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Canada

Grey-headed Chickadee

Photo: © Clyde Morris

Scientific Name

Poecile cinctus

Taxon

Birds

COSEWIC status

Endangered

Canadian Range

NT, YT

Reason for designation

This small passerine bird has a Holoarctic distribution from northern Europe across Asia, and into extreme northwestern North America. Historical Canadian range included Northwest Territories but more recently it has only been seen in Yukon, where there have been only two observations in Canada since 2000 despite extensive surveys in 2019. Although little is known about this species in Canada, it is considered at risk due to its very small population, and an inferred and projected decline in numbers. Key threats are likely climate change and severe weather, and related changes in natural processes such as freeze-thaw cycles and wildfire. These in turn affect the quality of habitats used for nesting, roosting, foraging, and food storage.

Wildlife Species Description and Significance

Grey-headed Chickadee (*Poecile cinctus*) is a brown-capped chickadee similar in appearance to Boreal Chickadee, but distinguished by white cheeks and neck, lighter flanks, and white-edged wing feathers. Both sexes have similar plumage. Grey-headed Chickadee vocalizations can be reliably distinguished from other chickadees by a distinct vocalization, the *EL* call, characterized by a spectrogram that resembles the capital letter "L". The subspecies resident in Canada, *P. c. lathami*, is endemic to North America. Grey-headed Chickadee is one of the least understood bird species in North America due to limited scientific monitoring and research, and its remote, largely inaccessible range with a sparse and dispersed human population. It has apparently suffered declines despite living year-round in remote, intact wilderness.

Distribution

Grey-headed Chickadee has a Holarctic distribution from northern Europe across Asia and into extreme northwestern North America. Historical Canadian range included Northwest Territories but recent data suggest a northward contraction of its historical North American range to the British-Richardson Mountains and Old Crow Basin ecoregions of northern Yukon, and the Brooks Range of northern Alaska. There are only two records in Canada since 2000, with no birds detected during extensive surveys (historical revisits and design-based samples using autonomous recording units) and data processing (automated and manual processing of recordings) in Yukon in 2019.

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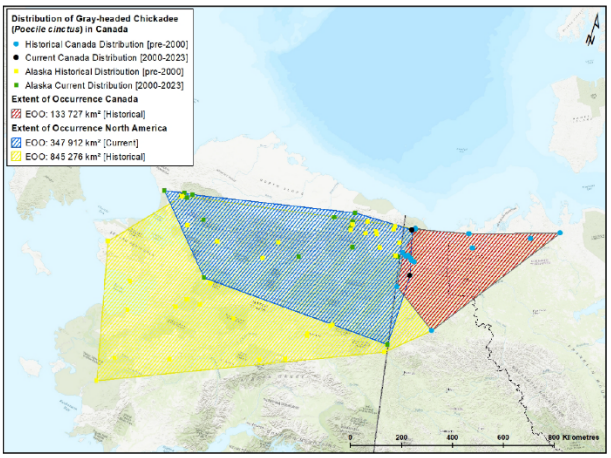
Canada



Historical (pre-2000) and current (2000-2023) extent of occurrence (EOO) for Grey-headed Chickadee (*Poecile cinctus*) in North America and Canada. Current Canadian EOO cannot be mapped as there are only two documented records from 2000 to 2023.

Source: COSEWIC. 2024. IN PRESS. COSEWIC assessment and status report on the Grey-headed Chickadee *Poecile cinctus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiii + 50 pp.

Habitat

Grey-headed Chickadee is a year-round resident thought to occur in similar habitat throughout the year. It generally occurs within mixed conifer-deciduous forests in the Arctic-Boreal region near the northern and western edge of the tree line within the Taiga Cordillera ecozone. Breeding habitat is dominated by spruce and willow (e.g., riparian areas and tall shrublands) and stands of Balsam Poplar. Grey-headed Chickadee is an obligate cavity nester, excavating new cavities or renovating natural cavities or woodpecker holes. Shifts in landcover, forest type, and tree composition within the Arctic-Boreal region within the last 20-30 years coincide with the northward range contraction of Grey-headed Chickadee.

Biology

Grey-headed Chickadee is a monogamous breeder, likely breeding at one year of age and producing one brood per year. Pairs nest singly and birds winter in small flocks. Nest-building begins in early May, clutch size is typically 6-10 eggs, incubation period is 14-15 days, and nestling period is 19 days. Females brood newly-hatched young, and both parents feed fledglings for approximately 10 days, after which young begin to disperse. Generation length is estimated to be 2.2 years. Key limiting factors for Grey-headed Chickadee are not well known. The species may be susceptible to abrupt population declines because it is non-migratory, occupies a harsh northern climate, and has a small population size, distribution, and year-round range. Additional limiting factors may include competition with Boreal Chickadee, dependence on cached food during non-breeding periods, and dependence on the availability of suitable nest and roost trees.

Population Sizes and Trends

Survey data are insufficient to estimate the size of the Grey-headed Chickadee breeding population in Canada. Surveys at 24 targeted sites where they historically occurred and 62 design-based survey sites from the Boreal Bird Monitoring Program in northern Yukon in 2019 failed to detect the species. Bayesian analysis based on assumed detection ranges and simulations of various abundances of Grey-headed Chickadee indicates that this result of no detection occurs in 50% of simulations when there are 159 individuals in the population (i.e., a 50% probability that there are fewer than 159 mature individuals in Canada). These simulations also suggest a 99% probability that the number of mature individuals is less than 1000 and a 68% probability that the number of mature individuals is less than 250. Survey data are insufficient to quantify population trends in Canada. However, a continuing decline is inferred based on substantial contraction of the extent of occurrence in recent decades in both Canada and Alaska, and the scarcity of recent records from sites that previously provided regular sightings.

Threats and Limiting Factors

The key threats to Grey-headed Chickadee are thought to be climate change and severe weather, and natural system modifications (wildfire). Continuing and interacting climate-induced changes in natural disturbance, natural processes, and forest conditions cause ongoing shifts likely to reduce the area, spatial location, and temporal distribution of mature forest

containing suitable dead, dying, or damaged trees for roosting and nesting, and live trees for foraging. Climate-induced changes in temperature, humidity, number of freeze-thaw events, and the presence/absence of deep-freeze events may influence the quality and integrity of cached food during the non-breeding period. Hybridization with Boreal Chickadee may pose an additional threat as preliminary evidence of hybridization between Grey-headed and Boreal Chickadee has been found in northern Alaska. Overall threat impact is Medium – Low.

Protection, Status, and Ranks

Grey-headed Chickadee is afforded protection in Canada under the *Migratory Birds Convention Act*. NatureServe ranks (2024) for Grey-headed Chickadee are Vulnerable to Apparently Secure (G3G4) globally, Critically Imperilled (N1) in Canada, Critically Imperilled (S1) in Yukon, and Critically Imperilled to Imperilled (S1S2) in Alaska. It is considered Unrankable (SU) in Northwest Territories. The Alaska Species Ranking System also ranks the species II Red, i.e., of very high conservation concern.

Source: COSEWIC. 2024. IN PRESS. COSEWIC assessment and status report on the Grey-headed Chickadee *Poecile cinctus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiii + 50 pp.

For more information, please visit:
https://species-registry.canada.ca/index-en.html

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Canada

Domed Disc

Photo: © Robert Forsyth

Scientific Name
Discus patulus

Taxon
Molluscs

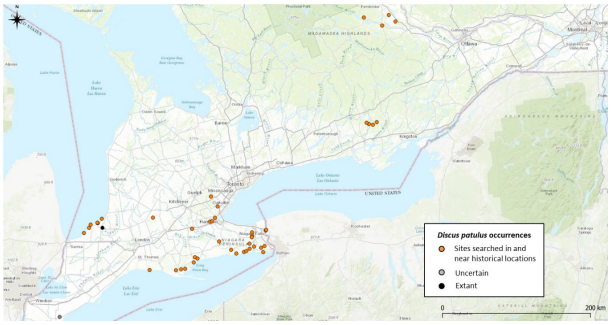
COSEWIC status
Endangered

Canadian Range
ON

Reason for designation
This medium-sized land snail (shell diameter about 1 cm) is known to occur at a single 150 ha site within mature Carolinian forest in southern Ontario. It may still occur at a second site that has not been recently searched. The known extant site only contains approximately 20% suitable forested habitat; the snail's micro-distribution is further restricted because individuals tend to aggregate under fallen, rotting logs. The species has been extirpated from 11 historical occurrences in southern Ontario and continued searches have not found other subpopulations. The main threats are climate change (droughts, changes in frost regimes) and invasive species (e.g., earthworms and slugs). The species' highly restricted distribution, its limited dispersal, and history of extirpation at similar adjacent sites undergoing agricultural expansion are the reasons for the designation.

Wildlife Species Description and Significance
Domed Disc (*Discus patulus*) is a medium-sized land snail (adult shell width about 1 cm) with a depressed, red-brown shell that has a large hole (umbilicus) on the underside. There is a thin flat layer (callus) at the base of the shell opening and coarse radial ribbing. This Canadian population is part of the unique Carolinian Forest fauna and has significance for ecosystem functioning through nutrient cycling as well as for the global conservation of this species as it is a range edge population. All species are significant and are interconnected and interrelated. There is no species specific Aboriginal Traditional Knowledge in the report.

Distribution
The species' global distribution extends in the United States from Michigan in the northwest to New York in the northeast, southward from southern Ontario in Canada to Louisiana and Florida. In Canada, the species may still be extant in Middlesex and Essex counties (Co.), southwestern Ontario. The species appears to have been extirpated from about 11 historically occupied southwestern Ontario sites.



Canadian distribution of Domed Disc (*Discus patulus*) in Ontario based on records compiled for this report (Table1). "Extant" (black dot) means that shells or live individuals have been found in the site within the last 20 years. "Uncertain" (grey dot) means the presence of the species is uncertain, because habitat was not accessible (private land). Because exact historical sites were not always identifiable within the current land use, all searched sites in the vicinity of historical occurrences (Table 1) are indicated as "historical" (orange dots).

Source: COSEWIC. 2024. IN PRESS. COSEWIC assessment and status report on the Domed Disc *Discus patulus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 46 pp.

Habitat
In North America, Domed Disc inhabits mature and late-successional forests, usually in river ravines with steep slopes, and can be found clustered under rotten logs and in deep leaf

litter. Habitat at the only known occupied Canadian site (Middlesex Co.) is surrounded by unsuitable arable land and a river. Habitat appears intact at the other possibly occupied site (Essex Co.) but the privately-owned land was not searched.

Biology

Domed Disc is an egg-laying land snail. Reproduction probably occurs in spring and late-summer. Hibernation extends from early October until April in temperate regions. Aestivation in summer may occur only during prolonged drought. Sexual maturity may be reached at 1 year and the species may live for 2–3 years. The species may mainly feed on decaying wood or fungi in the litter. Active dispersal for colonization of new areas is extremely slow because the species is generally found in sheltered micro-habitat (logs, rocks). There is no evidence of transportation by humans.

Population Sizes and Trends

The species is extirpated from 11 historical occurrences in Canada. One occurrence is considered extant (last collection from 2008), another is uncertain because it is on private land that has not been searched since 1994, and another possible occurrence (collection from 1899) remains unknown (exact coordinates unknown and no public land in the general area). The origin of another record, from drift material along the Thames River, also is unknown. The sole known extant subpopulation is within 148 ha of protected land of which about 30–40 ha is mature forest and forested slopes. The distribution of individuals in the habitat is patchy because colonies form in association with fallen logs.

Threats and Limiting Factors

Low dispersal ability and low physiological resistance to fluctuating environmental factors such as temperature and humidity are limiting factors. The main threat for Domed Disc is climate change (droughts, changes in frost regimes) and invasive species, such as earthworms, which are destroying the leaf-litter or slugs that may be competitors for shelter and food.

Protection, Status, and Ranks

Domed Disc has no legal designations. It is ranked globally secure (G5) and nationally secure (N5) in the US but imperilled (N2) in Canada and Ontario (S2).

Source: COSEWIC. 2024. IN PRESS. COSEWIC assessment and status report on the Domed Disc *Discus patulus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 46 pp.

For more information, please visit https://species-registry.canada.ca/index-en.html

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Canada

Cleland's Evening-primrose

Photo: © Parick Deacon

Scientific Name

Oenothera clelandii

Taxon

Vascular Plants

COSEWIC status

Endangered

Canadian Range

ON

Reason for designation

This relic of dry tallgrass prairie communities occurs from mid-western United States to Ontario. In Canada, this prairie wildflower is known from four isolated sites in southwestern Ontario. While no plants have been seen since 2001, it may still be present within the seedbank. Its decline in Canada is thought to be due to habitat loss and degradation through development, fire suppression, and competition with exotic and native terrestrial plants.

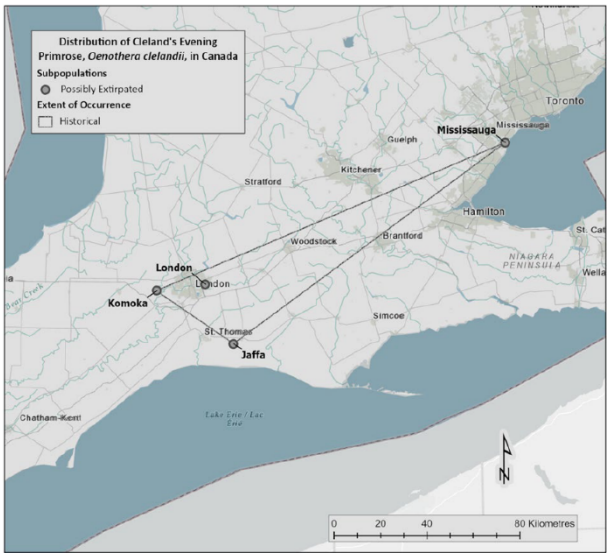
Wildlife Species Description and Significance

Cleland's Evening-primrose (*Oenothera clelandii*) is primarily a biennial forb that produces spikes of yellow flowers between the months of July and August in Ontario. The species may be a relic of the tallgrass prairie communities that extended into Ontario and from the United States Midwest that once comprised a large portion of the southern Ontario landscape following the retreat of the Laurentide Ice Sheet.

The Canadian population of Cleland's Evening-primrose 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 ranges.

Distribution

The range of Cleland's Evening-primrose reaches its northern extent in Canada where it has been documented at four subpopulations within the Carolinian life zone of southwestern Ontario. In the United States, the species' distribution extends from Wisconsin east to New Jersey and south to Arkansas.



Distribution of Cleland's Evening-primrose historical subpopulations in Ontario, Canada

Source: COSEWIC. 2023. IN PRESS. COSEWIC assessment and status report on the Cleland's Evening-primrose *Oenothera clelandii* in Canada.

Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiv + 41 pp.

Habitat

Cleland's Evening-primrose grows on dry sandy soils in fields, prairies, sand barrens, and savannahs as well as along roadsides and rail corridors. Within these habitats, the species often favours full sunlight and areas where disturbance of the soil has resulted in patchy cover of herbaceous vegetation and bare substrates. In Ontario, the species is known from dry tallgrass prairie habitats and open sandy areas along rail corridors and roads. Throughout much of its range, the quality of habitat is generally in decline due to competition from invasive species and the lack of natural disturbance including fire suppression.

Biology

Cleland's Evening-primrose is a mainly biennial forb that reproduces by seed. Most plants require a two-year life cycle and produce a basal rosette of leaves in the first year followed by a flowering stem and seed production in the second year. Plants are self-compatible and capable of self-fertilization. The night-flowering blooms, which include a relatively long floral tube, are pollinated by long-tongued insects including sphinx moths (*Sphingidae*) as well as other moths, bees, butterflies, flies, and hummingbirds. Evening-primrose seed can remain viable for up to several decades and may remain dormant in the seed bank until soil disturbance occurs and creates favourable conditions for the species to germinate.

Population Sizes and Trends

All known subpopulations in Canada appear to be possibly extirpated based on targeted surveys that were conducted at all four subpopulations in 2022. A stem count estimate was not provided for the Jaffa subpopulation in 1975 but the species was noted to be sparse and rare and the subpopulation is assumed to have been composed of few mature individuals. Plants in the Mississauga subpopulation were noted to be uncommon with approximately 30 individuals in flower in 1985. The London subpopulation was composed of few plants in 1993. All three of these subpopulations have undergone substantial habitat changes due to the proliferation of invasive species. The Komoka subpopulation contained as many as 200 to 300 plants in a localized area in the 1990s and the number of plants was described as abundant in the early 2000s. The last observation of the species in Canada was at Komoka in 2001 prior to a development that likely extirpated or severely reduced that subpopulation. Based on the estimated stem counts at each subpopulation, the negative search efforts in the intervening years, and changes that have occurred at each site, it is likely that all mature plants had disappeared prior to 2012. In the absence of mature plants, the continued persistence of the species at all subpopulations now relies on the germination of seed bank material, if present.

Threats and Limiting Factors

The main threats to the species include the modification of soil disturbance and fire regimes and the establishment of competitive vegetation including invasive species that has resulted in habitat degradation. Residential development is also a main threat at one subpopulation. The increased competition from invasive species noted at all four subpopulations is largely the result of the fire suppression, which is a threat to the persistence of dry prairie habitats. Ongoing site development continues to threaten the rail corridor sites in London and Mississauga.

Protection, Status, and Ranks

Cleland's Evening-primrose is not currently afforded any legal protection in Canada. It receives protection in the state of Ohio where it is listed as Endangered. It is ranked S1 (Critically Imperilled) in Arkansas and ranked S2 (Imperilled) in Missouri. The Global NatureServe conservation rank for the species is G3G5 (Vulnerable to Secure). It is ranked N1 (Critically Imperilled) in Canada, S1 in Ontario, and is unranked nationally for the United States. Three of the four documented Canadian subpopulations are located on private land, including one on conservation authority land. The fourth site is on land owned by the Government of Ontario.

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Source: COSEWIC. 2023. IN PRESS. COSEWIC assessment and status report on the Cleland's Evening-primrose *Oenothera clelandii* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiv + 41 pp.

For more information, please visit
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Canada

Pine Broomrape

Photo: © Erin Miller

Scientific Name
Aphyllon pinorum

Taxon
Vascular Plants

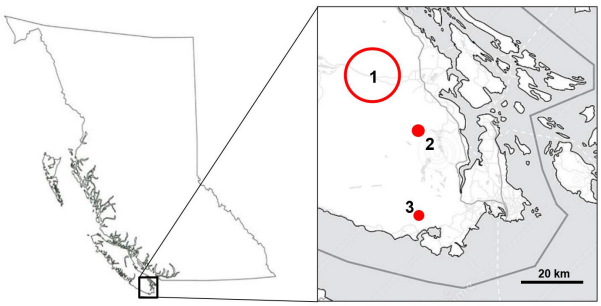
COSEWIC status
Endangered

Canadian Range
BC

Reason for designation
The Canadian population of this parasitic annual plant consists of fewer than 60 mature individuals where it remains in two forested areas on Vancouver Island at the northern extent of its North American range. In the past, plants have been lost due to logging, and currently it is threatened by recreational activities, especially trail building/maintenance, and increased ignition sources for forest fires. With a very small population and restricted distribution, this plant is at risk of extirpation from Canada.

Wildlife Species Description and Significance
Pine Broomrape (*Aphyllon pinorum*) is a parasitic annual forb that develops from a large subterranean tuber-like mass. It lacks chlorophyll and produces erect, branched stems with numerous tubular, yellowish to purplish flowers and abundant tiny, dust-like seeds in its capsular fruits.

Distribution
Pine Broomrape is an uncommon species along the west coast of North America, from southern Vancouver Island south to California. Disjunct subpopulations also occur in the interior of the Pacific Northwest (northern Idaho, eastern Washington, and eastern Oregon) and the mountains of New Mexico.



Range of Pine Broomrape in Canada. 1 = 'Cowichan River' (general locality); 2 = Koksilah River Provincial Park; 3 = Sooke Potholes Regional Park.

Source: COSEWIC. 2024. IN PRESS. COSEWIC assessment and status report on the Pine Broomrape *Aphyllon pinorum* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 28 pp.

Habitat
Pine Broomrape is closely associated with dry coniferous forest habitats, where it requires the presence of its host plant, Oceanspray, for successful seed germination and plant development. Canadian subpopulations are specifically associated with forests of Douglas-fir.

Biology
This is an annual species that reproduces primarily through self-fertilization, although it occasionally outcrosses via insect pollinators [bees]). It is completely dependent as a parasite on it's host, Oceanspray, from which it derives the water, minerals, and nutrients required for development. The minute seeds are well adapted for wind dispersal; however, dispersal distance may be reduced within the typically dense, forested habitats that the species occupies.

Population Sizes and Trends
Two extant subpopulations of Pine Broomrape are known in Canada, both from southern

Vancouver Island, although a third subpopulation with inconclusive details is known from a historical collection. Little data on long- or short-term trends in these subpopulations have been published, but current estimates of abundance at the two known sites suggest that the entire Canadian population numbers fewer than 60 individuals.

Threats and Limiting Factors

The primary threats to this species in Canada include recreation (especially trail building/maintenance) and the potential loss of its forested habitats through stochastic events (e.g., high-intensity fire); however, as both known subpopulations occur largely or entirely within protected areas (provincial and regional parks); they are afforded some level of protection from large-scale ecosystem impacts that could eliminate suitable habitat.

Protection, Status, and Ranks

Pine Broomrape currently has no legal protection in Canada. It is ranked in British Columbia (2019) as S1S2 - Critically Imperilled to Imperilled, placing it on the provincial red list. At the global scale, NatureServe ranks this species as Apparently Secure (G4; reassessed 2024). In Canada, all known subpopulations occur largely or entirely within protected parks.

Source: COSEWIC. 2024. IN PRESS. COSEWIC assessment and status report on the Pine Broomrape *Aphyllon pinorum* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 28 pp.

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Canada

Mudpuppy (Manitoba population)

Photo: © Scott Gillingwater

Scientific Name
Necturus maculosus

Taxon
Amphibians

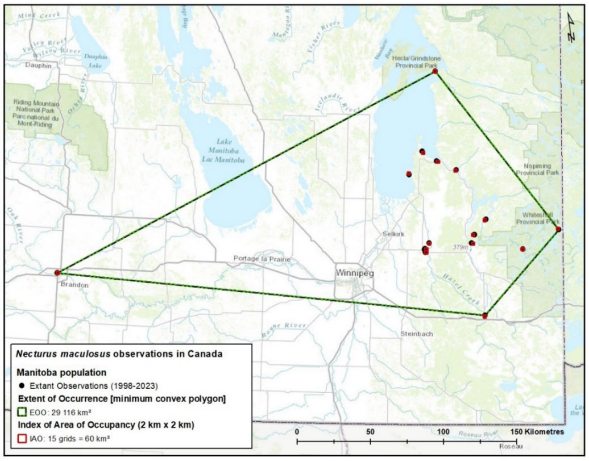
COSEWIC status
Threatened

Canadian Range
MB

Reason for designation
The range of the central Canadian population of this large, long-lived salamander is restricted to southeastern Lake Winnipeg and its tributaries in southern Manitoba. It is uncommon and has not been observed recently within much of its historical Canadian range. This population has a limited and declining distribution, with observed or inferred declines in its occupied area, number of locations, and quality of habitat. Its fully aquatic lifestyle, sedentary nature, and low reproductive potential make it vulnerable to a range of threats across all watersheds. This salamander is particularly vulnerable to sedimentation and pollutants from agriculture and forestry, flood control and river channelization activities, and impacts of invasive species, including Zebra Mussel and the recently arrived Rusty Crayfish.

Wildlife Species Description and Significance
Mudpuppy (*Necturus maculosus*) is a large aquatic salamander that ranges up to 49 cm in length. Its most obvious feature is prominent, red, ear-like external gills, which are retained throughout adulthood. It is the sole representative of the family Proteidae in Canada and plays a vital ecological role as the only known host of the Endangered Salamander Mussel (*Simpsonaias ambigua*).

Distribution
Mudpuppy is distributed across most of the east-central United States, from the Appalachian Mountains west to the Great Plains, south to Louisiana, and north into the southernmost parts of Manitoba, Ontario, and Québec. In Canada it occurs in two discrete populations, which are considered here as separate Designatable Units (DUs): 1) "Manitoba", which is restricted to the southeastern part of Lake Winnipeg and its tributaries in Manitoba; and 2) "Great Lakes-St. Lawrence", which is widely distributed in southern Ontario and Québec along the edge of the Great Lakes and adjacent water bodies, and in the Sydenham River, the Ottawa River basin, the St. Lawrence Lowlands along the Ottawa River, and in the St. Lawrence River and some of its tributaries.



Canadian range of Mudpuppy. EOO and IAO calculations for Manitoba population

Source: COSEWIC. 2023. IN PRESS. COSEWIC assessment and status report on the Mudpuppy *Necturus maculosus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 22 pp.

Habitat
Mudpuppy occupies permanent aquatic habitats, including both clear and turbid water in lakes, reservoirs, canals, ditches, and streams. It is absent from ephemeral water bodies and from small ponds that may freeze in the winter. Adults seek out deep, cold water during summer and

move toward areas where the water is cooler and better oxygenated. The species uses a variety of substrates (including rock, gravel, sand, and mud) but appears to be intolerant of heavy siltation. Mudpuppy prefers areas with an abundance of refuges and retreats. Adults prefer well-aerated waters but avoid high flows, and have been captured at depths as great as 32 m.

Biology

Mudpuppy is a generalist and opportunistic predator that feeds on a variety of benthic organisms. It is mainly nocturnal and tends to avoid exposure to sunlight. Mudpuppy is long-lived (>30 years), and, in Canada, females first reproduce between ages 7 and 10. Generation time is conservatively estimated at 15 years. Breeding occurs in shallow water in late September and October. Eggs are deposited on the roof of a small cavity dug under rocks, tree trunks, planks, and other debris, usually near riffles. Although generally sedentary, Mudpuppy remains active throughout winter, with an increase in activity during the coldest months. Dispersal appears to be limited, resulting in considerable population structuring both within and between watersheds.

Population Sizes and Trends

There are few quantitative data on population size or trends in either Canadian population. Mudpuppy appears to reach high local densities, particularly in the Great Lakes-St. Lawrence population, although there is evidence of decline from historical levels on the Canadian side of the Great Lakes and in the Manitoba population. Both EOO and IAO in the Great Lakes-St. Lawrence population have apparently declined from historical (pre-1997) levels by 7% and 14%, respectively, although it is unclear how much of the decline is due to sampling effort versus population loss. In the Manitoba population, EOO and IAO have apparently declined by up to 68% and 35%, respectively. While sampling effort is also a confounding factor in this DU, it is unlikely to have as significant an impact on observations of Mudpuppy, because search effort has consistently been low in Manitoba and is largely a function of ice fishing bycatch, which is likely to be at least as great or greater than it was pre-1997.

Photo: © Scott Gillingwater

Threats and Limiting Factors

Mudpuppy faces significant threats from 1) agricultural, forestry, industrial, and domestic pollutants including lampricides; 2) dams and water management resulting in rapid changes in water levels; 3) erosion, siltation, and habitat modification by recent invasive species. Additional threats include shoreline alteration from residential development and mortality from fishing bycatch. Botulism, extreme weather events, and lampricides have all been implicated in mass mortality events in the Great Lakes region over the past 20 years, resulting in estimated mortality of ~13,000 to ~33,000 individuals.

Mudpuppy's sedentary and obligately aquatic nature, extended longevity, and late maturation increase its susceptibility to habitat degradation and long-term accumulation of lipophilic toxins and reduce its resilience to catastrophic mortality events.

Protection, Status, and Ranks

Because Mudpuppy is designated "Not at Risk" in Canada, it does not benefit from any legal protection under the Species at Risk Act (SARA). However, as the obligate host of Salamander Mussel (which is federally listed as Endangered), threats to Mudpuppy within the range of Salamander Mussel are also considered as threats to the mussel. Such protections are therefore limited to one locality

on the Sydenham River. No provincial legislation directly protects Mudpuppy in Canada; the species is considered "Not at Risk" in Manitoba, Ontario, and Québec.

NatureServe ranks Mudpuppy as globally secure (rank G5 and rank G5T5 for the subspecies N. m. maculosus), owing to its extensive distribution in North America and its abundance in several regions. In Manitoba, the status of the species is vulnerable (S3), while it is apparently secure in Québec and Ontario (S4). The species is considered "Least Concern" according to the IUCN Red List.

Source: COSEWIC. 2023. IN PRESS. COSEWIC assessment and status report on the Mudpuppy *Necturus maculosus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 22 pp.

For more information, please visit https://species-registry.canada.ca/index-en.html

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Canada

Grey-cheeked Thrush *minimus* subspecies

Photo: © Darroch Whitaker @Parks Canada

Scientific Name

Catharus minimus minimus

Taxon

Birds

COSEWIC status

Threatened

Canadian Range

NL, NS, QC

Reason for designation

This songbird subspecies breeds only in dense montane forests of the Newfoundland archipelago and south coastal Labrador, with small numbers on coastal islands of Nova Scotia and on the French islands of Saint-Pierre-et-Miquelon. This bird likely winters in forests of northeastern Colombia and northwestern Venezuela. It differs genetically, in colour, and in song from the larger northern subspecies that is widespread across boreal Canada. Once abundant across the island of Newfoundland, it is now largely restricted to high-elevation habitats and some coastal islands. This is primarily due to nest depredation by a squirrel species introduced to Newfoundland in 1963. Overall numbers of the subspecies are conservatively estimated to have declined by 26.7-30.4% over the past 10 years, with declines likely to continue into the future. Other low-level threats include ecosystem changes related to introduced herbivores and control of insect outbreaks, energy development, mining, and effects of agriculture and logging on wintering habitat.

Wildlife Species Description and Significance

Grey-cheeked Thrush (*Catharus minimus*) is a medium-sized thrush found in boreal coniferous and mixed forests of northern Canada, Alaska, and Siberia. Newfoundland Grey-cheeked Thrush subspecies (*C. m. minimus*), hereafter Newfoundland Grey-cheeked Thrush, is intermediate in size and colouration between the continental Northern Grey-cheeked Thrush subspecies (*C. m. aliciae*) and the closely related sister species Bicknell's Thrush (*C. bicknelli*).

The breeding range of Newfoundland Grey-cheeked Thrush is almost entirely within Canada, and 92% is made up of islands, including 90% of its range on the island of Newfoundland. Grey-cheeked Thrush remains one of the least-studied songbirds in North America due to its furtive habits, affinity for dense, tangled habitats, and northern breeding distribution.

Distribution

Newfoundland Grey-cheeked Thrush is a Neotropical migrant songbird that breeds throughout the Newfoundland archipelago (including the French territory of Saint-Pierre-et-Miquelon), and in limited areas along the north shore of the Gulf of St. Lawrence (historical) and the strait of Belle Isle in southern Labrador, and likely on a few small islands on the Atlantic coast of Nova Scotia. Although Grey-cheeked Thrush was once common at all elevations on the island of Newfoundland, it is now largely restricted to montane habitats there, likely due to impacts of introduced Red Squirrel (*Tamiasciurus hudsonicus*). The winter range of Newfoundland Grey-cheeked Thrush is poorly understood but includes northeastern Colombia and northwestern Venezuela.

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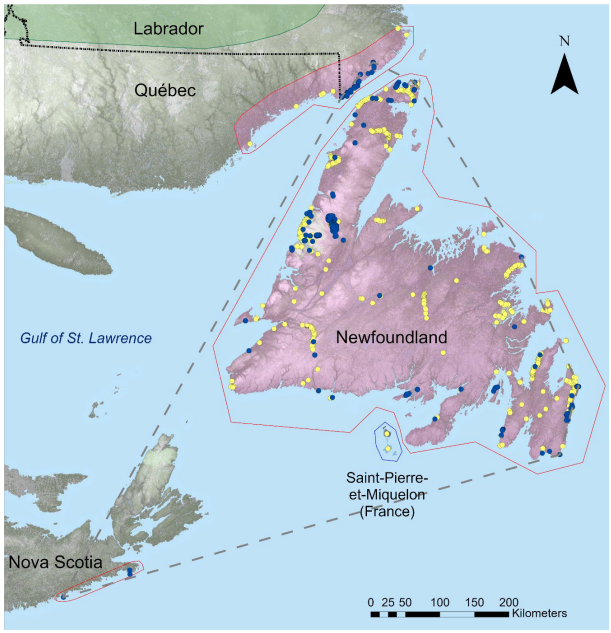
Canada



Breeding distribution of Newfoundland Grey-cheeked Thrush in Canada (pink) and Saint-Pierre-et-Miquelon (blue). Yellow dots depict sites where the species was reported during the breeding period (June-August) from 1899 to 2008 (n = 899), and blue dots indicate observations from 2009 to 2021 (n = 466). The current EOO is bounded by the dashed dark grey line, and red polygons delineate the key geographic elements of the population's breeding range in Canada: Newfoundland, the north shore of the Gulf of St. Lawrence, and Nova Scotia. The approximate (presumed) breeding range of Northern Grey-cheeked Thrush in Labrador (green) is shown for reference.

Source: COSEWIC. 2023. IN PRESS. COSEWIC assessment and status report on the Grey-cheeked Thrush minimus subspecies *Catharus minimus minimus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiii + 72 pp.

Habitat

Newfoundland Grey-cheeked Thrush breeding habitat includes windswept and stunted coastal conifer forests, montane old-growth conifer forest, regenerating clear-cuts, and conifer scrub. A common structural feature of these habitat types is dense low cover, particularly Balsam Fir (*Abies balsamea*). Winter habitat is poorly documented but includes premontane tropical forest in northern South America.

Biology

Little is known about the mating system of Newfoundland Grey-cheeked Thrush, but it may include groups of breeding birds, possibly including several males and females tending individual nests, as occurs in some closely related thrush species. Egg-laying begins in mid-June, although other aspects of breeding biology are poorly documented. Indirect evidence indicates that Red Squirrel is a significant nest predator of Newfoundland Grey-cheeked Thrush, and the two species now rarely co-occur.

Population Sizes and Trends

The global population of Newfoundland Grey-cheeked Thrush is estimated at about 91,000 mature individuals, based on the average of recent estimates from the Boreal Avian Modelling Project, Partners in Flight, and detailed calculations completed for this assessment using local survey data.

Newfoundland Grey-cheeked Thrush has experienced one of the most severe declines documented by the Breeding Bird Survey (BBS) in Canada, with an estimated reduction of breeding numbers in areas sampled by the BBS of -99.5% (95% CI: -99.9, -97.5) from 1974-2019. The cumulative decline recorded by the BBS over 10 years (2009-2019) was -71.4% (95% CI: -90.7, -21.4). The BBS overestimates the actual decline, as it does not sample high elevations and coastal islands where the population persists, and more conservative estimates that correct for those areas not covered by the BBS suggest an overall long-term population decline of -93.5 to -95.5%, and a decline of -26.7 to -30.4% over the past 10 years.

Threats and Limiting Factors

The main threat faced by Newfoundland Grey-cheeked Thrush is from invasive, non-native species, particularly Red Squirrel, which was first introduced to Newfoundland in 1963 and later reached other islands within its breeding range. Other lower-level threats include energy development and mining, ecosystem changes related to introduced herbivores and control of insect outbreaks, and ongoing loss and degradation of wintering habitat due to

conversion of forests for agricultural use and deforestation due to logging. Impacts of these threats are exacerbated by breeding areas being largely confined to islands, and variable productivity and recruitment in the context of low survivorship and moderate population fluctuations.

Protection, Status, and Ranks

Newfoundland Grey-cheeked Thrush is not listed in Canada under the *Species at Risk Act* (S.C. 2002, c.29), although the subspecies and its nests are protected under the *Migratory Birds Convention Act* (S.C. 1994, c.22). Newfoundland Grey-cheeked Thrush was listed as *Vulnerable* under the *Newfoundland and Labrador Endangered Species Act* (S.N.L. 2001, c.E-10.1) in 2005, and uplisted to *Threatened* in 2014. It is not listed in Quebec and its status has not been assessed in Nova Scotia. NatureServe ranks this subspecies as G5T4 globally (Apparently Secure subspecies), and on the island of Newfoundland, where only minimus subspecies is present, the species is ranked as S2B, SUM (Imperilled Breeder, Unranked Migrant).

Source: COSEWIC. 2023. IN PRESS. COSEWIC assessment and status report on the Grey-cheeked Thrush minimus subspecies *Catharus minimus minimus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiii + 72 pp.

For more information, please visit https://species-registry.canada.ca/index-en.html

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Canada

Forked Bluecurls

Photo: © Audrey Heagy

Scientific Name

Trichostema dichotomum

Taxon

Vascular Plants

COSEWIC status

Threatened

Canadian Range

NS, ON, QC

Reason for designation

In Canada, this annual mint grows on open dry sand deposits and acidic rocky barrens at only a few sites in southern Ontario, Quebec, and Nova Scotia. Over the past 10 years, the Canadian population declined by at least 50%, to 3200-3700 mature individuals. Although factors causing declines are not fully understood, most current threats relate to human activities that disrupt natural ecological processes, such as fire suppression and competition from native and invasive species in habitats affected by human development.

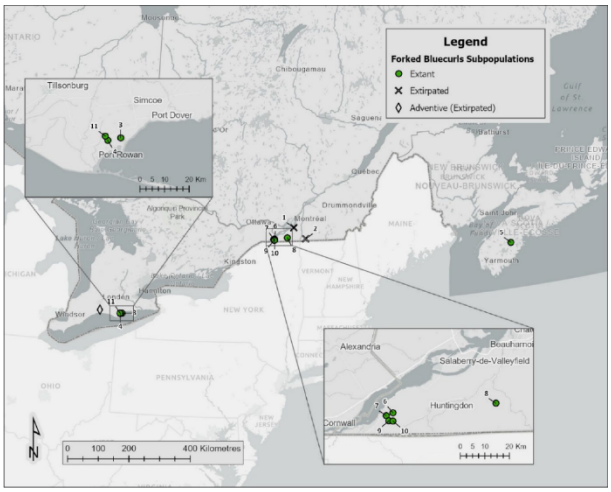
Wildlife Species Description and Significance

Forked Bluecurls is a small annual flowering plant in the mint family. The common name of this species refers to the arching stamens of the delicate blue flowers.

This species occurs only in sparsely vegetated open areas on dry to mesic, acidic, sandy, or gravelly mineral soils, in habitats that are important to several other species that are considered rare or at risk in Canada. The Canadian population is at the northern periphery of its global range.

Distribution

Forked Bluecurls occurs across eastern North America, from Texas, Florida, and the Bahamas, north to Ontario, Quebec, and Nova Scotia in southeastern Canada. Less than 1% of the global range and global population of this species occur within Canada.



Canadian subpopulations of Forked Bluecurls

Source: COSEWIC. 2023. IN PRESS. COSEWIC assessment and status report on the Forked Bluecurls *Trichostema dichotomum* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 47 pp.

Habitat

Across its range, Forked Bluecurls is found in a variety of natural habitat including barrens, rock outcrops, prairies, and open woods. It also occurs in open habitats associated with human

disturbance such as sandy fields and roadsides. In its core range in the southeast United States, this species tends to be a generalist and can tolerate a wide range of soil moisture and pH conditions but prefers full to partial sun. In the northern part of its range, including the Canadian population, its habitat requirements are more restrictive, and Forked Bluecurls is typically found only on acidic, dry to mesic, sandy or gravelly mineral soils in sparsely vegetated open areas. There are regional differences in habitat across the Canadian population.

Biology

Forked Bluecurls completes its life cycle in a single growing season. In Canada, flowering begins in late July, peaks in mid-August. and tapers off by early September. The number of flowers per plant varies with plant size, ranging from fewer than 10 to more than 250. Under ideal conditions it can produce large numbers of seeds. If conditions are suitable, most seeds germinate the following year, but some seeds can persist as a seedbank for future years. As with other annual plant species, seed-banking is critical in years with poor survival, flowering or seed-set. Seed longevity is uncertain. The fruit do not have any specialized dispersal mechanism and long-distance dispersal is considered rare.

Forked Bluecurls require loose, exposed, mineral soils with high light levels to germinate and thrive. It is not able to compete with dense ground cover or under shade-casting vegetation. In Canada, it is likely limited by climatic conditions. This species is drought tolerant and fire tolerant. Natural or anthropogenic disturbances that expose mineral soils, reduce ground cover, and maintain an open canopy can be beneficial for this species, provided the extent of the disturbance does not result in the complete loss of the seedbank or excessive plant mortality.

Population Sizes and Trends

The current population of Forked Bluecurls in Canada is estimated to be in the range of 3200 to 3700 mature individuals. This estimate is a minimum as it is based on late summer or early fall counts or estimates of the number of individual plants by various observers at known sites in recent years. The known sites are thought to represent most of the population although a few additional subpopulations or sites may exist at other sites.

Overall, the Canadian population of Forked Bluecurls appears to have declined by more than 50% over the past 10 years due to the large declines observed at four of the nine subpopulations. Longer-term trend information is not available.

Threats and Limiting Factors

The main threat to Forked Bluecurls in Canada is the general disruption of ecological processes at many sites in Ontario and Quebec. In the absence of natural or human disturbance, the growth of native and non-native plant species can rapidly cause the habitat to become unsuitable for this species. The overall threat impact for Forked Bluecurls is considered to be medium to low.

Protection, Status, and Ranks

Forked Bluecurls currently has no federal or provincial legal protection or status in Canada. The global status of this species is considered Secure (G5). In Canada, Forked Bluecurls is considered Critically Imperilled to Imperilled (N1N2) and is ranked as Critically Imperilled (S1) in the three provinces where it occurs (Ontario, Quebec, and Nova Scotia). About half of the current population occurs on protected lands, including a provincial Conservation Reserve in Ontario, a voluntary protected area in Quebec, and a provincial Wilderness Area in Nova Scotia.

Source: COSEWIC. 2023. IN PRESS. COSEWIC assessment and status report on the Forked Bluecurls *Trichostema dichotomum* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 47 pp.

For more information, please visit https://species-registry.canada.ca/index-en.html

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Canada

Hibberson's Trillium

Photo: © Carrina Maslovat

Scientific Name
Trillium hibbersonii

Taxon
Vascular Plants

COSEWIC status
Threatened

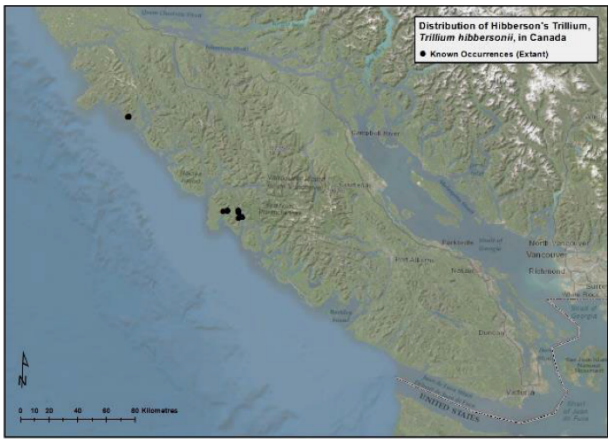
Canadian Range
BC

Reason for designation
This Canadian endemic perennial plant is globally restricted to a small area on the west coast of Vancouver Island in British Columbia. It is distributed in seven subpopulations, most with less than a few hundred individuals, on rocky outcrops and cliffs with seasonal seepages near ocean, river, and lake shorelines. It is threatened by the continuing decline of its habitat from landslides, severity of storms and flooding due to climate change and, indirectly, from forest-harvesting activities increasing erosion and altering seepage patterns. The limited population size and number of subpopulations makes the species vulnerable to these stochastic events.

Wildlife Species Description and Significance
Hibberson's Trillium is a small perennial herb with three broadly ovate leaves. The flowers grow on a short pedicel and have three pink petals that are offset with three green, fully divided sepals.

Hibberson's Trillium is endemic to the west coast of Canada. The showy flowers and diminutive stature have made Hibberson's Trillium a sought-after horticultural species.

Distribution
Hibberson's Trillium occurs only in British Columbia and is known from seven subpopulations on the west coast of Vancouver Island from the vicinity of Kyuquot Sound, Hesquiat Lake, and Sydney Inlet.



Global distribution of Hibberson's Trillium

Source: COSEWIC. 2023. IN PRESS. COSEWIC assessment and status report on the Hibberson's *Trillium Trillium hibbersonii* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 37 pp.

Habitat
Hibberson's Trillium is found in the Coastal Western Hemlock biogeoclimatic zone. Most subpopulations are found at low elevations next to the ocean or lakes in thin, poorly developed soils. Six of the subpopulations are found in thick layers of moss and lichen on open rocky ledges, outcrops, and cliffs with seasonal seepage. The seventh subpopulation is found in small mossy clefts in rock in a riparian area that is inundated during peak flows.

Biology
Hibberson's Trillium has been grown from offsets and flowered in three or four years from seed sown in pots; reproduction in the wild has not been studied. In a garden setting, Hibberson's

Trillium can persist for at least 35 years. The stems emerge from a rhizome annually in the spring and bloom in early April. Pollinators of other Trillium species include flies, bees, and beetles. Dispersal agents of other Trillium species include ants, wasps, ground beetles, and banana slugs that are attracted to a lipid-rich attachment on the seed and help disperse the seeds. Plants are eaten by bear and deer who may also act as seed dispersers. Seeds and seedlings may also be dispersed by water.

Population Sizes and Trends

A summation of the most recent survey data (2014–2023) at all seven subpopulations provides an estimated total of 1,220–1,370 flowering mature Hibberson's Trillium individuals. The number of flowering plants per subpopulation ranges from approximately 20 to 400–450 plants. There is no monitoring or population modelling data available for determining fluctuations and trends.

Hibberson's Trillium has persisted at four subpopulations that have had repeat visits since they were first documented in 1938, 1958, 1981, and 2001. The three other subpopulations were discovered in 2019 and two of these were resurveyed in 2023. There is ongoing habitat loss in unprotected areas, which may contain undocumented subpopulations.

Threats and Limiting Factors

The overall threat impact for Hibberson's Trillium is considered to be medium- low. Timber harvesting both in Hibberson's Trillium habitat and in upslope areas may alter seepage patterns, cause erosion and may result in landslides. Storms and flooding associated with extreme precipitation events may cause landslides. Climatic shifts may cause premature drying of seepage areas, extreme weather events, and sea level rise that may impact the species.

Protection, Status, and Ranks

Hibberson's Trillium is ranked S3 (Vulnerable) provincially, N3 (Vulnerable) nationally, and G3 (Vulnerable) globally. The species does not currently benefit from legal protection and it is not listed under the Species at Risk Act. It is not listed under the Convention on International Trade in Endangered Species (CITES).

The International Union for Conservation of Nature (IUCN) currently includes Hibberson's Trillium as a subtaxon of Western Trillium (listed as Least Concern on the Red List) but has identified that Hibberson's Trillium requires designation as a full species. As a separate species, Hibberson's Trillium will likely be categorized as vulnerable under category D1, very small or restricted population, but data were lacking at the time of assessment.

Four of the known Hibberson's Trillium subpopulations are within BC Parks while the remaining three are on provincial Crown land.

Source: COSEWIC. 2023. IN PRESS. COSEWIC assessment and status report on the Hibberson's *Trillium Trillium hibbersonii* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 37 pp.

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Canada

Rough-leaved Aster

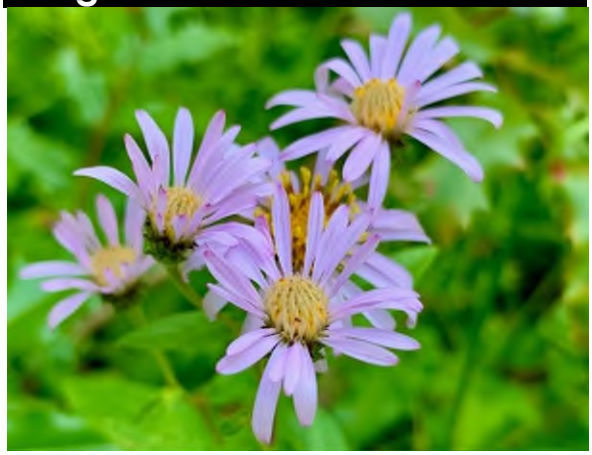


Photo: © Carrina Maslovat

Scientific Name

Eurybia radulina

Taxon

Vascular Plants

COSEWIC status

Threatened

Canadian Range

BC

Reason for designation

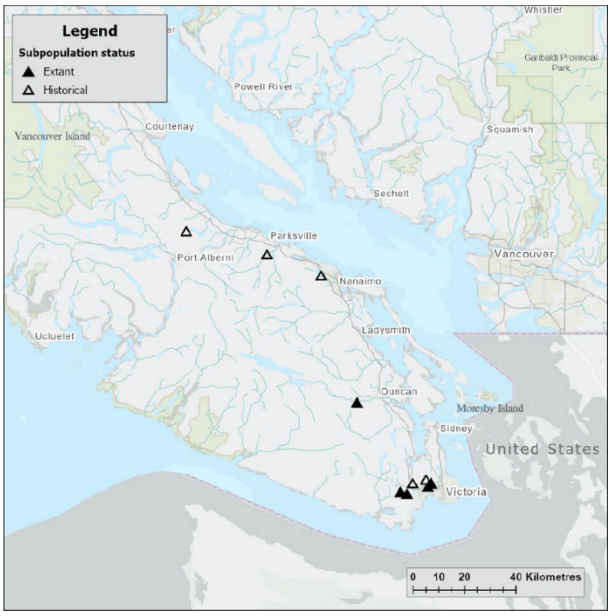
This herbaceous perennial occurs on southeast Vancouver Island, British Columbia where it reaches its northern range limit in North America. In Canada, it reproduces primarily by underground rhizomes and often presents only as rosettes of leaves. The species is known from only five subpopulations within a small range of 260 km², with only 330 known flowering stems and 788 non-flowering stems in total. Declines are suspected based on changes in the area, extent, and quality of habitat. The wildlife species may be negatively impacted both by maintenance activities along transportation corridors and invasive species in its habitat; it may also be limited by the absence of mature flowering individuals in some subpopulations.

Wildlife Species Description and Significance

Rough-leaved Aster is a long-lived, showy perennial herb. The thick leaves have sharp teeth along the margins and the flowers are pale violet with yellow centres that are grouped in a flat-topped cluster.

Distribution

In Canada, Rough-leaved Aster is at the northern limit of its distribution. The species is found on southeastern Vancouver Island in British Columbia. In the United States, it extends south through Washington, Oregon, and California, primarily west of the Cascade Mountains.



Canadian distribution of extant and historical Rough-leaved Aster.

Source: COSEWIC. 2024. IN PRESS. COSEWIC assessment and status report on the Rough-leaved Aster *Eurybia radulina* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 39 pp.

Habitat

In British Columbia, Rough-leaved Aster is found in mixed Douglas-fir, Garry Oak, Arbutus, and Shore Pine forests with partial canopy closure in the Coastal Douglas-fir biogeoclimatic zone. The sites are moderately moist with moderately rich soils at elevations from 60 – 427 m asl. Vegetation understory composition is variable with most sites having some shrub cover. All known subpopulations are next to trails or roads.

Biology

Rough-leaved Aster is an herbaceous perennial

that reproduces from seed and spreads by underground rhizomes. Flowering occurs from June through August but at three of the five subpopulations, flowering is sparse and infrequent. Based on studies of similar species in the subtribe Astereae, it is likely that flowering occurs the second year following germination. The fecundity is unknown. It is presumed based on studies of closely related species that Rough-leaved Aster is primarily an outbreeding species. Germination and seedling establishment have not been observed in the wild in Canada.

Population Sizes and Trends

Surveys in 2022 of all known subpopulations in Canada documented five extant subpopulations with a total of 330 flowering shoots and 788 non-flowering shoots. Shoots are connected by underground rhizomes and the number of separate individuals is not known. Prior estimates of subpopulation sizes suggest the population is stable, although historical subpopulations may have been destroyed due to habitat conversion. The species is presumed to be long lived and, in the absence of habitat destruction, the population is expected to be stable over time.

Threats and Limiting Factors

The overall impact to Rough-leaved Aster is Medium – Low. Threats include the invasive shrub, Scotch Broom, which casts shade, alters vegetation structure, changes soil chemistry creating conditions more favourable for other invasive species, and limits pollinator movement resulting in decreased seed set. Non-native grasses compete for light and moisture. Two subpopulations occur next to paved roads where mowing and other maintenance activities may limit sexual reproduction. Fires and fire suppression (including the use of retardants) may impact Rough-leaved Aster and human-caused fire is possible, especially in the two subpopulations next to roads. Two subpopulations may be impacted by land use changes associated with private landowner or Ministry of Transportation and Infrastructure (MOTI) activities. The impact of earthquakes, droughts, temperature extremes, and extreme rainfall events are unknown.

Protection, Status, and Ranks

Rough-leaved Aster was assessed by COSEWIC as Threatened in May 2024 and is not listed under the Species at Risk Act. NatureServe ranks Rough-leaved Aster as nationally Imperilled (N2) in Canada, and as Secure (G4G5) globally. Rough-leaved Aster is ranked as Imperilled (S2) in British Columbia and is thus red-listed. Of the five extant Canadian subpopulations, three are protected from development in regional parks. In the United States it is Not Ranked (NNR) nationally and has no status rank at the state level in Washington, Oregon, and California.

Source: COSEWIC. 2024. IN PRESS. COSEWIC assessment and status report on the Rough-leaved Aster *Eurybia radulina* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 39 pp.

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Canada

Mudpuppy (Great Lakes / St. Lawrence population)

Photo: © Scott Gillingwater

Scientific Name

Necturus maculosus

Taxon

Amphibians

COSEWIC status

Special concern

Canadian Range

ON, QC

Reason for designation

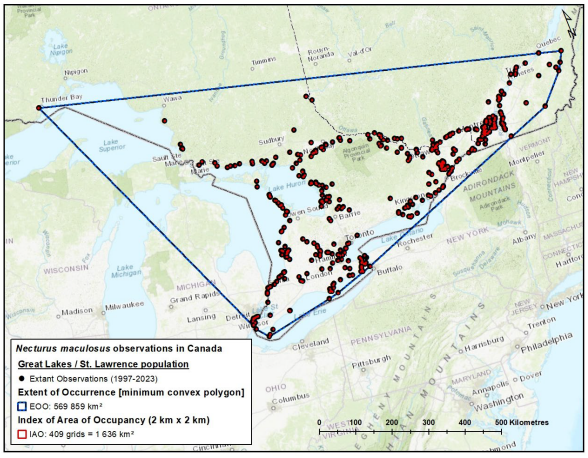
The eastern Canadian population of this large, long-lived salamander is widely distributed in southern Ontario and Quebec, along the edge of the Great Lakes and the St. Lawrence Lowlands. It remains widespread but recently appears to be missing from 14 percent of sites where it occurred historically, primarily in southern Ontario. Its fully aquatic lifestyle, sedentary nature, and low reproductive potential make it vulnerable to a range of widely occurring and increasing threats to water quality, including sedimentation and pollutants from agriculture, industry, forestry, and urban development. It is also at risk from flood control activities, river channelization, and impacts of invasive species. It is especially sensitive to lampricides used routinely for Sea Lamprey control across the Great Lakes Basin. This population may become Threatened if these threats are neither reversed nor managed.

Wildlife Species Description and Significance

Mudpuppy (*Necturus maculosus*) is a large aquatic salamander that ranges up to 49 cm in length. Its most obvious feature is prominent, red, ear-like external gills, which are retained throughout adulthood. It is the sole representative of the family Proteidae in Canada and plays a vital ecological role as the only known host of the Endangered Salamander Mussel (*Simpsonaias ambigua*).

Distribution

Mudpuppy is distributed across most of the east-central United States, from the Appalachian Mountains west to the Great Plains, south to Louisiana, and north into the southernmost parts of Manitoba, Ontario, and Québec. In Canada it occurs in two discrete populations, which are considered here as separate Designatable Units (DUs): 1) "Manitoba", which is restricted to the southeastern part of Lake Winnipeg and its tributaries in Manitoba; and 2) "Great Lakes-St. Lawrence", which is widely distributed in southern Ontario and Québec along the edge of the Great Lakes and adjacent water bodies, and in the Sydenham River, the Ottawa River basin, the St. Lawrence Lowlands along the Ottawa River, and in the St. Lawrence River and some of its tributaries.



Canadian range of Mudpuppy. EOO and IAO calculations for Great Lakes-St. Lawrence population

Source: COSEWIC. 2023. IN PRESS. COSEWIC assessment and status report on the Mudpuppy *Necturus maculosus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 22 pp.

Habitat

Mudpuppy occupies permanent aquatic habitats, including both clear and turbid water in lakes, reservoirs, canals, ditches, and streams. It is

absent from ephemeral water bodies and from small ponds that may freeze in the winter. Adults seek out deep, cold water during summer and move toward areas where the water is cooler and better oxygenated. The species uses a variety of substrates (including rock, gravel, sand, and mud) but appears to be intolerant of heavy siltation. Mudpuppy prefers areas with an abundance of refuges and retreats. Adults prefer well-aerated waters but avoid high flows, and have been captured at depths as great as 32 m.

Biology

Mudpuppy is a generalist and opportunistic predator that feeds on a variety of benthic organisms. It is mainly nocturnal and tends to avoid exposure to sunlight. Mudpuppy is long-lived (>30 years), and, in Canada, females first reproduce between ages 7 and 10. Generation time is conservatively estimated at 15 years. Breeding occurs in shallow water in late September and October. Eggs are deposited on the roof of a small cavity dug under rocks, tree trunks, planks, and other debris, usually near riffles. Although generally sedentary, Mudpuppy remains active throughout winter, with an increase in activity during the coldest months. Dispersal appears to be limited, resulting in considerable population structuring both within and between watersheds.

Population Sizes and Trends

There are few quantitative data on population size or trends in either Canadian population. Mudpuppy appears to reach high local densities, particularly in the Great Lakes-St. Lawrence population, although there is evidence of decline from historical levels on the Canadian side of the Great Lakes and in the Manitoba population. Both EOO and IAO in the Great Lakes-St. Lawrence population have apparently declined from historical (pre-1997) levels by 7% and 14%, respectively, although it is unclear how much of the decline is due to sampling effort versus population loss. In the Manitoba population, EOO and IAO have apparently declined by up to 68% and 35%, respectively. While sampling effort is also a confounding factor in this DU, it is unlikely to have as significant an impact on observations of Mudpuppy, because search effort has consistently been low in Manitoba and is largely a function of ice fishing bycatch, which is likely to be at least as great or greater than it was pre-1997.

Photo: © Scott Gillingwater

Threats and Limiting Factors

Mudpuppy faces significant threats from 1) agricultural, forestry, industrial, and domestic pollutants including lampricides; 2) dams and water management resulting in rapid changes in water levels; 3) erosion, siltation, and habitat modification by recent invasive species. Additional threats include shoreline alteration from residential development and mortality from fishing bycatch. Botulism, extreme weather events, and lampricides have all been implicated in mass mortality events in the Great Lakes region over the past 20 years, resulting in estimated mortality of ~13,000 to ~33,000 individuals.

Mudpuppy's sedentary and obligately aquatic nature, extended longevity, and late maturation increase its susceptibility to habitat degradation and long-term accumulation of lipophilic toxins and reduce its resilience to catastrophic mortality events.

Protection, Status, and Ranks

Because Mudpuppy is designated "Not at Risk" in Canada, it does not benefit from any legal protection under the *Species at Risk Act* (SARA). However, as the obligate host of Salamander Mussel (which is federally listed as Endangered), threats to Mudpuppy within the range of Salamander Mussel are also

considered as threats to the mussel. Such protections are therefore limited to one locality on the Sydenham River. No provincial legislation directly protects Mudpuppy in Canada; the species is considered "Not at Risk" in Manitoba, Ontario, and Québec.

NatureServe ranks Mudpuppy as globally secure (rank G5 and rank G5T5 for the subspecies *N. m. maculosus*), owing to its extensive distribution in North America and its abundance in several regions. In Manitoba, the status of the species is vulnerable (S3), while it is apparently secure in Québec and Ontario (S4). The species is considered "Least Concern" according to the IUCN Red List.

Source: COSEWIC. 2023. IN PRESS. COSEWIC assessment and status report on the Mudpuppy *Necturus maculosus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 22 pp.

For more information, please visit https://species-registry.canada.ca/index-en.html

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Canada

Finlayson's Oakworm Moth

Photo: © Christian Schmidt

Scientific Name
Anisota finlaysoni

Taxon
Arthropods

COSEWIC status
Special concern

Canadian Range
ON

Reason for designation
This moth is known only from Canada and is restricted to oak habitats in southern Ontario including savannah, woodland, forest edge, and other semi-open areas. It is exposed to many threats including competition from the invasive Spongy Moth during the larval stages and the impact of Btk pesticide used to control this non-native moth. Other threats include ecosystem modification from fire suppression and the decline of oak trees.

Wildlife Species Description and Significance
Finlayson's Oakworm Moth (*Anisota finlaysoni*) is a medium-sized moth in the family Saturniidae (giant silk moths). Adults are sexually dimorphic. The male forewing length (17-20 mm) is typically smaller than the female forewing length (24-30 mm). The dorsal surface of the female wings is tawny ochreous, and the undersides are ochreous-yellow. The male wing undersides are a distinct yellow/brassy colouration. Finlayson's Oakworm Moth is difficult to phenotypically distinguish with Orange-striped Oakworm Moth (*A. senatoria*).

The species has four life stages (egg, larva [with five instars], pupa and adult) and an annual life cycle. Mature larvae are approximately 50 mm in length and have black with bright yellow stripes. Oakworm larvae, in general, have a pair of long horns behind the head, however these horns are reduced to small knobs in the Finlayson's Oakworm Moth. The short horns are considered a distinguishing feature for larval identification. Mature larvae can be identified from photographs.

Distribution
Finlayson's Oakworm Moth has a global range restricted to southern Ontario and is considered endemic to Canada. Its historical range stretches from Rockport in the Thousand Island region, west along the north shores of Lake Ontario, south to the northeastern shore of Lake Erie, and east through the Niagara Peninsula to Fort Erie. At least 81 sites have been recorded, although its current range is now restricted to a minimum of 15 extant subpopulations in the east end of Lake Ontario and north of Lake Erie. Due to low detection and abundance, it is possible the species remains at some of its historical sites.

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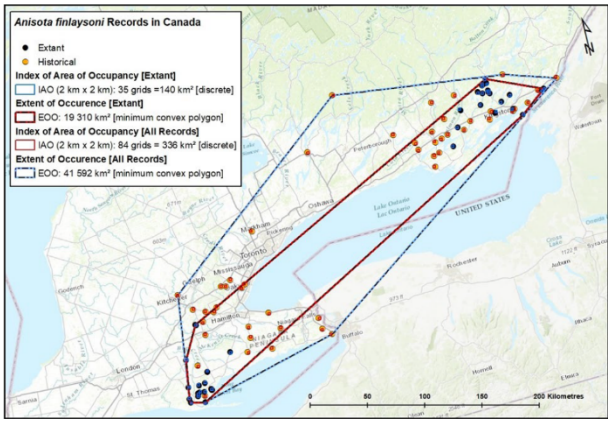

Extent of Occurrence and Index of Area of Occupancy for Finlayson's Oakworm Moth in Canada.

Source: COSEWIC. 2023. IN PRESS. COSEWIC assessment and status report on the Finlayson's Oakworm Moth *Anisota finlaysoni* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 69 pp.

Habitat

Finlayson's Oakworm Moth habitat is restricted to the Mixedwood Plains ecozone. The species' general habitat includes the open oak woodlands, savannahs, and forests; cleared land with some component of natural habitat and scattered oak trees; and natural oak habitat at the edges or adjacent to agricultural areas. Based on extant and historical observations, the species prefers open-grown oak trees, such as those found in natural oak savannahs, with a low density and abundance of shrubby vegetation. The larval host plants include White Oak (*Quercus alba*), Bur Oak (*Q. macrocarpa*), Black Oak (*Q. nigra*), Northern Red Oak (*Q. rubra*), and, to a lesser extent, Chinquapin Oak (*Q. muehlenbergii*). More specific ecological and plant community information is not available for the moth.

Biology

Adults fly from mid-June to mid-July. Eggs are laid in clusters on the underside of oak leaves. Young larvae are highly gregarious, and through successive moults, the late-stage older larvae disperse and become more solitary. Larvae mature in late August-September and spend the winter as pupae in the soil until the following June. The species has one generation per year.

Population Sizes and Trends

The size of the Canadian population of Finlayson's Oakworm Moth, and the abundance of separate subpopulations throughout its range, are unknown. Historically, the species appeared to fluctuate in abundance as noted during forest insect and disease surveys led by the Canadian Forest Service from the 1940s-1980s. During these historical surveys the moth's larval or adult abundance was enumerated but recorded by vague descriptions of defoliation levels on trees or groups of trees (e.g., 50%, 100%). There is evidence of extreme fluctuations based on information in these historical forestry reports.

Threats and Limiting Factors

Impacts from the spread of non-native Spongy Moth (*Lymantria dispar dispar*) and other larval pest species is the most serious and plausible threat to Finlayson's Oakworm Moth. Spongy Moth defoliates oak trees, decreasing this food supply and making the leaves less palatable to oakworm moth larvae. Applications of Btk are routinely deployed to control Spongy Moth and this pesticide is sprayed on foliage and when ingested, directly kills Finlayson's Oakworm Moth larvae within a few days. The decision to control Spongy Moth is by the county, town or individual landowner and many individuals do not consider lepidoptera species at risk in their Spongy Moth spray programs. Additional threats include ecosystems modifications that result from vegetation succession and fire suppression, and the cumulative threats to oak host trees (e.g., diseases). Housing, urban, and agricultural development continues to fragment much of the open meadow habitats in the area, as does mining, quarrying and road construction. Light pollution is also thought to impact moth subpopulations at a local scale.

Protection, Status, and Ranks

Finlayson's Oakworm Moth is not legally protected in Canada. The global and provincial conservation status are both imperiled (G2 and S2 respectively).

Source: COSEWIC. 2023. IN PRESS. COSEWIC assessment and status report on the Finlayson's Oakworm Moth *Anisota finlaysoni* in Canada.

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Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 69 pp.

For more information, please visit https://species-registry.canada.ca/index-en.html

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Canada

Pacific Sandpirate

Photo: © Tristan McKnight

Scientific Name

Lasiopogon pacificus

Taxon

Arthropods

COSEWIC status

Special concern

Canadian Range

BC

Reason for designation

In Canada, this robber fly's distribution is limited to openings in early to mid-successional forest in British Columbia's Lower Mainland. The larval stage is found only in sandy or gravelly soils. There are nine subpopulations documented, three of which are known only from historical records. Additional subpopulations probably exist but the total number is likely fewer than 20. The species' habitat is at risk from development and degradation from multiple causes.

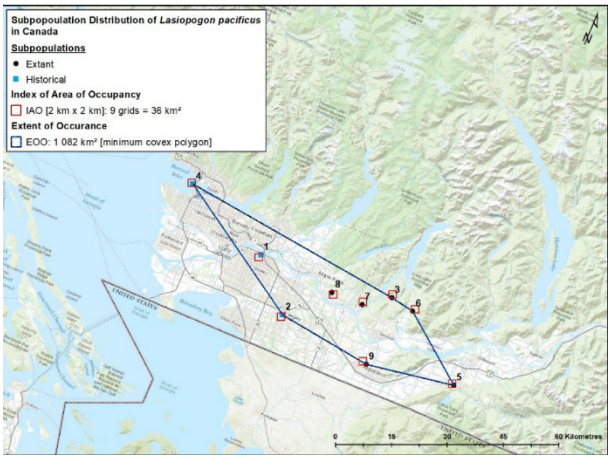
Wildlife Species Description and Significance

Pacific Sandpirate (*Lasiopogon pacificus*) is a medium-sized (~1 cm) robber fly (family Asilidae). Distinguishing characters include a broad gap between the eyes on top of the head, a bushy black mustache, three dark stripes running down the top of the thorax, abdominal segments with straight rings of dark and light, and two opposable stocky wedge-shaped claspers on the tip of the male abdomen.

Pacific Sandpirate is one of a group of robber flies where specialization in ecological niches has helped facilitate diversification and coexistence. Robber flies are popular among amateur naturalists with a growing number of internet-based resources and field guides.

Distribution

Pacific Sandpirate's global range is along the Pacific coast from southwestern British Columbia (BC) to southern Oregon. In Canada it is known only from fewer than 10 subpopulations along the lower Fraser River valley in BC.



Map of the lower Fraser River valley in British Columbia showing all extant and historical subpopulations of Pacific Sandpirate and Extent of Occurrence polygon around known subpopulations

Source: COSEWIC. 2024. IN PRESS. COSEWIC assessment and status report on the Pacific Sandpirate *Lasiopogon pacificus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 45 pp.

Habitat

Pacific Sandpirate inhabits early to mid-successional forest within the Coastal Western Hemlock biogeoclimatic zone, usually in hilly dry forest openings at low elevations (<300 m asl) not far from streams. Adults perch on bare sand or low rocks and logs in exposed sunny patches during the day and shelter overnight in low shrubbery. Eggs, larvae, and pupae live underground in sandy soil. Patchy disturbance

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from natural (e.g., winds, floods, or erosion) or anthropogenic (e.g., tree removal, trail building) causes can help maintain a constellation of small open areas where subpopulations of Pacific Sandpirate occur.

Biology

This species develops through complete metamorphosis, i.e., from egg to larva to pupa to adult. The generation time is at least two years. Adults emerge for a few weeks in late spring (mainly late May and June). Adults are likely generalist predators that feed mainly on other small flies, true bugs, and adult aquatic insects, while larvae are likely predators of beetle larvae. Most adult individuals stay within a home range of only a few dozen square metres, with lifetime net dispersal usually amounting to less than 1 km.

Population Sizes and Trends

Population size and trends of Pacific Sandpirate in Canada are unknown. Recent surveys focused on locating extant subpopulations and recording habitat information. The primary survey method has been wandering transects during the adult flight period. There are 35 specimens or observations from Canada, of which 12 are from the last 10 years. Of the six subpopulations that have been proven extant with recent records, five were newly documented during recent search effort. Three subpopulations are known from historical records only.

Threats and Limiting Factors

The Canadian range of Pacific Sandpirate has been subject to extensive waves of resource extraction, conversion of forest to agriculture, and urban development that have reduced and fragmented potential habitat. Some of the most important threats to Pacific Sandpirate include residential and commercial development, logging, pollution, and changes to habitat. Efforts to grow tracts of forest in the Coastal Western Hemlock biogeoclimatic zone may have interrupted some of the disturbance processes that once maintained a steady patchwork of early and mid-succession communities suitable for Pacific Sandpirate.

Protection, Status, and Ranks

Pacific Sandpirate has not been assessed by COSEWIC, is not listed under SARA, and is not afforded protection under legislation in BC. The species is not ranked globally or in the U.S.A. It is ranked Imperilled in Canada and BC (N2/S2) and is red-listed by the BC Conservation Data Centre. Most of the species' range in Canada falls within local government jurisdictions and provincial public land.

Source: COSEWIC. 2024. IN PRESS. COSEWIC assessment and status report on the Pacific Sandpirate *Lasiopogon pacificus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 45 pp.

For more information, please visit https://species-registry.canada.ca/index-en.html

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Canada

Prairie-dock

Photo: © Patrick Deacon

Scientific Name

Silphium terebinthinaceum

Taxon

Vascular Plants

COSEWIC status

Special concern

Canadian Range

ON

Reason for designation

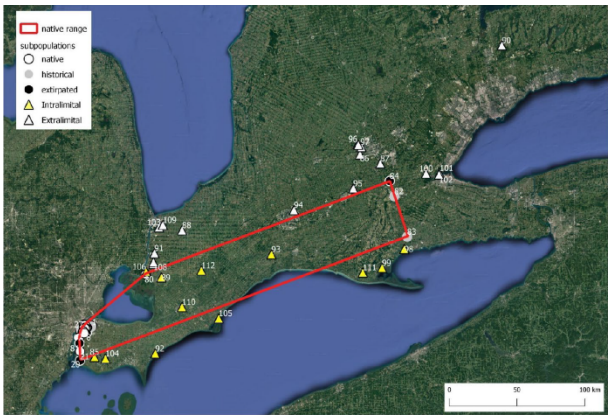
This showy long-lived plant is associated with tallgrass prairie habitat and reaches the northern edge of its range in southwestern Ontario, where it occurs in nine subpopulations. Although the number of plants likely is greater than 10,000, only a small percentage are known to reproduce through seeds. Changes in its native habitat through competition with native and exotic plants, compounded by fire suppression, are believed to be the greatest threats, although housing, commercial, and road construction, as well as herbicides, also threaten the species. Its persistence will likely require ongoing monitoring and management activities.

Wildlife Species Description and Significance

Prairie-dock (*Silphium terebinthinaceum*) is a forb in the Asteraceae family associated with tallgrass prairie habitat. The species has a deep taproot, a mass of large basal leaves and yellow composite flowers atop a stem that can reach more than 2.5 m in height. Two varieties are recognized, with all Canadian plants being variety *terebinthinaceum*.

Distribution

Prairie-dock occurs throughout the eastern United States from Wisconsin to Arkansas in the west and Virginia to Georgia in the east. Its core range includes southern Wisconsin, Illinois, and Missouri. The Canadian distribution of the species is restricted to the Carolinian Zone in southwestern Ontario. There are nine native extant subpopulations of Prairie-dock in Canada in Essex and Lambton counties. One subpopulation in Brantford and another near Townsend could not be relocated in 2023 and are presumed extirpated. These two subpopulations are of uncertain origin. Three other subpopulations are considered extirpated: River Canard and Knapps Island which are considered native, and Paris, which is also of uncertain origin. Some Prairie-dock sites are introduced by seeding and transplanting plants and the species is occasionally included in restoration or prairie creation plantings beyond its native range.



Distribution of Prairie-dock subpopulations in Ontario, Canada

Source: COSEWIC. 2024. IN PRESS. COSEWIC assessment and status report on the Prairie-dock *Silphium terebinthinaceum* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiv + 68 pp.

Habitat

Prairie-dock at Canadian sites is found in wet-mesic to mesic tallgrass prairie, oak savannah, and marsh. Many of the extant sites along rail

lines, hydro corridors, and roadsides support assemblages of tallgrass prairie species and many are considered remnant prairie habitat. In the United States, plants also occur in prairie fen communities. The sites where Prairie-dock occurs typically have limited tree and shrub cover with calcareous soil.

Biology

Prairie-dock is a long-lived species that can reach maturity at three to five years in a cultivated setting but may take longer to mature in the wild. Individual plants can live for more than 25 years and form a large taproot that supports the tall flowering stem. The taproot stores energy and allows plants to withstand drought, fire, mowing and declining habitat conditions. In full sunlight, the leaves of Prairie-dock orient in a north-south alignment to minimize evapotranspiration. Mature Prairie-dock plants can enter a prolonged state of reproductive suppression when conditions become unsuitable due to competing vegetation, periods of drought, or a combination of these factors.

The composite flowers are pollinated by long-tongued bees, bee flies, and hummingbirds and are self-incompatible. The plants reproduce from seed that is viable for one to two years but is selectively predated by small mammals and finches. The seeds have no specialized adaptations for long-distance dispersal.

Population Sizes and Trends

Of the 12,803 plants counted and estimated, only 133 were flowering in 2022 representing just over one percent of the Canadian population. It is unknown how many of the remaining plants are likely to reproduce in the future. The remaining number likely constitutes plants that are immature or otherwise reproductively suppressed. Individual plants are typically very long-lived and can persist without flowering for years.

Previous estimates of mature plants do not exist from any of the native subpopulations. The surveys conducted in 2022 inferred a decline in flowering plants at three sites that have previously contained dozens or hundreds of flowering plants within the last ten years.

Threats and Limiting Factors

The main threats to Prairie-dock in Canada affecting all native subpopulations are fire suppression and the alteration of habitat by invasive non-native species, namely European Common Reed and Autumn Olive. Five of the extant subpopulations are also threatened by road and railroad management, while three subpopulations are threatened by imminent residential and commercial development. Herbicide use may also threaten plants that occur along railways, utility corridors and roadsides.

Protection, Status, and Ranks

Prairie-dock is not currently afforded legal protection in Canada or the United States. The Global NatureServe conservation range rank for the species is G4 (Apparently Secure). It is ranked N1 (Critically Imperilled) in Canada, S1 in Ontario, and is has conservation rankings of S1 to S3 (Critically Imperilled to Vulnerable) in six southern United States jurisdictions, it is not ranked in nine US jurisdictions and is considered SU (Data Deficient) in Iowa. Three of the extant Canadian subpopulations occur in a provincial nature reserve, city parkland, and a recreational trail owned and operated by a conservation authority. A fourth subpopulation occurs on Walpole Island First Nation lands. The remaining extant subpopulations occur on private lands.

Source: COSEWIC. 2024. IN PRESS. COSEWIC assessment and status report on the Prairie-dock *Silphium terebinthinaceum* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiv + 68 pp.

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Canada

Horned Grebe

Photo: © Kyle Blaney

Scientific Name

Podiceps auritus

Taxon

Birds

COSEWIC status

Special concern

Canadian Range

AB, BC, MB, NB, NT, NS, NU, ON, QC, SK, YT, Atlantic Ocean, Pacific Ocean

Reason for designation

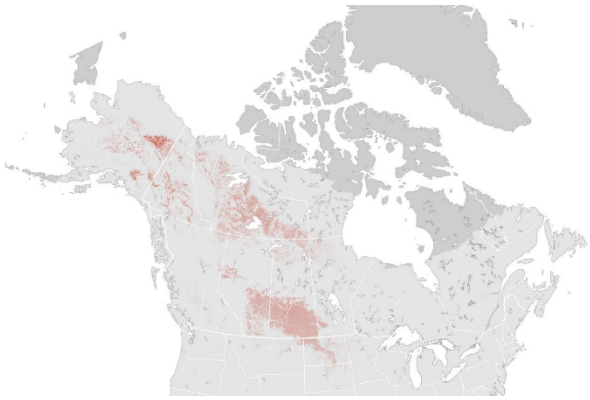
Approximately 92% of the North American breeding range of this waterbird occurs in Canada, primarily in prairie and boreal wetlands of western and central Canada. A very small, disjunct group breeds on Quebec's Magdalen Islands. Although Magdalen Islands birds were previously assessed separately, the species is now assessed as one population because the lack of evidence for unique adaptations no longer justifies separate assessment. Available data on population trends are mixed. However, the species is threatened by loss and degradation of wetland habitat, drought, collisions with power lines and other structures, and the potential for oil spills and fisheries bycatch on the wintering grounds. The overall impact of current and future threats may lead to declines of up to 30 percent over the species' next three generations.

Wildlife Species Description and Significance

Horned Grebe (*Podiceps auritus*) is a small waterbird with a long neck and short bill. It is named after a patch of erectable, buff-coloured feathers on its head, which extend from its eyes to the back of its nape. In breeding plumage Horned Grebe has a black face and back with chestnut foreneck and flanks. Two subspecies are recognized globally: *P. a. auritus* breeds in Eurasia and *P. a. cornutus* breeds in North America.

Distribution

Horned Grebe is found in North America, Europe, and Asia. Approximately 92% of the North American breeding range is in Canada, ranging from Yukon and British Columbia to Quebec, but with most birds breeding in the Prairies and Northwest Territories. The North American population winters primarily within the United States, with the highest numbers along the Pacific and Atlantic coasts.



Horned Grebe breeding distribution and relative abundance during the breeding season (7 June to 27 July), based on eBird data from 2005 to 2020. Darker red shading indicates higher population density.

Source: COSEWIC. 2023. IN PRESS. COSEWIC assessment and status report on the Horned Grebe *Podiceps auritus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiii + 54 pp.

Habitat

The Horned Grebe breeds primarily in the prairie and boreal ecological regions, where it occupies small to moderately sized freshwater wetlands, and occasionally brackish or alkaline waterbodies. Suitable breeding ponds have a

mix of emergent vegetation for nesting and open water for foraging. Pairs may occasionally occupy constructed wetlands, including borrow pit ponds. Horned Grebe primarily winters at inshore saltwater sites, but also uses medium to large freshwater lakes and ponds.

Biology

The Canadian population of Horned Grebe is estimated to comprise 200,000 to 500,000 mature individuals. The Breeding Bird Survey primarily samples the southern portion of the Canadian breeding range and may not accurately reflect overall population trends. It indicates a long-term (1970-2019) Canadian trend of -1.71% per year (95% Credible Interval [CI] = -4.56, 0.67), amounting to an estimated -57.0% (95% CI = -89.9, 38.7) over 49 years. During the most recent three-generation period (2006-2019), the average trend was -1.11% per year (95% CI = -6.05, 4.54), or -13.5% (95% CI = -55.5, 78.0) over that period. Christmas Bird Count results at the continental scale likely better reflect the overall Canadian population, given that most birds winter in the United States. The long-term trend of 0.38% per year (95% CI = -0.54, 1.59) since 1970 amounts to an estimated increase of 21.3% (95% CI = -24.1%, 123.6%) over 51 years. Over the most recent three-generation period (2008-2021), the average annual trend was estimated at 1.23% (95% CI = -3.22, 5.88), equivalent to 17.2% (95% CI = -34.7, 110.2) for the entire period. However, these BBS and CBC trends are non-significant. In contrast, recently released trends derived from eBird data show significant 3-generation (2007-2020) declines per count cell, primarily at median rates of decline greater than 30%, across the continental wintering range of the species. A range-wide estimate is not yet available via this analysis.

Threats and Limiting Factors

Permanent loss of wetlands to activities associated with agriculture and aquaculture and energy production and mining threatens the Horned Grebe. Up to 70% of wetlands within the Prairie Region have disappeared since European settlement, with some loss ongoing. Ecosystem modification through invasive aquatic plants reducing areas of open water, and eutrophication and degradation of nesting ponds due to agricultural activities, also pose a threat to Horned Grebe. Climate change is affecting this species: temporary drying of wetlands from precipitation changes can displace individuals or render habitat unsuitable. Horned Grebe is also at risk of mortality from collisions with utility and service lines (power lines) and renewable energy infrastructure (wind turbines). On the wintering grounds pollution from oil spills and being caught as bycatch in fisheries can also negatively impact the population. The overall threat impact for Horned Grebe over the next three generations (13 years) is estimated to be Medium.

Protection, Status, and Ranks

In Canada, Horned Grebe and its nest and eggs are afforded protection under the *Migratory Birds Convention Act*. Although the previous status report recognised two Horned Grebe Designatable Units (DUs), the Western and Magdalen Island populations, COSEWIC's current DU guidelines indicate that there is only one DU for this species in Canada. In December 2023, the Magdalen Islands population and the Western population were considered as a single unit by COSEWIC across the Canadian range and was designated Special Concern.

The Western population is however still listed as Special Concern, and the Magdalen Islands population as Endangered under the Species at Risk Act. In Quebec, this species is listed as "Threatened" under the "*Loi sur les espèces menacées ou vulnérables*," and is afforded protection under the "*Loi sur la conservation et la mise en valeur de la faune*". The species is also protected under the *Migratory Bird Treaty Act* in the United States. Horned Grebe is considered Globally Secure (G5) but ranked as Vulnerable by IUCN. In Canada, Horned Grebe is considered Secure (N5B, N4N5N). At a provincial or territorial level, Horned Grebe is listed as S1B, S3N, S4M (Critically Imperilled as a breeding population) in Ontario, and S3 (Vulnerable) in Alberta, Manitoba, and the Northwest Territories, with other subnational ranks more secure. In Quebec, NatureServe still

considers the species to have two subpopulations: the Western subpopulation has a rank of S3M, while that of the Magdalen Islands has a rank of S1B (Critically Imperilled).

Source: COSEWIC. 2023. IN PRESS. COSEWIC assessment and status report on the Horned Grebe *Podiceps auritus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiii + 54 pp.

For more information, please visit https://species-registry.canada.ca/index-en.html

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Canada

Blanchard's Cricket Frog

Photo: © Suzanne L. Collins

Scientific Name

Acris blanchardi

Taxon

Amphibians

COSEWIC status

Extirpated

Canadian Range

ON

Reason for designation

This small tree-frog is widespread in the eastern United States, along shorelines of lakes, ponds, and streams with dense aquatic vegetation. It was only known in Canada from two places in southern Ontario (Point Pelee and Pelee Island), and was last confirmed in 1977 on Pelee Island. The presence of this species can be readily confirmed by its distinctive, loud calls in suitable habitat during the breeding season. However, despite many intensive searches and citizen science programs in previously-occupied or apparently suitable habitat, there have been no reliable observations since the 1977 sighting. Thus, there is sufficient information to conclude that no individuals of this wildlife species remain in Canada.

Wildlife Species Description and Significance

The northern cricket frog is a small, semi-aquatic frog with a "warty" appearance and a pointed snout. The frogs are brown or grey, with a V-shaped mark between the eyes, faint markings on the back, and a broad dark stripe on the long back legs. The back feet have webbed toes. The breeding call of the male frog sounds like pebbles being rapidly clicked together. Adults measure 16 to 38 mm in length.

Distribution

The species remains widespread and common/abundant in places across its US range but has declined significantly especially in the northern portion of its range (Gray and Brown 2005).

Blanchard's Cricket Frog has not been confirmed on the Ontario mainland since 1961 (COSEWIC 2001; COSEWIC 2011; Environment Canada 2011). It was last confirmed from Pelee Island in 1977 (Oldham and Campbell 1990), but unconfirmed records occurred in the 1990s (Kellar et al. 1997; see Environment Canada 2011 and Oldham 2011 for a complete list of observations). The Committee on the Status of Species at Risk in Ontario (COSSARO 2011) declared Blanchard's Cricket Frog extirpated in 2011 based on the lack of observations despite extensive search effort.

Extensive wildlife surveys conducted from 2015 to 2021 on Pelee Island (Hathaway pers. comm. 2022; Hossie pers. comm. 2022; Wolfe pers. comm. 2022) and extensive citizen science programs (Choquette and Jolin 2018) have failed to produce a reliable observation since the previous status assessment. Given the short lifespan (Dodd 2013), widespread population declines, and tiny fragmented range in Canada with no possibility of rescue effect from the US, it is extremely unlikely that Blanchard's Cricket Frog persists in Canada.

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Distribution of the Northern Cricket Frog in Ontario

Sources: COSEWIC. 2024. IN PRESS. Addendum to the 2011 COSEWIC Status Report on the Blanchard's Cricket Frog *Acris blanchardi* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiii pp.
COSEWIC. 2001. COSEWIC assessment and update status report on the Northern Cricket Frog *Acris crepitans* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. v + 14 pp

Habitat

Northern cricket frogs inhabit the margins of water bodies, such as lakes, ponds, rivers, streams, and, sometimes, temporary ponds and rain pools. On Pelee Island, they have been found in shoreline marshes, pools, lagoons, drainage canals used for agriculture, ditches and flooded fields. They are usually found on muddy shores or in aquatic vegetation in shallow waters.

Biology

Northern cricket frogs in Canada breed in June and July. The frogs attach their eggs to vegetation below the water surface. Tadpoles metamorphose in 5 to 10 weeks. The juvenile frogs reach sexual maturity shortly after transformation from tadpoles. Northern cricket frogs hibernate under rocks or logs, or in depressions, holes and cracks in the shoreline, but away from water.

Threats and Limiting Factors

The scouring of coastal marshes during severe storms, and predation by birds, reptiles, bullfrogs and fish, are some of the natural factors contributing to the species' decline. However, loss of wetlands to development is the major factor affecting populations of northern cricket frogs. Damage to habitat includes drainage of marshes and the dredging of drainage canals that are used by the frogs as breeding sites. Habitat degradation is an important factor as well. These frogs are intolerant of pollution, and the runoff of pesticides and fertilizers is believed to be a major contributor to the decline and disappearance of the species.

Protection, Status, and Ranks

Blanchard's Cricket Frog has been listed as an extirpated species under the Ontario *Endangered Species Act*.

Sources: COSEWIC. 2024. IN PRESS. Addendum to the 2011 COSEWIC Status Report on the Blanchard's Cricket Frog *Acris blanchardi* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiii pp.
COSEWIC. 2001. COSEWIC assessment and update status report on the Northern Cricket Frog *Acris crepitans* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. v + 14 pp

For more information, please visit https://species-registry.canada.ca/index-en.html

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Canada

Long-billed Curlew

Photo: © Chuck Gordon @ Environment and Climate Change Canada

Scientific Name

Numenius americanus

Taxon

Birds

COSEWIC status

Threatened

Canadian Range

AB, BC, SK

Reason for designation

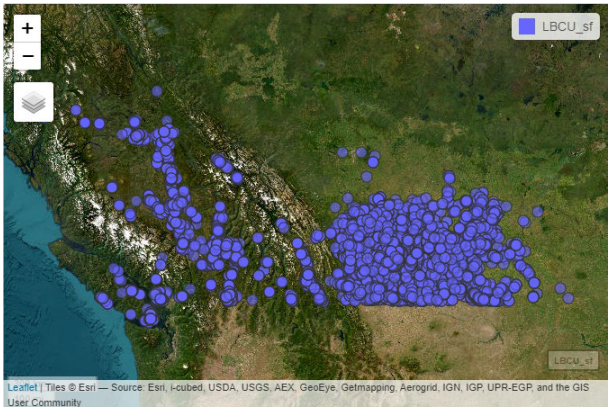
This large, long-billed shorebird breeds in the grasslands and prairies of western Canada from central British Columbia to Saskatchewan, and winters in the southern US and Mexico. It formerly bred in Manitoba, but breeding has not been observed there since the mid-1980s. Although declines have been documented in Canada since the 1970s, trends have recently become more negative, with a decline of approximately 50% over the last 20 years (3 generations), a likely decrease in the area occupied by breeding birds since the last status report in 2011, and declining quality of habitat. Key threats include droughts and extreme events induced by climate change; related changes to water management on the wintering grounds; impacts of pesticides on insect prey; and conversion and fragmentation of grasslands and suitable agricultural habitat by energy development, urban sprawl, and rural development on breeding and wintering grounds. As a relatively long-lived species with low reproductive output, its population is limited to slow growth even under favourable conditions.

Wildlife Species Description and Significance

Long-billed Curlew (*Numenius americanus*) is a very large, mottled-brown sandpiper with an extremely long, decurved bill and cinnamon underwing. Canadian birds are of the subspecies *N. a. parvus*.

Distribution

Long-billed Curlew breeds in the grassland regions of North America from southern Canada to northern Texas, wintering from central California to southern Florida and Mexico, and irregularly into Central America. In Canada, Long-billed Curlew breeds in British Columbia, Alberta, and Saskatchewan, and bred in Manitoba until the mid-1980s. BC and the Prairies are recognized by some as having distinct subpopulations but there is no evidence to suggest the presence of more than one designatable unit in Canada.



Element Occurrences of Long-billed Curlew in Canada based on records entered into

NatureCounts (2024) from 1 April to 31 July, 2000-2023.

Source: COSEWIC. 2024. IN PRESS. COSEWIC assessment and status report on the Long-billed Curlew *Numenius americanus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiv + 55 pp.

Habitat

Long-billed Curlew prefers extensive, flat areas of short native grassland for breeding, but also uses some agricultural areas for feeding, nesting and rearing young. During migration and in winter, the species frequents various shoreline and wetland habitat types.

Biology

Long-billed Curlew is migratory and generally arrives in Canada in March (British Columbia) or April (Alberta and Saskatchewan). Clutch size is usually four eggs. Incubation length is 27-30 days, with incubation shared by both sexes. Generation length is estimated to be 6.7 years. Eggs are vulnerable to predation by mammals and birds, as well as trampling by livestock. After chicks have hatched, adults disperse from the breeding territory. Females depart before males, followed by immature birds. Chicks have a high mortality rate, succumbing to heat stress, starvation and predation by hawks, corvids, and weasels. Curlews feed primarily on grasshoppers and beetles on the breeding grounds. Failed breeders may leave Canada by late June, with most others departing by the end of August.

Population Sizes and Trends

The most recent population estimate for Canada in 2023 is derived from modelling of remotely-sensed data and suggested a range of 139,795 to 147,783 mature individuals. Although the latter estimate is much higher than previous estimates for Canada, this reflects a change in methods rather than a population increase. The Breeding Bird Survey (BBS) indicates a substantial steady decrease in the size of the Canadian population beginning around 2004, amounting to a cumulative loss of about 51% over the past three generations (20 years). The decline has been greatest in Alberta, which supports the largest portion of the Canadian population. A targeted survey of the much smaller British Columbia population in 2022 did not show an appreciable population change compared to a survey conducted in 2005. Trends in U.S. states near to the Canadian population range from decreasing to strongly increasing; however, rescue from the U.S. is thought to be unlikely as immigrants to Canada would face suboptimal conditions in areas where their habitat has been lost or degraded.

Threats and Limiting Factors

Current and anticipated threats to Long-billed Curlew include: energy development; droughts and extreme events induced by climate change, including related changes to water management; conversion of grasslands to annual and perennial crops, sometimes associated with unsustainable and more intensive agricultural practices reducing habitat quality; fire suppression resulting in forest/shrubland encroachment; urban sprawl and rural development on both breeding and wintering habitat; impacts of pesticides resulting in declines in insect prey; habitat fragmentation that facilitates increased predation, and proliferation of non-native, invasive plant species – especially Leafy Spurge and knapweeds.

Additional threats to the species include inappropriate grazing management (i.e., absence of grazing, or high-intensity, frequent, or prolonged cattle grazing that reduce habitat quality); direct mortality through use of agricultural pesticides; hunting and poaching on wintering grounds and during migration; disturbance or harm caused by industrial activities; and accidental mortality caused by collisions with wind towers or vehicles. Given the recent and steepening population decline of the species, the impacts of threats may be increasing. Overall threat impact is assessed as Medium-High.

Protection, Status, and Ranks

Long-billed Curlew was added to Schedule 1 of the Canadian *Species at Risk Act* as Special Concern in 2005. COSEWIC confirmed this status in May 2011. Most recently, COSEWIC reassessed this species as Threatened in May 2024. The species and its nests are protected under the *Migratory Birds Convention Act* (1994)

in Canada and equivalent legislation in the U.S. Long-billed Curlew is Yellow-listed in British Columbia (since 2022), and it is considered a species of Special Concern in Alberta. Less than 1% of Long-billed Curlew breeding habitat in Canada is formally protected.

In the U.S., Long-billed Curlew has no status under the *Endangered Species Act*, but is listed as a U.S. Fish and Wildlife Service Bird of Conservation Concern nationally, in five U.S. Fish and Wildlife Service regions, and in several Bird Conservation Regions. Long-billed Curlew is also listed as a species of concern in several U.S. states.

NatureServe considers the species Apparently Secure globally and in the U.S, and Vulnerable in Canada. NatureServe ranks for Alberta and Saskatchewan are Vulnerable; ranks are Apparently Secure for British Columbia, and Presumed Extirpated for Manitoba.

Source: COSEWIC. 2024. IN PRESS. COSEWIC assessment and status report on the Long-billed Curlew *Numenius americanus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiv + 55 pp.

For more information, please visit https://species-registry.canada.ca/index-en.html

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Canada

Rigid Apple Moss

Photo: © Kella Sadler

Scientific Name

Bartramia aprica

Taxon

Mosses

COSEWIC status

Threatened

Canadian Range

BC

Reason for designation

This moss occurs in Canada in the Mediterranean climates of southern Vancouver Island and the Gulf Islands. It is restricted to rock outcrops and well-drained, shallow soil in close association with seepages, almost all within imperiled Garry Oak ecosystems. Increased survey effort has shown that the species is more widespread than previously known, reducing its risk of extirpation. However, the population remains small, and habitat loss through climate change, fire and fire suppression, and invasive non-native species continues to threaten the species.

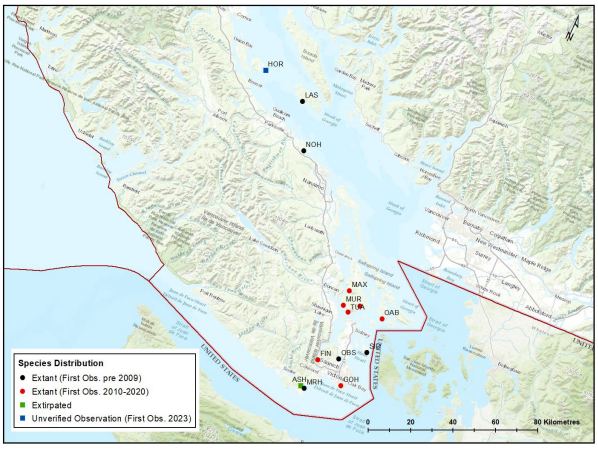
Wildlife Species Description and Significance

Rigid Apple Moss is a green to yellow-green moss that grows in tufts. It has a spherical sporangium (spore capsule) when young (until maturity) and linear leaves that are straight and erect in both wet and dry states.

In Canada, where the species reaches its northern global range limit, it is restricted to Garry Oak and associated ecosystems, which are "Critically Imperiled" in Canada.

Distribution

The taxonomy of Rigid Apple Moss changed recently due to new molecular analyses: the species found in Canada is restricted to the west coast of North America and also to Mediterranean climates in Europe. In Canada, just thirteen subpopulations are known on southeastern Vancouver Island and the adjacent Gulf Islands of British Columbia. Besides one known record of Rigid Apple Moss in Washington state, the Canadian population shows a significant disjunction from the centre of the species' North American distribution in California.



Canadian distribution of Rigid Apple Moss. Vancouver Island: Mount Finlayson (FIN), Government House (GOV), Mary Hill (MRH), Notch Hill, near Nanoose (NOH), Observatory Hill (OBS); Salt Spring Island: Mount Maxwell (MAX), Musgrave Rock (MUR), Reginald Hill (REH), Mount Tuam (TUA); Lasqueti Island, British Columbia Ecological Reserve (LAS); Pender Island: Oaks Bluff (OAB); Sidney Island: Wymond Point (SID), Hornby Island (HOR).

Source: COSEWIC. 2023. IN PRESS. COSEWIC assessment and status report on the Rigid Apple Moss *Bartramia aprica* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 50 pp.

Habitat

Populations of Rigid Apple Moss are typically associated with warm, dry summers and mild, wet winters. Most subpopulations have a

southern aspect. The Canadian population of Rigid Apple Moss occupies two distinct microhabitats, both of which are free of grass and herb cover: (1) well-drained, shallow, compacted soil, and (2) crevices or undersides of small overhanging lips of meta-igneous bedrock. Rigid Apple Moss subpopulations are closely associated with seepage and often occur in, or close to, intermittently and/or seasonally moist outflow paths.

Biology

Rigid Apple Moss disperses primarily as spores that result from sexual reproduction. Rigid Apple Moss is a small, upright moss, producing reproductive structures at the end of stems or branches. Male and female reproductive structures co-occur on the same plant. Although the Canadian population appears to produce spores successfully and regularly, dispersal is expected to be mainly local and dispersal between subpopulations is unlikely. The species has an estimated generation time of 11-25 years.

Population Sizes and Trends

In Canada, there are twelve extant Rigid Apple Moss subpopulations, and one extirpated subpopulation. Trends in the size and density of each Rigid Apple Moss subpopulation are difficult to estimate owing to the incomplete nature of historical records and inconsistent observation history. Three of the extant subpopulations have been monitored every eight to ten years and one has been monitored almost annually. Most other subpopulations have had at least one baseline survey.

Threats and Limiting Factors

Reliance on a narrow range of specific micro- and macro-habitat requirements is the main limiting factor for Rigid Apple Moss. Rigid Apple Moss is particularly sensitive to climate change because of its close association with rare macro- and micro-climatic patterns. These are projected to shift and experience increasing temperature and precipitation extremes with increasing frequency in the future. This sensitivity is supported by the NatureServe Climate Change Vulnerability Index which showed the species to be Extremely Vulnerable, a result that strongly supports the Threats Assessment score for climate change.

Other high impact threats – fire suppression, wildfire, and invasive species – are exacerbated by climate change. Lower impact threats such as residential and commercial development and human intrusion and disturbance (i.e., recreation, military exercises, and work) are more restricted in scope or are less imminent. In recent years the species' habitat type has been destroyed and degraded by urban development.

Protection, Status, and Ranks

Rigid Apple Moss is listed as Endangered, in 2003, under the *Species at Risk Act* (SARA) and three subpopulations are protected on federal land. In British Columbia, it is characterized as "S2/ Imperiled" (Red-listed) and receives some protection within provincial Ecological Reserves and parks (three subpopulations), on properties with conservancy covenants or in ecological reserves (three subpopulations), and within a Capital Regional District Park (one subpopulation).

Source: COSEWIC. 2023. IN PRESS. COSEWIC assessment and status report on the Rigid Apple Moss *Bartramia aprica* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 50 pp.

For more information, please visit https://species-registry.canada.ca/index-en.html

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Canada

Macoun's Meadowfoam

Photo: © Ceska Geobotanical Consulting

Scientific Name
Limnanthes macounii

Taxon
Vascular Plants

COSEWIC status
Special concern

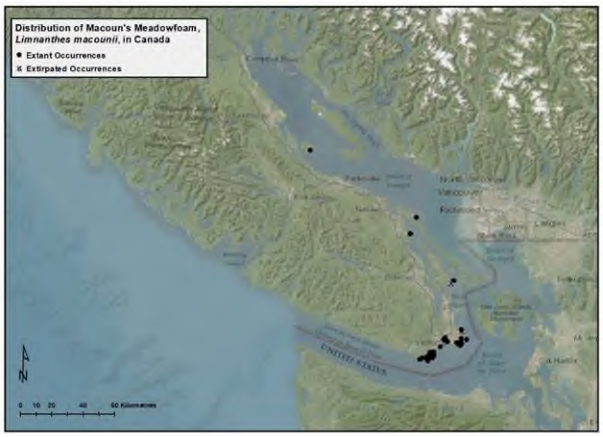
Canadian Range
BC

Reason for designation
This plant is a Canadian endemic that occurs within a narrow coastal fringe of seasonally wet microhabitats where it is at risk from continued competition with a wide range of exotic plants, increasing frequency of extreme weather events, and possible consumption by introduced and locally abundant Canada geese. The known population of this plant has increased considerably since the last assessment due to more search effort. This has resulted in the discovery of new sites, including a managed site, that increases the total population size 50-fold. The status has changed primarily due to a change in the way assessment criteria are now applied; the population is no longer considered to be severely fragmented.

Wildlife Species Description and Significance
Macoun's Meadowfoam is a small (2-5 cm tall, rarely up to 15 cm) annual plant with pinnately compound leaves. The flowers are bell- to bowl-shaped with four white petals that are 4-5 mm long and the fruit are yellow-green to light brown nutlets.

Macoun's Meadowfoam is the only member of the genus and one of only two species in the family Limnanthaceae found in Canada. Of the 20 currently recognized global taxa in the family, eight are of conservation concern. *Limnanthes* species may provide genetic material for breeding programs for *Limnanthes* crops grown for seed oil or glucosinolates.

Distribution
Macoun's Meadowfoam is endemic to southeastern Vancouver Island and the adjacent Gulf Islands in British Columbia. It has not been found on mainland British Columbia nor in the United States.



Map showing range of Macoun's Meadowfoam global population

Source: COSEWIC. 2023. IN PRESS. COSEWIC assessment and status report on the Macoun's Meadowfoam *Limnanthes macounii* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 22 pp.

Habitat
The habitat occurs in open areas or light, open forests, in microsites with short or sparse vegetation that are fully saturated or shallowly submerged in the winter and completely dry in the summer. Most subpopulations are on coastal shorelines within 200 m from the ocean where salt spray along with shallow soils (depth few to 30 cm) limits competing trees and shrubs. Habitat includes vernal pools, intermittent

seepage, wet depressions, ends of seepage streams, and depressions and seepages in open forests.

Biology

Macoun's Meadowfoam is a winter annual, germinating after fall rains and growing at a time when most other plants are dormant. Plants flower from March to early May and nutlets mature by the beginning of June. Germination rates are low, suggesting the species relies on seed banks to stagger germination in unfavourable years. Nutlet dispersal is presumed to occur over short distance by water. Although bees and flies pollinate other Limnanthes species, it is not known which species pollinate Macoun's Meadowfoam or if pollinators are required, given that the plants are self-compatible.

Population Sizes and Trends

Macoun's Meadowfoam is known from 31 extant subpopulations with a third of the subpopulations having more than one site per subpopulation. Most plants are concentrated in one large subpopulation (Whirl Bay) in a maintained fire break that is estimated to contain over four million plants. A further 12 subpopulations have over 1,000 plants but the remainder of the subpopulations have fewer than 400 plants each. The total population summed from the most recent count data is estimated to be between 4,270,000 – 4,275,000. The number of plants found fluctuates each year with annual weather variation. Some subpopulations and sites within subpopulations have been destroyed by development.

Threats and Limiting Factors

Threats associated with climate change include unseasonably dry periods in early spring that impact seed set and dry weather over the fall or winter that can damage plants and seedlings. Increased storm events may cause flooding of vernal pools with salt water or increase sea spray of sites that are at low elevations next to the shoreline. Temperature extremes can delay germination or exacerbate droughts.

Non-native, invasive shrubs including Scotch Broom, Gorse, and English Ivy degrade habitat by casting shade, altering vegetation structure, and fixing nitrogen which can create conditions more favourable for other invasive species. Invasive grasses reduce available moisture, decrease the amount of bare soil available in depressions and seepages and over time, create thatch accumulation in the depressions, and increase organic soils resulting in competing vegetation growth and drier pools with habitat less suitable for Macoun's Meadowfoam. Finally, non-native forbs can also compete for light and moisture with Macoun's Meadowfoam.

Recreational activities including hiking, picnicking, and camping can spread invasive plants. Although light trampling associated with recreational activities appears to benefit Macoun's Meadowfoam by limiting competition from invasive plants, excessive trampling results in compacted soils that produce smaller, less productive plants. Development on private and publicly owned land has destroyed historical subpopulations either through direct construction or by altering the hydrology required for seepage conditions.

Limiting factors include a lack of the specialized seepage or pool habitat, limited dispersal mechanisms and genetic isolation.

Protection, Status, and Ranks

Macoun's Meadowfoam is listed as Threatened on Schedule 1 of the *Species at Risk Act*. It is ranked Imperilled (S2?) in British Columbia, Imperilled (N2?) in Canada, and Imperilled (G2?) globally.

There are 11 occurrences that are federally managed, three on First Nations' Reserve lands, five provincially managed, eight regional parks, and nine occurrences held by private landowners.

Source: COSEWIC. 2023. IN PRESS. COSEWIC assessment and status report on the Macoun's Meadowfoam *Limnanthes macounii* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 22 pp.

For more information, please visit https://species-registry.canada.ca/index-en.html

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Canada

White Wood Aster

Photo: © Benoît Tremblay

Scientific Name
Eurybia divaricate

Taxon
Vascular Plants

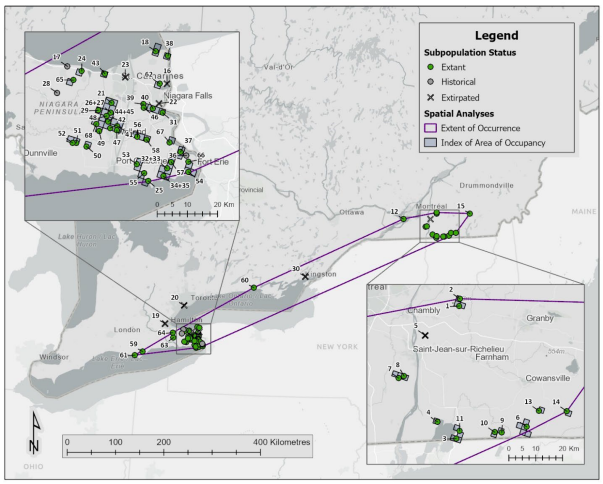
COSEWIC status
Special concern

Canadian Range
ON, QC

Reason for designation
This herbaceous perennial plant is found in the temperate forests of eastern North America, reaching the northern limit of its range in Canada. Thirty geographically-restricted and isolated subpopulations occur in patches of deciduous forest in extreme southern Ontario and southwestern Quebec. Recent surveys have found additional subpopulations, with over 100,000 known mature plants in Canada. The change in status reflects this higher estimate of abundance, and changes to the way that criteria are applied. However, the species is still threatened by habitat loss and degradation due to housing, recreational activities, agriculture, and forestry, as well as invasive species and deer browsing.

Wildlife Species Description and Significance
White Wood Aster (*Eurybia divaricata*) is a fall-flowering herbaceous perennial. Its upper leaves are lanceolate and deeply toothed, while its lower leaves are narrowly cordate and toothed. The inflorescence is a head of yellow or purple disk flowers surrounded by white ray flowers. The flower heads are united in a corymb.

Distribution
White Wood Aster is present in Canada and the United States. The species is common in most of its main range in the Appalachians, from New England to Georgia and Alabama. In Canada, the species is at the northern limit of its range. It is found in isolated subpopulations in southern Ontario (Niagara, Norfolk, and City of Quinte West regions), as well as in a few wooded areas in southwestern Quebec (Montérégie and Estrie).



Canadian distribution of White Wood Aster

Source: COSEWIC. 2023. IN PRESS. COSEWIC assessment and status report on the White Wood Aster *Eurybia divaricata* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 34 pp.

Habitat
The species grows in dry to moist deciduous forests with well-drained soils. It prefers habitats with openings in the tree canopy.

Biology
White Wood Aster spreads mainly asexually (rhizomes), but sexual reproduction is possible when conditions are favourable. Flowering occurs from the beginning of August to September, and fruiting, between the middle and the end of September.

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Population Sizes and Trends

The documented abundance of the Canadian population has increased since the last COSEWIC status report. This is mainly due to an increased search effort and reporting of sites, rather than real population growth. The most recent data indicate 61 subpopulations in Canada. In Quebec, there are 15 subpopulations: 14 extant and one extirpated. In Ontario, there are 46 subpopulations: 38 extant, two historical, and six extirpated. The previous report documented 25 subpopulations.

The most recent count of White Wood Aster in Canada estimates more than 101,000 flowering stems, including approximately 4,300 in Quebec and 97,150 in Ontario. The previous report documented just over 10,000 stems.

Threats and Limiting Factors

The species is mainly threatened by the loss of habitats linked to development, agriculture, forestry, invasive species, browsing by White-tailed Deer, and recreational activities. The subpopulations are mostly isolated, which can limit genetic exchanges.

Protection, Status, and Ranks

The species was previously designated as Threatened by COSEWIC in 1995 and 2002. The species has been listed as Threatened on Schedule 1 of the *Species at Risk Act* (SARA) since 2005. In Ontario, the species is listed as a Threatened species under the provincial *Endangered Species Act*, since 2007. In Quebec, it has been listed as a "Threatened" species under Quebec's *Act Respecting Threatened or Vulnerable Species* since 2005, which provides general habitat protection under this law.

Globally, the species is considered "Secure" (G5), while it is "Vulnerable" (N3) in Canada, "Imperilled" (S2) in Quebec and "Vulnerable" (S3) in Ontario.

Source: COSEWIC. 2023. IN PRESS. COSEWIC assessment and status report on the White Wood Aster *Eurybia divaricata* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 34 pp.

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Canada

Willowleaf Aster

Photo: © William Van Hemessen

Scientific Name

Symphyotrichum praealtum

Taxon

Vascular Plants

COSEWIC status

Special concern

Canadian Range

ON

Reason for designation

This herbaceous perennial plant reaches the northern limit of its range in Canada, and is geographically a highly restricted species that has undergone range contraction. Nine subpopulations occur in extreme southern Ontario. Recent surveys have found additional subpopulations, with over 200,000 known flowering shoots in Canada, mostly within transplanted subpopulations. The change in status reflects this higher estimate of abundance, changes to the way that criteria are applied, and new discovery of subpopulations. However, the species is still under threat from habitat loss and degradation due to mowing and maintenance of roads, trails, powerline corridors, fire suppression, encroachment of woody vegetation due to natural ecological succession, and residential development.

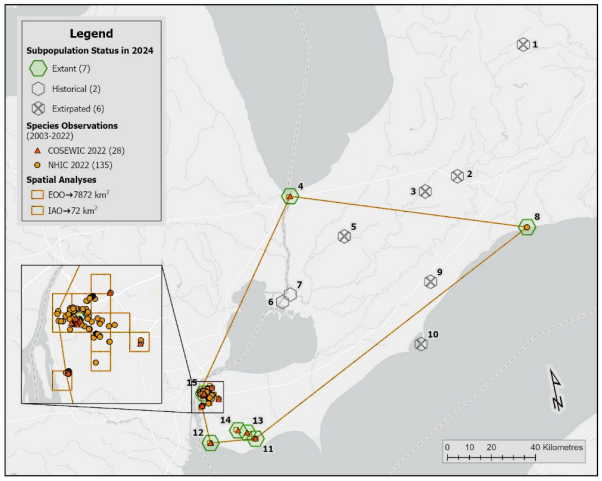
Wildlife Species Description and Significance

Willowleaf Aster is an herbaceous perennial plant in the aster family. It is characterized by composite heads of near-white to deep purple ray florets and yellow disc florets, narrow leaves with distinctive reticulate venation beneath, and rhizomatous growth habit.

Willowleaf Aster is at the northern fringe of its global range in Canada, which may be important for the future adaptive potential of the species.

Distribution

Willowleaf Aster is found only in North America where it occurs from northern Mexico to a small area of extreme southwestern Ontario. The majority of its range is in the central and eastern United States.



Extent of occurrence (EOO) and Index of Area of Occupancy (IAO) based on extant and historical (presumed extant) sites (2022)

Source: COSEWIC. 2024. IN PRESS. COSEWIC assessment and status report on the Willowleaf Aster *Symphyotrichum praealtum* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 44 pp.

Habitat

In Canada, Willowleaf Aster occurs in tallgrass prairies and other open habitats, and occasionally in thickets and along roads and trails. Some open habitats of Willowleaf Aster in Canada are transitioning to thicket and woodland habitats through natural ecological succession, which could negatively affect the species.

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Biology

Willowleaf Aster is a rhizomatous species that can form large colonies of up to 1,000 clonal stems. It is insect-pollinated and produces seeds inside an achene with a pappus of fine bristles to enable dispersal by wind. It requires cross-pollination by insects to successfully produce seeds, so individuals must be in close enough proximity that pollen can be transported between them by insects such as bees, wasps, and flies. It can successfully flower and produce fruit in the first year of growth following seed germination. The short lifespan of its seeds limits the potential for recovery from the seed bank.

Population Sizes and Trends

There are currently at least 210,530 mature individuals (flowering clonal stems) of Willowleaf Aster in Canada. Eighty-six percent of these are based on estimates of transplanted individuals that are established and reproducing. This number was inferred from a combination of field work conducted by the report writers in 2022 and secondary sources, namely observation data from Ontario's Natural Heritage Information Centre and monitoring by the Ontario Ministry of Transportation. Individuals are spread between seven extant subpopulations, but 98.6% of mature individuals occur in just one subpopulation in Windsor and LaSalle, Ontario. The statuses of two additional subpopulations at Bkejwanong (Walpole Island) First Nation are unknown but the subpopulations are likely still extant due to the continued presence of suitable habitat.

The estimate of abundance of Willowleaf Aster in Canada has increased by several orders of magnitude over the past 10 years. However, this is primarily a reflection of more detailed surveys for the species in recent years, mostly within transplanted colonies. Determining trends since the previous status report is complicated by a lack of abundance information in secondary sources and differences in how individuals were defined and counted.

Threats and Limiting Factors

The main threat to Willowleaf Aster in Canada appears to be natural succession of open habitats (e.g., prairies and meadows) to thickets and woodlands that are not suitable for the species. It requires open habitats that are maintained through natural disturbance (e.g., fires) or light anthropogenic disturbance (e.g., brush clearing). Other threats include habitat loss and degradation due to mowing and maintenance of roads, trails, and powerline corridors, along with fire suppression, encroachment of woody vegetation due to natural ecological succession, and housing and trail development.

Protection, Status, and Ranks

Willowleaf Aster is currently listed as Threatened on Schedule 1 of the federal *Species at Risk Act* (2002) and under Ontario's *Endangered Species Act* (2007). It has a global conservation rank of G5 (Secure), a national conservation rank of N2 (Imperilled) in Canada and a provincial conservation rank of S2 (Imperilled) in Ontario. It is considered Secure (N5) in the United States but has a rank of S1 (Critically Imperilled) or S3 (Vulnerable) in seven states. It is unranked in the majority of states where it occurs and has no legal status in Mexico.

Source: COSEWIC. 2024. IN PRESS. COSEWIC assessment and status report on the Willowleaf Aster *Symphyotrichum praealtum* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 44 pp.

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