack. A worldwide shrinking of tundra ecosystems towards the pole through shrubification (i.e., advancing Arctic shrubline in response to climate warming) and the intensification of rainstorms may also threaten Snowy Owl, with these effects increasingly prominent in the southern part of the tundra biome. Some adults winter in the Arctic sea ice, which is in decline.

During the non-breeding season, mortality associated with anthropogenic structures and vehicles seems to be affecting juveniles heavily, although adults are also affected. Specifically, 22-24% of mortality on the non-breeding grounds comes from weather (exposure), disease, predation, or starvation, while automobile collisions (18-22%), airplane collisions (9-11%) and electrocution (3-6%) are major sources of anthropogenic mortality. Snowy Owl is also exposed to indirect contamination (mostly anticoagulant rodenticides) and diseases (e.g., Highly Pathogenic Avian Influenza, West Nile Virus), of which the population-level

consequences are likely important, but currently uncertain.

Protection, Status, and Ranks

Snowy Owl is not protected in Canada under the *Migratory Birds Convention Act*, 1994, as owls (Strigidae) were excluded from the original convention, but it receives protection under a *Wildlife Act* (or equivalent) in every province and territory. It is globally assessed as Vulnerable by IUCN and on the Watch list (yellow) for North America by Partners in Flight. Its global conservation status is ranked by NatureServe as G4 (Apparently Secure) and in Canada as nationally Secure (N5B,N5N,N5M), although it is Critically Imperilled in Yukon (S1) and Labrador (S1B), and Vulnerable in Manitoba and the island of Newfoundland (S3N). Although Snowy Owl regularly nests in protected areas such as national parks (e.g., Sirmilik, Auyuittuq, Quttinirpaaq) and uses them as stopover sites (e.g., Grasslands NP), most of the species' range falls outside of national park boundaries or other protected areas.

Source: COSEWIC. 2025. IN PRESS. COSEWIC assessment and status report on the Snowy Owl *Bubo scandiacus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xv + 44 pp.

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Canada

Eastern Massasauga

Photo: © Ryan M. Bolton

Scientific Name
Sistrurus catenatus

Taxon
Reptiles

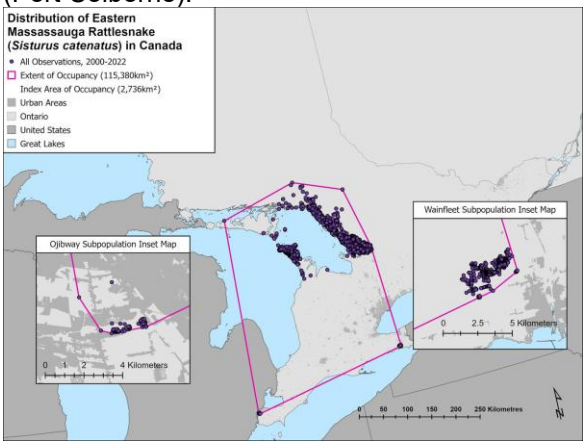
COSEWIC status
Threatened

Canadian Range
ON

Reason for designation
This rattlesnake consists of four subpopulations in Ontario, including Eastern Georgian Bay, Bruce Peninsula, Windsor, and Wainfleet. This species was previously assessed as two designatable units (DUs). However, based on the best and current evidence, snakes across the Canadian range were historically connected, and do not exhibit unique adaptations, so it was assessed as a single DU. All subpopulations are declining because of continued degradation and loss of habitat, increasing mortality on roads, and ongoing persecution of this venomous species. Human activity in the species' limited remaining range is intensifying, and the overall impact of current and future threats may lead to declines of greater than 30 percent over the species' next 25 years.

Wildlife Species Description and Significance
Eastern Massasauga (*Sistrurus catenatus*) is a relatively small, thick-bodied rattlesnake with a segmented rattle at the end of its tail. It is typically grey-light brown with dark brown saddle-shaped dorsal blotches. Eastern Massasauga has a triangular-shaped head, elliptical pupils, and a pair of heat-sensitive pits located between the eyes and nostrils. This is the only extant venomous snake in eastern Canada.

Distribution
Eastern Massasauga ranges from Canada (Ontario) south into the United States within the Great Lakes Plains and southern Boreal biogeographic regions and the Great Lakes-Upper St Lawrence Biogeographic Zone. This zone includes the Hurontario and Carolinian Amphibian and Reptile Faunal Provinces of Canada (COSEWIC 2009b). In Canada, Eastern Massasauga is restricted to two regions: (1) Great Lakes / St. Lawrence (GLSL) subpopulations: Bruce Peninsula and Eastern Georgian Bay and (2) Carolinian subpopulations Ojibway Prairie (Windsor) and Wainfleet Bog (Port Colborne).



Contemporary distribution of Eastern Massasauga (*Sistrurus catenatus*) in Canada. Extent of Occurrence (EOO) and Index of Area of Occurrence (IAO) (2000–2022). Prepared by the COSEWIC Secretariat.

Source: COSEWIC. 2025. IN PRESS. COSEWIC assessment and status report on the Eastern Massasauga *Sistrurus catenatus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xv + 110 pp.

Habitat

Eastern Massasauga inhabits wet prairie, old fields, peatlands, shrub thickets, bogs, fens, bedrock barrens, and deciduous and coniferous forests. Eastern Massasauga requires a semi-open, open, or small openings in the forest canopy. Hibernation sites include mammal or crayfish burrows, rock fissures, or other spaces below the frost line. The quantity and quality of Eastern Massasauga habitat in the Carolinian region continues to decline. Habitat surrounding the Georgian Bay region, although relatively widespread and intact, is subject to moderate levels of degradation and loss.

Biology

In Ontario, Eastern Massasauga has a short active season and generally hibernates from mid-September to mid-May. Eastern Massasauga feeds almost exclusively on small mammals; however, other snakes and amphibians also comprise part of their diet. Eastern Massasauga is cryptic, preferring to retreat or rely on camouflage and cover to avoid visual detection. Active seasonal movement from hibernacula varies by sex and maturity (from 0.5 km to 2.2 km) although longer distances have been reported in the GLSL region subpopulations. Mating occurs in late summer, with young born the following summer. Females may reach sexual maturity at 2 years of age and can reproduce annually, but consecutive breeding cycles are rare in Canada. Generally, the first breeding cycle is age 3 to 6. This species can live over 10 years in the wild, with a generation time of approximately 6 to 8 years, and annual adult mortality of 25 - 40%.

Population Sizes and Trends

The Population Viability Analysis (PVA) for the Canadian population with a conservative estimate of one additional road mortality, predicts a 46 to 100% decline in three generations. Six additional mortalities result in the potential for complete population collapse within just a few generations. Insufficient survey efforts hinder accurate population estimates for the GLSL region. Data from the Natural Heritage Information Centre (NHIC) indicates historical underreporting, affecting the understanding of occupied ranges, which correlate with population trends. The summer activity range is estimated at 2,373 km², suggesting a maximum population of 2,373 to 14,236 adults, with contemporary estimates for representative sites ranging from 2,435 to 12,027 adults. In the Carolinian region, subpopulations are in decline, with the Ojibway subpopulation deemed non-viable since 2019. The Wainfleet subpopulation is in a "managed recovery" state, but a PVA predicts a 68% extinction probability within 20–40 years without ongoing management.

Threats and Limiting Factors

The historical range-wide decline of Eastern Massasauga in Canada is attributed to habitat loss from agriculture, urbanization, resource extraction, and massive road expansion, in combination with persecution. Contemporary declines in the number of mature individuals are suspected in the GLSL region due to transportation (mortality on roads), climate change and severe weather effects (i.e., winter flooding), residential and commercial development, and biological resource use. Habitat quality, small patch size and poor resilience to climate change effects (i.e., environmental stochasticity), natural system modifications (historic peat mining, wetland drainage, ecological succession), and urban sprawl (transportation, residential development) are the greatest threats to the Carolinian subpopulations. Natural limiting factors include low reproductive rates, poor recruitment, late maturity, and high adult mortality. Habitat isolation, genetic drift, and low dispersal rates dictate that extirpated subpopulations are unlikely to be recolonized naturally.

Protection, Status, and Ranks

Eastern Massasauga was assessed by COSEWIC as 'Threatened' in Canada in 1991 and reconfirmed as 'Threatened' in 2002. In 2012, COSEWIC divided the species into two designatable units (DUs): 1) Great Lakes / St. Lawrence DU (Threatened), and 2) Carolinian DU (Endangered). The species no longer meets the criteria for a two DU structure and the species was assessed as a single DU in May 2025 as Threatened. Where appropriate the report maintains regional delineation. The species and their habitat are protected by the

provincial *Endangered Species Act, of* 2007 and by the *Species at Risk Act, of* 2002 on federal lands. Eastern Massasauga is also considered a 'Specially Protected Reptile' under the Ontario *Fish and Wildlife Conservation Act,* 1999. Recovery activities underway include population monitoring, outreach and education, road mitigation, ex-situ species survival plan, hibernation monitoring, neonatal "assisted hibernation", translocations, habitat quality enhancement, and scientific research.

Source: COSEWIC. 2025. IN PRESS. COSEWIC assessment and status report on the Eastern Massasauga *Sistrurus catenatus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xv + 110 pp.

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Butler's Gartersnake

Photo: © Gary Allen

Scientific Name
Thamnophis butleri

Taxon
Reptiles

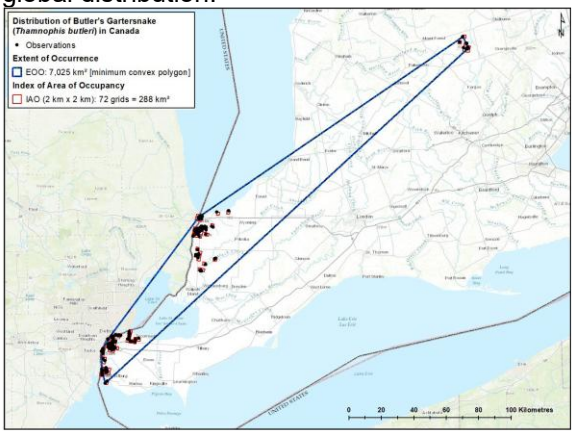
COSEWIC status
Threatened

Canadian Range
ON

Reason for designation
Subpopulations of this small, specialized snake occur in small, scattered, isolated habitat remnants in southern Ontario. Fragmentation of urban landscapes from roads in Windsor-Essex and Sarnia-Lambton prevents movement of individuals between subpopulations. Surveys since 2012 have not detected the species at two sites where they were formerly known. The species is threatened by the cumulative threats of residential and commercial development, transportation and service corridors, natural systems modifications, and the negative genetic effects of small population size and demographic stochasticity.

Wildlife Species Description and Significance
Butler's Gartersnake (*Thamnophis butleri*) is a small gartersnake approximately 40 cm long with three distinct and vibrant yellow stripes along the length of its dark brown back. This snake is easily confused with two other species of gartersnake (i.e., Eastern Gartersnake, *T. sirtalis*, and Eastern Ribbonsnake, *T. sauritus*), however, Butler's Gartersnake is shorter in length, has a smaller head, and has side stripes centred on the 3rd scale row. The conservation of Butler's Gartersnake in Canada contributes to the global persistence of this species and provides a unique opportunity for urban youth to observe and become interested in native reptiles.

Distribution
Butler's Gartersnake is confined to the Great Lakes Region, one of the most restricted global ranges of any snake in North America. Its distribution is patchy and limited to three small areas in southwestern Ontario, and parts of four U.S. states (Wisconsin, Ohio, Michigan, and Indiana). The Canadian distribution of Butler's Gartersnake occupies approximately 16% of its global distribution.



Current extent of occurrence (EOO) and index area of occupancy (IAO) of Butler's Gartersnake (*Thamnophis butleri*) in Canada. Extant subpopulations are Windsor-Essex (WI), Sarnia-Lambton (SA), and Luther Marsh (LM). Butler's Gartersnake may be extirpated from Walpole Island First Nation (WIFN), but it was classified as historical and included in the IAO estimate because its status there remains uncertain (see Appendix 2). Coordinate system: NAD 83, UTM Zone 17N. Map produced by COSEWIC Secretariat (Amit Saini).

Source: COSEWIC. 2024. IN PRESS. COSEWIC assessment and status report on the Butler's Gartersnake *Thamnophis butleri* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiii + 69 pp.

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Habitat

Characteristic habitat of Butler's Gartersnake primarily includes meadows, old fields, and tallgrass prairie, with nearby permanent or ephemeral wetlands or drainage features. This species is also found in urban areas within naturalized portions of city parks, industrial lands, commercial sites, and abandoned properties. Essential habitat components include a dense cover of grasses or forbs with a thick layer of thatch and an abundance of earthworms as prey. Overwintering sites include small mammal burrows, ant mounds, loose fill, foundations, and crayfish burrows. Gravid females gestate in open-canopy habitat and move to low lying areas with moist soils to give birth.

Biology

In southwestern Ontario, Butler's Gartersnake is generally active from April to October. Mating occurs in early spring and 8–10 young are born live, typically in July. Sexual maturity is reached after 2 years, and generation time is approximately 4 years. This snake feeds primarily on earthworms, and its predators are presumably the same as those of other snakes of the same genus (*Thamnophis*). Most individuals at study sites exhibited limited movements, with a maximum activity range of less than 1 ha and a mean movement distance of 300 m. However, a small number of individuals have been observed moving > 500 m.

Population Sizes and Trends

Using recent abundance and density estimates from four sites in the Windsor-Essex and Sarnia-Lambton regions, and extrapolating these across the range of this species, the total Canadian population size of Butler's Gartersnake is estimated at 6,560–23,600 adults. Results of targeted and incidental surveys indicate a recent decline of ~ 29% in the number of historically occupied sites in Windsor-Essex and Sarnia-Lambton since the previous status assessment in 2010. Range-wide, the Index Area of Occupancy has declined by 20% since the previous assessment. This species' ongoing occurrence at one relatively large historically occupied site is unknown.

Threats and Limiting Factors

Agricultural practices, forest succession, and urbanization have historically contributed to the loss and fragmentation of Butler's Gartersnake habitat in Canada. Currently, the three main threats to this species and its habitat are transportation and service corridors, residential and commercial development, and natural systems modifications. The overall threat impact for Butler's Gartersnake is considered to be medium. Habitat loss is ongoing in the Windsor-Essex and Sarnia-Lambton regions, but not in Luther Marsh.

Protection, Status, and Ranks

Butler's Gartersnake is listed as Endangered under both the federal *Species at Risk Act*, 2002 and the Ontario *Endangered Species Act, 2007.* This species is also a Specially Protected Reptile under the Ontario *Fish and Wildlife Conservation Act, 1997*. A federal recovery strategy for Butler's Gartersnake was completed in 2018, which identified Critical Habitat in 97-1 km^2 grid squares. In the United States, this species is only afforded legal protection in Indiana, where it is listed as Endangered. Globally, Butler's Gartersnake is ranked G4 (secure).

Source: COSEWIC. 2024. IN PRESS. COSEWIC assessment and status report on the Butler's Gartersnake *Thamnophis butleri* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiii + 69 pp.

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Least Bittern

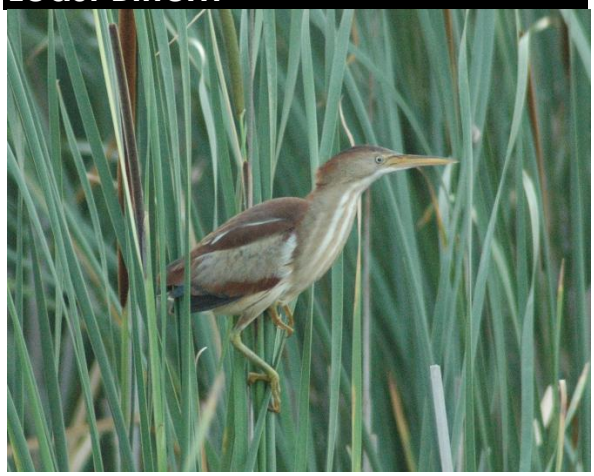


Photo: © Nick Bartok

Scientific Name
Botaurus exilis

Taxon
Birds

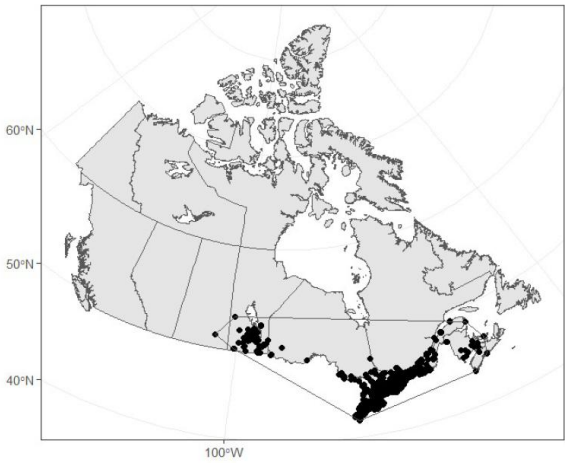
COSEWIC status
Special Concern

Canadian Range
SK, MB, ON, QC, NB, NS, PE

Reason for designation
This small, secretive member of the heron family relies on semi-open wetlands with emergent plants and relatively stable water levels. In Canada, the centre of its range is in southern Ontario and Quebec. Population size is estimated at 4300 mature individuals, an increase since the previous assessment which likely reflects improved survey coverage and techniques rather than an increase in numbers. Ongoing regional surveys over the last 10 years suggest that the Canadian population is currently stable. Nonetheless, given its specialized habitat requirements and low numbers, the species is vulnerable to future declines in Great Lakes water levels, loss of non-breeding habitat, and habitat conversion by invasive plants; it may again become Threatened if threats are not effectively mitigated or managed.

Wildlife Species Description and Significance
Least Bittern (*Botaurus exilis*) is the smallest heron in the Western Hemisphere. In shape and secretive habits, it resembles the more familiar American Bittern, but it is much smaller and somewhat more colourful. Its contrasting dark crown and back and buff wing patches distinguish it from all other marsh birds. Even so, it is very secretive and most often detected only by its cuckoo-like (coo-coo-coo) call. Least Bittern is highly valued by naturalists as a mysterious and attractive bird representative of pristine expanses of marshland. It is considered a useful indicator of wetland health.

Distribution
The species nests from southern Canada to southern South America, with North American birds assumed to be wintering mainly along the Gulf and Mexican coasts, south to Panama. In Canada, it breeds in southern Manitoba, Ontario, Quebec, New Brunswick, and probably at least occasionally in Prince Edward Island, Nova Scotia, and eastern Saskatchewan. The majority of birds breed in southern Ontario. The Canadian Range of Least Bittern is <5% of the global range by area.



Canadian EOO of Least Bittern based on breeding season occurrences in NatureCounts database, April 1 to July 31, 2013-2024 (Ethier pers. comm. 2024). Points within the Boreal Shield, where wetland characteristics tend to differ from elsewhere in the species' range, may be isolated

occurrences or instead due to low survey effort (Bazin pers. comm. 2023).

Source: COSEWIC. 2024. IN PRESS. COSEWIC assessment and status report on the Least Bittern *Botaurus exilis* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiii + 49 pp.

Habitat

Least Bittern breeds strictly in marshes of emergent wetland plant species (usually cattails, *Typha* spp.) that have relatively stable water levels and interspersed areas of open water (i.e., hemi-marsh). Such marshes have declined considerably across the species range since European settlement, although recently the rate of decline might be slowing, thanks to protection and stewardship programs for wetlands.

Biology

Adults arrive on Canadian breeding grounds from late March to early May, with calling and nesting beginning by early May. They are only weakly territorial, sometimes nesting in small, loose colonies. Thus, territory and home range size are highly variable. Nest success also varies considerably, as nests are subject to flooding, collapse, and depredation by a variety of predators. Some individuals can raise two broods in one season, but many aspects of demography remain poorly understood. Generation length is estimated to be 3.1 years. Least Bittern is extremely secretive and feeds primarily on small fish and insects.

Population Sizes and Trends

About 2150 pairs (4300 mature individuals) are thought to nest in Canada, but the precision of this estimate is uncertain due to the species' secretive nature. This increase over the estimated population size from the previous status report (1500 pairs, 2009) represents an increase in search effort rather than a true increase. Numbers have historically declined in Canada, and in the northern and central United States. More recently, evidence for increasing or declining population trends is more equivocal. Over the last 10-year period, Breeding Bird Survey data and eBird models suggest a decline, but trends are non-significant. Marsh bird monitoring programs suggest increases in abundance in monitored regions due to temporary increases in water levels, particularly in the past five years, although apart from one region of Ontario, these trends too are non-significant.

Threats and Limiting Factors

Habitat loss and degradation are by far the biggest threats to the species. Historically, these threats included wholesale destruction of marshes, mainly for agriculture, although this trend has slowed. Degradation of wetlands continues in much of the range through such factors as fragmentation, reduced water quality, and invasive marsh plants. Other threats apply more locally, such as collisions with towers, fences, and cars; recreational activities; and perhaps toxins such as pesticides. Threats are assumed to occur throughout the species' range, on migration, breeding, and non-breeding grounds.

Protection, Status, and Ranks

The species is protected federally under the *Migratory Birds Convention Act 1994* and by its current listing as Threatened under the *Species at Risk Act*. It is also provincially listed as Endangered in Manitoba, Threatened in Ontario, Vulnerable in Quebec, and Threatened in Nova Scotia and New Brunswick. NatureServe lists Least Bittern as Apparently Secure nationally (N4B) and in Ontario (S4B), Imperilled in Manitoba (S2S3B) and Quebec (S2B), and Critically Imperilled in New Brunswick (S1S2B). It is assessed globally by the IUCN Red List of Threatened Species as Least Concern. Least Bittern is not listed federally in the United States, but its status ranges from not listed to Endangered in states that border Canada.

Source: COSEWIC. 2024. IN PRESS. COSEWIC assessment and status report on the Least Bittern *Botaurus exilis* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiii + 49 pp.

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Macropis Cuckoo Bee

Photo: © Matt Pelikan

Scientific Name
Epeoloides pilosulus

Taxon
Arthropods

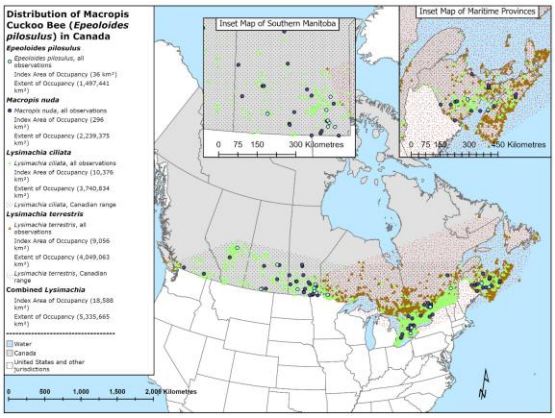
COSEWIC status
Data Deficient

Canadian Range
AB, SK, MB, ON, QC, NB, NS

Reason for designation
This very rare cuckoo bee lays its eggs in other bee nests and requires a specialized combination of its host bee (*Macropis nuda*), and the host's food plants (native oil-producing loosestrifes). Since the first status report, eight additional sites have been recorded, greatly expanding the species' known Canadian distribution. Based on the new information on distribution, there is substantial unsurveyed potential habitat for the cuckoo, host bee, and the host bee's food plants across Canada. It is no longer possible to make conclusions about the species' extent of occurrence, population size, threats, or trends. Thus, there was a change in status from Endangered to Data Deficient.

Wildlife Species Description and Significance
Macropis Cuckoo Bee, *Epeoloides pilosulus* (Cresson, 1878), is the only North American member of this genus, the other species being found in Europe. *Epeoloides* Giraud, 1863 is the only genus in the tribe Epeoloidini (Apidae, Nomadinae), a unique lineage of bees containing only these two species that are nest parasites (henceforth referred to as cuckoo bees) of bees of the genus *Macropis* Panzer, 1809 (Melittidae), all of which are *Lysimachia* spp. plant oil-collecting obligates. Female cuckoo bees sneak into the nests of their host(s) and lay eggs on the food provision collected by the female host bee. The host's egg and/or larva is killed by the cuckoo, which then consumes the food provision.

Distribution
Globally, Macropis Cuckoo Bee ranges in North America from Alberta east through Saskatchewan, Manitoba, Ontario, Québec, New Brunswick, and Nova Scotia in Canada, south throughout much of the eastern and central United States. There is a scattering of more recent iNaturalist records, including Massachusetts, New Hampshire, and New York. Macropis Cuckoo Bee is arguably one of the rarest bees in North America. The first specimen in Canada was collected from Québec in the late 1880's and only 25 specimens have ever been collected or observed in Canada. In the past 50 years, it has been collected in Canada from Ontario (1978), Nova Scotia (2002), Alberta (2010), Saskatchewan (2013), Manitoba (2019, 2020, 2022) and New Brunswick (2023). There are seventeen subpopulations recorded in Canada: eight extant and nine historical. In the last ten years (2015-2024), only eight specimens have been collected or observed despite increased bee collecting throughout much of southern Canada.



The distribution of Macropis Cuckoo Bee (*Epeoloides pilosulus*), its host bee (*Macropis nuda*), and host bee host's food plants (*Lysimachia terrestris* and *Lysimachia ciliata*) in Canada. *Lysomachia terrestris* records west of Saskatchewan are considered introduced and not considered part of the plant's native geographic range in Canada. Data from GBIF (2025). Map created by Ryan Collins (COSEWIC Secretariat, June 2025).

Source: COSEWIC. 2025. IN PRESS. COSEWIC assessment and status report on the Macropis Cuckoo Bee *Epeoloides pilosulus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xv + 49 pp.

Habitat

Macropis Cuckoo Bee is found in habitats supporting both their host bee (*Macropis nuda*) and the host's food plants (i.e., oil producing *Lysimachia* species – Fringed Loosestrife [*L. ciliata*] and Swamp Candles [*L. terrestris*] are likely the most important). Host bee food plants grow in ephemeral wet habitats, though both host bee and the host's food plants have been recorded from drier, albeit shadier habitats. Both Macropis Cuckoo Bee and the host bee also use dogbane (*Apocynum* spp.) and potentially other milkweeds (*Asclepias* spp.) as nectar plants, and their presence with host bee food plants may be a good indicator of suitable habitat for both bee species. Host bee nest sites are typically within or adjacent to patches of the host's food plant, in sandy soil with sun exposure and vegetative undergrowth.

Biology

Macropis Cuckoo Bee has an annual life cycle; adults emerge in June and July. Peak activity of the cuckoo coincides with peak nesting activity of the host bee which occurs in July and corresponds with flowering of the host bee's food plants. Males and females overwinter as mature larvae (i.e., pre-pupae) within host bee nests, and re-commence development as heat units are accumulated in the following spring. Females then search out host nests using scent and lay their egg within the host nest. Unlike most cuckoo bees, *Epeoloides* spp. females stay in host nests for a long time (one hour or more), mainly to construct a cell closure after laying their egg. *Epeoloides* spp. eggs hatch into larvae and begin consuming food provisions intended for the host's offspring. The cuckoo larvae pass through 4 or 5 instars before entering diapause (i.e., overwintering).

Population Sizes and Trends

Sampling effort, collecting methods, and available data are insufficient to assess the range wide population size and trends for Macropis Cuckoo Bee. Most sampling efforts have not been systematic and have only detected the presence of the cuckoo bee in a few areas, while other efforts have documented its host and/or the host's food plant(s). It is unknown if Macropis Cuckoo Bee subpopulations are severely fragmented, although poor dispersal ability of both cuckoo and host bee, combined with low abundance and presumed isolated extant subpopulations, render it probable.

Threats and Limiting Factors

The main threats to Macropis Cuckoo Bee are inferred; threats that could impact the abundance and/or distribution of the host bee's food plants, including habitat loss, degradation, fragmentation, and conversion. These threats primarily fall under other ecosystem modifications. For example, the continued spread of non-native and invasive plants such as Purple Loosestrife (*Lythrum salicaria*; not related to the loosestrife host bee plants) and European Common Reed (*Phragmites australis* subsp. *australis*) in wet areas cause ecosystem modifications that degrade bee host's food plant habitat. Other non-native plant species are also important competitors with the bee host's food plant in drier habitats, including thistles (*Cirsium* spp.) and Leafy Spurge (*Euphorbia esula*).

Protection, Status, and Ranks

Macropis Cuckoo Bee was assessed as endangered by the Committee on the Status of Endangered Wildlife in Canada in 2011 and listed as such on Schedule 1 of the federal *Species at Risk Act* (SARA) in 2018. Critical habitat was not identified in the federal recovery strategy. Macropis Cuckoo Bee is globally and nationally assessed Critically Imperilled (G1/N1 respectively).

Source: COSEWIC. 2025. IN PRESS. COSEWIC assessment and status report on the Macropis

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Cuckoo Bee *Epeoloides pilosulus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xv + 49 pp.

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