



American Marten - Newfoundland Population

Photo: © Tyrone Mulrooney



Scientific Name

Martes americana atrata

Taxon

Mammals

COSEWIC Status

Special Concern

Canadian Range

Newfoundland and Labrador

Reason for designation

This species is a geographically isolated, and genetically and ecologically distinct population. This is one of only 14 mammal species endemic to the island of Newfoundland. The population decline began in the early 20th century and was largely the result of direct and incidental harvest. Current data and a recent population estimate suggest that distribution and abundance have increased since the last COSEWIC assessment in 2007. These increases are likely the result of underestimates of the number of marten, a reduction in harvest mortality, and more favourable ecological conditions for the species. The population no longer meets the criteria for Threatened, and is assessed as Special Concern as it would likely become Threatened if not managed effectively.

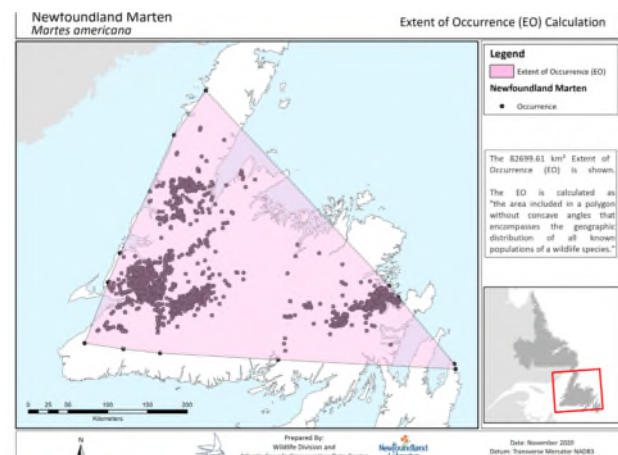
Wildlife Species Description and Significance

The Newfoundland population of American Marten (*Martes americana atrata*) is a geographically isolated and genetically and ecologically distinct designatable unit found only on the island of Newfoundland. Compared to other subspecies of marten, this population consists of animals that are larger and have darker pelage. Marten is one of only 14 mammals native to Newfoundland. The unique genetic characteristics and ecology of Newfoundland Marten make it an important component of biodiversity in Canada.

Dusky

Distribution

The historical range of Newfoundland Marten is assumed to have coincided with forested ecosystems. The species' range contracted in the early 20th century and currently includes forested ecosystems across the island, particularly in southcentral and southwestern Newfoundland (Little Grand Lake/Red Indian Lake complex), Northern Peninsula (Main River Watershed), and on the east coast (Terra Nova area).



Extent of occurrence of the Newfoundland population of American Marten, Newfoundland, Canada. Occurrence of Marten were recorded between 1970–2018 (n=7,592).

Source: Source: Atlantic Canada Conservation Data Centre; Forestry and Wildlife Branch, Government of Newfoundland and Labrador. 2020.

Habitat

Throughout the range, American Marten (*Martes americana*) is typically associated with mature conifer and mixed-wood forests. Older forests provide dense overhead cover, coarse woody debris, low-hanging branches, and shrub understory. Such habitat elements provide refuge from predators and maternal and natal dens, but are less restrictive to the distribution of marten in Newfoundland where the landscape is naturally fragmented and where there are fewer predators and competitors. In the past, mature forests were thought to be the primary requirement of marten habitat; recent studies revealed that marten used younger stands consisting of regenerating (<6 m) and precommercially thinned forest.

Biology

Newfoundland Marten is an opportunistic feeder with a broad diet. Previously, Meadow Vole was the critical food resource for this population. The introduced Southern Red-backed Vole was first documented in 1999 on the west coast of Newfoundland. Over the last 2 decades, Southern Red-backed Vole has expanded its range and now occurs throughout the island. This species is a staple in the diet of other populations of American Marten in North America and is now consumed by Newfoundland Marten. The current diet has not been re-examined since Southern Red-backed Vole became widespread.

Population Sizes and Trends

The range and population size of Newfoundland Marten contracted throughout the 20th century, initially as a result of fur trapping and incidental mortality in snares and traps. The establishment of the forest industry during the early part of the 20th century had a compounding effect, accelerating habitat change via harvesting and simultaneously increasing human access and trapping.

In 1985, there were an estimated 630–875 Newfoundland Marten. A second and third estimate in 1995 and 2007 suggested 300 and 320–622 mature individuals. A fourth more comprehensive estimate was conducted in 2019 and suggested that the population had increased to 2,494–2,773 mature marten. The total, but still incomplete population estimate (~75% of the island with forest inventory data), is 2,558–2,837 when including approximately 64 mature

individuals estimated for Terra Nova and Gros Morne National Parks. The apparent growth in the population resulted from a combination of two factors: 1) an actual increase in the number of marten and; 2) previous population assessments that were conservative and hampered by lack of empirical data.

The distribution of Newfoundland Marten has increased since the previous COSEWIC assessment (2007); marten now occur in at least 15 of the 18 designated forest management districts on the island as well as in both national parks. Marten are recolonizing parts of their historical range, notably in the Baie Verte Peninsula, Stephenville south area, and forested areas in southcentral Newfoundland. Marten may now be present on the Avalon Peninsula for the first time in over a century.

Threats and Limiting Factors

The most important threat for Newfoundland Marten is incidental harvest. However, a general decline in people participating in trapping and snaring, changes in regulations and gear, and the implementation of best management practices have reduced the incidental capture of Newfoundland Marten. Mortality from motor-vehicle collisions and habitat loss from forestry and utility corridors are lower impact threats to the species.

Protection, Status and Ranks

Newfoundland Marten is listed as Threatened under the provincial Endangered Species Act and federal Species at Risk Act. The global status of American Marten, as assessed by the IUCN, is Least Concern; neither the Newfoundland population or subspecies (*M. americana atrata*) was assessed. Using the NatureServe methodology, the province provided a provisional ranking for Newfoundland Marten of Vulnerable to Apparently Secure (S3S4). Marten habitat is protected in reserves and parks. Critical habitat has been identified as part of the recovery planning process; as of 2010, 16% was protected from forestry, snaring, and trapping. Commercial trapping for marten in Newfoundland has been illegal since 1934. Marten are incidentally taken in snares and traps in areas of Newfoundland where such activities are not directly prohibited.

Source: COSEWIC. 2022. COSEWIC assessment and status report on the American Marten *Martes americana atrata* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 42 pp.

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Bobolink

Photo: © Christian Artuso



Scientific name

Dolichonyx oryzivorus

Taxon

Birds

COSEWIC status

Special Concern

Canadian range

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

Reason for designation

This grassland songbird undertakes an annual round-trip migration of approximately 20,000 km between its breeding grounds in southern Canada and wintering range in central South America. Over 25% of the global population breeds in Canada, mostly from Saskatchewan to Quebec. Population size decreased sharply throughout the 1980s and 1990s, and has since continued to decline, but at a slower rate. Based on improved analytical techniques, the ten-year decline reported in the 2010 status report is now believed to have been -26%, similar to the -25% change between 2009 and 2019. Key threats to the species occur throughout its life cycle, including incidental mortality and nest failure from haying and other agricultural activities, habitat loss and fragmentation and pesticide exposure in all seasons, and persecution at winter feeding and roosting sites. If these threats

are not managed effectively, the species may become Threatened.

Wildlife Species Description and Significance

Bobolink is a medium-sized songbird in the blackbird family. During the breeding season, males are black, splashed with white and gold on their upperparts. Females, juveniles, and males outside the breeding season, are beige, streaked with brown, and are frequently mistaken for a large sparrow. No subspecies or genetic distinctions are recognized. Bobolink is an obligate grassland specialist and a consumer of agricultural insect pests.

Distribution

The breeding range of Bobolink includes parts of southern Canada from British Columbia to the island of Newfoundland, and south to the northern United States. It winters in South America, primarily east of the Andes in Bolivia, Paraguay, and Argentina.



Global Distribution of the Bobolink. Data adapted from NatureServe (Ridgely et al. 2003).

Source: Renfrew, R.B., K.A. Peters, J.R. Herkert, K.R. VanBeek, and T. Will. 2019. A full life cycle conservation plan for Bobolink (*Dolichonyx oryzivorus*). U.S. Fish & Wildlife Service.

Habitat

Prior to European settlement, the breeding range of Bobolink coincided with the tall-grass prairie of the mid-western United States and south-central Canada. Most of this prairie was converted to agricultural land over a century ago. At roughly the same time, large swaths of forest in eastern North America were cleared for hayfields and pastures that provided alternate habitat for the birds. Since then, Bobolink has mostly nested in hayfields and pastures, although it also uses wet prairie, grassy peatlands, alvars, abandoned fields dominated by tall grasses, remnants of native prairie, and even sedge and grass meadows of marshes and bogs. It is generally less common in dry shorter-grasslands, intensively grazed pastures, alfalfa fields, or in row crop monocultures.

Biology

Bobolink is a semi-colonial species that is often polygynous. Birds arrive back in Canada from their South American wintering grounds in mid-

May. Males establish their breeding territories by performing elaborate courtship flights, chases, and songs. Females construct nests on the ground. Clutches contain 3-7 eggs. Nestlings are fed by both parents for 10-11 days and fledglings are fed for at least 1 week.

Population Sizes and Trends

In Canada, the Bobolink population is estimated at about 2.6 million adults, which represents 26% of the global population. North American Breeding Bird Survey (BBS) data for the period 1970 to 2019 indicate a significant annual population trend of -2.63% in Canada (95% CI = -2.99%, -2.27%), amounting to a loss of 73% of the population over 49 years. The annual rate of decline in Canada has been slightly steeper over the most recent 10-year period (2009 to 2019), at -2.87% (95% CI = -4.08, -1.47), corresponding to a cumulative population loss of 25% during this time. The United States population has also undergone both long- and short-term declines, although not quite as severe.



Photo © Avery Wells

Threats and Limiting Factors

The main causes of the decline in Bobolink abundance have been identified as: 1) habitat loss on both the breeding and wintering grounds, primarily caused by the conversion of native prairie and forage crops (hay and pasture) to intensive row crops (corn, soybean), 2) incidental mortality from hay-mowing operations that destroy nests, and 3) pesticide use on the breeding and wintering grounds, which causes both direct and indirect mortality. Overall, the impact of threats likely to affect Bobolink over the next decade is considered to be high.

Protection, Status and Ranks

Bobolink, its nest, and its eggs are protected in Canada under the Migratory Birds Convention Act 1994. It is currently protected as a Threatened species under Schedule 1 of the Species at Risk Act, 2002, and by various provincial pieces of legislation. It is ranked as Secure globally (G5) and nationally (N5) in Canada and the United States by NatureServe, although at a provincial scale it ranks as high as S2 (Imperilled) in Alberta and Prince Edward Island, and S1 (Critically Imperilled) in Newfoundland and Labrador.

Source: COSEWIC. 2022. COSEWIC assessment and status report on the Bobolink *Dolichonyx oryzivorus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 60 pp.

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Dense Draba

Photo: © Frédéric Courso



Scientific name

Draba pycnosperma

Taxon

Vascular Plants

COSEWIC status

Special Concern

Canadian range

Québec, Newfoundland and Labrador

Reason for designation

This small plant occurs on rock outcrops, cliffs, and talus slopes within 2.5 km of the coast along the Gaspé Peninsula and Strait of Belle Isle (Quebec, Newfoundland & Labrador), and is found nowhere else in the world. Fewer than 3000 plants are currently known, occupying a small portion of seemingly abundant suitable habitat. Invasive introduced plant species are degrading the draba's habitat. As most plant colonies consist of only a few individuals and are associated with steep, dynamic substrates, they may be vulnerable to stochastic events such as rockslides. This species is near to qualifying for Threatened status, and failure to effectively mitigate the threats could result in the species becoming Threatened.

Wildlife Species Description and Significance

Dense Draba is a small perennial plant that grows in dense clumps. Basal rosette leaves are covered with four-rayed cross-shaped hairs, which are sometimes spurred or branched. Flower stalks bear 5–40 white flowers and one to four leaves. The plump inflated dry fruits contain seeds that overlap in shingle-like fashion and that are turned obliquely to the thin wall dividing the two fruit cavities. It is endemic to eastern Canada.

Distribution

This species is limited to the Gaspé Peninsula region and along the north shore of the Gulf of St. Lawrence to Labrador, near the Québec border, with most of the population concentrated around Percé. An additional historical record exists from the island of Newfoundland. Past reports from Nova Scotia are now known to have been incorrect.



Distribution of Dense Draba in Canada: calculation of the Extent of Occurrence (EOO) and of the Index of Area of Occupancy (IAO). Map produced by COSEWIC Secretariat

Source: COSEWIC. 2022. COSEWIC assessment and status report on the Dense Draba *Draba pycnosperma* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 29 pp.

Habitat

This species grows in full sun or light shade on mesic to xeric sites, on escarpments, rocky sea cliffs, talus slopes, or rock outcrops at or near the seashore. The parent rock at these sites is composed of mudstone, limestone or calcareous sandstone, and conglomerate.

Biology

The species flowers from late May to July and the fruiting season lasts until late August. Seeds are dispersed mainly by wind and gravity. The flowers are visited by bumble bees and the plant is subject to insect herbivory. The species is limited to cliff or scarp faces where vegetation is very sparse and interspecific competition is low. In the meadows on Bonaventure Island or along the edges of the tops of escarpments or cliffs, a dense cover of graminoids or low shrubs may limit the species' expansion.

Population Sizes and Trends

There are 10 known subpopulations, four of which are historical, but considered extant pending additional search effort. The total known population is 2,742 individuals. However, this is a minimum number, because much of the demographic data are estimates and most sites have only been partially surveyed. The available data do not allow any clear population trends to be determined.

Threats and Limiting Factors

All potential threats are local in nature. The primary threats are the invasion of the species' habitat by introduced plants such as Wild Chervil at some of the Bonaventure Island sites, as well as trampling by visitors in places accessible by trail in the Percé area. Although of unknown impact, the expansion of the Northern Gannet breeding colony on this island could also be detrimental to the species. The very small size of most Dense Draba colonies makes them vulnerable to stochastic events such as the collapse of portions of the rock faces where they grow.

Protection, Status and Ranks

Dense Draba currently has no special status nationally in Canada or internationally. In Québec, it has been designated as threatened since 2010 under the Act Respecting Threatened or Vulnerable Species. It is ranked G1 and N1 (Critically Imperilled) by NatureServe. In Québec, the Centre de données sur le patrimoine naturel du Québec (CDPNQ) ranks it as S1 while it is ranked as SH (possibly extirpated) in Newfoundland. The most significant occurrence is in Île-Bonaventure-et-du-Rocher-Percé Provincial Park and hence on public land. The colonies at L'Anse-Blanchette, Anse-Saint-Georges, and L'Anse-aux-Amérindiens, on the Gaspé Peninsula, are afforded protection from being within Forillon National Park.

Source: COSEWIC. 2022. COSEWIC assessment and status report on the Dense Draba *Draba pycnosperma* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 29 pp.

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Dukes' Skipper

Photo: © Blake A. Mann



Scientific name
Euphyes dukesi

Taxon
Arthropods

COSEWIC status
Special Concern

Canadian range
Ontario

Reason for designation

This wetland specialist butterfly is found in open hardwood swamps and clearings of extreme southwestern Ontario. The species has a restricted range within the counties of Essex, Chatham-Kent, and Lambton, with only 12 known extant subpopulations. Its historical habitat has changed since European settlement, which has led to geographical isolation of suitable wetland patches. Larvae feed on native sedges that are displaced when the invasive European Reed encroaches into the butterfly's wetland habitat. This invasive plant is present at seven of the 12 extant subpopulations and has increased its range in southern Ontario by almost 30% between 2010 and 2017. The spread of invasive plants could lead to extirpation at some sites in the future.

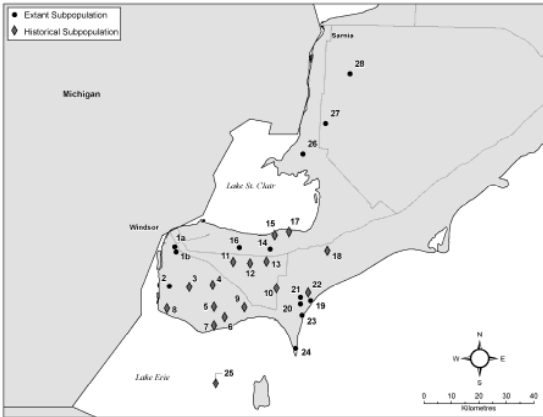
Wildlife Species Description and Significance

Dukes' Skipper (*Euphyes dukesi*) is a large (wingspan 31-37mm) dark skipper with rounded wing edges. The species is sexually dimorphic. Males have sooty-black wings, occasionally showing orange along the forewing costa (forewing front edge) and the centre of the hindwing. Females are dark brown, sometimes showing one or two orange spots in the centre of the forewing. The underside in both sexes is orange-brown with a pale orange-yellow streak running through the centre of the hindwing. The species is uncommon throughout its range. Globally, there are two *subspecies of Dukes' Skipper* (*E. dukesi dukesi* and *E.d.calhouni*); only the *E.e.dukesi* is assessed in this status report.

Distribution

Globally, Duke's Skipper ranges from southern Ontario, south through Michigan and the Mississippi River drainage to eastern Texas and Louisiana; eastward to the Atlantic and Gulf coasts in Florida. The ranges of the two subspecies (*E.d.dukesi* and *E.d.calhouni*) intersect in northern Florida; only *E.e.dukesi* ranges in Canada.

In Canada, the Dukes' Skipper is restricted to extreme southwestern Ontario in Essex, Chatham-Kent, and Lambton counties. There are 28 documented subpopulations: 12 extant and 16 historical. The Canadian range extent, including extant and historical subpopulations, is 2,486 km².



Dukes' Skipper (*Euphyes dukesi*) subpopulations in Canada (see Table 1 for subpopulation names). Map by G. Schaus.

Source: COSEWIC. 2022. COSEWIC assessment and status report on the Dukes' Skipper *Euphyes dukesi* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 46 pp.

Habitat

Dukes' Skipper is a wetland specialist and found in hardwood swamps and natural clearings or edges with large sedge patches. In Ontario, the larval host plants are Lake Sedge (*Carex lacustris*) and Shoreline Sedge (*Carex hyalinolepis*), both common and widespread throughout skipper's range. A shaded aspect appears important for Dukes' Skipper; adults are observed under a forest canopy with dappled sunlight. Adults nectar on a variety of wildflowers including Swamp Milkweed (*Asclepias incarnata*), Common Milkweed (*Asclepias syriaca*) and thistles (*Family Cardueae*).

Biology

Dukes' Skipper has one generation per year, a flight period from early July through mid-August and an adult lifespan of approximately three weeks. Females oviposit on the underside of leaves of their host plant. Eggs hatch and larvae feed until they reach their fourth instar, at which stage they enter diapause (i.e., overwintering life stage). Post-diapause larvae emerge in the spring, continue to feed on host plants, and pupate after the fifth instar.

Dukes' Skipper males do not appear territorial but will actively patrol sedge patches in pursuit of females. Females rest and bask on sedges.

The dispersal ability of Duke's Skipper is unstudied and unknown. They are noted to have a slower flight speed, when compared with other members of the genus *Euphyes*. Based on information from related *Euphyes* species, the dispersal distance is estimated to be a maximum of two kilometres.

Population Sizes and Trends

Dukes' Skipper surveys have focused on recording the skipper's presence, habitat preferences and other natural history information. All observations in Canada have been adults, and no information on population trends or fluctuations are available.

The widespread historical loss of wetland and swamp habitats in southern Ontario over the past 200 years has led to geographical isolation of suitable Dukes' Skipper habitat patches. Quantified data that show habitat trends in southwestern Ontario within the last 10 years are not well documented, however ecosystem changes are trending from non-native/invasive European Reed (*Phragmites australis australis*), which is rapidly spreading into many wetland habitats.

Threats and Limiting Factors

Threats to Dukes' Skipper are inferred from declines in extent and quality of habitat at known sites in southwestern Ontario. The primary threats are ecosystem modifications that result from the spread of invasive plants, primarily European Reed, which is abundant within the habitats of at least seven extant Dukes' Skipper subpopulations. Other threats include habitat conversion to annual and perennial non-timber crops, residential development, and changes to their wetland habitat from climate change. Limiting factors that may contribute to the skipper's decline include its presence as small, localized subpopulations and a limited dispersal ability. Subpopulations in Canada come close to being severely fragmented¹ based on the ecosystem modifications from the spread of European Reed. A single European Reed plant can spread 1-2m/year. This invasive plant grows up to 2 metres, can shade and out-compete native larval host and adult nectar plants, and is contributing to a decline in quality and the gradual loss of available Dukes' Skipper habitat.

Protection, Status and Ranks

Neither Dukes' Skipper or its host plants are listed under the federal Species at Risk Act or the Ontario Endangered Species Act. Dense-blazing Star (nectar plant) is Threatened under both acts (NHIC 2020b). The skipper's global rank is Vulnerable (G3G4), national rank Imperiled (N2) and Ontario rank imperiled (S2).

Source: COSEWIC. 2022. COSEWIC assessment and status report on the Dukes' Skipper *Euphyes dukesi* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 46 pp.

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Dusky Dune Moth



Photo © Nick Page

Scientific name

Coppablepharon longipenne

Taxon

Arthropods

COSEWIC status

Threatened

Canadian range

Alberta, Saskatchewan, Manitoba

Reason for designation

This moth is restricted to a handful of open, active sand dunes and blowouts on the Prairies. Beginning in the 1940s, these dunes are slowly becoming stabilized and vegetated, and the area of open sand of many dunes has declined by an estimated 10-40% per decade. The decline in dune area has reduced the moth's habitat and has resulted in a more fragmented landscape. Although the moth can be common where it is found, it occurs in only a small proportion of the apparently suitable sites and has disappeared from a few historical localities. Dispersal between most dune systems is extremely unlikely and the moth is likely not viable at several sites, and viability is uncertain at others but there are continuing declines in quality and quantity of habitat.

Wildlife Species Description and Significance

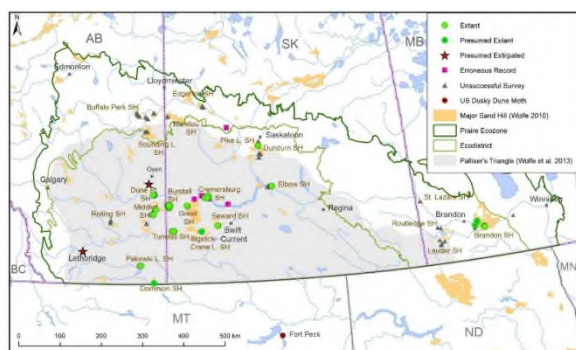
Dusky Dune Moth (*Coppablepharon longipenne*) is a medium-sized (11–20 mm) light brown noctuid

(cutworm or owlet) moth with a distinctive line of black dots on the forewing. Adults are sexually dimorphic in size, with males slightly smaller than females. Males have narrowly bipectinate antennae (about 2.5 times as long as wide), whereas female antennae are filiform. Dusky Dune Moth is a member of a highly specialized dune-dwelling community of plants and animals that are restricted to the isolated active sand dunes across the prairie landscape that were left by the retreat of the continental glaciers, thousands of years ago.

Distribution

Dusky Dune Moth is restricted to the Great Plains of North America, with a global range that extends from near Saskatoon, in the Canadian prairies, south to Texas. The Canadian range of Dusky Dune Moth extends from Spruce Woods Provincial Park in southwestern Manitoba, through southern Saskatchewan to southeastern Alberta. The global and Canadian distribution is not continuous, and subpopulations are confined to small, highly fragmented, discrete areas of suitable habitat.

In Canada, Dusky Dune Moth is known from 15 subpopulations: 13 extant and two historical. This includes three new subpopulations recorded since the first COSEWIC status report. Within the sand hill habitats where the 13 subpopulations occur, Dusky Dune Moth is present at 35 sites (i.e., discrete sand dunes or blowouts separated by vegetated habitat). There are likely additional unrecorded Canadian subpopulations of Dusky Dune Moth; given that only about 60 % of the potentially suitable habitat for this species has been surveyed. The species does not appear to be abundant.



Known Canadian records for Dusky Dune Moth (*Coptophanes longipennis*). See Appendix 1 for site details. Map by R. Foster, August 1, 2021.

Source: COSEWIC, 2022. COSEWIC assessment and status report on the Dusky Dune Moth *Coptophanes longipennis* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 59 pp.

Habitat

Dusky Dune Moth primarily occurs in active sand dunes, or sand blowout habitats associated with sand hills or dune fields. Less frequently, it uses open sandy areas that have been the result of human activity (e.g., sandy roads and fire breaks). The species appears to be more abundant in naturally occurring sand dunes.

Biology

Little is known about the biology of Dusky Dune Moth; it is nocturnal, and difficult to survey. In Canada, the species has one generation per year and a flight period from mid-June to late August. Dusky Dune Moth does not appear to be host plant specific. Mating occurs on low vegetation or on the ground, with oviposition (egg laying) in shallow sand. The eggs hatch into larvae approximately three weeks later and feed below-ground on dune vegetation, likely burrowing into the soil for the winter, although the microsite and sand depth are unknown. Larvae emerge in the spring or early summer and continue feeding prior to pupation, which occurs in the soil. The adult dispersal ability of Dusky Dune Moth is unknown. Given that dune habitats are often patchily distributed, it is likely that short-distance dispersal occurs to adjacent habitats. However, dispersal between regionally isolated sand dune systems (>10 km) is unlikely.

Population Sizes and Trends

Over the past decade, the number of sites occupied by Dusky Dune Moth in Canada appears to be stable but has declined from historical levels due to sand dune habitat loss. Over the last 100 years, the active dune habitats on which the moth depends have substantially declined in area, a trend that is expected to continue. At least two subpopulations (Lethbridge and Sunnydale) have been extirpated in the last century. It is likely that a third, the occurrence at the Dominion Sand Hills, is also lost since there is very little open sand habitat remaining. Too few data are available on which to base subpopulation estimates or a Canada-wide population estimate. However, the abundance of Dusky Dune Moth at extant sites is presumed to have declined, as inferred from a decrease in active bare sand habitat due to dune stabilization.

Threats and Limiting Factors

The primary threat to the long-term survival of Dusky Dune Moth appears to be the loss of habitat resulting from the stabilization of active sand by both native and introduced vegetation. This natural process is largely driven by regional climate trends, but has accelerated over the last 150 years, in part due to decreasing aridity, reduced wildfire, and the decline in abundance of Plains Bison (*Bison bison bison*), which would have been part of the natural habitat disturbance patterns.

Protection, Status and Ranks

Most of the known Dusky Dune Moth sites have secure tenure on leased provincial Crown land, within provincial or regional parks, or the federal Department of National Defence lands. A few sites are on Indigenous lands, private land or where the land tenure is unknown (particularly for historical occurrences).

Dusky Dune Moth is listed as Endangered under federal Species at Risk Act and Endangered under the Manitoba Endangered Species and Ecosystems Act. It is ranked as G4 (Apparently Secure) globally, N2 (Imperilled) nationally in Canada, S1 (Critically Imperilled). In the provinces, it is ranked S1S2 (Critically Imperilled) in

Manitoba, S1S2 in Alberta, and S2
(Imperilled) in Saskatchewan.

Source: COSEWIC. 2022. COSEWIC assessment and status report on the Dusky Dune Moth *Copablepharon longipenne* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 59 pp.

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Eastern False Rue-Anemone

Photo © William van Hemessen



Scientific name

Enemion biternatum

Taxon

Vascular Plants

COSEWIC status

Special Concern

Canadian range

Ontario

Reason for designation

This perennial forest herb is at the northern edge of its range and in Canada is restricted to a few fragmented riverside sites in southwestern Ontario. It occurs in six subpopulations that are at risk of decline in area and quality of habitat resulting from various activities, including recreational trail use and expansion of exotic invasive plants.

Since the previous assessment, COSEWIC has changed its interpretation and application of the terms 'severe fragmentation' and 'area of occupancy' to better align with IUCN assessment criteria and the species exceeds criteria thresholds as now applied.

Wildlife Species Description and Significance

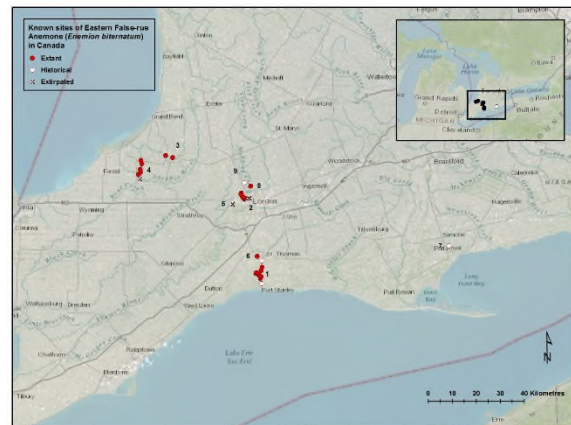
Eastern False Rue-anemone (*Enemion biternatum*) is a delicate spring-flowering perennial herb that grows to 10-40 cm in height.

The flowers are 1.5-2 cm wide with five white petal-like sepals surrounding a cluster of stamens with yellow anthers.

The Canadian population of Eastern False Rue-anemone is restricted to the Carolinian Zone in southwestern Ontario, where it is part of a nationally significant suite of species of conservation concern at the northern edge of their range.

Distribution

Eastern False Rue-anemone occurs in the United States and Canada. This species is considered common throughout most of its range from the Great Lakes south to Oklahoma, Arkansas, and Tennessee west of the Appalachians. It is rare on the periphery of this range and possibly extirpated from New York and South Dakota. In Canada, Eastern False Rue-anemone occurs locally in southwestern Ontario, which represents less than 1% of its global range. There are six documented extant subpopulations.



Distribution of Eastern False Rue-anemone in Canada. Numbers correspond to the subpopulation identifiers used in this report (see Table 1). Map produced by COSEWIC Secretariat for this report and used with permission.

Source: COSEWIC. 2022. COSEWIC assessment and status report on the Eastern False Rue-anemone *Enemion biternatum* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 57 pp.

Habitat

This woodland perennial herb grows in moist deciduous woodlands and thickets, often on river floodplain terraces and valley slopes, and sometimes on tablelands. Canadian subpopulations are generally found in hardwood Carolinian forests, often dominated by Sugar Maple in combination with various other species.

Biology

In Canada, Eastern False Rue-anemone flowers from April to May and bears fruit in May to June. Insects are the main pollinators. The seeds germinate in the autumn. Eastern False Rue-anemone is a perennial with considerable vegetative propagation. Specific information on the age of first flowering, longevity or average age of mature individuals in the population is not available. First flowering of individuals developed from seed or vegetative propagules likely requires several years.

Population Sizes and Trends

The Eastern False Rue-anemone population in Canada was previously estimated at one million stems and considered stable. This population is distributed across several subpopulations and numerous sites, although the vast majority of plants are concentrated at just two sites, representing two subpopulations. The current population size is considered similar to previous estimates, due in part to increased survey effort. Declines have occurred or are inferred to have occurred at a few sites including a large decline (approximately 70%) in the estimated number of stems at the largest reported patch.

Threats and Limiting Factors

Competition from invasive non-native plants is considered the primary threat to this species in Canada. High densities of White-tailed Deer may be reducing plant vigour. Recreational trails are present close to Eastern False Rue-anemone plants at many sites and may result in localized trampling and soil compaction. Many of the subpopulations are in or near expanding urban areas and recreational pressures are expected to increase.

Important limiting factors for this species include its limited dispersal capability, low rate of visitation by pollinators, and self-compatibility which can lead to inbreeding depression or reduced reproductive success, particularly in small subpopulations in fragmented habitat.

Protection, Status and Ranks

Eastern False Rue-anemone is listed as Threatened under the Species at Risk Act in Canada and under the Endangered Species Act, 2007 in Ontario. A federal Recovery Strategy that identifies critical habitat was prepared in 2017. Ontario has adopted the federal Recovery Strategy and prepared a response statement outlining the provincial government's intended actions and priorities. The plant and its general habitat are afforded protection under the provincial Endangered Species Act, 2007. Many extant subpopulations occur on private lands. Several sites with significant numbers of plants are within municipality-owned lands and conservation areas that are managed for conservation purposes. None of the known occurrences are on federal lands.

This species has a NatureServe conservation rank of Globally Secure (G5), although the status has not been reviewed since 1984. It is ranked Imperilled in Ontario (S2) and Canada (N2). The species is also of conservation concern in nine jurisdictions on the periphery of its range in the United States.

Approximately half of the known Canadian population of this species is on publicly owned lands.

Source: COSEWIC. 2022. COSEWIC assessment and status report on the Eastern False Rue-anemone *Enemion bitermatum* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 57 pp.

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Eastern Foxsnake – Carolinian Population

Photo: @ Joe Crowley



Scientific name

Pantherophis vulpinus

Taxon

Reptiles

COSEWIC status

Threatened

Canadian range

Ontario

Reason for designation

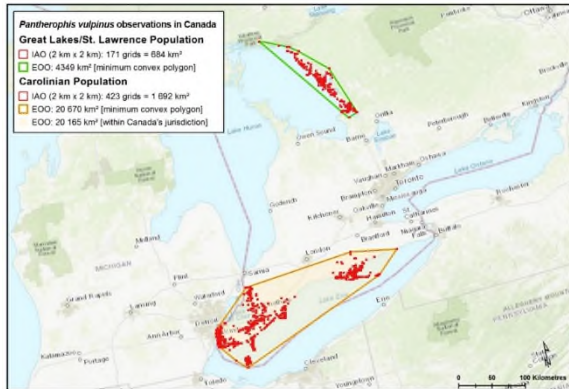
This large, non-venomous snake is confined to a few small disjunct areas of southwestern Ontario within a landscape subjected to intensive agriculture and urbanization and crisscrossed by a network of roads. New information since the last assessment includes better understanding of population genetic structure, abundance, and habitat use, and clarification of threats. Aggregation of snakes at hibernation sites increases their vulnerability to natural catastrophes and human disturbance. Long seasonal migrations to and from these sites place them at particular risk from road mortality. The number of mature individuals is expected to continue to decline as a result of road mortality and other threats, including storms and flooding associated with climate change. A better understanding of the snake's distribution and re-evaluation of the degree of population fragmentation contributed to the change in status from Endangered to Threatened.

Wildlife Species Description and Significance

Eastern Foxsnake (*Pantherophis vulpinus*) is a North American ratsnake and one of the largest snakes in Canada. Adults are patterned with dark blotches on a yellowish background with alternating smaller dark blotches on the sides. This snake is an important predator of rodents and poses no threat to humans, yet it is often killed out of fear or hatred.

Distribution

Globally, Eastern Foxsnake is limited to the Great Lakes region of North America. In Canada, this species is restricted to Ontario and occurs as two distinct populations: the Carolinian population in southwestern Ontario and the Great Lakes / St. Lawrence population along the eastern shoreline of Georgian Bay. Although the major disjunctions in the Canadian range pre-date European settlement, historical and ongoing habitat loss have further fragmented the Carolinian population. The known range of Eastern Foxsnake in Canada has increased since the previous status assessment due to increased search effort; similarly, the known number of hibernation sites in the Georgian Bay region has increased. Hibernation sites have been lost, however, in the Carolinian region.



Current (1999–2018) Canadian range of Eastern Foxsnake (*Pantherophis vulpinus*) showing the extent of occurrence (EOO) and index area of occupancy of the two designatable units (DU): Carolinian and Great Lakes / St. Lawrence (GLSL). The Norfolk County area is represented by the cluster in the northeast in the Carolinian DU. All pre-1999 observations fall within, or in very close proximity to, the current EOO of the GLSL DU, whereas some historical observations fall outside the current EOO of Carolinian DU (see Appendix 1 and 2). Map prepared by Sydney Allen (COSEWIC Secretariat).

Source: COSEWIC. 2021. COSEWIC assessment and status report on the Eastern Foxsnake *Pantherophis vulpinus*, Carolinian population and Great Lakes / St. Lawrence population, in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xv + 68 pp.

Habitat

Eastern Foxsnakes spend most of the active season in open habitats, including wetlands and rocky shorelines. This species requires suitable hibernation sites and egg-laying sites, many of which are used by dozens of snakes year after year. Large-scale habitat loss has occurred within ranges of both Canadian populations, but disproportionately in the Carolinian region due to historical and ongoing conversion of wetlands and other natural areas to urban and agricultural uses.

Biology

Eastern Foxsnakes mature in about 4 years and may live 11–12 years. The generation time is estimated at 7.5 years. The snakes spend half of the year active above ground and the remainder below ground in hibernation sites. The snakes can swim for kilometres along shorelines and across open water to access island habitat, but expanses of intensive agriculture are a barrier to

movement. Foxsnakes are adept at using some human-made structures to meet their needs.



Photo: © Joe Crowley

Population Sizes and Trends

The Carolinian population includes about 4,150–7,230 and the Great Lakes / St. Lawrence population about 1,180–2,190 mature individuals. Human-caused threats are contributing to a continuing decline in abundance of this species in both populations.

Threats and Limiting Factors

Foxsnakes have been most severely impacted by the historical loss of wetland habitat in the Carolinian region, resulting from intensive agriculture and, to a lesser extent, from residential, commercial, and highway development. Habitat loss continues to threaten both populations. Road mortality is now the predominant threat to the species, particularly in the Carolinian region, followed by climate change and natural system modifications.

Protection, Status and Ranks

Eastern Foxsnake was previously assessed by COSEWIC as Endangered in both the Carolinian and Great Lakes / St. Lawrence populations. Similarly, it is listed under the federal Species at Risk Act as two populations, both Endangered. Provincially, they are listed as Endangered (Carolinian population) and Threatened (Great Lakes / St. Lawrence population) under the Ontario Endangered Species Act. This legislation makes it illegal to kill, harm or harass individuals, or damage or destroy their habitat. The majority of parks and protected areas are in the northern portion of the species' Canadian range, leaving

the southern population to persist in a few small isolated habitat patches.

Source: COSEWIC. 2021. COSEWIC assessment and status report on the Eastern Foxsnake *Pantherophis vulpinus*, Carolinian population and Great Lakes / St. Lawrence population, in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xv + 68 pp.

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Eastern Foxsnake - Great Lakes/St. Lawrence Population



Photo: © Joe Crowley

Scientific name

Pantherophis vulpinus

Taxon

Reptiles

COSEWIC status

Threatened

Canadian range

Ontario

Reason for designation

This large, non-venomous snake is restricted to the eastern shoreline of Georgian Bay, where it reaches the northern limits of its distribution. Population size is small, most likely less than 2000 mature individuals, but further sampling of historical sites is required. Large aggregations of snakes at hibernation sites increase their vulnerability to natural catastrophes and human disturbance. Long seasonal migrations to and from these sites place them at particular risk from road mortality. A better understanding of the snake's distribution and re-evaluation of the degree of population fragmentation contributed to the change in status from Endangered to Threatened.

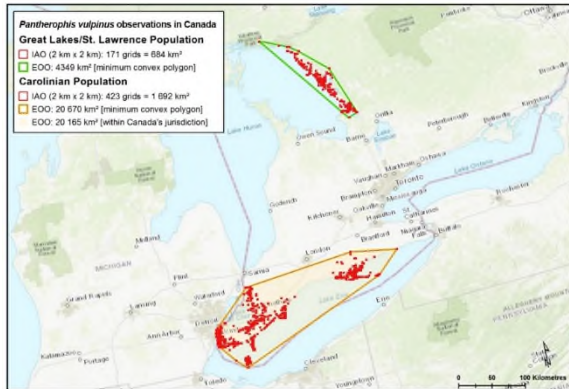
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Distribution

Globally, Eastern Foxsnake is limited to the Great Lakes region of North America. In Canada, this species is restricted to Ontario and occurs as two distinct populations: the Carolinian population in southwestern Ontario and the Great Lakes / St. Lawrence population along the eastern shoreline of Georgian Bay. Although the major disjunctions in the Canadian range pre-date European settlement, historical and ongoing habitat loss have further fragmented the Carolinian population. The known range of Eastern Foxsnake in Canada has increased since the previous status assessment due to increased search effort; similarly, the known number of hibernation sites in the Georgian Bay region has increased. Hibernation sites have been lost, however, in the Carolinian region.



Current (1999–2018) Canadian range of Eastern Foxsnake (*Pantherophis vulpinus*) showing the extent of occurrence (EOO) and index area of occupancy of the two designatable units (DU): Carolinian and Great Lakes / St. Lawrence (GLSL). The Norfolk County area is represented by the cluster in the northeast in the Carolinian DU. All pre-1999 observations fall within, or in very close proximity to, the current EOO of the GLSL DU, whereas some historical observations fall outside the current EOO of Carolinian DU (see Appendix 1 and 2). Map prepared by Sydney Allen (COSEWIC Secretariat).

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Habitat

Eastern Foxsnakes spend most of the active season in open habitats, including wetlands and rocky shorelines. This species requires suitable hibernation sites and egg-laying sites, many of which are used by dozens of snakes year after year. Large-scale habitat loss has occurred within the ranges of both Canadian populations, but disproportionately in the Carolinian region due to historical and ongoing conversion of wetlands and other natural areas to urban and agricultural uses.

Biology

Eastern Foxsnakes mature in about 4 years and may live 11–12 years. The generation time is estimated at 7.5 years. The snakes spend half of the year active above ground and the remainder below ground in hibernation sites. The snakes can swim for kilometres along shorelines and across open water to access island habitat, but expanses of intensive agriculture are a barrier to movement. Foxsnakes are adept at using

some human-made structures to meet their needs.

Population Sizes and Trends

The Carolinian population includes about 4,150–7,230 and the Great Lakes / St. Lawrence population about 1,180–2,190 mature individuals. Human-caused threats are contributing to a continuing decline in abundance of this species in both populations.

Threats and Limiting Factors

Foxsnakes have been most severely impacted by the historical loss of wetland habitat in the Carolinian region, resulting from intensive agriculture and, to a lesser extent, from residential, commercial, and highway development. Habitat loss continues to threaten both populations. Road mortality is now the predominant threat to the species, particularly in the Carolinian region, followed by climate change and natural system modifications.

Protection, Status and Ranks

Eastern Foxsnake was previously assessed by COSEWIC as Endangered in both the Carolinian and Great Lakes / St. Lawrence populations. Similarly, it is listed under the federal Species at Risk Act as two populations, both Endangered. Provincially, they are listed as Endangered (Carolinian population) and Threatened (Great Lakes / St. Lawrence population) under the Ontario Endangered Species Act. This legislation makes it illegal to kill, harm or harass individuals, or damage or destroy their habitat. The majority of parks and protected areas are in the northern portion of the species' Canadian range, leaving the southern population to persist in a few small isolated habitat patches.

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Johnson's Hairstreak

Photo: ©Michelle Connolly



Scientific name

Callophrys johnsoni

Taxon

Arthropods

COSEWIC status

Special Concern

Canadian range

British Columbia

Reason for designation

This butterfly is found in Canada only in southern British Columbia from Vancouver Island east to Hope. It lives in coastal old growth and late successional second growth coniferous forests with a large component of Western Hemlock. Caterpillars feed only on flowers of Hemlock Dwarf Mistletoe, a hemiparasite of Western Hemlock. Hemlock Dwarf Mistletoe reduces economic value of trees and therefore forest management practices that remove Western Hemlock to reduce mistletoe in older forests are an ongoing threat. This species could become Threatened if threats influencing its persistence are not managed.

Wildlife Species Description and Significance

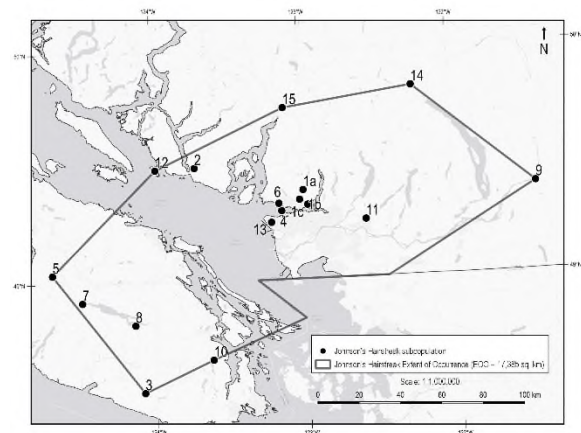
Johnson's Hairstreak is a small (2.5-3.0 cm wingspan) chocolate-brown butterfly with white-

tipped tails on the hindwings. Sexes differ slightly; females tend to be larger and paler brown than males.

Johnson's Hairstreak is one of a group of butterflies that reach their northern distribution limit in western Canada. Caterpillars feed on Hemlock Dwarf Mistletoe that grows in Western Hemlock dominated forests. The mistletoe is considered a pest by the forest industry.

Distribution

In Canada, the species has a small range in southwestern British Columbia (BC), extreme southeastern mainland to Hope. There are ten extant and 5 historical subpopulations; however, there are likely additional subpopulations. The global range extends to coastal California, and east to Idaho. Less than 5% of the global range is in Canada.



Canadian range of Johnson's Hairstreak (*Callophrys johnsoni*) based on convex hull polygon around known records for the species (see Table 1). The extent of occurrence (EOO) is 17,385 km² based on a convex hull polygon around known subpopulations and removing the portion of the polygon within the United States. Map by Greg Amos (ENV).

Source: COSEWIC. 2022. COSEWIC assessment and status report on the Johnson's Hairstreak *Callophrys johnsoni* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 61 pp.

Habitat

In BC, Johnson's Hairstreak inhabits coastal old growth and late successional second growth (> 81 years) coniferous forests with a large (> 40%) component of Western Hemlock. Most records are under 625 m above sea level (asl); however, there is one subpopulation on Vancouver Island at 880-980 m asl.

Larvae feed on Hemlock Dwarf Mistletoe, a hemiparasitic plant dependent on Western Hemlock. As a forest stand ages, mistletoe abundance increases both on individual trees, and throughout the stand. Mistletoe forms dense brooms on different branches, produces seeds, and spreads throughout a tree. The caterpillar requires blooming shoots of Hemlock Dwarf Mistletoe upon which to feed. In BC, an estimated 15% of Western Hemlock stands host Hemlock Dwarf Mistletoe, concentrated in a north-south band about 150 km wide along the coast.

Adults spend time in the canopy and descend to open meadow where they feed on nectar from various flowers.

Biology

Johnson's Hairstreak has four life stages (egg, caterpillar [four instars], pupa and adult) and develops through complete metamorphosis. The adult flight period and mating occurs from late May through late June in B.C. The eggs are laid singly on sprouting and blooming shoots of Hemlock Dwarf Mistletoe, presumably in the upper canopy where dappled light needed to enable the growth of mistletoe shoots and flowers. Eggs hatch within a few weeks and larvae grow through the four instars, feeding on all parts of Hemlock Dwarf Mistletoe. Johnson's Hairstreak overwinters as a pupa sheltered in a mistletoe broom. There is one generation per year in B.C.

Population Sizes and Trends

Johnson's Hairstreak surveys have focused on recording new subpopulations, natural history, and habitat information, resulting in observations from 1900 to 2021. The primary survey method has been wandering transects during the adult flight period, through potential areas where flowering plants are abundant, the surveyor

targeting floral patches to observe resting and feeding butterflies. No information on the Canadian population size or trends are available. A decline in the overall Canadian population is inferred and projected based on the documented historical loss of older growth forest, projected future loss of Johnson's Hairstreak habitat based on current logging practices, and long-term forest management practices that minimize mistletoe abundance to protect timber quality.

Threats and Limiting Factors

The highest impact threat to Johnson's Hairstreak and potential habitat is the removal of older growth and late successional second growth (> 81 years) forests throughout the Coastal Western Hemlock Biogeoclimatic Zone in southwestern BC. At present, approximately 1945 km² of old growth and late successional second growth (> 81 years) habitat remains within the potential range of Johnson's Hairstreak.

Logging and forest management recommendations that limit the spread of Hemlock Dwarf Mistletoe are effectively reducing the potential future habitat for Johnson's Hairstreak and can be used to infer and project a decline in future Johnson's Hairstreak habitat. Forest management that results in reduced mistletoe include general or targeted removal of mistletoe-infected trees (e.g., clearcut harvesting, partial harvesting with selective removal of infected trees) and historical silvicultural practices that have resulted in stand conditions that are not conducive to mistletoe growth/establishment (e.g., clearcutting followed by even-aged planting).

Protection, Status and Ranks

Johnson's Hairstreak has some protection under the provincial Forest and Range Practices Act, and Protected Areas Act. It is listed as Identified Wildlife and managed through provisions outlined in the Identified Wildlife Management Strategy. Johnson's Hairstreak is not protected under the provincial Wildlife Act and there are no confirmed records in provincial parks or protected areas. The species is recorded from Stanley Park (a federal property owned by Parks Canada Agency and managed by the City of Vancouver) and Pacific Spirit Park (Metro Vancouver regional government).

Globally, Johnson's Hairstreak is ranked apparently Vulnerable (G3), nationally it is Critically Imperilled/Imperilled (N1N2) and provincially it is S1 (Critically Imperilled). The host plant is not at risk. Most extant subpopulations of Johnson's Hairstreak span multiple landowners including provincial crown forestland, municipal and regional parks, and private land.

Source: COSEWIC. 2022. COSEWIC assessment and status report on the Johnson's Hairstreak *Callophrys johnsoni* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 61 pp.

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Meadow Thistle - Mingan population

Photo: ©Pierrot Vaillancourt



Scientific Name

Cirsium scariosum

Taxon

Vascular Plants

COSEWIC Status

Endangered

Canadian Range

Quebec

Reason for designation

This perennial herb is restricted to upper portions of beaches on four islands of the Mingan archipelago in the Gulf of St. Lawrence. The population has a very limited distribution and few individuals – in 2018 it consisted of only 367 mature plants. The population is expected to continue to decline as a result of continuing threats, primarily an increase in storms due to climate change, which cause beach erosion as well as the deposition of sediment and woody debris. Given the small, coastal areas over which the population is found, a single storm can severely impact entire sites. Other threats related to climate change include rising sea level, reduced winter sea ice and snow cover, drought, and tree encroachment.

Wildlife Species Descriptions and Significance

Meadow Thistle (*Cirsium scariosum* var. *scariosum*) is a herbaceous perennial plant with

an erect flowering stem arising from a leafy rosette. It is 10-100 cm tall and has pink to purple flowers.

Meadow Thistle has two populations in Canada separated by about 3500 km: a Rocky Mountain population and another on the Mingan Archipelago in the Gulf of St. Lawrence. The two populations have been isolated from each other for thousands of years, have diverged genetically, and are considered separate designatable units. The Mingan population is of scientific and educational significance pertaining to plant survival as affected by both glacial history over thousands of years and current climate change impacts.

Distribution

The Mingan population occurs in eastern Quebec in the Gulf of St. Lawrence on four islands of the Mingan Archipelago, has a range of about 32 km², and is completely isolated from other North American populations. The total Canadian range represents about 0.5% of the global (North American) range.



Extant and extirpated occurrences of Meadow Thistle of the Mingan population. Map produced by COSEWIC Secretariat.

Source: COSEWIC. 2022. COSEWIC assessment and status report on the Meadow Thistle *Cirsium scariosum*, Rocky Mountain population and Mingan population in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xv + 81 pp.

Habitat

The western (Rocky Mountain) population occurs predominantly in grassy montane to subalpine meadows and forest openings. These open areas include undisturbed sites and sites affected by both natural (e.g., avalanche, animal activity, fire) and human disturbance (e.g., roads, well sites, gravel pits, cut blocks). The plant appears to be shade-intolerant and often occurs in moist sites.

The eastern (Mingan Archipelago) population consists of scattered individuals confined to a marginal strip of the upper beach between the seashore and inland coniferous forest in well drained soil over limestone bedrock. The plants are exposed to sea water spray as well as storms that erode the site and deposit sediment and plant debris. Meadow Thistle is often scattered between pieces of driftwood and some individuals grow on the edge of the forest where light is sufficient.

Biology

Meadow Thistle flowers and produces seed only once in its life and does not reproduce vegetatively. The flowering stem is produced from a leafy rosette and then the plant dies in that growing season. Flowering plants are produced in the Rocky Mountain population usually after 2-9 years and after 5-22 years in the Mingan population. About 70% of rosettes in the Rocky Mountain population and 97% in the Mingan population do not survive to the flowering stage. The main causes of rosette deaths in the Rocky Mountain population are small mammal herbivory and drought, and in the Mingan population are erosion from storms, competition from other plants, insufficient snow cover, and drought.

Population Sizes and Trends

The Rocky Mountain population in 2019 was estimated to have about 4.4 million individuals of all ages, including about 2.5 million mature plants (capable of reproduction). Based on two transects in Waterton Lakes National Park there was a decline of 96% over three generations (12 years) as well as a similar decline from 2002 to 2019. Repeated counts at 24 spot observations in other parts of the Rocky Mountain population also showed declines (median of -88%), suggesting that the entire population is declining.

The Mingan population in 2018 was composed of 1349 individuals of all ages, including 367 mature plants. The population is estimated to have declined by 26% over the past two generations and is expected to be reduced further by 8% over three generations (2017-2047). The numbers have fluctuated over the years, with some increased recruitment due to seeds being sown by hand. Population models indicate a continuing decline to very low numbers or extirpation, despite recovery interventions implemented since 2001.

Threats and Limiting Factors

The main threat to the Rocky Mountain population is from Thistle Head Weevil, an introduced Eurasian insect. Other lower impact threats include mortality related to an increase in fire frequency, size, and intensity, domestic livestock grazing, and herbicide control programs.

The main threats to the Mingan population are storm events which cause beach erosion as well as the deposition of sediment and woody debris. Storms are likely increasing due to climate change, which is also having effects through rising sea level and reduced winter sea ice. Other threats include reduced habitat area because of tree encroachment, reduced snow cover, and drought.

Photo © Nancy Dénommée



Protection, Status and Ranks

The Rocky Mountain population occurs primarily on public land (national and provincial parks, provincial crown lands). The Mingan population occurs within Mingan Archipelago National Park Reserve. Meadow Thistle is currently ranked

globally as Secure; this rank was last reviewed in 2009 and needs reconsideration. In Canada, it is Vulnerable and, in the USA, ranked as Secure. It is ranked as Critically Imperiled in Quebec, Imperiled in Alberta, and Vulnerable in British Columbia. It is ranked as apparently Secure to Secure in Montana and Imperiled in Wyoming. However, there is no indication that the threat posed by the Thistle Head Weevil throughout western North America has been considered. Meadow Thistle is legally designated as Threatened in Quebec.

Source: COSEWIC. 2022. COSEWIC assessment and status report on the Meadow Thistle *Cirsium scariosum*, Rocky Mountain population and Mingan population in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xv + 81 pp.

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Meadow Thistle – Rocky Mountain population



Photo: © Peter Achuff

Scientific Name
Cirsium scariosum

Taxon
Vascular Plants

COSEWIC Status
Endangered

Canadian Range
British Columbia, Alberta

Reason for designation

This perennial herb occurs in grassy montane to subalpine meadows and forest openings in the mountains of southeastern British Columbia and southwestern Alberta. Plants flower and produce seed only once, after 2 to 9 years, and then die. Most plants do not survive to the flowering stage due to herbivory from small mammals and drought. Those plants that do flower are threatened by the non-native Thistle Head Weevil, resulting in little, if any, seed production and a precipitous continuing decline in thistle numbers since 2002. Other threats include mortality related to an increase in wildfire due to climate change, grazing by domestic livestock, and herbicide control programs that target exotic invasive thistle species.

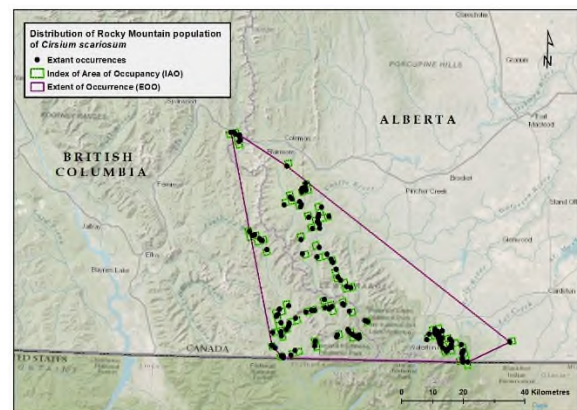
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Distribution

The Rocky Mountain population occurs in southeastern British Columbia and southwestern Alberta, extends over an estimated range of 3181 km², and is contiguous with populations that extend south to California, Utah, and Colorado.



Extent of Occurrence and Index of Occupancy for Meadow Thistle – Rocky Mountain population. Map produced by COSEWIC Secretariat.

Source: COSEWIC. 2022. COSEWIC assessment and status report on the Meadow Thistle *Cirsium scariosum*, Rocky Mountain population and Mingan population in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xv + 81 pp.

Habitat

The western (Rocky Mountain) population occurs predominantly in grassy montane to subalpine meadows and forest openings. These open areas include undisturbed sites and sites affected by both natural (e.g., avalanche, animal activity, fire) and human disturbance (e.g., roads, well sites, gravel pits, cut blocks). The plant appears to be shade-intolerant and often occurs in moist sites.

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Meadow Thistle flowers and produces seed only once in its life and does not reproduce vegetatively. The flowering stem is produced from a leafy rosette and then the plant dies in that growing season. Flowering plants are produced in the Rocky Mountain population usually after 2-9 years and after 5-22 years in the Mingan population. About 70% of rosettes in the Rocky Mountain population and 97% in the Mingan population do not survive to the flowering stage. The main causes of rosette deaths in the Rocky Mountain population are small mammal herbivory and drought, and in the Mingan population are erosion from storms, competition from other plants, insufficient snow cover, and drought.

Population Sizes and Trends

The Rocky Mountain population in 2019 was estimated to have about 4.4 million individuals of all ages, including about 2.5 million mature plants (capable of reproduction). Based on two transects in Waterton Lakes National Park there was a decline of 96% over three generations (12 years) as well as a similar decline from 2002 to 2019. Repeated counts at 24 spot observations in other parts of the Rocky Mountain population also showed declines (median of -88%), suggesting that the entire population is declining.

The Mingan population in 2018 was composed of 1349 individuals of all ages, including 367 mature plants. The population is estimated to have declined by 26% over the past two generations and is expected to be reduced further by 8% over three generations (2017-2047). The numbers have fluctuated over the years, with some increased recruitment due to seeds being sown by hand. Population models indicate a continuing decline to very low numbers or extirpation, despite recovery interventions implemented since 2001.

Threats and Limiting Factors

The main threat to the Rocky Mountain population is from Thistle Head Weevil, an introduced Eurasian insect. Other lower impact threats include mortality related to an increase in fire frequency, size, and intensity, domestic livestock grazing, and herbicide control programs.

The main threats to the Mingan population are storm events which cause beach erosion as well as the deposition of sediment and woody debris. Storms are likely increasing due to climate change, which is also having effects through rising sea level and reduced winter sea ice. Other threats include reduced habitat area because of tree encroachment, reduced snow cover, and drought.

Protection, Status and Ranks

The Rocky Mountain population occurs primarily on public land (national and provincial parks, provincial crown lands). The Mingan population occurs within Mingan Archipelago National Park Reserve. Meadow Thistle is currently ranked globally as Secure; this rank was last reviewed in 2009 and needs reconsideration. In Canada, it is Vulnerable and, in the USA, ranked as Secure. It is ranked as Critically Imperiled in Quebec, Imperiled in Alberta, and Vulnerable in British Columbia. It is ranked as apparently Secure to Secure in Montana and Imperiled in Wyoming. However, there is no indication that the threat posed by the Thistle Head Weevil throughout western North America has been considered. Meadow Thistle is legally designated as Threatened in Quebec.

Source: COSEWIC. 2022. COSEWIC assessment and status report on the Meadow Thistle *Cirsium scariosum*, Rocky Mountain population and Mingan population in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xv + 81 pp.

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Northern Oak Hairstreak

Photo: © Jessica Linton



Scientific name

Satyrium favonius ontario

Taxon

Arthropods

COSEWIC status

Threatened

Canadian range

Ontario

Reason for designation

This species is a closed canopy (>60% cover) oak woodland specialist. Only a few, isolated subpopulations remain within a small range of southwestern Ontario although there are likely a few undocumented occurrences for this difficult-to-survey species. Within this range, the habitat that this species is dependent on is also declining in extent and quality. The primary threat is the application of broad-spectrum lepidopteran insecticides to control outbreaks of the non-native moth species, and other ecosystem changes which impact this species directly and further reduce habitat quality.

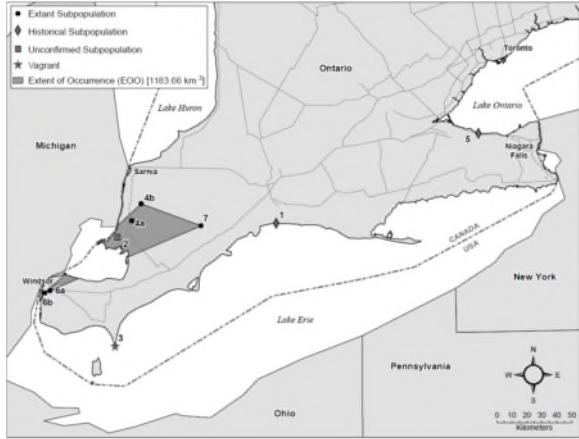
Wildlife Species Description and Significance

Northern Oak Hairstreak (*Satyrium favonius ontario*) is a small (wingspan 24-38 mm)

brownish-grey butterfly with hindwing tufts (also called tails). Wing undersides are brownish grey with prominent orange patches near the hindwing margins and a blue patch below the lower tail. There is a series of white and black dashed lines on the hindwing undersides and the white median line forms an obvious "W" marking above the blue patch. Larvae are yellowish and slug-like with green dorsal stripes and a yellow lateral stripe. Pupae are dark brown and mottled with fine hairs. Northern Oak Hairstreak is of interest to entomologists because of its association with rare oak-dominated woodlands of southern Ontario.

Distribution

Northern Oak Hairstreak (*S. f. ontario*) ranges from Massachusetts to Georgia and west to extreme southern Ontario and Michigan, Iowa, Oklahoma, and southcentral Texas. Globally, there are four subspecies of Oak Hairstreak, although only one subspecies, the Northern Oak Hairstreak, ranges in Canada. Northern Oak Hairstreak is considered widespread but localized and becomes increasingly scarce towards the northern edge of its range. In Canada, it is restricted to six subpopulations in southwestern Ontario: Port Stanley (#1, historical); Grimsby (#2, historical); Lambton County (#4, extant); Walpole Island (#5, unconfirmed), Windsor (#6, extant), and Middlesex (#7, extant). One individual was recorded from Point Pelee (#3, vagrant), however there are no additional records from this habitat and this sighting is not considered representative of a viable subpopulation.



Northern Oak Hairstreak (*Satyrium favonius ontario*) subpopulations in Canada (Table 1). Map produced by Gerry Schaus, Natural Resource Solutions Inc (May 2022).

Source : COSEWIC, 2022. COSEWIC assessment and status report on the Northern Oak Hairstreak *Satyrium favonius ontario* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 41 pp.

Habitat

In Canada, Northern Oak Hairstreak inhabits oak woodlands with > 60% canopy cover. Adults are nectar generalists and visit floral resources within forest openings or meadows adjacent to the oak forest edges. Larval food plant(s) are unconfirmed in Canada, although suspected to be White Oak (*Quercus alba*). In the northern portion of its range in the United States, females have been observed ovipositing on White Oak, which also occurs at habitats where extant Northern Oak Hairstreak subpopulations are recorded in Canada. Early instar larvae feed on pollen from buds and flowers but switch to chewing on young leaves as it develops through its five instars. Adults also feed on aphid honeydew and on pip gall honeydew secretions. Pip galls are created by small cynipid wasps that are parasitic on oak trees. The developing larva, within an oak acorn, is within a little gall that protrudes between an acorn and its cap. The gall excretes a sugary solution that covers the surface of the gall; hairstreaks consume this excretion or honeydew.

Biology

Northern Oak Hairstreak has a short flight period (mid-June to mid-July) and one generation per year in Canada. Adult lifespan is unknown but is

likely less than two weeks. Adults likely spend most of their time in the canopy of oak woodlands; a life history trait that makes surveys and abundance counts a challenge to accurately document. Eggs are laid on twigs in the oak woodland canopy, the eggs overwinter and hatch the following spring. Pre-pupal larvae crawl from the canopy, down the trunk of the tree and pupation occurs in the leaf duff at the base of oak trees. Male hairstreaks defend their mating territories and demonstrate hilltopping behaviour (mate-location behaviour where males create a territory on a hilltop and wait for females). When threatened, Northern Oak Hairstreaks rub their tailed hindwings to produce a distracting false head display. Records suggest that Northern Oak Hairstreak expanded its range further into southern Ontario and northeastern United States by several hundred kilometres in the last half of the 20th century and with climate change, further northward range expansion is expected.

Population Sizes and Trends

Little information on population trends and fluctuations is available for Northern Oak Hairstreak in Canada or the United States. Records suggest the species is not abundant although it is likely under detected. All observations in Canada have been adults, most often observed nectaring. Ground-level sightings are not considered a reliable indicator of subpopulation abundance.

Threats and Limiting Factors

Threats to Northern Oak Hairstreak are inferred from general threats to Lepidoptera in southwestern Ontario and the extent and quality of the habitat at known sites. The main direct threat to Northern Oak Hairstreak is broad-spectrum pesticide application to control outbreaks of non-native/invasive Spongy Moth (*Lymantria dispar dispar*). Other threats include ecosystem modifications resulting from inappropriate management of oak woodlands (e.g., long-term fire suppression), residential development, recreational activities that compact overwintering sites and trample nectar plants, oak wood harvesting, invasive species, and climate change. The main limiting factors for Northern Oak Hairstreak are speculative but likely include small subpopulation size, limited dispersal ability, and natural parasitic enemies.

Protection, Status and Ranks

Northern Oak Hairstreak and its host plant(s) are not protected by the Canada Species at Risk Act or the Ontario Endangered Species Act. The species has a global rank of Apparently Secure to Secure (G4G5T4) and a national (Canada) and provincial (ON) rank of Critically Imperilled (S1). The United States national rank is Apparently Secure (N4) and in Michigan (closest subpopulation to Canada), it is considered Critically Imperilled.

Source: COSEWIC. 2022. COSEWIC assessment and status report on the Northern Oak Hairstreak *Satyrrium favonius ontario* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 41 pp.

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Pumpkin Ash

Photo: © William van Harnissen



Scientific name
Fraxinus profunda

Taxon
Vascular Plants

COSEWIC status
Endangered

Canadian range
Ontario

Reason for designation

This rare tree occurs in forested wetlands in the Carolinian Zone of southern Ontario, where it is estimated the number of mature individuals has recently declined by over 90% due to impacts of invasive Emerald Ash Borer. Only two mature individuals are known and fewer than ten are expected to remain in Canada, and these potentially face additional threats from logging and land conversion. Over 400 known seedlings and saplings are also at continued risk from Emerald Ash Borer.

Wildlife Species Description and Significance

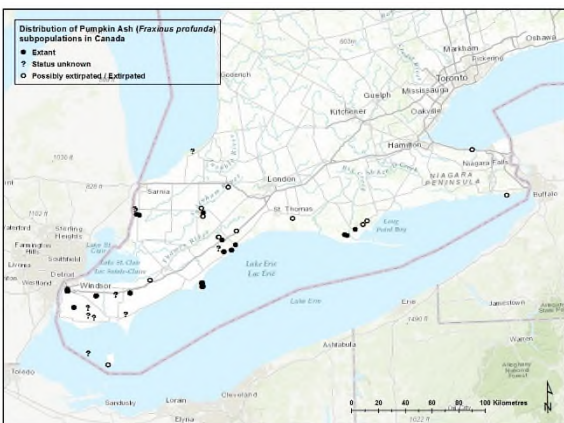
Pumpkin Ash (*Fraxinus profunda*) is a medium-sized, broad-leaved hardwood tree in the Olive Family (*Oleaceae*). It was first discovered in Canada in 1992. The opposite, pinnately-compound leaves are 20 to 45 cm long with leaflets which are densely pubescent on the bottom surface or, occasionally, only on the veins. Pumpkin Ash has the largest winged fruit (samaras) of any ash. Like most ash species in Canada, Pumpkin Ash is threatened by Emerald Ash Borer, an invasive non-native insect.

Morphological Description

Pumpkin Ash is a member of the Meliodes section of ashes, which includes White Ash and Green Ash. Pumpkin Ash is difficult to distinguish from other species especially if fruit is absent, but diagnostic vegetative key features can be used. The fruit of Pumpkin Ash has a broader wing and a longer calyx than other Meliodes ashes.

Distribution

Pumpkin Ash is native to eastern North America from Florida to extreme southern Canada. In Canada, Pumpkin Ash is only found in southwestern Ontario where it was previously reported from 39 subpopulations in Elgin, Essex, Lambton, Norfolk, and Middlesex counties, the Municipality of Chatham-Kent and the Regional Municipality of Niagara. Less than 1% of the global range of Pumpkin Ash occurs in Canada.



Canadian range of Pumpkin Ash (*Fraxinus profunda*). Map prepared by Alain Filion (COSEWIC Secretariat).

Source : COSEWIC, 2022. COSEWIC assessment and status report on the Pumpkin Ash *Fraxinus profunda* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 49 pp.

Habitat

Throughout its range, Pumpkin Ash occurs in swamps, wet floodplain forests and, occasionally, in brackish coastal swamps. In Canada, Pumpkin Ash occurs in intermediate-mature deciduous swamps often dominated by Silver Maple, and in floodplain forests. Much of the suitable habitat for Pumpkin Ash within its Canadian range has been lost since European settlement, and conversion of deciduous swamps to agriculture is continuing within its range.

Biology

Pumpkin Ash reaches sexual maturity (i.e., produces flowers and fruit) later than most other ash species in Canada. Flowers are unisexual and trees are dioecious. Like other ash species, the flowers of Pumpkin Ash are small and wind pollinated. The flowers emerge between late April and mid-May, generally at the same time as the leaves. Seeds mature from late summer to fall and are dispersed from October to December by wind and water. Seed production is infrequent. Pumpkin Ash seeds are generally short-lived with viability estimates ranging from a few months to two to three years after dispersal. For this reason, seedbanks are unlikely to persist at sites where sexually mature individuals have been killed by Emerald Ash Borer. Generation time for Pumpkin Ash is estimated at 60 years, which may be an underestimate for this

species, but has been used for other ash species, including Black Ash.

Population Sizes and Trends

There are currently 13 extant subpopulations in Canada with a total of 417 individuals counted in the following size classes: 1) <5 cm - 350 seedlings/saplings; 2) 5-10 cm - 56 saplings; 3) 10-20 cm - 11 immature trees; and 4) >20 cm – two sexually mature individuals (females) were found, both of which showed evidence of Emerald Ash Borer infestation. Based on fieldwork conducted for this status report, 15 subpopulations are known to be extirpated or presumed extirpated representing a 38% decline in number of subpopulations. The status of 12 subpopulations is unknown.

Emerald Ash Borer has caused mortality of a large number of mature Pumpkin Ash trees within one generation, but exact numbers of individuals lost is difficult to quantify due to a lack of historical abundance information. The total decline in the number of mature individuals over the previous generation is estimated to be over 90%.

Threats and Limiting Factors

Pumpkin Ash is threatened by Emerald Ash Borer, an Asian wood-boring beetle that has caused significant mortality of ash in southeastern Canada. Emerald Ash Borer is well established across the range of Pumpkin Ash in Canada, and it is estimated that over 90% mortality of mature Pumpkin Ash has already occurred. Based on the IUCN threats calculator, the overall threat impact for this species is Very High.

Other threats to Pumpkin Ash include: 1) land conversion to agriculture; 2) roads and utilities; 3) logging and wood harvesting; 4) recreational activities; 5) climate change; 6) deer-browsing, and 7) ecosystem modification by non-native plant species.

Photo: © William van Hemessen



Protection, Status and Ranks

Pumpkin Ash currently has no federal legal protection in Canada. In Ontario, habitat of Pumpkin Ash has some legal protection under provincial and/or municipal policies for the protection of woodlands, wetlands, and floodplains. The majority (54%) of extant Pumpkin Ash subpopulations are on private and municipal lands. Three extant subpopulations are on lands managed for conservation purposes (i.e., provincial parks and lands owned by groups such as the Nature Conservancy of Canada). Three subpopulations are on lands managed by conservation authorities for water resources and recreation.

Pumpkin Ash currently has a global conservation rank of Apparently Secure (G4) and a national conservation rank of Critically Imperilled (N1) in Canada and in Ontario, has a subnational conservation rank of Critically Imperilled (S1).

Source: COSEWIC. 2022. COSEWIC assessment and status report on the Pumpkin Ash *Fraxinus profunda* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 49 pp.

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Seaside Bone Lichen

Photo: © Stephen Schamoff



Scientific name

Hypogymnia heterophylla

Taxon

Lichens

COSEWIC status

Not at Risk

Canadian range

British Columbia

Reason for designation

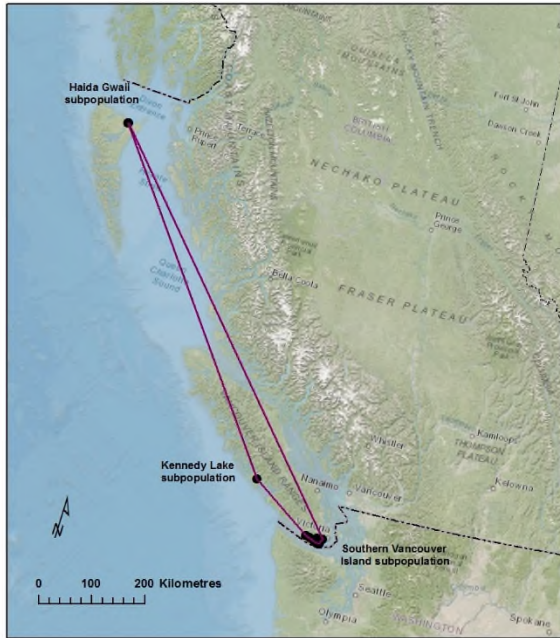
This leafy lichen is endemic to western North America, and in Canada was once thought to occur only on the southern tip of Vancouver Island. Two additional subpopulations have since been found, one farther north on Vancouver Island and the other on Haida Gwaii, significantly expanding its previously-known range and ecological amplitude. Surveys since the last assessment have revealed that there are between 600,000 and 3,000,000 thalli, a 30-fold increase in the known population. In view of this new information, this lichen is assessed as "Not at Risk". Threats include fires, housing developments, human intrusion, and pollution, but the overall impact is considered to be low. The effects of storms and summer droughts on this species could not be quantified but are unlikely to have a significant near-term impact on the very large population.

Wildlife Species Description and Significance

Hypogymnia heterophylla (Seaside Bone Lichen) is a large lichen with hollow, inflated, mostly ascending-spreading lobes that are irregular in width and which usually bear lateral lobules. The lichen is epiphytic and can grow to be 8 cm or more in diameter. The lichen has a whitish upper surface and black lower surface. Seaside Bone Lichen is locally abundant. It occurs in three areas in coastal British Columbia, where it represents the northernmost extension of a more widespread population that also occurs on the west coast of the United States.

Distribution

Seaside Bone Lichen is endemic to western North America. It is known from British Columbia in Canada and from California, Oregon, and Washington in the United States. In BC, it occurs on the southern tip of Vancouver Island, at Kennedy Lake on the western side of Vancouver Island, and on northern Graham Island, in the archipelago of Haida Gwaii.



Canadian occurrences of *Hypogymnia heterophylla* showing the estimated extent of occurrence (EOO) (red line). See Figures 3 and 4 for more details. The three subpopulations are the cluster of occurrences on southern Vancouver Island, the one at Kennedy Lake, and the one on Haida Gwaii. Map from COSEWIC Secretariat.

Source : COSEWIC, 2022. COSEWIC assessment and status report on the Seaside Bone Lichen *Hypogymnia heterophylla* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 46 pp.

Habitat

Seaside Bone Lichen occurs as an epiphyte, mostly on Shore Pine and Douglas-fir in open-canopy forest and on solitary trees along marine shores where ventilation is sufficient to dry the thalli and underlying substrates rapidly after rain. A small number of thalli have been observed on lignum of wooden fences near colonized trees.

Biology

Seaside Bone Lichen is a lichen that has a green alga as its photosynthetic partner. Asexual reproductive structures are lacking although very local dispersal may be possible following fragmentation of thalli. The main reproductive structures are apothecia produced by the fungal partner. These contain ascospores that are ejected at maturity and dispersed by wind and rain. Formation of a new thallus requires contact

of the germinated spore with a suitable algal partner. Longevity of the thalli is unknown but is at least a decade.

Population Sizes and Trends

There are three subpopulations of Seaside Bone Lichen in Canada. The total number of thalli in the subpopulations is estimated at between 600,000 and three million on about 30,000 trees. Nearly all of the known thalli occur in Canada in a small area on southern Vancouver Island, on promontories between Sooke and Victoria. A smaller subpopulation of the lichen, consisting of a few hundred thalli, has been discovered on the margin of Kennedy Lake on the west coast of Vancouver Island. A third very small subpopulation with fewer than 100 thalli has been found on Haida Gwaii, near the village of Masset. The trends in population size are unknown, but future declines are, in the absence of major climate alterations, likely to be small. The apparent increase in the size of the known Canadian population since the last assessment in 2008, is a result of greater search effort and understanding of the ecology of this species, rather than an increase in the population.

Threats and Limiting Factors

The threats assessment indicated that the overall threat, to the current very large population of the Seaside Bone Lichen, was low. The impact of housing development, human intrusion and air pollution is likely negligible. The effects of storms and summer drought could not be quantified for this lichen, which is believed to be resistant to these threats as it is most common on coastal promontories. The Seaside Bone Lichen may be affected by fires which are likely to increase in number as a result of climate change. Fires can lead to the loss of lichen thalli through mortality of host trees. However, the frequency and impact of fires, in the areas where the lichen is most abundant, are likely to be low. Finally, most of the Canadian population of Seaside Bone Lichen occurs at sites that have protected-area designations and are within a restricted geographic area, on the southern tip of Vancouver Island.

Protection, Status and Ranks

Seaside Bone Lichen is currently ranked by NatureServe globally as G4 (Apparently Secure) (2017) and nationally as N2 (Imperilled) in Canada. As of April 2019, it has been ranked S2 (Imperilled) and is Red-listed by the British Columbia Conservation Data Centre. However, the new data in this current report have not been incorporated into subnational or national ranks. Seaside Bone Lichen was assessed as Threatened by COSEWIC in 2008 and is listed under the government of Canada's Species at Risk Act (SARA). It has not been assessed by the International Union for the Conservation of Nature (IUCN).

Source: COSEWIC. 2022. COSEWIC assessment and status report on the Seaside Bone Lichen *Hypogymnia heterophylla* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 46 pp.

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Sharp-tailed Snake (Pacific Coast population)



Photo: © James Harding

Scientific name

Contia tenuis

Taxon

Reptiles

COSEWIC status

Threatened

Canadian range

British Columbia

Reason for designation

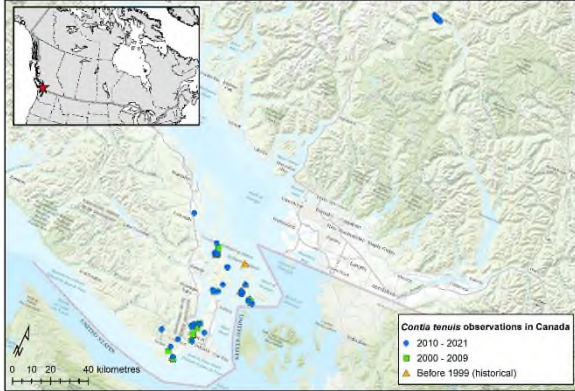
The Canadian distribution of this tiny snake is confined to a small area in southeastern Vancouver Island and the southern Gulf Islands of British Columbia. Increased search effort since the last assessment has resulted in the documenting of five previously unrecorded subpopulations, extending the known range. The number of mature individuals is thought to be ~12,000. These snakes continue to face threats from introduced species, ongoing development, off-trail recreation, habitat fragmentation by roads, and increasing droughts associated with climate change. The explosive growth of the introduced invasive Common Wall Lizard in recent years is of concern; these lizards may prey on eggs and hatchling snakes and have the potential to eliminate or greatly reduce some subpopulations in the near future. Re-evaluation of the degree of population fragmentation and better understanding of the snakes' distribution and abundance contributed to the change in status from Endangered to Threatened.

Wildlife Species Description and Significance

Sharp-tailed Snake, *Contia tenuis*, is a small, slender snake with a total length of adults usually less than 34 cm. Distinguishing features include unkeeled scales that give the snake a smooth appearance, solid dorsal colouration, and lack of prominent longitudinal stripes in adults. Distinctive black and white barring on the underside and a thorn-like scale at the tip of the tail are diagnostic. As one of only two species of the genus *Contia*, the species has scientific significance for evolutionary studies. On the coast, the species is a component of rare Garry Oak and Arbutus ecosystems.

Distribution

The global distribution of Sharp-tailed Snake extends from southwestern British Columbia to the central coast of California. In Canada, the species has been recorded from southern Vancouver Island, southern Gulf Islands in the Strait of Georgia (North and South Pender, Saltspring, and Galiano), and Pemberton Valley in mainland British Columbia, where it was discovered in 2011. The disjunct, relict Pemberton Valley population is at the northernmost extent of the species' range. Unique local adaptations are likely due to its long (thousands of years) isolation from its coastal counterparts, harsh climate, and distinct habitats. Two designatable units are therefore proposed: Pacific Coast population, including all island subpopulations, and Coast Mountains population, including the Pemberton Valley snakes.



Distribution of Sharp-tailed Snake in Canada. Symbols for different periods represent the last record of the species at each site. The Pacific Coast DU includes records from Vancouver Island and adjacent small islands in southwest British Columbia, whereas the Coast Mountains DU includes the northernmost cluster of records, in Pemberton Valley, mainland British Columbia. Map prepared by Sydney Allen (COSEWIC Secretariat).

Source: COSEWIC. 2021. COSEWIC assessment and status report on the Sharp-tailed Snake *Contia tenuis*, Pacific Coast population and Coast Mountains population, in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xvi + 63 pp.

Habitat

Sharp-tailed Snake inhabits low elevation, open-canopy woodlands dominated by Douglas-fir; Arbutus and/or Garry Oak are usually also present along the coast. The snakes are often found in or near forest openings on rocky outcrops and hillsides. Such habitats are naturally fragmented, which is exacerbated by human habitation, roads, and other developments. Occupied sites usually have good exposure to sun, shallow soil and leaf litter, and a large cover of rock. Rocky slopes with southern exposure provide warm microhabitats required for egg-laying and thermoregulation and are also used for hibernation. Such sites are exceedingly important and may be a limiting resource at the species' northern distributional limits. Available information suggests that individual snakes occur in approximately the same areas year-round with only minor seasonal shifts in habitat use; there is no evidence of long-range migratory movements, such as recorded for many larger snakes in temperate regions.

Biology

Sharp-tailed Snake is secretive and spends much of its time underground, making it difficult to find and study. Along the coast, the species has been detected in all months of the year, but surface activity peaks during the relatively cool periods in spring and fall; some activity also takes place on warm summer nights, especially after rain. In Pemberton, seasonal activity is limited by long cold periods in winter and high temperatures in summer. The diet is thought to consist mostly of slugs, including introduced species. Females lay a clutch of about three to five eggs, and young may take two to three years to mature, as reported for other small snakes. Individual Sharp-tailed Snakes can live nine years or more, and generation time is estimated to be five to seven years.

Population Sizes and Trends

The Pacific Coast population is estimated at roughly 12,000 and the Coast Mountains population at 350 mature individuals, based on recorded densities at a Vancouver Island site monitored intensively for 8 years. These values represent minimum estimates because the area of occupancy is incompletely known at most sites, and population size could not be estimated for three coastal wilderness sites that contain relatively large areas of unsurveyed habitat.

Population trends are unknown, but a continuing decline is inferred and projected from habitat trends and threats. In particular, loss of high-quality habitat has been documented over the past decade in Langford, Vancouver Island, and in Pemberton. The species continues to persist at most known sites, but there have been no further observations from Galiano Island since the original sighting in 1981.

Threats and Limiting Factors

The rarity of Sharp-tailed Snake in Canada is likely due to climatic and historical factors. The species exists at the northern limits of its range in southern British Columbia, and present-day populations are probably relicts from a more extensive past distribution. Habitat loss, degradation, and fragmentation due to housing and other developments pose major threats to both Pacific Coast and Coast Mountains populations. Invasive species, particularly Common Wall Lizard, pose an additional threat to the Pacific Coast population. Expanding road networks and high intensity off-trail recreational activities are threats at some sites. Summer droughts, predicted to increase in frequency and duration due to climate change, are a pervasive threat across the species' Canadian range, but climate change may also positively affect the species by increasing thermoregulation opportunities at the northern extremity of its range.

Protection, Status and Ranks

Under Canada's Species at Risk Act, Sharp-tailed Snake is listed as Endangered and is on Schedule 1, the official list of wildlife species at risk. A recovery strategy has been prepared, and a total 552.68 ha of Critical Habitat, distributed across the species' Canadian distribution, has been delineated. Records of the species exist from five federal lands, where the provisions of the Act are currently implemented. The species also occurs in several regional and municipal parks, where development on its habitat is limited. In the Gulf Islands, the majority of occupied sites are on unprotected private lands. In Pemberton Valley, the species occurs mostly on unprotected private and public lands. The Wildlife Act of British Columbia prohibits the collection, handling, and trade of all native wildlife species, including Sharp-tailed Snake, without a permit.

Source: COSEWIC. 2021. COSEWIC assessment and status report on the Sharp-tailed Snake *Contia tenuis*, Pacific Coast population and Coast Mountains population, in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xvi + 63 pp.

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Skillet Clubtail

Photo: © Danny O'Shea



Scientific name

Gomphurus ventricosus

Taxon

Arthropods

COSEWIC status

Special Concern

Canadian range

Ontario, Québec, New Brunswick, Nova Scotia

Reason for designation

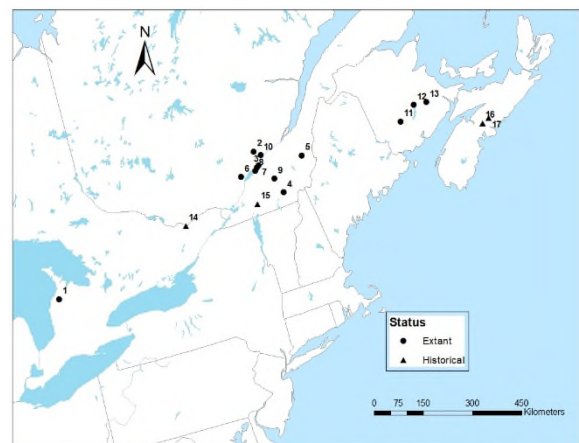
This dragonfly of eastern North America is rarely observed and only in small numbers at known sites. Larvae live in small to large rivers. It is thought that adults spend much of their time away from the river, foraging, and only return to breed - thus are seldom seen. Increased survey effort and reporting have resulted in the documentation of 10 new subpopulations since the first assessment in 2010, distributed across a much broader area, and there are now 13 known subpopulations. The species is exposed to urban and rural development, the cumulative effects of aquatic pollution to larvae, roadkill, boat wakes, and invasive aquatic species. Failure to mitigate these threats could result in the species becoming Threatened.

Wildlife Species Description and Significance

Skillet Clubtail is one of the most striking dragonfly species in Canada. Adults are characterized by a flat, pan-like expansion at the end of its otherwise slim abdomen. The body length is 45-48 mm long, dark brown and black, with conspicuous yellow markings on the dorsal abdomen, greenish-yellow markings on the thorax, dark green eyes, and clear wings.

Distribution

The global range of Skillet Clubtail is confined to North America east of the Mississippi and Red rivers, north to Minnesota and New Brunswick, and south to Tennessee. In Canada it occurs in 13 widely separated subpopulations in southern Ontario (Saugeen River), southern Québec (Batiscan, Bécancour, Nicolet, Nicolet-Sud-Ouest, Sainte-Anne, Godefroy, Saint-François, Chaudière, and Chicot rivers), New Brunswick (Saint John, Salmon, and Canaan rivers), with additional historical subpopulations in Québec, Nova Scotia, and in Ontario.



Canadian subpopulations of Skillet Clubtail (*Gomphurus ventricosus*) with records from 1924–2021 (Table 1). Map prepared by A. Harris

Source: COSEWIC. 2022. COSEWIC assessment and status report on the Skillet Clubtail *Gomphurus ventricosus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 47 pp.

Habitat

Skillet Clubtail larvae live in small to large rivers with a silt, cobble, and bedrock substrate and pools and patches of soft sediments. They inhabit a wide range of waters; ranging in clarity from clear to stained and relatively turbid. Adult habitat is poorly understood, and adults are rarely observed. Adults apparently spend most of their lives in forests and open habitats within up to approximately three kilometers of the river.

Biology

Skillet Clubtail has three life stages and develops through complete metamorphosis. Females deposit their eggs in the water, and the larvae hatch and create shallow burrows in the soft substrates, where they can take at least two years to develop before adult emergence. In the centre of the continent, the species emerges in late May and fly to mid August, but over most of its Canadian range, the species has a synchronous adult emergence in the latter two weeks of June. Following emergence, the dragonflies fly from the river for an extended period of maturation. Adults appear to spend little time near the larval waters, and likely spend most of their life in the surrounding forest.

Population Sizes and Trends

The Canadian population size and trends of Skillet Clubtail are unknown. Since the first COSEWIC status report, eight previously unknown subpopulations have been documented in southern Ontario and Québec; as well as museum specimens from two additional Québec subpopulations. Substantial search effort in New Brunswick has produced few records of the species, suggesting that it is rare in that province. The record in Ontario from along the Ottawa River remains historical.

Threats and Limiting Factors

There are four low-level threats to Skillet Clubtail individuals and habitats. These threats include habitat loss to both the terrestrial adult foraging life stage, and aquatic larval stages, caused by housing and urban development; adult roadkill is ongoing at most subpopulations; wave-wash from passing boats may kill emerging dragonflies on the larger rivers; and water

pollution from agricultural run-off. Threats of unknown impact include aquatic invasive species that change the habitat and/or consume dragonfly larvae, water quality changes caused by residential development, and dams and water management. Rising sea levels are a potential future threat to the Saint John River subpopulation.

Protection, Status and Ranks

Skillet Clubtail was designated as Endangered in 2010 and is listed under Schedule 1 of the federal Species at Risk Act. Skillet Clubtail is classified as Endangered under New Brunswick's Species at Risk Act and Data Deficient under Ontario's Endangered Species Act. In Québec, this species is on the Liste des espèces floristiques et fauniques susceptibles d'être désignées menacées ou vulnérables (List of plant and wildlife species which are likely to be designated as threatened or vulnerable).

The federal Recovery Strategy identifies critical habitat for Skillet Clubtail on four sections of the Saint John River and two sections of the Batiscan River. River and stream habitats in Canada receive some protection under the federal Fisheries Act where fish habitat is present, although this protection does not specifically apply to Skillet Clubtail. Provincial water protection acts offer protection to water quality and flow in lakes and rivers. None of the larval habitats of Canadian subpopulations are within parks or other protected areas and most of the terrestrial habitat surrounding the rivers is privately owned.

Skillet Clubtail is ranked as G3 (Vulnerable) globally, N2 (Imperiled) in Canada and N3 nationally in the United States. It is ranked as S1 (Critically Imperiled) in Québec, Nova Scotia, and Ontario, and S1S2 (Critically Imperiled to Imperiled) in New Brunswick. The International Union for Conservation of Nature (IUCN) Red List of Threatened Species ranks Skillet Clubtail as Least Concern.

Source: COSEWIC. 2022. COSEWIC assessment and status report on the Skillet Clubtail *Gomphurus ventricosus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 47 pp.

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Vancouver Island Shieldback

Photo: ©James Miskelly



Scientific name

Steiroxys cf. strepens

Taxon

Arthropods

COSEWIC status

Endangered

Canadian range

British Columbia

Reason for designation

This flightless shieldback katydid has an extremely limited distribution on southern Vancouver Island with fewer than 10 observations between 1990 and 2011. The only recent records are from a small urban park, Mount Tolmie, in Greater Victoria. The population inhabits Garry Oak ecosystems which have experienced historical and widespread habitat loss. The impacts from increased predation by invasive European Wall Lizards, and decline in habitat quality in an urban park threaten the existence of this shieldback in Canada.

Wildlife Species Description and Significance

Vancouver Island Shieldback (*Steiroxys cf. strepens* Fulton 1930) is a 25-30 mm (body

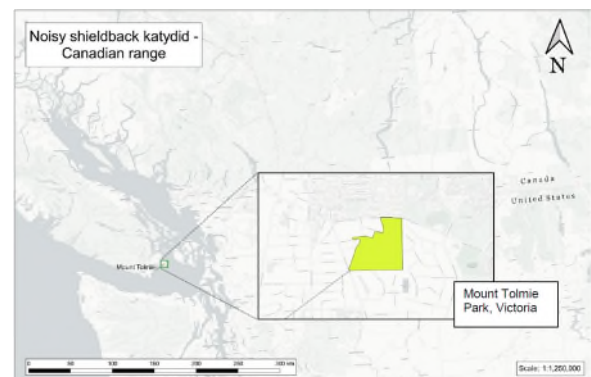
length) katydid in the family Tettigoniidae. Shieldback katydids are characterized by their short, robust bodies and thin antennae that are longer than the body.

Distribution

The global range of Vancouver Island Shieldback is only known from Mount Tolmie Park in the District of Saanich, southeastern Vancouver Island.

Vancouver Island Shieldback is known from Canada based on five records from Mount Tolmie and one from southern Vancouver Island prior to 1985.

Surveys in the past 15 years for Vancouver Island Shieldback have focused on finding new occurrences and continued presence at Mount Tolmie. Between 2010 and 2018 more than 30 sites in potential habitat, and more than 30 hours of survey effort during active period of adults (July to September) occurred. In 2019 (6 sites) and 2021 (5 sites) were targeted for more intensive search effort: a total of more than 97 hours and 75 kms. No Vancouver Island Shieldbacks were observed in 2019 nor 2021.



Canadian range for Vancouver Island Shieldback (*Steiroxys cf. strepens*), formerly known as Noisy Shieldback Katydid; one site at Mount Tolmie park in Saanich, BC. Map by Greg Amos

Source: COSEWIC. 2022. COSEWIC assessment and status report on the Vancouver Island Shieldback *Steiroxys cf. strepens* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 42 pp.

Habitat

The natural habitat in Mount Tolmie Park is sparsely vegetated Garry Oak and associated scrub oak woodland. These open meadow habitats are sparsely treed with Garry Oak, Douglas-fir, Arbutus, and other species. Understory vegetation includes native and introduced grasses with a high diversity of forbs, and shrubs. These scrub oak woodlands can also occur on inland cliffs, bluffs, and rocky outcrops that have been formed by erosion, the collapse of rock faces or riverbanks, and cumulative deposition of organic matter over time. The soils on these cliffs and bluffs form within the ledges, bedrock fissures and crevices, which then support grasses, mosses, lichens, and stunted trees and shrubs. Such habitats are potential areas where Vancouver Island Shieldback could occur.

Shieldback katydids, in general, establish territories (the males), seek shelter, hunt, and remain camouflaged from predators.

Biology

The life cycle of Vancouver Island Shieldback is poorly understood and notes here are based largely on Noisy Shieldback and other *Steiroxys* spp. Nymphs resemble smaller versions of adults and grow through a series of moults until the species reaches maturity, at 25-30 mm, in mid-summer. Adults do not fly. Males call in a series of very short rasping chirps beginning with a few notes and increasing to a rapid flutter.

Population Sizes and Trends

No information on the Canadian population size or trends are available, although numbers are presumed to be small.

Threats and Limiting Factors

The highest impact threat to Vancouver Island Shieldback is likely predation by non-native European Wall Lizards and domestic cats. Human activity, both recreational and work to maintain the park, are also threats. The habitat quality at Mount Tolmie Park is inferred to be declining from the cumulative impacts of fire

suppression and the subsequent encroachment of native and non-native/invasive plants. Road mortality may also be a threat.

Protection, Status and Ranks

Vancouver Island Shieldback is not protected under provincial or federal legislation. The species is not yet ranked globally. The conservation status rank (as Noisy Shieldback) is imperiled, nationally and provincially (N1, S1) (Gelling pers. comm. 2022).

Source: COSEWIC. 2022. COSEWIC assessment and status report on the Vancouver Island Shieldback *Steiroxys* cf. *strepens* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 42 pp.

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Victorin's Gentian

Photo: © Frédéric Coursol



Scientific name

Gentianopsis virgata ssp. *victorinii*

Taxon

Vascular Plants

COSEWIC status

Special Concern

Canadian range

Quebec

Reason for designation

This short-lived annual or biennial plant is endemic to Canada, and occurs in highly-restricted tidal freshwater or brackish shoreline habitats of the St. Lawrence River estuary in Quebec. About 30,000 mature plants are presently known from 35 small localized coastal sites. It is at risk from a wide range of threats, including habitat damage and loss through competition with invasive plant species, erosion and inundation from the effects of climate change, disruption by all-terrain vehicles, and potentially from oil spills. Change of status from Threatened in the previous assessment largely reflects a change in the definition of some assessment criteria. This subspecies is near to

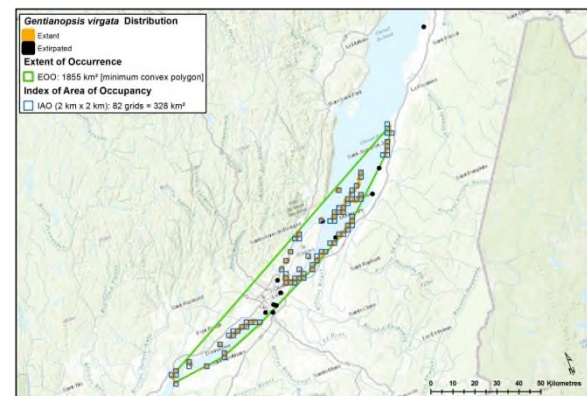
qualifying for Threatened status, and failure to effectively mitigate these threats could result in the species becoming Threatened.

Wildlife Species Description and Significance

Victorin's Gentian (*Gentianopsis virgata* ssp. *victorinii*) is an annual or biennial plant about 15-50 cm in height. It is the only species of gentian that occurs in freshwater tidal marsh habitat in the lower St. Lawrence River.

Distribution

Victorin's Gentian is endemic to the St. Lawrence estuary of southern Quebec, where it grows exclusively in freshwater tidal marsh habitat along both shores of the lower St. Lawrence River in Quebec.



Current distribution of Victorin's Gentian in Canada showing extant and extirpated occurrences, extent of occurrence and index of area of occupancy (COSEWIC Secretariat).

Source: COSEWIC. 2022. COSEWIC assessment and status report on the Victorin's Gentian *Gentianopsis virgata* ssp. *victorinii* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 37 pp.

Habitat

Victorin's Gentian typically occurs in tall, dense Prairie Cordgrass beds and sometimes on raised rock outcrops. It prefers thick surface deposits (over 15 cm) of fine or mixed texture (seldom coarse), with no, or very few, stones (very stony on rare occasions). This zone is covered by water for two to three hours a day during high tides but is seldom reached by low tides or lower high tides.

Biology

Victorin's Gentian flowers from mid-July to mid-September and is an annual, winter annual or biennial plant. The flowers exhibit nyctinasty, remaining closed on overcast days and when submerged by the tide. Pollination is by insects. Fruiting begins in August and continues until October. The seeds are dispersed by water. It is assumed that seed banks are produced with a viability of at least a few years.

Population Sizes and Trends

The subspecies is known from 48 subpopulations: 35 extant, one historical, seven extirpated, and five not relocated. The total Canadian population numbers at least 30,432 individuals, concentrated mainly in six subpopulations (which represent 70% of the population).

Subpopulation size fluctuates from year to year. Since the last status report update, five new subpopulations have been discovered and seven are considered to have been extirpated. There is no overall trend identified at the scale of the area of occupancy.

Threats and Limiting Factors

The most serious threats to the subspecies are the encroachment on its habitat by invasive non-native plants, the effects of climate change, and recreational activities and other human disturbances. The subspecies is considered highly vulnerable to climate change impacts.

Protection, Status and Ranks

Victorin's Gentian was assessed as Threatened in Canada by COSEWIC in 2004 and added to Schedule 1 of the Species at Risk Act. The Centre de Données sur le Patrimoine Naturel du Québec has assigned it the NatureServe global rank of Imperilled (G2), a Canadian rank of Imperilled (N2), and a provincial rank of Imperilled (S2).

Victorin's Gentian was designated as Threatened in Quebec, in February 2001 and is currently protected under the Act Respecting Threatened or Vulnerable Species. Twenty-five extant subpopulations occur partially or completely within protected areas.

Source: COSEWIC. 2022. COSEWIC assessment and status report on the Victorin's Gentianopsis virgata ssp. victorinii in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 37 pp.

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