



Aweme Borer

Photo: © Agriculture and Agri-Food
Canada/Agriculture et agroalimentaire Canada;
photo: Jocelyn Gill



Scientific Name

Papaipema aweme

Taxon

Arthropods

COSEWIC Status

Data Deficient

Canadian Range

Saskatchewan, Manitoba, Ontario

Reason for designation

Until 2009, this moth was known from only a few sites in Canada. Misinterpreted habitat associations and assumptions with known collection sites led to many years of searching inaccurate habitats. In 2015, Bog Buckbean (*Menyanthes trifoliata*) was confirmed as the larval host plant, the moth's primary habitat narrowed to fens or peatlands with quaking mats, and it was learned that the larvae live inside the stem, making detection difficult. New records from east-central Saskatchewan to the Ottawa Valley in Ontario, extended the geographic range of the species, suggesting the species is likely more common and widespread than previously understood. However, there is much unsurveyed suitable habitat within the moth's range. The population size and trends are unknown. Given these unknowns its status has changed from Endangered to Data Deficient.

Wildlife Species Description and Significance

Aweme Borer (*Papaipema aweme*) is a noctuid moth with a wingspan of 33–37 mm. The forewing is light brown with darker brown markings and the hindwings are pale yellow white. Larvae have pale unbroken lateral stripes.

Distribution

The global range of Aweme Borer extends from central Saskatchewan east through Manitoba to Ontario and southwards into the United States through Minnesota, Wisconsin, Michigan and New York. Globally, there are 22 subpopulations. The global range could be much larger due to extensive potential habitat that has not been surveyed.

The Canadian range is from southern Ontario west through Manitoba and Saskatchewan. In Canada, there are 13 subpopulations (12 extant and one presumed extirpated due to lack of suitable habitat). The species is likely in Alberta, although there have yet to be records to confirm this possibility.



Canadian range and subpopulations of Aweme Borer (*Papaipema aweme*).

Source: COSEWIC. 2020. COSEWIC assessment and status report on the Aweme Borer *Papaipema aweme* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 44 pp.

Habitat

Aweme Borer inhabits open to sparsely treed rich graminoid fen with a quaking mat or with shallow standing water. Habitats are variable and include large open fens, fen channels through treed wetlands, and lake shoreline peatlands. All habitats contain the larval host plant, Bog Buckbean, and are dominated by Woolly-fruited Sedge (*Carex lasiocarpa*) and other sedges. Some habitats are within peatland complexes over 15 km² in size.

Biology

Aweme Borer has an annual life cycle and one flight period per year, starting in late August and lasting longer in the United States. The eggs overwinter and larvae hatch sometime in the spring. Larvae are monophagous on Bog Buckbean and are presumed to pupate on or inside the host plant stems. Adults, mainly females, can disperse several kilometres from larval habitat. It is unlikely the population is severely fragmented.

Population Sizes and Trends

There are insufficient data on Aweme Borer abundance or distribution to assess fluctuations or trends in Canada or elsewhere in the species' global range. Evidence for large abundance is limited; however, at one collection site more than 150 adults were observed during one survey date. Rescue is considered possible due to dispersal potential and proximity of one subpopulation that straddles the international border. The number of subpopulations and the extent of Canadian and global ranges are expected to increase with additional search effort.

Threats and Limiting Factors

Aweme Borer has a wide range and most subpopulations are in natural areas with few immediate threats. The main threats to the southernmost Aweme Borer subpopulation (#11)

include ecosystem modifications that change due to the spread of native and non-native plants. The impacts of climate change or development that alter peatland and fen hydrology have the potential to impact larval development. Habitat that is too dry can induce premature host plant senescence and larval mortality because the larvae are borers and rely on the host plant moisture to remain alive while in the stem. Alternately, prolonged flooding drowns the plants and the larvae. Some of these impacts could occur through habitat shifting and drought as a result of climate change, which at present is a likely threat with unknown scope and severity.

Protection, Status and Ranks

Aweme Borer is listed as Endangered on Schedule 1 of the federal *Species at Risk Act* (SARA), and listed under the *Ontario Endangered Species Act 2007* (ESA). The species is not legally protected under provincial acts in Saskatchewan or Manitoba.

Aweme Borer is ranked globally and nationally vulnerable to apparently secure (G3G4 and N3N4, respectively). The species is ranked Unknown in Ontario (SU) and Manitoba (SU). In Saskatchewan the species has not been ranked (SNR). The host plant is not at risk. One subpopulation is in an Ontario provincial park, one is on a Canadian military base, one is on private property, and two are presumed to be on municipal property. Seven subpopulations are on provincial Crown land.

Source: COSEWIC. 2020. COSEWIC assessment and status report on the Aweme Borer *Papaipema aweme* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 44 pp.

For more information, please visit www.sararegistry.gc.ca.

For information regarding reproduction rights, please contact Environment and Climate Change Canada's Public Inquiries Centre at 1-800-668-6767 (in Canada only) or 819-997-2800 or email to ec.enviroinfo.ec@canada.ca



Barn Swallow

Photo: © Gordon Court



Scientific name

Hirundo rustica

Taxon

Birds

COSEWIC status

Special Concern

Canadian range

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

Reason for designation

This aerial insectivore is among the world's most widespread birds, with about 6.4 million mature individuals in Canada. It experienced a substantial population decline in North America over more than two decades, beginning in the mid- to late 1980s. However, the Canadian population has remained largely stable over the past ten years (2009-2019), with a substantial increase in Saskatchewan largely offsetting ongoing declines in several other provinces. Key threats include declining populations of insect prey, increasing frequency of severe temperature fluctuations during spring migration and the breeding season, and in some regions, loss of suitable nesting sites. Although the Canadian population remains large and overall declines

have abated, the species may once again become Threatened if threats continue or worsen.

Wildlife Species Description and Significance

Barn Swallow is a medium-sized passerine with metallic blue upperparts, cinnamon underparts, and a chestnut throat and forehead. Its most recognizable feature is a deeply forked tail with long outer feathers. Males have a longer tail, somewhat glossier upperparts and a darker breast.

Barn Swallow is a member of the ecological guild known as aerial insectivores, of which many members are in decline globally.

Distribution

Barn Swallow is the most globally widespread species of swallow, occurring on every continent except Antarctica. In the western hemisphere, it breeds in Canada primarily south of the treeline, the United States and Mexico; Argentina also has a small breeding population. Barn Swallow has been documented breeding in every province and territory. Barn Swallow is a long-distance migrant, overwintering in the southern United States, parts of Mexico, and Central and South America.



Canadian breeding range of Barn Swallow

Source: COSEWIC. 2021. COSEWIC assessment and status report on the Barn Swallow *Hirundo rustica* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 60 pp.

Habitat

Before European colonization of North America, Barn Swallows largely nested on fissures in cliffs, rock overhangs, and caves. Thereafter, their preferred nest sites became human-made structures, including barns, stables, houses, sheds, and bridges. Barn Swallows prefer to forage over open spaces such as grasslands, agricultural fields, shorelines, woodland clearings, wetlands, sand dunes, tundra, and roads.

Biology

Barn Swallows nest in colonies or independently. They construct a small cup-shaped nest and affix it to a vertical, or occasionally a horizontal surface. The breeding season in Canada is typically from May through July. Most clutches contain 4-5 eggs; a second brood is often reared, particularly in southern Canada. Some Barn Swallows of both sexes breed in their first year. Barn Swallows forage mostly on the wing, actively pursuing and catching flying insects; however, they may forage on the ground opportunistically. Generation length is estimated to be approximately 3 years.

Population Sizes and Trends

In Canada, the Barn Swallow population is currently estimated to be at least 6.4 million mature individuals. This represents approximately 3.4% of the global Barn Swallow population and 13.6% of the population in the United States and Canada. Over 60% of the Canadian population currently breeds in the Prairie provinces.

Population trend estimates for Barn Swallow are based on Breeding Bird Survey data. For the period 1970-2019, there was a statistically significant annual trend of -2.34% (95% CI = -2.66% to -2.05%) per year in Canada, corresponding to an overall decline of 68.6% over 49 years. During the most recent 10-year period (2009-2019) the Canadian population has been close to stable, changing at -0.12% (95% CI = -1.07% to 0.89%) per year, amounting to a decrease of -1.2% over the decade. However, at a regional scale there has been a large increase in Saskatchewan, offsetting substantial ongoing declines in Ontario and Quebec. Comparisons of first and second generation breeding bird atlases in Alberta, Ontario, Quebec, and the Maritimes show results consistent with long-term declines of populations across Canada, with the largest reductions in eastern provinces (Ontario, Quebec, and the Maritimes).

Threats and Limiting Factors

Substantial research is still required to better understand threats affecting Barn Swallow. Currently the most pertinent concerns are thought to be modifications to the natural system (indirect threats such as pesticides and habitat loss reducing prey quality and quantity), climate change, housing and commercial development, changes in agriculture (annual and perennial non-timber crops, and livestock farming and ranching), roads and railroads, and pollution. These threats are thought to be reducing the quantity and quality of insect prey, causing lowered reproductive success and direct

mortality. Threats on the wintering grounds are not currently well understood, but are likely related to changes in land-use, resulting in the destruction of suitable foraging habitat, as well as the intensification of agricultural practices that reduce insect populations. The overall impact of threats on Barn Swallow over the next decade is considered to be medium. Limiting factors for Barn Swallow include a dietary dependence on insect prey and low post-fledging survival rates.

Protection, Status and Ranks

In Canada, the *Migratory Birds Convention Act*, 1994 protects Barn Swallow, its nests, and eggs. The species is also listed as Threatened under Schedule 1 of the *Species at Risk Act*, 2002. In Canada, Barn Swallow is listed as N3N4 (Vulnerable to Apparently Secure) nationally, and S2 (Imperilled) in the Yukon Territory, New Brunswick, Prince Edward Island and Newfoundland, S2? (Imperilled?) in the Northwest Territories, S2S3 (Imperilled to Vulnerable) in Nova Scotia, S3 (Vulnerable) in Alberta and Quebec, S3S4 (Vulnerable to Apparently Secure) in British Columbia, S4 (Apparently Secure) in Manitoba, and S5 (Secure) in Saskatchewan and Ontario. In the United States, Barn Swallow is protected under the *Migratory Bird Treaty Act*, and ranked nationally as N5 (Secure). Globally, Barn Swallow is considered G5 (Secure).

Source: COSEWIC. 2021. COSEWIC assessment and status report on the Barn Swallow *Hirundo rustica* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 60 pp.

For more information, please visit
www.sararegistry.gc.ca.

For information regarding reproduction rights, please contact Environment and Climate Change Canada's Public Inquiries Centre at 1-800-668-6767 (in Canada only) or 819-997-2800 or email to ec.enviroinfo.ec@canada.ca



Black Hills Mountainsnail



Photo: © Robert G. Forsyth

Scientific name
Oreohelix cooperi

Taxon
Molluscs

COSEWIC status
Endangered

Canadian range
Alberta, Saskatchewan

Reason for designation

Globally, this small (shell width about 1 cm) land snail is confined to four mountainous “sky islands” on the Great Plains of North America. In Canada, it occurs only in the Cypress Hills of Alberta and Saskatchewan. Known from this area since 1905, albeit under a different name, this species occurs on ridges, hilltops, cliffs, and slopes at or near the sand, silt, cobbles, and conglomerates of the Cypress Hills Formation. The snails are patchily distributed within these habitats. It is absent from the gently sloping southern exposure of the Cypress Hills and seldom occurs in the valley bottoms. This slow-moving species is susceptible to catastrophic wildfire, exacerbated by a build-up of fuels from fire suppression over the past century and drought associated with climate change. Introduced species, including ground-foraging Wild Turkey and a parasite, are a growing concern.

Wildlife Species Description and Significance

Black Hills Mountainsnail is one of three species of its genus (*Oreohelix*) occurring in the Cypress Hills. It is clearly distinguished from the others within the genus by its smaller size and genetics. The shell of this species is about 1 cm in diameter, opaque, greyish-white or brown, and usually has one or two brown spiral bands, although sometimes bands are absent. The shell surface has irregular incremental wrinkles and striae. Very young snails have a flattened, keeled shell with coarse sculpture and scaly ridges.

Black Hills Mountainsnails, as do other terrestrial species of snail, perform important ecological roles: they consume and therefore aid in the decomposition of dead plant matter; they are important in cycling calcium through the ecosystem, making it available to other organisms; and they serve as hosts and food for a variety of other organisms.

As one of the few large-bodied molluscs in the Cypress Hills, Black Hills Mountainsnail is a molluscan representative of this unglaciated region’s special fauna and flora. This species is scientifically important within the context of glaciation, relictual species, geographic disjunction, dispersal, and the significance of sky islands (isolated mountainous areas surrounded by entirely different lowland terrain) as generators of biodiversity.

Distribution

Black Hills Mountainsnail is restricted to four sky islands on the Great Plains of South Dakota, Wyoming, Montana, Alberta, and Saskatchewan. In Canada, this species occurs only on the western butte of the Cypress Hills (Alberta/Saskatchewan), where it is mostly

associated with the Cypress Hills Formation, a variable stratum of gravel, sand, sandstone, and conglomerate rock. At some sites, snails occur down slope from the Cypress Hills Formation. In the Cypress Hills, it is likely that there are some connections between known sites, such as along slopes and ridgelines. It is absent from the central butte of the Cypress Hills. All known occurrences in Canada, except one, are within Cypress Hills Interprovincial Park (Alberta and West Block, Saskatchewan). In the Pleistocene, this species occurred east as far as Iowa and Illinois.



Global range of Black Hills Mountainsnail (*Oreohelix cooperi*)

Source: COSEWIC, 2021. COSEWIC assessment and status report on the Black Hills Mountainsnail *Oreohelix cooperi* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 48 pp.

Habitat

Typical habitats of Black Hills Mountainsnail include steep slopes and cliffs, in areas with Cypress Hills Formation. They live in dry habitats such as under juniper, as well as under flattened, dead grass and cinquefoil shrubs at the margin of the plateau prairie and very thin vegetation on exposed hill tops. They are found in moister habitats as well, with abundant and varied understorey vegetation along and below cliffs in coniferous forests. A leaf litter layer is necessary. Snails grow larger and might be more common in these moister, cooler habitats, which are considered optimum for this species.

Biology

Black Hills Mountainsnail is a simultaneous hermaphrodite, with both male and female genitalia concurrent in each individual. This species, like all *Oreohelix*, is ovoviviparous, with eggs retained and then hatching within the parent. There is most likely one clutch of offspring per year. Growth likely occurs when snails are most active; snails are dormant during winter (hibernation) and summer (aestivation). In general, *Oreohelix* species are believed to mature in 1–3 years and possibly live for up to six years, with the average life span less than two years. Generation time for this species is estimated to be 2–3 years.

This species, like most land snails, has limited dispersal capacity. There is little evidence of dispersal away from the conglomerate, cobble, or silt layer of the Cypress Hills Formation.

This species is likely a generalist detritivore and herbivore and therefore has no specific plant requirements for food. Predation on it, likely by small mammals, has been seen. This species is frequently infected by an invasive European trematode.

Population Sizes and Trends

No information is available on population sizes and trend. Surveys to date have focused on detecting its presence. This species is somewhat gregarious, often occurring in tens to perhaps hundreds of individuals where it is found.

Threats and Limiting Factors

Limiting factors for land snails in general are their poor ability for dispersal and low tolerance for extreme changes in environmental conditions such as humidity and temperature. The most serious and plausible threat is catastrophic wildfire, exacerbated by a century of fire suppression and climate change. A very

hot fire burning down to the mineral soil would be devastating, killing snails and destroying vegetation and the litter layer. Additional but low impact threats include tourism development, trampling by recreationalists and cattle, and the introduction of invasive species including ground-foraging birds and a European parasite, the latter of which affects the snail's reproduction.

Protection, Status and Ranks

No direct legal protection is currently afforded to this species in Canada or the USA. As all but one known site is within Cypress Hills Interprovincial Park, habitat is generally well-protected.

Source: COSEWIC. 2021. COSEWIC assessment and status report on the Black Hills Mountainsnail *Oreohelix cooperi* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 48 pp.

For more information, please visit
www.sararegistry.gc.ca.

For information regarding reproduction rights, please contact Environment and Climate Change Canada's Public Inquiries Centre at 1-800-668-6767 (in Canada only) or 819-997-2800 or email to ec.enviroinfo.ec@canada.ca



Canada Warbler



Photo: @Carl Savignac

Wildlife Species Description and Significance

Canada Warbler is a small, colourful songbird. Males are more brightly marked than females and immatures, with blue-grey upperparts and tail contrasting with a yellow throat and breast. Black stripes form a necklace on the breast, which is bolder on males than on females. Nearly 80% of the global population breeds in Canada, giving the country a large jurisdictional responsibility for conservation of this species.

Scientific name

Cardellina canadensis

Taxon

Birds

COSEWIC status

Special Concern

Canadian range

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

Distribution

Canada Warbler breeds in all provinces and territories except Nunavut and Newfoundland and Labrador. In the United States, it breeds in several northern states and southward along the Appalachian Mountains. It migrates to overwinter in northwestern South America.

Reason for designation

This small songbird has 80% of its breeding range in Canada and winters in the northern Andes Mountains. Breeding Bird Survey results show that the long-term decline of the Canadian population began to slow down in 2003 and that numbers have increased steadily since 2012, with an overall growth of 46% over the past decade. However, significant threats persist, most notably clearing of forests in South America for livestock farming and other agriculture. The revised status reflects the substantial improvement in population trend since the previous assessment of Threatened, but concern remains that the species is at risk of becoming Threatened again if threats are not managed effectively.



Global range of Canada Warbler across the seasons.

Source: COSEWIC. 2020. COSEWIC assessment and status report on the Canada Warbler *Cardellina canadensis* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 54 pp.

Habitat

Wet, mixed deciduous-coniferous forests with a well-developed shrub layer tend to be preferred for breeding, but Canada Warbler also uses riparian shrub forest on slopes and in ravines, and in stands regenerating after natural and anthropogenic disturbances. In its wintering range, Canada Warbler favours mature forest at altitudes of 1000 to 2000 m, but also occurs in second-growth forests, forest edges, shade coffee plantations, and other semi-open areas. During migration, the species most frequently occurs in woodlands with dense understory, including floodplain forests.

Biology

Canada Warbler breeds once annually, typically laying four to five eggs. Incubation lasts about 12 days. Chicks remain in the nest for 10 days, and are dependent on parents for 2 to 3 weeks after they leave the nest. Generation time is estimated to be 2 years.

Population Sizes and Trends

The Canadian population of Canada Warbler is estimated to be between 2 million and 10.4 million individuals. Breeding Bird Survey results for Canada indicate a cumulative decline of 51% between 1970 and 2019, but an improving trend since around 2003, including a cumulative increase of 46% between 2009 and 2019, which has restored the population to mid-1990s levels. Trends vary regionally in Canada, with the strongest short-term increases in the core of the range in the central and eastern boreal forest, contrasting with ongoing declines in Alberta and the Maritimes. Other data sources agree with a long-term decrease in Canada Warbler population size; the majority also indicate ongoing declines in the short-term, but in many cases the most recent data are at least 5-10 years old, largely preceding the recent increase documented by the Breeding Bird Survey.

Threats and Limiting Factors

Habitat loss and degradation on the South American wintering range in the Andes are thought to be the most likely factors responsible for the long-term decline of Canada Warbler. Within Canada Warbler's wintering range, over 90% of the primary mountain forests have been cleared since the 1970s. In recent years there has been some regrowth at higher elevations in parts of the wintering range, but ongoing losses elsewhere and at lower elevations. Habitat loss has also occurred within parts of its Canadian breeding range, and along migration corridors, especially where wet forests have been drained for urban development or conversion to

agricultural land (particularly in the east), or industrial expansion and road development (particularly in the west). During migration, evidence suggests the species is disproportionately vulnerable to collisions with tall buildings and other structures.

The need for forested wintering habitat in the northern Andes is a key limiting factor for Canada Warbler. The species shows some flexibility with regard to its ability to occupy shade-grown coffee plantations, but these are increasingly being converted to sun coffee cultivation, which is unsuitable for Canada Warbler.



Photo: © Carl Savignac

designated threatened or vulnerable in Quebec. Canada Warbler is considered a species of high conservation concern by Partners in Flight in Canada and the United States. NatureServe ranks it as globally secure and the IUCN ranks it as Least Concern.

Source: COSEWIC. 2020. COSEWIC assessment and status report on the Canada Warbler *Cardellina canadensis* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 54 pp.

Protection, Status and Ranks

Canada Warbler adults, nests and eggs are protected in Canada under the *Migratory Birds Convention Act, 1994*. It is also currently protected under Canada's *Species at Risk Act* as a Threatened species. It is listed as Endangered under the Nova Scotia *Endangered Species Act*, Threatened under Manitoba's *Endangered Species and Ecosystems Act* and the New Brunswick *Endangered Species Act*, and Special Concern under Ontario's *Endangered Species Act*. It is also considered Vulnerable in British Columbia and is on the list of species likely to be

For more information, please visit www.sararegistry.gc.ca.

For information regarding reproduction rights, please contact Environment and Climate Change Canada's Public Inquiries Centre at 1-800-668-6767 (in Canada only) or 819-997-2800 or email to ec.enviroinfo.ec@canada.ca



Cobblestone Tiger Beetle



Photo: © Henri Goulet

Scientific name

Cicindela marginipennis

Taxon

Arthropods

COSEWIC status

Special Concern

Canadian range

New Brunswick

Reason for designation

This distinctive tiger beetle has a small and scattered range within New Brunswick spread over three isolated geographic areas: the Saint John River, the Southwest Miramichi River, and the Grand Lake area. This species' habitat, which is sparsely vegetated cobble and sand beaches on lake shores and riverine islands, is highly fragmented and limited. Up to 74% of potential habitat on the Saint John River was lost with the construction of the Mactaquac Dam in the 1960s. The main threats to the habitat include shoreline modifications from cottage development and soil compaction from ongoing all-terrain vehicle (ATV) recreation within the Grand Lake area. Because the larvae live in burrows among cobblestones, beach traffic from ATVs and other vehicles can crush burrows and cause mortality to individual larvae as well as negatively impact the habitat structure. The shoreline in front of cottages is often modified by removal of vegetation and sometimes levelling, including

sand deposition which smothers larval burrows. The improved status of the beetle reflects additional sites discovered, including a new watershed, since the last assessment as well as a change in the interpretation of severe fragmentation. However, the species may become Threatened if threats are not managed with demonstrable effectiveness..

Wildlife Species Description and Significance

Cobblestone Tiger Beetle (*Cicindela marginipennis*) is in the subfamily Cicindelinae, family Carabidae. Adults (11 – 14 mm long) are predatory and have large mandibles, elytra (i.e., the hardened front wings) with a narrow continuous cream-coloured border and a bright red-orange abdomen that is clearly visible during flight. No subspecies are described.

Tiger beetle larvae (e.g., grub-like with a flattened head and pronotum and large sickle-shaped mandible) typically construct and inhabit vertical burrows in the soil. The top of the head and pronotum (i.e. part of thorax adjacent to the head) together form a flattened disk used to create a plug at the top of their burrow, concealing the entrance and resident larva. The larvae are predatory and wait in their concealed burrow for unsuspecting prey to walk by on the soil surface. The dorsal surface of the larva's fifth abdominal segment is equipped with two pairs of large hooks that attach to the wall of the tunnel, securing the beetle larva if the prey attempts to drag it from its burrow.

Distribution

Globally, Cobblestone Tiger Beetle ranges in eastern North America. The species distribution throughout its range is not contiguous; the species occurs in small and widely separated disjunct subpopulations associated with major

river systems. In the United States (U.S.), the species ranges from Mississippi and Alabama in the south, to Ohio and Maine in the north. In Canada, it is known from New Brunswick and occurs in seven subpopulations spread over three isolated geographic areas: The Saint John River, the Southwest Miramichi River, and the Grand Lake area. Cobblestone Tiger Beetle occurs in colonies that occupy discrete portions of cobblestone shoreline, termed sites throughout this report.



Distribution of Cobblestone Tiger Beetle (*Cicindela marginipennis*) in New Brunswick, Canada.

Source: COSEWIC. 2021. COSEWIC assessment and status report on the Cobblestone Tiger Beetle *Cicindela marginipennis* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiii + 50 pp.

Habitat

In Canada, Cobblestone Tiger Beetle occurs on sparsely vegetated cobble and sand beaches on lake shores and the upstream end of riverine islands. The primary factor that has a significant impact on the structure of the beetle's habitat is the shoreline water level, which is heavily influenced by flow patterns during the spring freshet and water levels (e.g., including levels of drought) the remainder of the season.

Biology

Cobblestone Tiger Beetle has four life stages (egg, larva, pupa, and adult) and undergoes complete metamorphosis. There have been no studies on its life history; however, the biology is like that of other tiger beetles. *Cicindela* species have a 1-4-year life cycle. Eggs are laid in the summer and larvae hatch and create a burrow in which they remain for up to three years. Tiger beetles typically pass through three larval stages or instars, each of these living in the same burrow. The third instar builds a chamber in the soil and then forms a pupa from which the adult later emerges. These immature stages can withstand flood events, as the beach substrate in which they reside is flooded annually at many sites. Tiger beetles are predators of both larval and adult arthropods. Adults are active during the day and will readily take flight when approached.

Population Sizes and Trends

Cobblestone Tiger Beetle is documented at a minimum of 37 sites in Canada; the current (as of 2019) Canadian population is estimated at 11,093 - 14,333 adults. Population abundance studies completed in 2007 and 2008 estimated 8,483 - 9,083 adults at the eight sites known at that time. The increase in population is due to additional sites being documented at the Grand Lake Complex and Southwest Miramichi River areas.

No formal population census has been done since 2008 so there are no data available to estimate a population trend. Colonies at all five sites on the Saint John River and all four sites within the Grand Lake Complex recorded between 2003 and 2005 were confirmed in 2014 or later. A large proportion (up to 74%) of potential island habitats for this species on the Saint John River was lost with the construction of the Mactaquac Dam in the 1960s.

Threats and Limiting Factors

In Canada, the distribution of Cobblestone Tiger Beetle is highly fragmented, occurring in small colonies in a specialized and fragile habitat. This results in a high probability of local extirpation at extant sites. The main threats apply to the habitat at the Grand Lake Complex and include cottage development and soil compaction from illegal vehicle use along cobblestone beaches. Because the larvae live in burrows among cobblestones, beach traffic from vehicles may crush burrow sites, cause mortality to individual larvae as well as negatively impact the habitat structure. Observation at one site within the Grand Lake Complex suggests habitat degradation from frequent vehicle use likely caused a decline of beetles within this area. The small size of colonies at some sites and popularity of tiger beetles for natural history collectors makes this species susceptible to over-collecting.

Protection, Status and Ranks

Cobblestone Tiger Beetle was assessed as Endangered by COSEWIC and is listed as such under Schedule 1 of the federal *Species at Risk Act* (SARA) and New Brunswick *Species at Risk Act*. All subpopulations and habitats occur on non-federal land for which the federal SARA does not apply, and to date none of the prohibitions of the New Brunswick *Species at Risk Act* are afforded to the species.

Source: COSEWIC. 2021. COSEWIC assessment and status report on the Cobblestone Tiger Beetle *Cicindela marginipennis* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiii + 50 pp.

For more information, please visit
www.sararegistry.gc.ca.

For information regarding reproduction rights, please contact Environment and Climate Change Canada's Public Inquiries Centre at 1-800-668-6767 (in Canada only) or 819-997-2800 or email to ec.enviroinfo.ec@canada.ca



Davis's Shieldback

Photo © Mary E. Gartsshore



Scientific name

Atlantiscus davisii

Taxon

Arthropods

COSEWIC status

Threatened

Canadian range

Ontario

Reason for designation

This flightless katydid is found only in six small areas of the sand barren and oak savannah habitats of the Norfolk Sand Plain in southwestern Ontario, where it occurs with other rare species of conservation concern such as Fern-leaved Yellow False Foxglove and Virginia Goat's-rue. The Canadian population is estimated at fewer than 1500 mature individuals. The species has presumably declined over the past 150 years due to the over 90% reduction of dry oak woodland, savannah, and sand barren habitats in southern Ontario. This species depends on fire-maintained ecological communities, and the quality and quantity of this habitat have declined as a result of fire-suppression, forest succession, afforestation efforts, and invasive species. These threats continue with one site likely extirpated as a result of land clearing as recently as 2020.

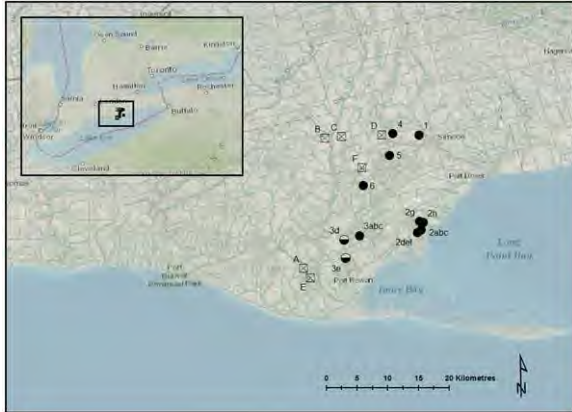
Wildlife Species Description and Significance

Davis's Shieldback (*Atlantiscus davisii*) is a flightless member of family Tettigoniidae (katydids or bush crickets). Adults are 20-25 mm long with a mottled brown and grey colouration. As is typical of shieldback katydids, this species is robust, with a rounded head, a sculpted pronotum (shield-like plate) on the top and sides of the thorax, and a large bulging abdomen. Males have short leathery forewings that extend only a short distance beyond the pronotum and two short projections at the end of the abdomen (cerci). The wings on the female are entirely covered by the pronotum and a long sword-like ovipositor projects behind the abdomen. Nymphs are smaller and similar in appearance to adults except that the male forewings are not fully developed.

In Canada, Davis's Shieldback occurs only in the southern Norfolk Sand Plain physiographic region in southern Ontario. These same habitats have additional species of conservation concern, such as Fern-leaved Yellow False Foxglove and Virginia Goat's-rue.

Distribution

Davis's Shieldback occurs in eastern North America, with a range that extends from Iowa east to Vermont, southwards to North Carolina, and west to Arkansas. A disjunct population occurs in central Michigan. The distribution in Canada is restricted to a small area north of Lake Erie in southern Ontario. The Canadian population consists of six extant subpopulations, although the persistence of one subpopulation is uncertain.



Davis's Shieldback (*Atlanticus davisii*) distribution in Canada. Black circles indicate the sites where the species was confirmed present in 2019 or 2020. Half-filled circles indicate approximate positions of two previously known sites where presence was not confirmed during 2019-2020 search effort. Squares with X indicate other areas with potentially suitable habitat where this species was not detected during targeted searches in 2019-2020.

Source: COSEWIC. 2020. COSEWIC assessment and status report on the Davis's Shieldback *Atlanticus davisii* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 46 pp.

Habitat

In Canada, Davis's Shieldback is closely associated with oak woodland, oak savannah and sand barren habitats on dry sandy soils. It is most often found near forest edges, in woodland openings, or openings along forest access roads or trails. Key habitat features include the presence of well-drained sandy soils, dry leaf litter, low shrubs or saplings, and the availability of sunlight at ground level. Katydidids tend to inhabit the leaf litter and above-ground shrubbery.

Biology

Davis's Shieldback has one generation per year and grows through incomplete metamorphosis. It probably overwinters in the egg stage, with nymphs hatching in the spring, and undergoing a series of moults before maturing in early summer. Adults are active from July through September,

perishing once temperatures drop below freezing.

The adults and nymphs eat plant and animal materials. Adults and nymphs are incompletely nocturnal, being most active from dusk until shortly after midnight, and only intermittently active during the day. Adult males produce songs (stridulations) by rubbing their wings; females do not sing. Their quiet but distinctive songs are useful in locating individuals and for species identification. The female uses her ovipositor to insert the eggs into the ground.

Population Sizes and Trends

The Davis's Shieldback population in Canada is presumed to have declined; the extent of dry oak woodland, savannah and sand barren habitats in southern Ontario has declined by over 90% over the past 150 years. Habitat decline is continuing although the number of known subpopulations has increased due to increased search effort. Available data suggest the Canadian population is small, with a preliminary estimate of between 300-1310 mature individuals over the six extant subpopulations.

Threats and Limiting Factors

Threats to Davis's Shieldback are primarily from ecosystem modifications driven by a combination of fire suppression, forest succession, afforestation and invasive non-native/native plant species. Habitat loss due to road construction, land clearing and light industrial development is ongoing at one of the six subpopulations (#1-6).

Davis's Shieldback habitats are fire-dependent ecological communities. Fire suppression and the consequent invasion of woodland openings by native and non-native woody species are pervasive threats to the habitats of all subpopulations. These threats are partly mitigated by prescribed burning and other vegetation management activities at some protected areas.

A major historical cause of habitat loss in the Canadian range was the widespread planting of conifer plantations in dry sandy openings and open woodlands. Afforestation of open areas is a possible threat at Davis's Shieldback sites outside protected areas.

Protection, Status and Ranks

Davis's Shieldback and its habitat have no legal protection in Canada or Ontario. The six subpopulations are spread over 17 known landowners (referred to as sites): nine sites are in provincially owned protected areas, including Turkey Point Provincial Park and two separate tracts in the St. Williams Conservation Reserve. Three other sites are publicly owned lands that are not protected areas.

Davis's Shieldback is critically imperilled in Canada (N1) and Ontario (S1). The species has not been ranked globally. In Michigan this species is imperilled or vulnerable (S2S3) and has been designated as a species of Special Concern. No other jurisdictions in the United States have assigned a conservation status to the species.

Source: COSEWIC. 2020. COSEWIC assessment and status report on the Davis's Shieldback *Atlantius davisii* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 46 pp.

For more information, please visit
www.sararegistry.gc.ca.

For information regarding reproduction rights, please contact Environment and Climate Change Canada's Public Inquiries Centre at 1-800-668-6767 (in Canada only) or 819-997-2800 or email to ec.enviroinfo.ec@canada.ca



Ferruginous Hawk



Photo: © Bob Gress

Scientific name
Buteo regalis

Taxon
Birds

COSEWIC status
Special Concern

Canadian range
Alberta, Saskatchewan, Manitoba

Reason for designation

This large hawk is the only raptor endemic to North American grasslands. Its Canadian range is largely limited to the southern Prairies of Alberta and Saskatchewan, with a few individuals in southwestern Manitoba. Overall population trends have been stable or slightly increasing over the past three generations, despite ongoing loss of nesting and foraging habitat. The revised status reflects an improvement in population trend since the previous assessment, but recognizes that the species may become Threatened again if threats such as displacement by energy production, increased competition for

nesting habitat, disturbance at nest sites, and persecution of prey are not effectively managed.

Wildlife Species Description and Significance

Ferruginous Hawk is the largest hawk in North America, and the only raptor that is endemic to the grasslands of the continent. Most individuals are pale below with a rusty orange back, but some are dark brown with a contrastingly lighter tail.

Distribution

Ferruginous Hawk breeds from the prairie provinces to the southwest United States, and winters from the southwest United States to northern Mexico. By 1980, the northern edge of the Canadian range had contracted 150-350 km south from its historical limit, likely influenced by factors including shooting, reduced prey availability, and habitat loss.



Ferruginous Hawk breeding distribution in Canada

Source: COSEWIC. 2021. COSEWIC assessment and status report on the Ferruginous Hawk *Buteo regalis* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 46 pp.

Habitat

Ferruginous Hawk requires open habitat, including grassland, shrub-steppe, or desert, typically nesting on elevated features such as trees or nest platforms. Nesting density and the likelihood of re-using nests between years is higher in landscapes with less than 50% cropland. The availability of preferred nesting and wintering habitat has declined by over 80% historically and continues to decrease.

Biology

Ferruginous Hawk first breeds at two years, has a clutch of 2-8 eggs, and raises 2-3 young on average each year. Generation time is estimated as nearly 7 years. Compared to other raptors, Ferruginous Hawk has a specialized diet, heavily favouring Richardson's Ground Squirrel as prey, and is more easily disturbed by human activity near nests.



Photo: © Bob Grass

Population Sizes and Trends

The Canadian population is estimated to be 3000-4000 mature individuals, based on surveys specifically targeting nesting Ferruginous Hawk. Breeding Bird Survey data indicate significant long-term population increases in both Canada and the United States, but only a marginally positive trend overall in both countries for the past three generations (1998-2019), with continued increases in some regions being offset by declines in others. Surveys in Alberta specifically targeting Ferruginous Hawk suggest roughly stable or slightly increasing numbers over the most recent span available (2000-2015), whereas nest counts in Manitoba have declined substantially over the past three generations. The Saskatchewan population has not been monitored in sufficient detail to derive a provincial trend from targeted surveys.

Threats and Limiting Factors

Threats to Ferruginous Hawk include loss of nesting sites, reduction in prey availability, disturbance from energy production and agriculture, collisions with vehicles and infrastructure, and climate change and severe weather. However, the impact of some of these threats may have been partially offset in recent years by recovery actions.

Protection, Status and Ranks

Ferruginous Hawk is listed as Threatened under Schedule 1 of the federal *Species at Risk Act*, Endangered under the *Alberta Wildlife Act*, and Threatened under the *Manitoba Endangered Species Act*. The species is not listed in Saskatchewan, under *The Wild Species at Risk Regulations*. NatureServe ranks it as Apparently Secure globally (G4), Vulnerable in Canada (N3), and Apparently Secure (N4) in the United States. Within Canada, it is ranked Vulnerable (S3) in Saskatchewan, but Imperilled to Vulnerable (S2S3) in Alberta, and Critically Imperilled (S1) in

Manitoba, and Vulnerable or worse in the U.S. border states where it has been ranked.

Source: COSEWIC. 2021. COSEWIC assessment and status report on the Ferruginous Hawk *Buteo regalis* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 46 pp.

For more information, please visit
www.sararegistry.gc.ca.

For information regarding reproduction rights, please contact Environment and Climate Change Canada's Public Inquiries Centre at 1-800-668-6767 (in Canada only) or 819-997-2800 or email to ec.enviroinfo.ec@canada.ca



Grappletail

Photo: © John D. Reynolds



Scientific name

Octogomphus specularis

Taxon

Arthropods

COSEWIC status

Special Concern

Canadian range

British Columbia

Reason for designation

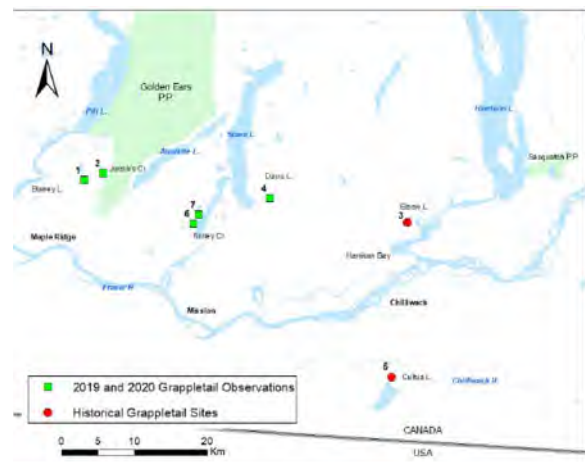
This dragonfly is known from only seven fast-flowing, warm streams that drain small lowland lakes in the mountains of the lower Fraser Valley in southwestern British Columbia. Here, the species is at the northern edge of a range that extends south to Mexico. Larvae forage for three years in streams while adults forage for only a few weeks in nearby forests. There are no estimates of population trends from about 150 observations in the past 90 years. Most streams where it occurs are in forested watersheds with few threats. However, local threats include roadkill at stream crossings and disturbance to the stream habitat by recreational vehicles.

Wildlife Species Description and Significance

Grappletail (*Octogomphus specularis*) is a slender dragonfly, 51 to 53 mm long. The top and sides of the thorax are yellow or pale green with a broad black stripe between them. The abdomen is black with a fine pale stripe on the top and between the abdominal segments. In males, the abdomen widens posteriorly and has two distinctive, yellow, eight-branched appendages (cerci) at the tip.

Distribution

Grappletail's global range extends from southwestern British Columbia along the Pacific coast of the United States and into northernmost Mexico. The United States range is mostly west of the Sierra Nevada and Cascade Mountains. In Canada it is known from seven streams in the Lower Fraser River valley in southwestern British Columbia in an area extending over 514 km².



Map of southern British Columbia showing Grappletail range.

Source: COSEWIC, 2021. COSEWIC assessment and status report on the Grappletail *Octogomphus specularis* in Canada, Committee on the Status of Endangered Wildlife in Canada, Ottawa, x + 38 pp.

Habitat

Grappletail larvae inhabit sand and gravel or organic debris in slow to moderately flowing sections with boulder and cobble substrates, usually in fast-flowing streams. All known Canadian subpopulations are immediately downstream from lakes, where stream water is warmer and food availability is greater compared to other streams.

Biology

Like all dragonflies, Grappletails have an aquatic larval stage and terrestrial adult stage. The larvae (nymphs) inhabit streams where they feed on aquatic invertebrates. They spend three years in the larval stage. When mature, the nymphs climb onto boulders, banks, and overhanging trees where they emerge as adults. Males typically remain near the stream while females often move up to about 100 m into the surrounding forest. Adults feed on flying insects. Males perch on sunny rocks, twigs, and leaves on the stream bank and forage up and down the stream. Females return to the stream when ready to mate. They oviposit by flying in loops over a pool and dipping the tip of the abdomen into the water. The flight dates are mid-June to early September in British Columbia, with about 70% of adult records in July.

Population Sizes and Trends

Population size and trends of Grappletail in Canada are poorly known. There are a total of 154 specimens and observations since 1936, but no population estimates or trend data are available. Grappletail was found at four of the six previously known subpopulations during 2019 and 2020 surveys but its status could not be confirmed at the remaining two subpopulations. A new subpopulation was documented in 2020.

Threats and Limiting Factors

Most of the habitat where the seven subpopulations occur is relatively intact within mainly forested watersheds with little habitat conversion along the streams where larvae would likely reside. Sweltzer Creek has been subject to shoreline development and water quality changes caused by recreational, agricultural, and urban runoff. Other potential threats include roadkill (streams flow under bridges or through culverts at most sites), invasive species, water quality changes, and stream sedimentation related to logging.

Protection, Status and Ranks

Grappletail is not protected under the Canadian *Species at Risk Act* or the U.S. *Endangered Species Act* list. River and stream habitats in Canada receive some protection under the federal *Fisheries Act* where fish habitat is present. Grappletail is on the provincial Red List in British Columbia with a rank of S2 (Imperilled), but not specifically protected by legislation. The Jacobs Creek, Loon Creek, and Blaney Creek subpopulations are in the Malcolm Knapp Research Forest, owned by the University of British Columbia. The site is managed as a working forest where research, logging, and other activities take place. The Davis Creek subpopulation is in Davis Lake Provincial Park. The Rolley Creek subpopulation is in the Mission Municipal Forest and on a provincial road allowance. Its headwaters include Rolley Lake Provincial Park, Crown land, and privately owned land. Elbow Creek and its upstream watershed are on Crown Land. The land surrounding the Sweltzer Creek subpopulation consists of a municipal park in the community of Cultus Lake. The upstream watershed includes Cultus Lake Provincial Park, Crown land, and private land. This watershed extends into the US.

Source: COSEWIC. 2021. COSEWIC assessment and status report on the Grappletail *Octogomphus specularis* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 38 pp.

For more information, please visit

www.sararegistry.gc.ca

For information regarding reproduction rights, please contact Environment and Climate Change Canada's Public Inquiries Centre at 1-800-668-6767 (in Canada only) or 819-997-2800 or email to ec.enviroinfo.ec@canada.ca



Lakeside Daisy



Photo: © Wasył Bakowsky

Scientific name
Tetraneuris herbacea

Taxon
Vascular Plants

COSEWIC status
Special Concern

Canadian range
Ontario

Reason for designation

This perennial herb occurs only in the Great Lakes region where it is restricted to rare alvar and lakeshore calcareous bedrock habitats. Ninety-five percent of the world population is in Canada. This species may be very abundant where it occurs, and a few large subpopulations on western Manitoulin Island buffer the level of risk to the rest of the population. Ongoing threats include fire suppression, trampling by pedestrians, off-road vehicle use, building and

road construction, quarrying, logging in adjacent forests, and invasion by exotic species. The change in status since the last assessment is the result of increased search effort and a change in interpretation of severe fragmentation.

Wildlife Species Description and Significance

Lakeside Daisy (*Tetraneuris herbacea*) is a rhizomatous, colonial perennial in the Aster Family. In early spring it produces single, yellow, daisy-shaped heads of flowers, each borne on a hairy stalk. It is a globally significant Great Lakes endemic with a narrowly confined distribution.

Distribution

Lakeside Daisy is known only from the Great Lakes Region in Michigan, Ohio, Illinois, and Ontario. In Canada, the species occurs only in the Manitoulin Island region and on the Bruce Peninsula in Ontario. There are 25 subpopulations in the Manitoulin Island region and nine on the Bruce Peninsula for a total of 34 subpopulations in Canada. The areal size of subpopulations ranges from <100 m² to stretches of shoreline almost 3 km long and up to 1 km wide. The Canadian range of Lakeside Daisy probably accounts for over 95% of the global population. The Canadian population is considered one designatable unit.



Range of Lakeside Daisy in the Manitoulin Island Region. Purple shading indicates generalized subpopulation area in which Lakeside Daisy polygons occur (but species may not occupy all of shaded area).

Source: COSEWIC. 2021. COSEWIC assessment and status report on the Lakeside Daisy *Tetaneuris herbacea* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 42 pp.



Range of Lakeside Daisy on the Bruce Peninsula. Purple shading indicates generalized subpopulation area in which Lakeside Daisy polygons occur (but species may not occupy all of shaded area).

Source: COSEWIC. 2021. COSEWIC assessment and status report on the Lakeside Daisy *Tetaneuris herbacea* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 42 pp

Habitat

Lakeside Daisy has a very narrow habitat preference and is restricted to alvar ecosystems and limestone bedrock shorelines where bedrock is exposed. Three subpopulations on the Bruce Peninsula grow on limestone boulders. Much of the habitat of Lakeside Daisy has a history of fire, but no site has had more than one fire in over 100

years, so fire may be necessary only over very long time frames.

Biology

Lakeside Daisy flowers must have pollen from a genetically different mate to set seed. Individual plants may live for several decades. The average age of individuals has been calculated to be approximately 16 years. Fruits have no special adaptations for dispersal and most seedlings appear within 1 m of adults. The Canadian population is not severely fragmented.

Population Sizes and Trends

There may be between 87,000 and 220,000 mature individuals (genets) in Canada, each with 20 to 50 ramets (clonal shoots). Available trend data for 12 subpopulations show four with decreases, six that are stable, and two that are stable or may have increased. Subpopulations can remain fairly stable for decades. No subpopulations are known to have become extirpated. Rescue from outside populations, which are much smaller or hundreds of kilometres away, is considered highly improbable.

Threats and Limiting Factors

The main threats to Lakeside Daisy are trampling by pedestrians, off-road vehicle use, building and road construction, quarrying, logging in adjacent forests and habitat infestation by exotic species. Artificially prolonged vegetation succession due to fire suppression and impacts from climate change may be affecting habitat over very long time frames. Changes in lake levels may be a limiting factor for shoreline subpopulations. There are 29 locations in Canada.

Protection, Status and Ranks

Lakeside Daisy is listed as Threatened in the federal *Species at Risk Act* (SARA) and in Ontario on the *Species at Risk in Ontario* (SARO)

List under the *Endangered Species Act, 2007*. In the United States, it is federally listed as Threatened. It is globally ranked G3 or vulnerable, nationally N3 or vulnerable in Canada, and S3 or vulnerable in Ontario. It is ranked N1 or nationally critically imperilled in the US, and S1 or critically imperilled in Illinois, Michigan, and Ohio. Critical habitat was identified in Canada in 2011 under the SARA for 38% of Lakeside Daisy habitat area in the Manitoulin Island region and 67% on the Bruce Peninsula. Approximately 353 ha of Lakeside Daisy habitat is in protected areas, as well as 247 ha in private ownership, 71 ha in corporate ownership, and ~5 ha divided among First Nation, Crown, and municipal management.

Source: COSEWIC. 2021. COSEWIC assessment and status report on the Lakeside Daisy *Tetraneuris herbacea* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 42 pp.

For more information, please visit
www.sararegistry.gc.ca.

For information regarding reproduction rights, please contact Environment and Climate Change Canada's Public Inquiries Centre at 1-800-668-6767 (in Canada only) or 819-997-2800 or email to ec.enviroinfo.ec@canada.ca



Leach's Storm-Petrel - Atlantic population



Photo © Bruce MacIavish

Scientific Name

Oceanodroma leucorhoa

Taxon

Birds

COSEWIC Status

Threatened

Canadian Range

Quebec, New Brunswick, Prince Edward Island, Nova Scotia, Newfoundland and Labrador, Atlantic Ocean

Reason for designation

This small, long-lived pelagic seabird has an extensive global range, nesting on offshore islands in disjunct populations in the North Atlantic and North Pacific Oceans. The Atlantic population nests in underground burrows at more than 80 colonies in eastern Canada. Birds often fly hundreds of kilometres from colonies to forage on tiny bioluminescent fish. This population overwinters in productive equatorial waters of the Atlantic Ocean, with some birds reaching waters off South Africa and Brazil. Surveys at eight major colonies indicate that the number of individuals has declined by 54% over the past three generations (44 years), and the rate of decline is increasing. Some Quebec colonies have been lost in recent years, and expanding Atlantic Puffin colonies are displacing this species from preferred nesting habitat at several large colonies. Low adult survival related to higher

predation rates by gulls appears to be a key demographic factor in the observed declines. These declines are expected to continue. Additional threats include changes in the food web of the northwest Atlantic, as well as offshore oil and gas production and attraction to human sources of light which cause collisions and stranding of young birds. Despite declines, the overall population remains large and widespread, with about 5 million mature individuals estimated to breed in Canada.

Wildlife Species Descriptions and Significance

Leach's Storm-Petrel is the smallest (~45 g) and the most wide-ranging procellariiform (petrel) species breeding in the Northern Hemisphere. This tube-nosed seabird is characterized by dark blackish-brown plumage, a forked tail, a broad pale diagonal wing-bar, and a distinctive white rump patch. It breeds in large colonies, nesting in underground burrows that it excavates on coastal and offshore islands.

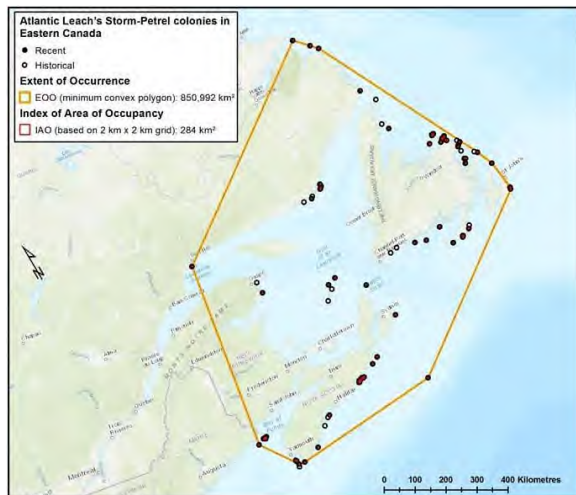
Canada has considerable global responsibility for Leach's Storm-Petrel, hosting about 40% of the world's breeding population. The Atlantic Leach's Storm-Petrel population in Canada represents about a third of global numbers, with the species' largest colony at Baccalieu Island, Newfoundland. This species was designated Globally Threatened in 2016 by BirdLife International and uplisted to *Vulnerable* on the IUCN Red List, based on significant population declines, particularly in the western Atlantic.

Distribution

Leach's Storm-Petrel breeds mainly in the Northern Hemisphere on offshore islands of the Atlantic (south to ~41° N) and Pacific (south to ~25° N) oceans. Atlantic and Pacific populations are considered to be separate designatable units (DUs), as they are geographically disjunct with

very limited opportunities for gene exchange, and only the Atlantic DU is considered here.

There are up to 93 active Atlantic Leach's Storm-Petrel breeding colonies in eastern Canada, from southern Labrador to the mouth of the Bay of Fundy in New Brunswick, including the Gulf of St. Lawrence in Quebec. The species breeds most abundantly along Newfoundland's east and south coasts and Nova Scotia's Atlantic coast. Atlantic Leach's Storm-Petrel over-winters primarily between equatorial Atlantic waters and the southwest coast of Africa, as well as in the western Atlantic Ocean off Brazil.



Map showing recent colonies with confirmed breeding records since 1970 (black dots) and historical breeding colonies (no confirmation since 1970; open dots) for Atlantic Leach's Storm-Petrel in Eastern Canada. Extent of occurrence (EOO) is shown within the orange polygon, and index of area of occupancy (IAO) is shown in red within black dots showing recent colony sites.

Source : COSEWIC. 2020. COSEWIC assessment and status report on the Leach's Storm-Petrel (Atlantic population) *Oceanodroma leucorhoa* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 70 pp.

Habitat

Leach's Storm-Petrel breeds on vegetated islands generally free of mammalian predators, and prefers well-drained habitats suitable for excavating underground burrows, such as low forest and meadow. Atlantic Leach's Storm-Petrel usually nests on islands occupied by other

seabirds, often including large gulls, and tends to use different habitat from other burrow-nesting species. The quantity and quality of suitable habitat has decreased at some colonies, primarily as a result of encroachment by species such as Atlantic Puffin.

Atlantic Leach's Storm-Petrel is a surface-feeder, foraging over or beyond the continental shelf during the breeding season. It travels 400-800 km from colonies to forage nocturnally in open oceanic waters on vertically migrating bioluminescent lantern-fish, among other prey. During the non-breeding period, Atlantic Leach's Storm-Petrel is primarily associated with warm productive waters, in areas with high nutrient upwelling or in coastal regions.

Biology

Atlantic Leach's Storm-Petrel typically first breeds at 6-7 years of age in Canada, with a generation time estimated at 14.8 years under normal conditions. However, in eastern Canada, effective generation time is likely to be lower, as adult survival is estimated at only ~0.78-0.86 across several colonies in Atlantic Canada. Adults are monogamous and show high nest site fidelity, generally returning to the same nesting burrow each year to raise a single chick. In contrast, young birds rarely return to their natal colony to breed, suggesting that Leach's Storm-Petrel colonies across the Atlantic Ocean act as one metapopulation as a result of high natal dispersal. Incubation takes 37-50 days, and chicks fledge at 58-77 days of age. Atlantic Leach's Storm-Petrel is strictly nocturnal at the colony, where all adult arrivals, departures, and chick fledging take place at night.

Population Sizes and Trends

A total of 106 colonies either currently or previously supported breeding Leach's Storm-Petrels in eastern Canada, with the current population estimated at about 5,277,000 mature individuals. Twenty islands that each support colonies with over 2,000 mature individuals

collectively host 99.7% of the population. Ten colony sites which previously hosted breeding storm-petrels are known to have been abandoned within the past three generations, resulting in an estimated decline in the index of area of occupancy of about 11% over that period.

Trend analyses were conducted for eight colonies that account for about 91% of the eastern Canadian population, and include all major colonies. An average annual rate of decline of -1.74%/year was observed at monitored colonies over the past three generations (44 years), with a steeper decline of -2.64%/year observed over the past two generations (30 years). Estimated reductions are similar over these two time periods because the rate of decline steepened in recent years, with a -55.2% decline over the past two generations, and -53.8% over the past three generations. Paleo-ecological studies at Baccalieu Island show a peak population size in the mid-1980s followed by a rapid decline, corroborating population trends estimated using traditional surveys. Populations of Leach's Storm-Petrel at a colony in Saint-Pierre et Miquelon, France, adjacent to Newfoundland, appear to be generally stable, and the much smaller Maine population in the United States is increasing. However, all potential source colonies in the eastern Atlantic are declining.

Threats and Limiting Factors

Factors driving the decline of Atlantic Leach's Storm-Petrel population are currently unknown, but are likely multi-factorial. Low annual adult survival rates at colonies across eastern Canada appear to be a key demographic factor contributing to observed declines, and are partly influenced by high predation by large gulls at some breeding colonies. Poor annual survival for Atlantic Leach's Storm-Petrel contrasts with estimates of ~0.97 for populations along Canada's Pacific coast. Atlantic Leach's Storm-Petrel is threatened by offshore oil and gas production and other marine industries, primarily through light attraction causing collisions and

strandings on offshore structures and vessels. Artificial lights in communities or industrial sites near colonies cause recently fledged Leach's Storm-Petrels to collide with structures or become stranded on the ground, where they are vulnerable to predation. Expanding Atlantic Puffin colonies are encroaching onto nesting habitat at the largest storm-petrel colonies. Rising global temperatures appear to be causing reduced breeding success in some colonies at the southern edge of the range. The incidence of severe weather events associated with climate change is increasing, contributing to mass strandings of Leach's Storm-Petrels, and ecosystem changes associated with abnormally high temperatures may affect prey availability on their breeding and wintering grounds. Exposure to high levels of mercury, as well as other contaminants acquired through the ingestion of plastic particles, may have negative effects on adult survival, reproductive success, and recruitment.

Protection, Status and Ranks

Leach's Storm-Petrel is protected in Canada under the federal *Migratory Birds Convention Act, 1994* and parallel legislation in the United States and Mexico. Currently in Canada, 29 islands, which together host 93% of the Atlantic Leach's Storm-Petrel population, are protected federally as Migratory Bird Sanctuaries or National Parks, or provincially as Wildlife Management Areas or Seabird Ecological Reserves.

Source : COSEWIC. 2020. COSEWIC assessment and status report on the Leach's Storm-Petrel (Atlantic population) *Oceanodroma leucorhoa* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 70 pp.

For more information, please visit www.sararegistry.gc.ca.

For information regarding reproduction rights, please contact Environment and Climate Change Canada's Public Inquiries Centre at 1-800-668-6767 (in Canada only) or 819-997-2800 or email to ec.enviroinfo.ec@canada.ca



Lesser Yellowlegs

Photo: © Gary Donaldson



Scientific Name

Tringa flavipes

Taxon

Birds

COSEWIC Status

Threatened

Canadian Range

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

Reason for designation

This medium-sized shorebird has 80% of its breeding range in Canada's boreal region, migrates through the United States and Caribbean, and winters mostly in South America. It has experienced substantial long- and short-term declines, most recently estimated at 25% over three generations (12 years) based on the Breeding Bird Survey, and greater than 50% over 10 years based on International Shorebird Surveys. Declines are expected to continue. Key concerns include the loss of wetland and intertidal habitat used on migration and in winter, and hunting for sport and subsistence, which has been reduced in some areas but likely remains the most significant threat. Additionally, emerging threats from climate change include increased risk of drought in breeding areas, coastal

flooding, and greater severity of hurricanes during fall migration..

Wildlife Species Description and Significance

Lesser Yellowlegs is a small, slender shorebird with greyish plumage, a long neck, a straight black bill that is roughly the same length as its head, and long, bright-yellow legs. This migrant travels up to 30,000 km in a round trip between its breeding and wintering grounds. Approximately 80% of Lesser Yellowlegs breed in Canada.

Distribution

Lesser Yellowlegs breeds primarily in the boreal forest of Canada and Alaska, including all provinces and territories except the Maritimes. It winters in coastal areas from the southern United States through South America, with concentrations on the northern coast of South America and in the Pampas region of northern Argentina, Uruguay, and southern Brazil.



Canadian breeding range and estimate of extent of occurrence of Lesser Yellowlegs.

Source : COSEWIC. 2020. COSEWIC assessment and status report on the Lesser Yellowlegs *Tringa flavipes* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 64 pp.

Habitat

Lesser Yellowlegs nests on dry ground near peatlands, marshes, ponds, and other wetlands in the boreal forest and taiga. In winter and during migration, the species frequents coastal salt marshes, estuaries and ponds, as well as lakes, other freshwater wetlands, and anthropogenic wetlands such as flooded rice fields and sewage lagoons.

Biology

Lesser Yellowlegs can begin breeding at one year old, and is estimated to have a generation length of 4 years. Females typically lay a single clutch of four eggs in mid-May, and may lay a second clutch if the first is lost to predation. Incubation lasts approximately 22 days; the young leave the nest shortly after hatching. Lesser Yellowlegs is monogamous and only defends a small area around the nest or brood. Adults may travel many kilometres from the nest to the wetlands where they forage, so home range may be as large as several dozen square kilometres.

Population Sizes and Trends

The North American population of Lesser Yellowlegs as of 2020 is estimated to be at least 527,000 mature individuals, with 80% (422,000) breeding in Canada. Data from the North American Breeding Bird Survey (BBS) estimate an average annual trend of -2.40% in Canada over the most recent three generations (2007 to 2019), corresponding to a cumulative loss of 25%. From 1970 to 2019, the average annual BBS trend is -2.36%, amounting to a total decline of 69%. This is comparable to the significant 2.75% annual (69% cumulative) decline shown by shorebird migration monitoring data in North America between 1974 and 2016; over the most recent decade (2006 to 2016; slightly less than three generations) the decline based on these surveys accelerated to 7.28% annually, amounting to 53%. This estimate includes the

Alaskan population, which BBS results indicate is declining more rapidly than the Canadian population. Periodic surveys at migratory stopovers in the Caribbean and at key wintering regions in South America also indicate steep rates of decline within the past three generations.

Threats and Limiting Factors

Hunting of Lesser Yellowlegs during migration and on wintering grounds in the Caribbean and South America appears to be the greatest threat to the species. Ongoing habitat loss is also a concern, especially with respect to agricultural expansion and shoreline development in South America. Various impacts related to climate change remain poorly understood but may be increasing in importance. Other threats which may contribute to ongoing declines are energy production and mining, increasing abundance of predators, and various forms of pollution.

Protection, Status and Ranks

In Canada, Lesser Yellowlegs and its nests and eggs are protected under the *Migratory Birds Convention Act, 1994*. The species was assessed as Threatened by COSEWIC in November 2020. NatureServe considers Lesser Yellowlegs to be Secure or Apparently Secure in Canada, although it is ranked Vulnerable in five provinces and territories, and Imperilled to Apparently Secure in the Northwest Territories. The Western Hemisphere Shorebird Reserve Network (WHSRN) aims to designate and protect migratory stopover sites of significance at regional to hemispheric scales, but offers no legal protection. Quill Lakes in Saskatchewan is the only Canadian WHSRN site with globally significant numbers of Lesser Yellowlegs, but habitat there has been severely degraded as a consequence of unregulated and unlicensed drainage of wetlands.

Source : COSEWIC. 2020. COSEWIC assessment and status report on the Lesser Yellowlegs *Tringa flavipes* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 64 pp.

For more information, please visit
www.sararegistry.gc.ca.

For information regarding reproduction rights, please contact Environment and Climate Change Canada's Public Inquiries Centre at 1-800-668-6767 (in Canada only) or 819-997-2800 or email to ec.enviroinfo.ec@canada.ca



Maleberry



Photo: © Alain Belliveau

Scientific name

Lyonia ligustrina

Taxon

Vascular Plants

COSEWIC status

Endangered

Canadian range

Nova Scotia

Reason for designation

This colonial deciduous shrub is part of a disjunct assemblage of Atlantic Coastal Plain flora. It is known from a single lakeshore site in a protected area in southern Nova Scotia separated by more than 245 km from the next nearest site across the Gulf of Maine. The Canadian population appears stable, but its very small size (approx. 33 mature individuals) and extremely local distribution (612 m²) place it at risk. Although immediate threats are low, this population faces potential threats from off-road vehicle activity and invasive Glossy Buckthorn.

Wildlife Species Description and Significance

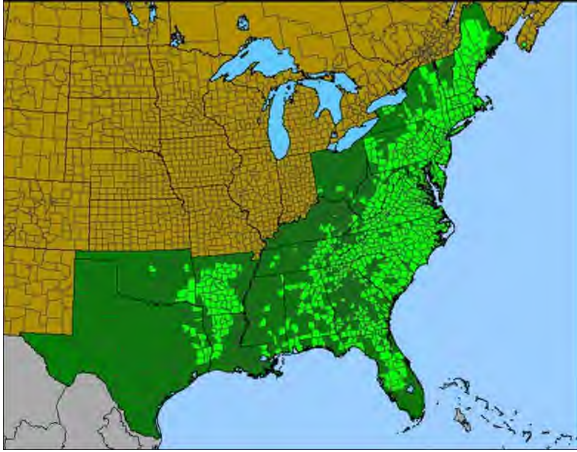
Maleberry is a broad-leaved, deciduous shrub with multiple erect woody stems coming from branching rhizomes and reaching a height of 4

m. Leaves are 2-9 cm long, oval and generally pointed at both ends, with smooth or slightly toothed margins. The small, vase-shaped flowers are in elongate inflorescences in which individual flowers are on short stalks at the tips of the previous year's stems. Fertilized flowers develop into globe-shaped, woody capsules of 2-4 mm that split open along five sutures and remain on the shrub through the following growing season.

Maleberry is of special interest as an extremely rare species in Canada and as a classic example of a disjunct Atlantic Coastal Plain flora species in southern Nova Scotia. The Nova Scotia occurrence could be significant to northward colonization under a future warmer climate. Maleberry is host plant to a leaf tar spot fungus that may be restricted to the single Maleberry occurrence in Canada. Maleberry supports some host-specific insect species that could occur in Canada. It is also occasionally used as a landscape plant and a homeopathic remedy.

Distribution

Maleberry is restricted to the eastern United States with a single occurrence in southernmost Nova Scotia. It occurs from south-central Maine, northern Vermont and central New York to central Florida, eastern Texas and Oklahoma. Northward, occurrence is sparser west of the Appalachian Mountains. The variety *ligustrina* that occurs in Canada extends south and west to northern Alabama.



Global range of Maleberry (*Lyonia ligustrina*), modified from Kartesz (2015). State level distribution is indicated in dark green. Counties in the United States with documented occurrences are shaded pale green. The Nova Scotia occurrence is indicated with a pale green dot. The variety *ligustrina* found in Canada extends south to the southern Appalachian Mountains in northern Alabama

Source : COSEWIC. 2020. COSEWIC assessment and status report on the Maleberry *Lyonia ligustrina* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 39 pp.

Habitat

The Nova Scotia population of Maleberry occurs in a fairly open, peaty lakeshore Red Maple swamp with scattered Red Spruce, Balsam Fir, Yellow Birch, and tall shrubs. In the United States, Maleberry occurs primarily in wetlands: swamps, shrub thickets, bogs – especially along the margins – river, stream, pond and lake shores, and sometimes rich fens. It also regularly occurs in upland woods and thickets, sometimes including disturbed habitats (old field, powerline and second-growth forest).

Biology

Maleberry is a long-lived perennial shrub that can reproduce from seed or vegetatively via spreading rhizomes. Generation time is difficult to determine from available information but may be around 20 years. Maleberry flowers in mid- to

late July in Nova Scotia. It is primarily pollinated by bees, including some specialist pollen collecting species, and can be self-compatible. Fruit mature in late summer or early autumn and remain on the shrub through the winter, dispersing small seeds via wind and secondarily via water or perhaps within mud on animal fur or feathers.

Population Sizes and Trends

The Canadian population consists of 780 stems representing at least 33 mature individuals (and believed to be well under 250 mature individuals) over an area of 51 m by 12 m. No evidence of change in population size is known, and the population is anticipated to be stable through the future as long as potential threats from off-road vehicle activity and Glossy Buckthorn invasion are managed by the Nova Scotia Nature Trust.

Threats and Limiting Factors

Threats to Maleberry in Nova Scotia are limited because the only known occurrence is within a area owned by the Nova Scotia Nature Trust. Unauthorized off-road vehicle use and potential associated brush clearing could affect a small proportion of individuals along the population margin. Competitive exclusion from the invasive shrub Glossy Buckthorn is a potential threat in future decades. The nearest known occurrence is 45 km away, although it probably occurs even nearer. Expansion of Glossy Buckthorn will be slow acting over one to several generations and could be readily managed at the small known Maleberry occurrence.

Potential limiting factors in Canada are limited dispersal ability and seedling establishment, effects of leaf tar spot fungus, and browsing by Snowshoe Hare and White-tailed Deer.

Photo: © Sean Blaney



Protection, Status and Ranks

Maleberry currently has no legal status in any jurisdiction of occurrence. Ohio (SH) and Vermont (S3S4) are the only jurisdictions aside from Nova Scotia in which ranks indicate some level of concern. Elsewhere the species is Secure or Apparently Secure (S4 or S5), or Unranked (SNR, for this species the absence of a rank probably indicates that it is generally considered secure).

Source: COSEWIC. 2020. COSEWIC assessment and status report on the Maleberry *Lyonia ligustrina* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 39 pp.

For more information, please visit
www.sararegistry.gc.ca.

For information regarding reproduction rights, please contact Environment and Climate Change Canada's Public Inquiries Centre at 1-800- 668-6767 (in Canada only) or 819-997-2800 or email to ec.enviroinfo.ec@canada.ca.



Red Knot *islandica* subspecies



Photo: © Charles Francis

Wildlife Species Description and Significance

Red Knot (*Calidris canutus*) is a medium-sized shorebird with a typical “sandpiper” profile: medium-long bill and smallish head, longish legs, and long tapered wings giving the body an elongated streamlined profile. In breeding plumage, the face, neck, breast and much of the underparts are rufous red. The upperparts are dark brown or black spangled with rufous and grey. In winter plumage, knots (used throughout to refer to Red Knots in general) have white underparts and pale grey back.

Red Knot is a “flagship” species for shorebird conservation, with long, inter-continental migrations and high vulnerability to threats, as it concentrates in large numbers at a few key sites on migration and in winter. It crosses many international boundaries and is symbolic of the need for international cooperation for successful conservation. Conservation of sites used by knots also benefits many other shorebird species.

Scientific name

Calidris canutus islandica

Taxon

Birds

COSEWIC status

Not at Risk

Canadian range

Nunavut, Northwest Territories

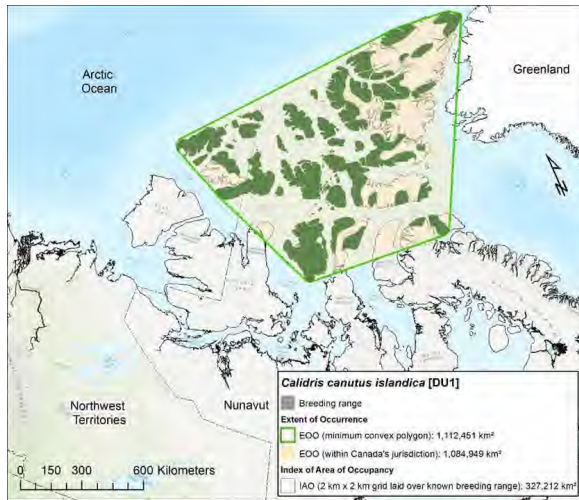
Reason for designation

This medium-sized shorebird breeds in the northeastern Canadian High Arctic and migrates across the North Atlantic Ocean to overwinter in coastal Europe. About 120,000 birds breed in Canada and make up 40% of the global population. Winter surveys in Europe indicate that populations have been stable or fluctuating slightly over the past three generations. Individuals congregate at many sites in winter, where they may be exposed to threats such as disturbance and effects of shoreline stabilization. Risks from exposure to storms and severe weather during trans-oceanic migratory flights may increase with climate change. However, as past population declines have been halted, and former threats from shellfish harvesting in Europe are much reduced, the status of this population has improved since the last assessment.

Distribution

Six subspecies of Red Knot are currently recognized worldwide, each with distinct biogeographical populations that differ to varying degrees in distribution, in scheduling of the annual cycle, and genetically. Three subspecies occur in Canada: *C. c. islandica*, *C. c. roselaari*, and *C. c. rufa*. The taxonomy of North American Red Knot populations has been revised since the 2007 COSEWIC Status Report, with the populations wintering in Tierra del Fuego, as well as those wintering in northern Brazil and in southeastern USA / Gulf of Mexico / Caribbean, which were formerly assigned to *C. c. roselaari*, all now regarded as part of *C. c. rufa*. These three populations of *rufa* are also treated here as separate designatable units (DUs). Red Knot

islandica subspecies breeds in the northeastern Canadian High Arctic, and winters on the European Atlantic seaboard.



Extent of occurrence (EOO) and index of area of occupancy (IAO) for Red Knot *C. c. islandica* (DU1) in Canada, based on the known breeding range within the northeastern Canadian Arctic

Source : COSEWIC. 2020. COSEWIC assessment and status report on the Red Knot *Calidris canutus islandica* subspecies (*Calidris canutus islandica*), *roselaari* subspecies (*Calidris canutus roselaari*) and *rufa* subspecies (*Calidris canutus rufa*) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xxxv + 173 pp.

Habitat

Red Knot nests in barren habitats in the Arctic, such as windswept ridges, slopes, or plateaus, with little vegetation cover. On migration and wintering areas, knots use coastal areas with extensive sandflats, mudflats and rocky flats, where birds feed on bivalves and other invertebrates. Along the mid-Atlantic coast of the eastern United States, they use sandy beaches and feed on high-energy Horseshoe Crab eggs. They also use salt marshes, brackish lagoons, mangrove areas, mussel beds, peat banks, rocky intertidal platforms, inland saline lakes, and agricultural fields.

Biology

Red Knot is monogamous, with pairs usually laying a single clutch of four eggs in the latter half of June, and the eggs hatching about mid-July. Females depart soon thereafter, leaving the males to accompany the young until they fledge. Breeding success varies considerably, depending on weather and the abundance and impacts of predators. Red Knot has comparatively high adult annual survival, ranging from 0.62-0.92 (mean 0.80), which varies in response to foraging and weather conditions on wintering grounds and during migration. Red Knot has a generation time of about 7 years, and most individuals start breeding at age two years.

Red Knot undergoes significant physiological changes during migration, to increase flight efficiency and permit rapid accumulation of body stores after reaching the breeding grounds. Organs and tissues involved in flight increase in size, while digestive organs and leg muscles decrease. Stores of fat and protein remaining on arrival on the breeding grounds are then used to regrow the latter organs in preparation for the breeding attempt.

Population Sizes and Trends

Recent counts and mark-resighting estimates of *C. c. islandica* birds wintering in Europe suggest a Canadian population of about 128,000 mature individuals. Annual winter surveys in coastal Europe show a stable or slightly fluctuating population trend over the past three generations.

Threats and Limiting Factors

Many of the key threats to Red Knot are associated with its long-distance migrations and physiological changes that maximize flying efficiency and breeding success. Its relatively inflexible life history strategy makes Red Knot particularly sensitive to the effects of human interventions and changing climate and habitat

conditions. Threats affecting all five DUs to varying extents include ecosystem modifications/biological resource use which affect food resources needed at critical times of the year (e.g., Horseshoe Crab harvest in Delaware Bay, Grunion fishery in Mexico), habitat shifting and alteration (e.g., climate change effects on habitat conditions and predator relationships on the breeding grounds), and changes to coastal habitats resulting from sea-level changes. Significant disturbance from human activities occurs in many areas, and most DUs are affected by increased predation or disturbance from increasing falcon populations. Oil spills pose a threat to all DUs. Increased frequency and intensity of storms on the breeding grounds, and hurricanes in migration areas, may periodically cause significant mortality, especially for those DUs that undergo long trans-oceanic migratory flights.

Shoreline stabilization and dredging for cockles (now much reduced) in coastal wintering areas of NE Europe has reduced the quality of foraging and roosting habitats. Changing climate may affect breeding habitats and cause increased predation on breeding grounds and lead to reduced habitat quality at migration and wintering sites owing to sea level rise and ocean acidification.

Protection, Status and Ranks

Red Knot is protected in Canada under the *Migratory Birds Convention Act* (1994). It was listed on Schedule 1 of the *Species at Risk Act* in 2012, as follows: *C. c. rufa* Endangered (the southern Tierra del Fuego / Patagonia wintering population, now DU3); *C. c. roselaari* Threatened (including present DU2, the northeastern South America wintering population in northern Brazil and the southeastern USA / Gulf of Mexico / Caribbean wintering population, DU4 and DU5, now believed to be *C. c. rufa*), and *C. c. islandica* (now DU1) Special Concern (the previous DUs

reflect earlier taxonomic designations). Red Knot (*C. c. rufa*) is also listed under species-at-risk legislation in Ontario, Quebec, New Brunswick, Nova Scotia, and Newfoundland and Labrador. *C. c. islandica* and *C. c. roselaari* are not listed under provincial or territorial species-at-risk legislation.

Red Knot (*C. c. rufa*) is listed federally in the United States as Threatened, and as Threatened in New Jersey and as of Special Concern in Georgia. *C. c. rufa* was added to Appendix 1 of the Convention on Migratory Species in 2005. Red Knot was listed as Critically Endangered on the Brazilian list in 2014 and categorized as Endangered in Argentina, Chile and Uruguay. France declared the species to be protected in Guadeloupe and Martinique in 2012 and in French Guiana in 2014. *C. c. roselaari* has been designated as Endangered in Mexico and as a species of management concern in the United States.

NatureServe lists *C. c. rufa* globally as G4T1, nationally in Canada as N1B and N1N, and nationally in the United States as N1N. It ranks *C. c. rufa* as S1 to S3 in Northwest Territories, Ontario, Quebec, Saskatchewan, Prince Edward Island, Nova Scotia, New Brunswick, and Newfoundland in Canada, and in Virginia in the United States. *C. c. islandica* is ranked N3B nationally and S2B in Northwest Territories.

Source: COSEWIC. 2020. COSEWIC assessment and status report on the Red Knot *Calidris canutus*, *islandica* subspecies (*Calidris canutus islandica*), *roselaari* subspecies (*Calidris canutus roselaari*) and *rufa* subspecies (*Calidris canutus rufa*) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xxxv + 173 pp.

For more information, please visit www.sararegistry.gc.ca.

For information regarding reproduction rights, please contact Environment and Climate Change Canada's Public Inquiries Centre at 1-800- 668-6767 (in Canada only) or 819-997-2800 or email to ec.enviroinfo.ec@canada.ca.



Red Knot *rufa* subspecies (Northeastern South America wintering population)

Photo: © Raymond Belhumeur



Scientific name

Calidris canutus rufa

Taxon

Birds

COSEWIC status

Special Concern

Canadian range

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

Reason for designation

This medium-sized shorebird breeds in the central Canadian Arctic and migrates long distances to overwinter on the northeastern coast of South America, centred in northern coastal Brazil. Overall numbers appear to be stable, with an estimated wintering population of about 19,800 mature individuals. During migration, the population congregates at key sites on the eastern seaboard of the United States, where it is vulnerable to threats from human harvesting of Horseshoe Crab (whose eggs are an essential food source for northbound migrants) in Delaware Bay, disturbance and predation from recovering falcon populations, and disturbance from

recreational activities. Risks from exposure to storms and severe weather during long migratory flights may increase with climate change.

Wildlife Species Description and Significance

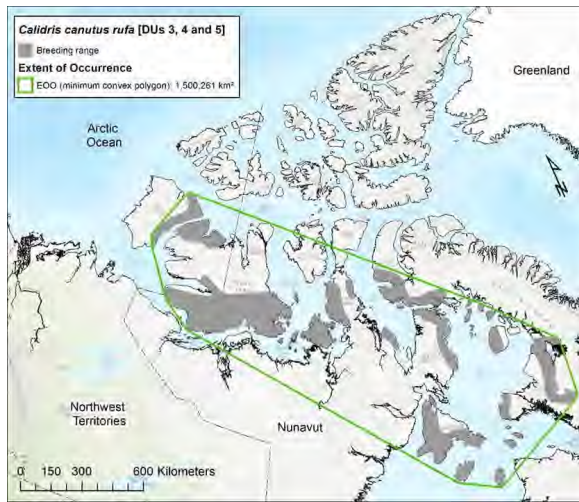
Red Knot (*Calidris canutus*) is a medium-sized shorebird with a typical “sandpiper” profile: medium-long bill and smallish head, longish legs, and long tapered wings giving the body an elongated streamlined profile. In breeding plumage, the face, neck, breast and much of the underparts are rufous red. The upperparts are dark brown or black spangled with rufous and grey. In winter plumage, knots (used throughout to refer to Red Knots in general) have white underparts and pale grey back.

Red Knot is a “flagship” species for shorebird conservation, with long, inter-continental migrations and high vulnerability to threats, as it concentrates in large numbers at a few key sites on migration and in winter. It crosses many international boundaries and is symbolic of the need for international cooperation for successful conservation. Conservation of sites used by knots also benefits many other shorebird species

Distribution

Six subspecies of Red Knot are currently recognized worldwide, each with distinct biogeographical populations that differ to varying degrees in distribution, in scheduling of the annual cycle, and genetically. Three subspecies occur in Canada: *C. c. islandica*, *C. c. roselaari*, and *C. c. rufa*. The taxonomy of North American Red Knot populations has been revised since the 2007 COSEWIC Status Report, with the populations wintering in Tierra del Fuego, as well as those wintering in northern Brazil and in

southeastern USA / Gulf of Mexico / Caribbean, which were formerly assigned to *C. c. roselaari*, all now regarded as part of *C. c. rufa*. These three populations of *rufa* are also treated here as separate designatable units (DUs). Red Knot *rufa* subspecies (Northeastern South America wintering population) breeds in the central Canadian Arctic, and winters on the northeastern coast of South America, centred in the Maranhão district of northern Brazil.



Extent of occurrence (EEO) for Red Knot *C. c. rufa* (DUs 3, 4, and 5) in Canada, based on the known breeding range of the subspecies within the central Canadian Arctic

Source : COSEWIC. 2020. COSEWIC assessment and status report on the Red Knot *Calidris canutus*, *islandica* subspecies (*Calidris canutus islandica*), *roselaari* subspecies (*Calidris canutus roselaari*) and *rufa* subspecies (*Calidris canutus rufa*) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xxxv + 173 pp.

Habitat

Red Knot nests in barren habitats in the Arctic, such as windswept ridges, slopes, or plateaus, with little vegetation cover. On migration and wintering areas, knots use coastal areas with extensive sandflats, mudflats and rocky flats, where birds feed on bivalves and other invertebrates. Along the mid-Atlantic coast of the eastern United States, they use sandy beaches and feed on high-energy Horseshoe Crab eggs. They also use salt marshes, brackish lagoons, mangrove areas, mussel beds, peat banks,

rocky intertidal platforms, inland saline lakes, and agricultural fields.

Biology

Red Knot is monogamous, with pairs usually laying a single clutch of four eggs in the latter half of June, and the eggs hatching about mid-July. Females depart soon thereafter, leaving the males to accompany the young until they fledge. Breeding success varies considerably, depending on weather and the abundance and impacts of predators. Red Knot has comparatively high adult annual survival, ranging from 0.62-0.92 (mean 0.80), which varies in response to foraging and weather conditions on wintering grounds and during migration. Red Knot has a generation time of about 7 years, and most individuals start breeding at age two years.

Red Knot undergoes significant physiological changes during migration, to increase flight efficiency and permit rapid accumulation of body stores after reaching the breeding grounds. Organs and tissues involved in flight increase in size, while digestive organs and leg muscles decrease. Stores of fat and protein remaining on arrival on the breeding grounds are then used to regrow the latter organs in preparation for the breeding attempt.

Population Sizes and Trends

Some 32,500 Red Knots of all ages were found on the northeastern coast of Brazil during aerial surveys in 2019. This total was considerably higher than on previous surveys, although the difference likely reflects improved methodology designed specifically for Red Knots. Numbers overall appear to be relatively stable or fluctuating slightly, with an estimated population of about 19,800 mature individuals wintering in northeastern South America.

Threats and Limiting Factors

Many of the key threats to Red Knot are associated with its long-distance migrations and physiological changes that maximize flying efficiency and breeding success. Its relatively inflexible life history strategy makes Red Knot particularly sensitive to the effects of human interventions and changing climate and habitat conditions. Threats affecting all five DUs to varying extents include ecosystem modifications/biological resource use which affect food resources needed at critical times of the year (e.g., Horseshoe Crab harvest in Delaware Bay, Grunion fishery in Mexico), habitat shifting and alteration (e.g., climate change effects on habitat conditions and predator relationships on the breeding grounds), and changes to coastal habitats resulting from sea-level changes. Significant disturbance from human activities occurs in many areas, and most DUs are affected by increased predation or disturbance from increasing falcon populations. Oil spills pose a threat to all DUs. Increased frequency and intensity of storms on the breeding grounds, and hurricanes in migration areas, may periodically cause significant mortality, especially for those DUs that undergo long trans-oceanic migratory flights.

Major threats include ongoing issues with Horseshoe Crab abundance in Delaware Bay, increased predation and disturbance from increasing falcon populations, and possible effects from climate change, including increasing storm frequency on breeding grounds (habitat alteration, predation) and on migration and wintering areas (e.g., sea-level rise).

Protection, Status and Ranks

Red Knot is protected in Canada under the *Migratory Birds Convention Act* (1994). It was listed on Schedule 1 of the *Species at Risk Act* in 2012, as follows: *C. c. rufa* Endangered (the southern Tierra del Fuego / Patagonia wintering population, now DU3); *C. c. roselaari* Threatened (including present DU2, the

northeastern South America wintering population in northern Brazil and the southeastern USA / Gulf of Mexico / Caribbean wintering population, DU4 and DU5, now believed to be *C. c. rufa*), and *C. c. islandica* (now DU1) Special Concern (the previous DUs reflect earlier taxonomic designations). Red Knot (*C. c. rufa*) is also listed under species-at-risk legislation in Ontario, Quebec, New Brunswick, Nova Scotia, and Newfoundland and Labrador. *C. c. islandica* and *C. c. roselaari* are not listed under provincial or territorial species-at-risk legislation.

Red Knot (*C. c. rufa*) is listed federally in the United States as Threatened, and as Threatened in New Jersey and as of Special Concern in Georgia. *C. c. rufa* was added to Appendix 1 of the Convention on Migratory Species in 2005. Red Knot was listed as Critically Endangered on the Brazilian list in 2014 and categorized as Endangered in Argentina, Chile and Uruguay. France declared the species to be protected in Guadeloupe and Martinique in 2012 and in French Guiana in 2014. *C. c. roselaari* has been designated as Endangered in Mexico and as a species of management concern in the United States.

NatureServe lists *C. c. rufa* globally as G4T1, nationally in Canada as N1B and N1N, and nationally in the United States as N1N. It ranks *C. c. rufa* as S1 to S3 in Northwest Territories, Ontario, Quebec, Saskatchewan, Prince Edward Island, Nova Scotia, New Brunswick, and Newfoundland in Canada, and in Virginia in the United States. *C. c. islandica* is ranked N3B nationally and S2B in Northwest Territories.

Source: COSEWIC. 2020. COSEWIC assessment and status report on the Red Knot *Calidris canutus*, *islandica* subspecies (*Calidris canutus islandica*), *roselaari* subspecies (*Calidris canutus roselaari*) and *rufa* subspecies (*Calidris canutus rufa*) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xxxv + 173 pp.

For more information, please visit
www.sararegistry.gc.ca.

For information regarding reproduction rights, please contact Environment and Climate Change Canada's Public Inquiries Centre at 1-800- 668-6767 (in Canada only) or 819-997-2800 or email to ec.enviroinfo.ec@canada.ca.



Red Knot *rufa* subspecies (Southeastern USA / Gulf of Mexico / Caribbean wintering population)



Photo: © Raymond Belhumeur

Scientific name
Calidris canutus rufa

Taxon
Birds

COSEWIC status
Endangered

Canadian range
Nunavut, Northwest Territories, Alberta, Saskatchewan, Manitoba, Ontario, Quebec, New Brunswick, Nova Scotia, Prince Edward Island, Newfoundland and Labrador

Reason for designation

This medium-sized shorebird breeds in the central Canadian Arctic and overwinters along the coasts of southeastern United States, Gulf of Mexico and islands in the Caribbean Sea. Migration and wintering surveys indicate that the population has experienced steep declines, in the range of 33-84% over three generations, with no evidence of recovery. The current population is estimated to be about 9300 mature individuals. During migration it congregates at a few key sites on the eastern seaboard of the United States, making it vulnerable to threats from human harvesting of Horseshoe Crabs (whose eggs are an essential food source for northbound migrants) in Delaware Bay,

disturbance and predation from recovering falcon populations, and disturbance from recreational activities. Risks from exposure to storms and severe weather during fall and winter may increase with climate change.

Wildlife Species Description and Significance

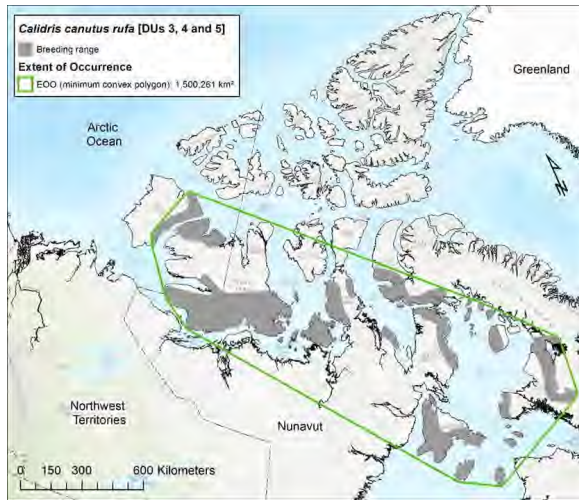
Red Knot (*Calidris canutus*) is a medium-sized shorebird with a typical “sandpiper” profile: medium-long bill and smallish head, longish legs, and long tapered wings giving the body an elongated streamlined profile. In breeding plumage, the face, neck, breast and much of the underparts are rufous red. The upperparts are dark brown or black spangled with rufous and grey. In winter plumage, knots (used throughout to refer to Red Knots in general) have white underparts and pale grey back.

Red Knot is a “flagship” species for shorebird conservation, with long, inter-continental migrations and high vulnerability to threats, as it concentrates in large numbers at a few key sites on migration and in winter. It crosses many international boundaries and is symbolic of the need for international cooperation for successful conservation. Conservation of sites used by knots also benefits many other shorebird species.

Distribution

Six subspecies of Red Knot are currently recognized worldwide, each with distinct biogeographical populations that differ to varying degrees in distribution, in scheduling of the annual cycle, and genetically. Three subspecies occur in Canada: *C. c. islandica*, *C. c. roselaari*, and *C. c. rufa*. The taxonomy of North American Red Knot populations has been revised since the 2007 COSEWIC Status Report, with the populations wintering in Tierra del Fuego, as well

as those wintering in northern Brazil and in southeastern USA / Gulf of Mexico / Caribbean, which were formerly assigned to *C. c. roselaari*, all now regarded as part of *C. c. rufa*. These three populations of *rufa* are also treated here as separate designatable units (DUs). Red Knot *rufa* subspecies (Southeastern USA / Gulf of Mexico / Caribbean wintering population) breeds in the central Canadian Arctic, and winters along the coasts of the southeastern United States, Gulf of Mexico, and Caribbean Sea.



Extent of occurrence (EOO) for Red Knot *C. c. rufa* (DUs 3, 4, and 5) in Canada, based on the known breeding range of the subspecies within the central Canadian Arctic

Source : COSEWIC. 2020. COSEWIC assessment and status report on the Red Knot *Calidris canutus*, *islandica* subspecies (*Calidris canutus islandica*), *roselaari* subspecies (*Calidris canutus roselaari*) and *rufa* subspecies (*Calidris canutus rufa*) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xxxv + 173 pp.

Habitat

Red Knot nests in barren habitats in the Arctic, such as windswept ridges, slopes, or plateaus, with little vegetation cover. On migration and wintering areas, knots use coastal areas with extensive sandflats, mudflats and rocky flats, where birds feed on bivalves and other invertebrates. Along the mid-Atlantic coast of the eastern United States, they use sandy beaches and feed on high-energy Horseshoe Crab eggs. They also use salt marshes, brackish lagoons,

mangrove areas, mussel beds, peat banks, rocky intertidal platforms, inland saline lakes, and agricultural fields.

Biology

Red Knot is monogamous, with pairs usually laying a single clutch of four eggs in the latter half of June, and the eggs hatching about mid-July. Females depart soon thereafter, leaving the males to accompany the young until they fledge. Breeding success varies considerably, depending on weather and the abundance and impacts of predators. Red Knot has comparatively high adult annual survival, ranging from 0.62-0.92 (mean 0.80), which varies in response to foraging and weather conditions on wintering grounds and during migration. Red Knot has a generation time of about 7 years, and most individuals start breeding at age two years.

Red Knot undergoes significant physiological changes during migration, to increase flight efficiency and permit rapid accumulation of body stores after reaching the breeding grounds. Organs and tissues involved in flight increase in size, while digestive organs and leg muscles decrease. Stores of fat and protein remaining on arrival on the breeding grounds are then used to regrow the latter organs in preparation for the breeding attempt.

Population Sizes and Trends

Recent estimates based on population modelling indicate that a total of about 10,400 Red Knot of all ages winter in coastal areas of the southeastern United States, with at least 5,000 additional knots likely wintering on islands in the Caribbean, for a total of about 15,400 birds. Adults likely make up about 60% of these totals, resulting in an overall southeastern USA / Gulf of Mexico / Caribbean wintering population (DU5) estimate of 9,300 mature individuals. The weight of evidence from migration and wintering surveys indicates that the population has

experienced steep long-term declines, in the range of 33-84% over three generations, with no evidence of recovery.

Threats and Limiting Factors

Many of the key threats to Red Knot are associated with its long-distance migrations and physiological changes that maximize flying efficiency and breeding success. Its relatively inflexible life history strategy makes Red Knot particularly sensitive to the effects of human interventions and changing climate and habitat conditions. Threats affecting all five DUs to varying extents include ecosystem modifications/biological resource use which affect food resources needed at critical times of the year (e.g., Horseshoe Crab harvest in Delaware Bay, Grunion fishery in Mexico), habitat shifting and alteration (e.g., climate change effects on habitat conditions and predator relationships on the breeding grounds), and changes to coastal habitats resulting from sea-level changes. Significant disturbance from human activities occurs in many areas, and most DUs are affected by increased predation or disturbance from increasing falcon populations. Oil spills pose a threat to all DUs. Increased frequency and intensity of storms on the breeding grounds, and hurricanes in migration areas, may periodically cause significant mortality, especially for those DUs that undergo long trans-oceanic migratory flights.

Disturbance by recreationists significantly affects quality of foraging and roosting areas on wintering and migration areas in eastern North America. Major threats include ongoing issues with Horseshoe Crab abundance in Delaware Bay, increased predation and disturbance from increasing falcon populations, and possible effects from climate change, including increasing storm frequency on breeding grounds (habitat alteration, predation) and on migration and wintering areas

Protection, Status and Ranks

Red Knot is protected in Canada under the *Migratory Birds Convention Act* (1994). It was listed on Schedule 1 of the *Species at Risk Act* in 2012, as follows: *C. c. rufa* Endangered (the southern Tierra del Fuego / Patagonia wintering population, now DU3); *C. c. roselaari* Threatened (including present DU2, the northeastern South America wintering population in northern Brazil and the southeastern USA / Gulf of Mexico / Caribbean wintering population, DU4 and DU5, now believed to be *C. c. rufa*), and *C. c. islandica* (now DU1) Special Concern (the previous DUs reflect earlier taxonomic designations). Red Knot (*C. c. rufa*) is also listed under species-at-risk legislation in Ontario, Quebec, New Brunswick, Nova Scotia, and Newfoundland and Labrador. *C. c. islandica* and *C. c. roselaari* are not listed under provincial or territorial species-at-risk legislation.

Red Knot (*C. c. rufa*) is listed federally in the United States as Threatened, and as Threatened in New Jersey and as of Special Concern in Georgia. *C. c. rufa* was added to Appendix 1 of the Convention on Migratory Species in 2005. Red Knot was listed as Critically Endangered on the Brazilian list in 2014 and categorized as Endangered in Argentina, Chile and Uruguay. France declared the species to be protected in Guadeloupe and Martinique in 2012 and in French Guiana in 2014. *C. c. roselaari* has been designated as Endangered in Mexico and as a species of management concern in the United States.

NatureServe lists *C. c. rufa* globally as G4T1, nationally in Canada as N1B and N1N, and nationally in the United States as N1N. It ranks *C. c. rufa* as S1 to S3 in Northwest Territories, Ontario, Quebec, Saskatchewan, Prince Edward Island, Nova Scotia, New Brunswick, and Newfoundland in Canada, and in Virginia in the United States. *C. c. islandica* is ranked N3B nationally and S2B in Northwest Territories.

Source: COSEWIC. 2020. COSEWIC assessment and status report on the Red Knot *Calidris canutus*, *islandica* subspecies (*Calidris canutus islandica*), *roselaari* subspecies (*Calidris canutus roselaari*) and *rufa* subspecies (*Calidris canutus rufa*) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xxxv + 173 pp

For more information, please visit
www.sararegistry.gc.ca.

For information regarding reproduction rights, please contact Environment and Climate Change Canada's Public Inquiries Centre at 1-800- 668-6767 (in Canada only) or 819-997-2800 or email to ec.enviroinfo.ec@canada.ca.



Ross's Gull



Photo: © Mark Malloy

Scientific name

Rhodostethia rosea

Taxon

Birds

COSEWIC status

Endangered

Canadian range

Nunavut, Manitoba, Newfoundland and Labrador, Arctic Ocean, Atlantic Ocean

Reason for designation

This small little-known gull nests at 1-3 known colonies in the Canadian High Arctic and likely winters in the Labrador Sea. Fewer than 20 mature individuals are known to breed in Canada, although roughly similar numbers may occur undetected. Large numbers of fall migrants seen annually off northern Alaska likely come from a separate large population in eastern Russia. This species has low productivity in Canada, with frequent breeding deferral, nest abandonment, and no chicks fledged over a period of 14 years at the only known active Canadian colony. These factors contribute to inferred continuing population decline. The abandonment of Low Arctic nesting sites since the last assessment has reduced its range and number of locations in Canada, and its breeding range is now limited to the High Arctic. Major threats impeding reproductive success include the killing of chicks by Arctic

Terns at colonies, and contamination from airborne toxic chemicals. Effects of ongoing climatic changes on food availability, reproductive success, and adult survival are largely unknown.

Wildlife Species Description and Significance

Ross's Gull is a small Arctic gull with light, buoyant flight and quick, shallow wingbeats, characterized by a unique wedge-shaped tail. Breeding adults have a distinctive black collar, and the pale head and body feathers take on a light pink cast. Juvenile birds have black outer primaries and a broad black diagonal band across the inner wing.

Ross's Gull is the only member of the genus *Rhodostethia*, and its plumage, vocal repertoire, courtship behaviour, and general ecology are unique among gulls. Scientific studies are largely limited to opportunistic observations at small colonies in Russia and Canada and of migrating gulls at Point Barrow, Alaska. Its winter ecology is largely unknown, although its winter range likely overlaps with pelagic gulls and alcids in subarctic waters. Ross's Gull is known to Inuit in Nunavut and Indigenous residents of Barrow, Alaska, and sought by birdwatchers as a rare winter visitor to lower latitudes.

Distribution

Ross's Gull's breeding stronghold is assumed to lie in eastern Russia, with scattered nesting records from Canada and Greenland. Large flocks of Ross's Gull that annually migrate past Point Barrow each fall are thought to originate in eastern Russia. Birds from the very small Canadian Arctic breeding population likely overwinter in the Labrador Sea.



Extant breeding sites of Ross's Gull in Canada

Source : COSEWIC. 2021. COSEWIC assessment and status report on the Ross's Gull *Rhodostethia rosea* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 35 pp.

Habitat

Ross's Gull typically nests in flat, low-lying areas with low vegetative cover, and has nested in two habitat types in Canada. Ross's Gull is now most frequently encountered on High Arctic islands in Queens Channel, Nunavut, on small sparsely vegetated gravel islands adjacent to marine open-water polynyas. Small numbers formerly nested in marshy Low Arctic floodplain habitat near Churchill, Manitoba, where it has not been confirmed breeding since 2005.

Biology

Ross's Gull likely first breeds after 2 years, with a generation time of about 5 years. It lays 1-3 eggs in a scrape on the ground, in loose colonies, typically of 2-10 pairs. Ross's Gull frequently defers or abandons nesting, or relocates to a different nesting site, in response to snow cover, prolonged inclement weather, or terrestrial predators. Studies of tagged birds have shown very low overall breeding success and mate fidelity.

Adult Ross's Gulls feed on small invertebrates in freshwater environments, and on zooplankton and small fish on migration and when overwintering at sea. Its eggs and chicks are

vulnerable to terrestrial and avian predators. Sympatrically nesting Arctic Terns have been observed killing Ross's Gull chicks at High Arctic colonies, and are likely an important cause of breeding failure in Canada.

Population Sizes and Trends

Little is known about the population status of Ross's Gull in Canada. It has only been monitored regularly at Nasaruaalik Island, in High Arctic Nunavut, where 1-6 pairs nest annually. It is likely that much fewer than 250 mature individuals breed in Canada. Extensive areas of apparently suitable habitat may host small undetected colonies. Migration counts and extrapolations from breeding surveys in Siberia suggest a global population of about 50,000 mature individuals.

The number of breeding Ross's Gull in Canada has varied over the past three generations, and has been relatively stable or declining slightly over the short-term. A projected continuing population decline is inferred from lack of reproductive output in 14 years of study at the only known Canadian colony. Ross's Gull is no longer known to breed near Churchill, in Low Arctic Canada, resulting in a significant decline in apparent extent of occurrence. However, surveys of Ross's Gull migrating past Point Barrow do not suggest that global populations have declined overall.

Threats and Limiting Factors

Threats to Ross's Gull in Canada are poorly understood. High rates of chick mortality as a result of attacks by Arctic Terns in shared colonies, and predation and disturbance by Polar Bear and Arctic Fox are major threats. Low hatching rates may be a result of egg infertility linked to high levels of mercury and persistent organic pollutants from airborne sources. Most Ross's Gulls nest in remote areas where human activity is limited or absent. Shipping activity in the Labrador Sea poses a low risk to birds that winter there. Many climate-related changes in

terrestrial High Arctic breeding habitats are unlikely to affect this species within three generations, and effects of shifts in marine conditions in breeding and wintering areas are unknown.

Protection, Status and Ranks

Ross's Gull, its eggs and nests are protected in Canada under the *Migratory Birds Convention Act 1994*, and the species was listed as Threatened under the *Species at Risk Act 2002*. It is listed as Endangered under Manitoba's *Endangered Species Act*. Internationally, Ross's Gull is listed as a Threatened or Endangered Species in Russia's Red Book, and is fully protected in Russia and Greenland against deliberate harm or disturbance. It is protected in the United States under the *Migratory Bird Treaty Act*. Ross's Gull is assessed by the IUCN in Canada as Critically Imperilled/Imperilled, and globally as a species of Least Concern.

Source: COSEWIC. 2021. COSEWIC assessment and status report on the Ross's Gull *Rhodostethia rosea* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 35 pp.

For more information, please visit
www.sararegistry.gc.ca.

For information regarding reproduction rights, please contact Environment and Climate Change Canada's Public Inquiries Centre at 1-800- 668-6767 (in Canada only) or 819-997-2800 or email to ec.enviroinfo.ec@canada.ca.



Seaside Centipede Lichen

Photo: © Anna Roberts



Scientific name

Heterodermia sitchensis

Taxon

Lichens

COSEWIC status

Threatened

Canadian range

British Columbia

Reason for designation

This leafy lichen is known from 20 occurrences on the west coast of Vancouver Island, Canada, and from two in the US. It has highly specific habitat requirements and grows only on partially defoliated small-diameter Sitka Spruce twigs on trees, close to the shoreline, that often receive nitrogen enrichment from sea lion haul-out sites or bird nest sites. The number of mature individuals (thalli) is thought to be less than 1000, and the lichen is highly vulnerable to intense storm activity associated with climate change that destroys the twigs upon which the lichen is found. The change of status from Endangered reflects increased knowledge of the distribution as a result of increased survey effort.

Wildlife Species Description and Significance

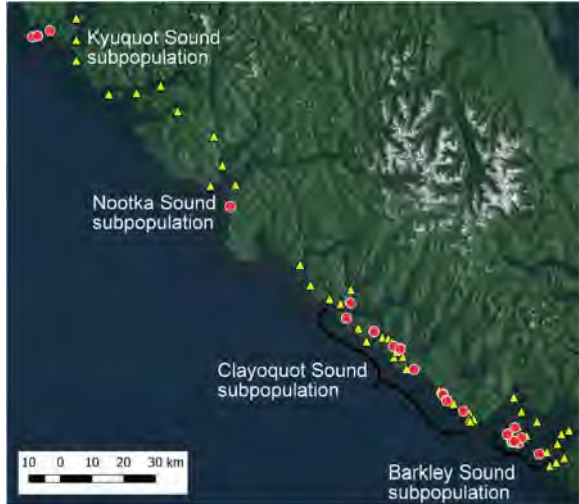
Seaside Centipede Lichen, *Heterodermia sitchensis* Goward & Noble, is a pale greyish,

leafy to semi-erect lichen in the *Physciaceae*. It can be recognized by the presence of marginal cilia and tiny urn-like structures near the lobe tips. It was first described from western Vancouver Island.

Seaside Centipede Lichen is among the most northerly members of a predominantly tropical to warm temperate genus. The majority of its global population is found in Canada, where it occupies a very narrow latitudinal range along the west coast of Vancouver Island. The soredia-bearing “urns” located near the lobe tips are believed to be unique among lichens.

Distribution

In Canada, Seaside Centipede Lichen occurs only on Vancouver Island in coastal British Columbia, where it ranges from the Pacific Rim National Park, north 210 km to Kyuquot Sound. Outside of Canada, it is known from two outlying subpopulations in coastal Oregon. In Canada, despite more than 200 person-days of targeted searching by individuals familiar with the species since 2001, there are only 20 known Seaside Centipede Lichen occurrences recorded, forming four subpopulations.



The Canadian occurrences of Seaside Centipede Lichen, *Heterodermia sitchensis* (red circles), and nearby areas searched unsuccessfully (yellow triangles). The range extends from Folger Island in Barkley Sound, north along the western edge of Vancouver Island, to Kyuquot Sound. The occurrences are grouped into four subpopulations: Kyuquot Sound, Nootka Sound, Clayoquot Sound and Barkley Sound.

Source : COSEWIC. 2021. COSEWIC assessment and status report on the Seaside Centipede Lichen *Heterodermia sitchensis* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiii + 40 pp.

Habitat

Throughout its range, Seaside Centipede Lichen occurs exclusively at the seaside on sheltered but well-ventilated nutrient-enriched and defoliated twigs in the lower canopy of slow-growing old Sitka Spruce trees. In Canada, it is known exclusively from the Very Wet Hypermaritime subzone of the Coastal Western Hemlock Zone. In Oregon, one subpopulation is in old-growth temperate rainforest with Western Hemlock and the other is in a patch of Sitka Spruce and Shore Pine on open dunes.

Biology

In keeping with its strong tendency to colonize small twigs, Seaside Centipede Lichen is a short-lived species with a generation time in the

order of 7-10 years. By the end of that period, its substratum is usually overgrown by mosses, hepatics and other lichens, all of which tend to outcompete it. Seaside Centipede Lichen reproduces exclusively via soredia (powdery asexual propagules made up of algal cells and fungal hyphae). Dispersal is presumed to be poor by wind, rain or birds that feed on invertebrates which live on the twigs where the lichen occurs.

Population Sizes and Trends

The most recent count of Seaside Centipede Lichen in Canada totals 314 thalli. These are divided among twenty spatially separate occurrences, three of which may now be extirpated. The occurrences are grouped into four geographically distinct subpopulations. Sixty-one percent of the total population at last count was found at three occurrences. The number of thalli at a site can vary, depending on the intensity of winter storms, which can both eliminate existing habitat and create new microsites for future colonization. However, no long-term trends in population size have been documented. The results of extensive searches, and the monitoring of Seaside Centipede Lichen populations in Canada, indicate that this rare lichen has very specific habitat requirements, is severely fragmented, and the total population is probably fewer than 1000 mature individuals.

Threats and Limiting Factors

The incidence and severity of threats to Seaside Centipede Lichen are difficult to predict. Habitat disturbance and inundation from tsunamis, climate change and severe weather leading to habitat shifting pose the greatest threats to Seaside Centipede Lichen, along with impacts from human intrusion and disturbance from recreational activities. Habitat destruction through logging or land development is an additional threat to a few occurrences.

There are several limiting factors that cause Seaside Centipede Lichen to be rare throughout

its range. As a transient or fugitive species, Seaside Centipede Lichen must colonize as suitable habitat becomes available. This comprises living but partially defoliated twigs of Sitka Spruce. The lichen is then displaced over time by overgrowth of more competitive mosses and lichens. In summary, colonization and survival of Seaside Centipede lichen requires that the lichen must first successfully disperse its propagules to Sitka Spruce twigs growing close to the sea with suitable microclimates that are enriched by high nitrogen levels from birds or marine mammal haulouts.

Protection, Status and Ranks

Seaside Centipede Lichen was assessed as Endangered by COSEWIC in 2006 and is listed as Endangered on Schedule 1 of the federal *Species at Risk Act*. The species is listed by NatureServe as “globally imperiled” (G1) worldwide and “critically imperiled” (S1) within British Columbia. The species is also included on British Columbia’s “Red List” of species at risk of being extirpated, endangered or threatened.

Seaside Centipede Lichen is part of the Multi-species Action Plan for the Pacific Rim National Park Reserve, which lists recovery measures to protect the species and critical habitat for three occurrences within the park. A Recovery Strategy for Seaside Centipede Lichen has also been completed.

Thirteen of the twenty Seaside Centipede Lichen occurrences in Canada have some sort of protection. Eight are within Pacific Rim National Park Reserve and are protected from human disturbance by the *National Parks Act* and by the *Species at Risk Act*. Five are in provincial recreation sites, parks or wildlife management areas

Source: COSEWIC. 2021. COSEWIC assessment and status report on the Seaside Centipede Lichen *Heterodermia sitchensis* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiii + 40 pp.

For more information, please visit www.sararegistry.gc.ca.

For information regarding reproduction rights, please contact Environment and Climate Change Canada’s Public Inquiries Centre at 1-800- 668-6767 (in Canada only) or 819-997-2800 or email to ec.enviroinfo.ec@canada.ca.



Short-eared Owl



Photo: © Christian Artuso

Scientific name

Asio flammeus

Taxon

Birds

COSEWIC status

Threatened

Canadian range

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

Reason for designation

The Canadian population of this widespread nomadic owl breeds in open grassland, tundra, and wetland habitats in all provinces and territories, and winters in southern Canada and the United States. The use of new atlas-based population estimation procedures suggests that the size of the Canadian population is about 31,000 mature individuals, roughly 10% of previous estimates. Its numbers vary over space and time in response to cycles in the availability of small mammals—its main prey. This adds uncertainty to estimates of the rate of decline in the Canadian population. Data from both the Breeding Bird Survey and Christmas Bird Counts indicate a decline of more than 30% over the past three generations. The Canadian population is projected to continue to decline

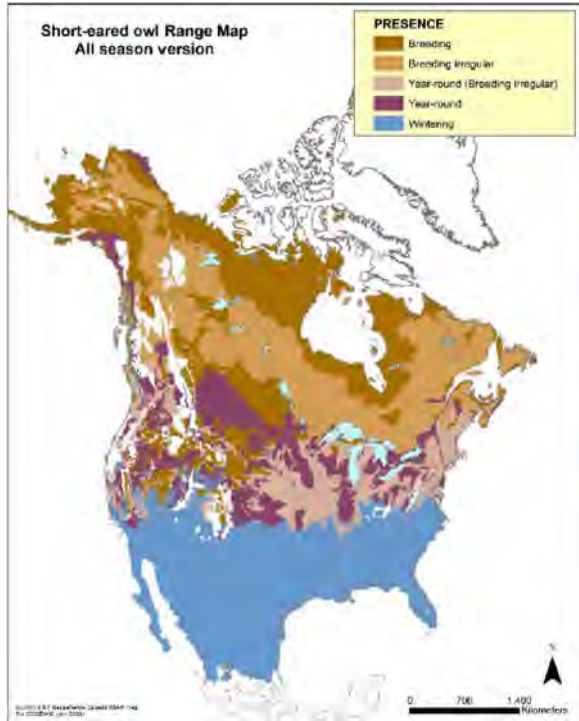
because of future threats, including reduced availability of nesting and wintering habitat resulting from crop conversion, agricultural intensification, urbanization, and invasive plants. In low Arctic habitats, increased growth of shrubs as a result of climate warming (shrubification) will further reduce prey availability and increase predation risk.

Wildlife Species Description and Significance

Short-eared Owl (*Asio flammeus*) is a medium-sized owl, approximately 34-42 cm in length. Plumage is mottled brown above and buff with heavy streaking below, varying only slightly by sex and age. Short-eared Owl is largely crepuscular and hunts through the evening and into the night, and is recognizable by its agile, moth-like flight over open areas.

Distribution

Short-eared Owl has the broadest global distribution of any owl, with a range that includes most of North America and Eurasia, parts of South America, Africa, and many oceanic islands. North American breeding range extends from the Canadian Arctic south to Nevada in the west and Massachusetts in the east, and the winter range spans from southern Canada to Mexico. It breeds across Canada, regularly in the subarctic tundra and prairies, and more sparsely elsewhere.



Breeding, wintering, and year-round distribution of Short-eared Owl in North America

Source : COSEWIC. 2021. COSEWIC assessment and status report on the Short-eared Owl *Asio flammeus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiii + 69 pp.

Habitat

Short-eared Owl favours open habitats throughout the year, including grasslands, tundra, and wetlands. Breeding typically occurs in open landscapes at least 50-100 ha in area, and nests are preferentially located on the ground near clumps of taller vegetation that provide concealment. In winter, Short-eared Owls roost in conifers adjacent to open areas used for hunting or on the ground in the shelter of tall grasses or forbs. Declines in the extent and quality of open grassland and wetland habitats have likely reduced the distribution and abundance of Short-eared Owl in southern Canada.

Biology

Age of first breeding is thought to be one year; lifespan is poorly documented but generation time is considered to be about 4 years. A single brood is raised annually, although a replacement clutch may be laid in cases of early nest failure. Diet primarily comprises voles, lemmings, and other small mammals. Short-eared Owls tend to be nomadic, often moving relatively long distances through the year to areas with high rodent abundance. This results in substantial fluctuations in abundance at local and regional scales, complicating the estimation of overall numbers and population trends.

Population Sizes and Trends

The previous COSEWIC estimate of the size of the Canadian Short-eared Owl population of about 350,000 mature individuals was based on Breeding Bird Survey (BBS) data. However, the BBS samples only a small part of the Canadian breeding range with low sample sizes. Interpretation and extrapolation of breeding bird atlas results from the past two decades likely provide a more accurate estimate of approximately 31,000 mature individuals, over half of which breed in Northwest Territories and Nunavut.

Short-eared Owl population trends estimated from BBS data indicate declines of -70% between 1970 and 2019, and -31% over the most recent three-generation period, although the BBS does not sample the core of the Canadian population breeding in the tundra. There is greater overlap between the wintering range and coverage by the Christmas Bird Count (CBC). CBC trends for Canada show similar declines of -79% between 1970 and 2019, and -27% over the past three generations, with steepest decreases in Alberta, Manitoba, Ontario, and Quebec. The winter distribution of Canadian birds is poorly known, but most individuals likely overwinter in the United States. At a continental scale, CBC trend estimates for 2007 to 2019 range from -6.5% to -33.6%,

depending on the method of analysis. Declines in numbers and range have also been documented by breeding bird atlases completed in British Columbia and Quebec since the previous status report.

Threats and Limiting Factors

Natural system modifications, and climate change and severe weather, are the most important threats to Short-eared Owl, and each is expected to have a low to medium impact on populations. In low Arctic habitats, where a large percentage of the population nests, increased growth of shrubs as a result of climate warming (shrubification) will further reduce prey availability and increase predation risk. The cumulative effect of these threats and six others considered to be of low impact is anticipated to have a medium to high overall impact on the species.

Protection, Status and Ranks

Short-eared Owl is listed as a species of Special Concern under Canada's *Species at Risk Act*. It is listed under provincial endangered species legislation in Manitoba (Threatened), Ontario (Special Concern), New Brunswick (Special Concern), and Newfoundland and Labrador (Vulnerable). In Quebec, it is on the list of wildlife species likely to be designated threatened or vulnerable.

In the United States, Short-eared Owl is protected under the *Migratory Bird Treaty Act*, but is not listed under the *Endangered Species Act*. It is considered Endangered in 11 states, and Threatened or Special Concern in five others.

Globally, Short-eared Owl is classified as Least Concern by IUCN. NatureServe ranks Short-eared Owl as Secure (G5) globally, Apparently Secure as a breeder and migrant but Vulnerable as a non-breeding/wintering population in Canada (N4B-N3N-N4M in Canada), and nationally Secure (N5) in the United States. The

breeding status of Short-eared Owl is ranked as Critically Imperilled to Vulnerable (S1 to S3) in all provinces and territories, with status having worsened in four provinces and one territory since the previous status report.

Source: COSEWIC. 2021. COSEWIC assessment and status report on the Short-eared Owl *Asio flammeus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiii + 69 pp.

For more information, please visit www.sararegistry.gc.ca.

For information regarding reproduction rights, please contact Environment and Climate Change Canada's Public Inquiries Centre at 1-800- 668-6767 (in Canada only) or 819-997-2800 or email to ec.enviroinfo.ec@canada.ca

