COSEWIC
Status Appraisal Summary

on the

Frosted Elfin
Callophrys irus

in Canada

EXTIRPATED
2019

COSEWIC
Committee on the Status
of Endangered Wildlife
in Canada

COSEPAC
Comité sur la situation
des espèces en péril
au Canada

COSEWIC status appraisal summaries are working documents used in assigning the status of wildlife species suspected of being at risk in Canada. This document may be cited as follows:

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COSEWIC
Assessment Summary

Assessment Summary – May 2019

Common name
Frosted Elfin

Scientific name
Callophrys irus

Status
Extirpated

Reason for designation
This butterfly occurred in one restricted area of oak savanna in southern Ontario. It was last recorded in 1988 and has not been seen since despite repeated surveys.

Occurrence
Ontario

Status history
Extirpated by 1988. Designated Extirpated in April 1999. Status re-examined and confirmed in May 2000, April 2010, and May 2019.

COSEWIC
Status Appraisal Summary

Frosted Elfin

Lutin givré

Callophrys irus

Range of occurrence in Canada: Ontario

COSEWIC Status History:
Extirpated by 1988. Designated Extirpated in April 1999. Status re-examined and confirmed in May 2000, April 2010, and May 2019.

Wildlife species:

Change in eligibility, taxonomy or designatable units: yes ☐ no ☒

Explanation:
There are currently three described subspecies of Frosted Elfin, although only the nominate subspecies (*Callophrys irus irus*) is known from Canada. There have been no changes to the taxonomy since the previous COSEWIC assessments. There are inconsistencies in the literature about the taxonomic status of the species, mainly the possibility of additional subspecies in the United States, though these are not applicable for the species in Canada (see Pelham 2008; Schweitzer *et al*. 2011; Pohl *et al*. 2018). For the purposes of this status report the entity, no matter its name, is the only representative of the species in Canada.

Range:

Change in Extent of Occurrence (EOO): yes ☐ no ☒ unk ☐

Change in Index of Area of Occupancy (IAO): yes ☐ no ☒ unk ☐

Change in number of known or inferred current locations[1]: yes ☐ no ☒ unk ☐

Significant new survey information yes ☒ no ☐

Explanation:
Frosted Elfin was last observed in Ontario in 1988 at the St. Williams Conservation Reserve, Norfolk County (COSEWIC 2000; Environment and Climate Change Canada 2017). There have been no additional historical records found from unidentified museum specimens or personal collections, nor have there been new observations of the species in potential habitats.

1 The term 'location' defines a geographically or ecologically distinct area in which a single threatening event can rapidly affect all individuals of the taxon present. The size of the location depends on the area covered by the threatening event and may include part of one or many subpopulations. Where a taxon is affected by more than one threatening event, location should be defined by considering the most serious plausible threat. Where the most serious plausible threat does not affect all of the taxon's distribution, other threats can be used to define and count locations in those areas not affected by the most serious plausible threat. (Source: IUCN 2010, 2011). In the absence of any plausible threat for the taxon, the term "location" cannot be used and the subcriteria that refer to the number of locations will not be met. (Source: IUCN 2010, 2011).

The St. Williams Conservation Reserve has been thoroughly inventoried for all butterflies over the recent decades by the academic, biologist and naturalist community. There are annual butterfly checklists from these and the other remnant oak savanna habitats in southern Ontario that have been continuously updated over long periods of time, as shown by the abundance of butterflies recorded from this area during the correct flight season (May) (Macnaughton *et al*. 2019). Despite extensive search effort in these and other remnant savanna habitats with the species host plant, Wild Lupine, Frosted Elfin has not been reported in the province since 1988 (COSEWIC 2000; Environment and Climate Change Canada 2017; Jones pers. comm. 2018; Linton pers. comm. 2018; Macnaughton *et al*. 2019). The known area and potential habitat at the St. Williams Conservation Reserve is 1035 hectares, although Frosted Elfin occupied a small portion of that habitat (Otis pers. comm. 2018).

A butterfly in an unidentified drawer of specimens housed at the Royal Ontario Museum was recently identified as Frosted Elfin (unique identifier TEA17_21409, collected May 27, 1937 by Quimby F. Hess at Grand Bend, Lambton County [now Pinery Provincial Park]). Examination of the specimen concluded this identification was erroneous and in fact a Hoary Elfin (*Callophrys polios*) (Jones pers. comm. 2018).

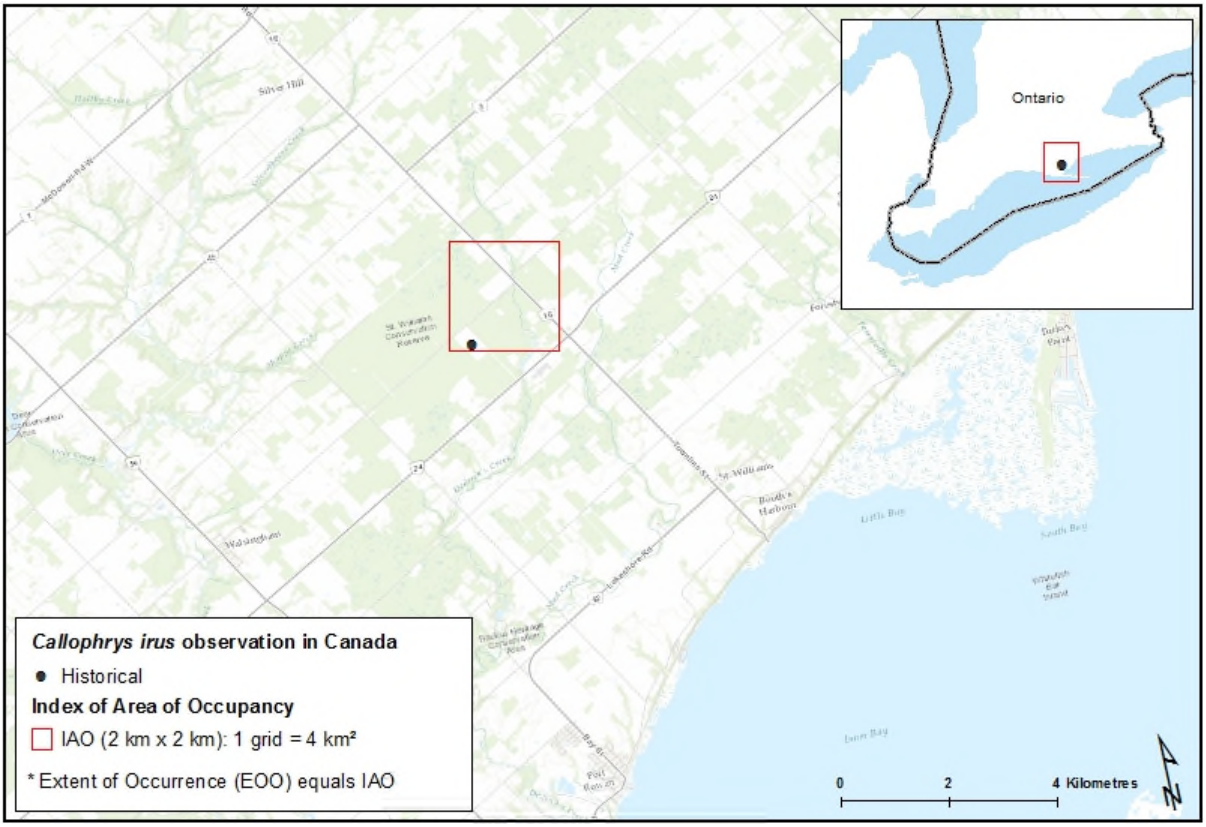

Figure 1. Historical extent of occurrence (EOO; 4 km^2) and index of area of occupancy (IAO; 4 km^2) of the Frosted Elfin, where 65 observations of Frosted Elfin were made from 1969–1988.

Population Information:

Change in number of mature individuals:	yes ☐ no ☒ unk ☐
Change in population trend:	yes ☐ no ☒ unk ☐
Change in severity of population fragmentation:	yes ☐ no ☒ unk ☐
Change in trend in area and/or quality of habitat:	yes ☒ no ☐ unk ☐
Significant new survey information	yes ☐ no ☒

Explanation:
There have been no population studies on the Frosted Elfin in Canada (COSEWIC 2000; Environment and Climate Change Canada 2017). Population information on Frosted Elfin is limited to abundance counts completed within areas around the St. Williams Conservation Reserve prior to 1988, the last year the species was observed. There are 32 observation dates between 1969 and 1988; the most observations of Frosted Elfin were 12 individuals on May 12, 1979 (COSEWIC 2000; Macnaughton *et al*. 2019). The population at the St. Williams Conservation Reserve was estimated at less than 100 individuals in any given year (Packer 1990; COSEWIC 2000; Environment and Climate Change Canada 2017).

Habitat quality has improved at the St. Williams Conservation Reserve, based on various savanna restoration activities (e.g., invasive plant removal, fire management), since this species was last detected in 1988 (see Threats).

Threats:

Change in nature and/or severity of threats: yes ☒ no ☐ unk ☐

Explanation:
A formal threats assessment was not completed for inclusion in this COSEWIC status appraisal summary. However, existing and future threats were examined and discussed in the federal recovery strategy that includes Frosted Elfin (Environment and Climate Change Canada 2017). Threats are defined as the proximate activities or processes that have caused, are causing, or may cause in the future the destruction, degradation, and/or impairment of the entity being assessed (i.e., Frosted Elfin) in the area of interest (i.e., the St. Williams Conservation Reserve) (Salafsky *et al*. 2008). Threats are assessed under the International Union for the Conservation of Nature-Conservation Measures Partnership (IUCN-CMP) threat categories 1–11 and summarized below (for full text see Environment and Climate Change Canada 2017).

Present-day potential threats to the historical Frosted Elfin habitat at the St. Williams Conservation Reserve include recreational activities (Threat 6.1) that impact host plant patches (Environment and Climate Change Canada 2017). A large number of hikers to an area can destroy habitat, trample host plants, and increase the spread of non-native plants. Impacts from dog-walking can also impact host plant health, particularly if dog-owners do not respect leash bylaws and dogs dig, defecate or urinate repeatedly within the same areas.

Other proximal threats include the spread of invasive non-native/alien plants that out-compete Wild Lupine (categorized under Threat 8.1 in the recovery plan; however, proximal threats are considered 7.3 other ecosystem modifications). Invasive plants include Orange Hawkweed (*Pilosella aurantiaca*), Leafy Spurge (*Euphorbia virgata*), Cypress Spurge (*E. cyparissias*), Crown Vetch (*Securigera varia*), White Sweet Clover (*Melilotus albus*) and Spotted Knapweed (*Centaurea stoebe*), which are all present at the St. Williams Conservation Reserve (Jarvis 2014; Jones pers. comm. 2018) and considered detrimental to Frosted Elfin habitats (USFWS 2018). Additional non-native plants such as Autumn Olive (*Elaeagnus umbellata*), Multiflora Rose (*Rosa multiflora*), and Hoary False-alyssum (*Berteroa incana*) are also found in Wild Lupine habitat at the St. Williams Conservation Reserve (Heagy pers. comm. 2019).

Native White-tailed Deer (*Odocoileus virginianus*) will over-browse on Wild Lupine and other nectar plants and thus consume feeding larvae (Threat 8.2). Climate change from habitat shifting and alteration (Threat 11.1), droughts (11.2) and temperature extremes (Threat 11.3) could all impact host plants and habitat through timing of life cycle and emergence (Environment and Climate Change Canada 2017). Droughts can be problematic for small populations with limited habitat. An extended summer drought can cause premature host plant senescence and was a contributing factor in the decline of the Frosted Elfin subpopulation at St. Williams Conservation Reserve (Otis pers. comm. 2018). The non-native European Fire Ant (*Myrmica rubra*) is recorded from the St. Williams Conservation Reserve and is a likely predator on Frosted Elfin larvae, especially if the larvae are on host plants within the home range of this invasive ant's nest.

Excessive collecting (Threat 5.1) is a historical threat although specimen collecting is still a threat to rare butterflies in Ontario and a possibility if Frosted Elfin were to be reintroduced (COSEWIC 2006; Environment and Climate Change Canada 2017).

Historical threats to Frosted Elfin are predominantly habitat loss from land conversion for residential/ commercial development (Threat 1.1 and 1.2) and agriculture (Threat 2.1). Sandy oak savanna, woodland and tallgrass prairie habitats in Ontario prior to European settlement are estimated at 80,000–200,000 ha (Taylor *et al*. 2014). Today approximately 1% remains of the oak savanna, woodland and tallgrass prairie habitats in Ontario (Taylor *et al*. 2014). Frosted Elfin would have occurred in the savanna portion.

More recent threats that likely led to the extirpation of the species include fire suppression (Threat 7.1) programs and the lack of the natural disturbance processes that prevent vegetation succession (e.g., wildfire) and thereby enable the abundant growth of Wild Lupine. If the butterfly were reintroduced to the province these threats would still be applicable to the St. Williams Conservation Reserve (and other potential reintroduction sites) without habitat management. Additional historical threats include widespread insecticide spray programs to control non-native European Gypsy Moth (*Lymantria dispar dispar*) within the same habitats as Frosted Elfin (Threat 9.3). The provincial Gypsy Moth control program is no longer active; however, pesticide drift (Threat 9.3) from regional Gypsy Moth or other pest treatments within municipalities and/or on private properties adjacent to the St. Williams Forest Conservation Reserve (or other potential reintroduction sites) may still be a potential threat should Frosted Elfin be reintroduced (Environment and Climate Change Canada 2017). The threat of pesticide drift is considered low because the historical Frosted Elfin habitats of the St. William's Conservation Reserve are at least 500 metres from the nearest agricultural field and buffered by forest.

Additional limiting factors: In Canada, Frosted Elfin is dependent on Wild Lupine as a larval food plant (COSEWIC 2000). Although additional host plants, such as Yellow Wild Indigo, are used elsewhere in the species range, their use in Canada is unknown. Multiple Wild Lupine patches, a minimum of 2.4 ha in size and within 2 km of one another, are thought to be sufficient to support subpopulations of Frosted Elfin (Swengel 1996). Suitable patches do not exist in Canada now. Frosted Elfin males are territorial and will defend Wild Lupine habitat patches (Packer 1990); if suitable habitat patches are limited then female/male mate finding and the number of potential mating events may also be limited. Research in the United States suggests the species does not always occupy the same habitat patches in consecutive years (Swengel and Swengel 1999); fluctuation in site occupancy and abundance will also be limited by the number of available habitat patches.

Protection:

Change in effective protection: yes ☒ no ☐ unk ☐

Explanation:
Federal protection: Frosted Elfin is listed as Extirpated under Schedule 1 of the federal *Species at Risk Act* (SARA). This species is one of three butterflies included in the multi-species recovery strategy for the Karner Blue (*Lycaeides melissa samuelis,* now *Plebejus samuelis*), Frosted Elfin (*Callophrys irus*) and Eastern Persius Duskywing (*Erynnis persius persius*) in Canada (Environment and Climate Change Canada 2019). The recovery strategy sets out a schedule of studies (Section 7.2) of when and how critical habitat would be identified if recovery is deemed feasible or the species is reintroduced in Canada (Environment and Climate Change Canada 2019).

Provincial (Ontario) protection: In 2008 Frosted Elfin was assessed by the Committee on the Status of Endangered Species in Ontario (COSSARO) and listed as Endangered under Ontario's *Endangered Species Act* [ESA] (ESA 2007). Under this act, endangered species receive protection for both the individuals and their habitat. In 2010, Frosted Elfin was re-assessed and its status changed from Endangered to Extirpated. Extirpated species receive species protection but not habitat protection unless a habitat regulation is prescribed. Frosted Elfin does not currently have a prescribed habitat regulation.

Under the Ontario ESA there are no requirements for recovery planning until such time the province determines that reintroduction is feasible. Recovery feasibility for Frosted Elfin is discussed in the federal recovery strategy for the species (see Environment and Climate Change Canada 2019). The minimum Wild Lupine patch size required to sustain a subpopulation is unknown but likely smaller than what is required by Karner Blue (Environment and Climate Change Canada 2017). Research in the United States recommends multiple Wild Lupine patches, a minimum of 2.4 ha in size and within 2 km of one another (Swengel 1996). The minimum number of butterflies needed for a self-sustaining subpopulation of Frosted Elfin is unknown; however, the subpopulation at St. Williams Conservation Reserve (referred to as St. Williams Forestry Station during the time the study was conducted) was roughly estimated at less than 100 individuals in any one year (Packer 1990).

Scientific information to inform the decision to reintroduce Frosted Elfin to Canada can be drawn from the research assessing the quality and quantity of suitable habitat for the SARA-listed Karner Blue, which is also extirpated from Canada (see Chan 2004; Chan and Packer 2006; Bernard *et al*. 2012; Jarvis 2014; Otis 2017). No formerly occupied habitats that remain in Ontario are of adequate size or provide the abundance of Wild Lupine needed to sustain populations of the butterfly, although in recent years restoration efforts, which have included seeding and prescribed burning, have been implemented in Norfolk County. To date (January 2019) there is no decision to reintroduce Frosted Elfin to Canada although the Ontario Butterfly Species at Risk Recovery and Implementation Team is actively supporting efforts towards recovery of the species, including habitat restoration and research (Jones pers. comm. 2018; Linton pers. comm. 2018; Otis pers. comm. 2018).Other non-legal conservation status ranks for Frosted Elfin:

Ontario subnational status: SX (Extirpated) (NHIC 2018)
Canada General Status: NX (Extirpated) (Natureserve 2018)
Global Status: G3 (Vulnerable) (Natureserve 2018)
United States National Status: N3 (Vulnerable) (Natureserve 2018)
United States Subnational Status: Alabama (SU [undetermined]), Arkansas (SNR [Not Ranked]), Connecticut (S2S3 [imperilled to vulnerable]), Delaware (S1 [Critically imperilled]), District of Columbia (SH [historical]), Florida (S1), Georgia (S2S4), Illinois (SH), Indiana (S1), Kansas (SNR), Kentucky (S1), Louisiana (S2S3), Maine (SX), Maryland (S1), Massachusetts (S2S3), Michigan (S2S3), New Hampshire (S1), New Jersey (S2), New York (S1S2), North Carolina (S2), Ohio (S1), Oklahoma (S1), Pennsylvania (S1S2), Rhode Island (S1), South Carolina (SNR), Tennessee (S1?), Texas (SNR), Vermont (S1), Virginia (S2?), West Virginia (S1), Wisconsin (S1)(Natureserve 2018).

The conservation status rank for Wild Lupine in Ontario is imperilled/vulnerable (S2S3) and for Yellow Wild Indigo is critically imperilled/imperilled (S1S2). Both plants have not been assessed by COSEWIC or COSSARO nor listed under SARA or the Ontario ESA.

Rescue Effect:

Change in evidence of rescue effect: yes ☐ no ☒

Explanation:
Frosted Elfin is at risk throughout its global range (Natureserve 2018). In the United States the species remains within habitats that are isolated and widely separated from one another (Natureserve 2018; USFWS 2018). Adults are non-migratory and tightly associated with host plant patches (COSEWIC 2000; Schweitzer *et al*. 2011; USFWS 2018). There are few habitat patches in Canada that meet the minimum requirements to sustain a Frosted Elfin subpopulation (Environment and Climate Change Canada 2017). It is not possible for the species to recolonize the known historical site at the St. Williams Conservation Preserve, nor any other suitable habitat in Ontario, without human assistance (i.e., a captive breeding, habitat restoration and reintroduction program).

Quantitative Analysis:

Change in estimated probability of extirpation: yes ☐ no ☒ unk ☐

Details: Frosted Elfin has not been recorded in Ontario since 1988 (COSEWIC 2000; Environment and Climate Change Canada 2017) and there had been no quantitative analysis prior to its extirpation.

Summary and Additional Considerations: In November 2017, the Ontario Butterfly Species at Risk Recovery and Implementation Team had their first meeting (Linton pers. comm. 2018) and recovery team members work on many of the recovery actions for Frosted Elfin. The multi-species federal recovery strategy includes Frosted Elfin (Environment and Climate Change Canada 2019).

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TECHNICAL SUMMARY

Callophrys irus

Frosted Elfin

Lutin givré

Range of occurrence in Canada: Ontario

Demographic Information

Generation time	1 year
Is there an [observed, inferred, or projected] continuing decline in number of mature individuals?	Not applicable
Estimated percent of continuing decline in total number of mature individuals within [5 years or 2 generations]	Not applicable
[Observed, estimated, inferred, or suspected] percent [reduction or increase] in total number of mature individuals over the last [10 years, or 3 generations].	Not applicable
[Projected or suspected] percent [reduction or increase] in total number of mature individuals over the next [10 years, or 3 generations].	Not applicable
[Observed, estimated, inferred, or suspected] percent [reduction or increase] in total number of mature individuals over any [10 years, or 3 generations] period, over a time period including both the past and the future.	Not applicable
Are the causes of the decline a. clearly reversible and b. understood, and c. ceased?	a. yes; b. yes c. no
Are there extreme fluctuations in number of mature individuals?	No

Extent and Occupancy Information

Estimated extent of occurrence (EOO)	Present day EOO 0 Historical EOO = 4 km^2
Index of area of occupancy (IAO) (2x2 grid value)	Present day IAO 0 Historical IAO = 4 km^2
Is the population “severely fragmented” i.e., is >50% of its total area of occupancy in habitat patches that are (a) smaller than would be required to support a viable population, and (b) separated from other habitat patches by a distance larger than the species can be expected to disperse?	a. Not applicable b. Not applicable
Number of “locations”[2]	0
Is there an [observed, inferred, or projected] decline in extent of occurrence?	Not applicable
Is there an [observed, inferred, or projected] decline in index of area of occupancy?	Not applicable

Is there an [observed, inferred, or projected] decline in number of subpopulations?	Not applicable
Is there an [observed, inferred, or projected] decline in number of “locations”*?	Not applicable
Is there an [observed, inferred, or projected] decline in [area, extent and/or quality] of habitat?	No
Are there extreme fluctuations in number of subpopulations?	Not applicable
Are there extreme fluctuations in number of “locations”?	Not applicable
Are there extreme fluctuations in extent of occurrence?	Not applicable
Are there extreme fluctuations in index of area of occupancy?	Not applicable

Number of Mature Individuals (in each subpopulation)

Subpopulations (give plausible ranges)	N Mature Individuals
Total	None

Quantitative Analysis

Is the probability of extinction in the wild at least [20% within 20 years or 5 generations, or 10% within 100 years]?	No data

Threats (direct, from highest impact to least, as per IUCN Threats Calculator)

Was a threats calculator completed for this species? No, however threats were assessed under IUCN-CMP threat categories as part of the multi-species federal recovery strategy that includes Frosted Elfin (see Environment and Climate Change Canada 2019).

What additional limiting factors are relevant? Larvae depend on Wild Lupine to complete their life cycle and this plant is ranked imperilled/vulnerable in Ontario; larvae are cannibalistic; males establish and defend territories and if habitat is limited, then mate-finding may also be limited; larvae feed on flowering parts of the host plant and may be limited by plant phenology; habitat patch size may need to be a minimum of 2.4 ha and within 2 km of one another to support populations (Swengel 1996).

Rescue Effect (immigration from outside Canada)

Status of outside population(s) most likely to provide immigrants to Canada.	S1 – S3 in all jurisdictions where the species has been assessed
Is immigration known or possible?	Not possible
Would immigrants be adapted to survive in Canada?	Yes
Is there sufficient habitat for immigrants in Canada?	Unknown
Are conditions deteriorating in Canada?+	Unknown

+ See Table 3 (Guidelines for modifying status assessment based on rescue effect)

Are conditions for the source (i.e., outside) population deteriorating?	Yes
Is the Canadian population considered to be a sink?	Not applicable
Is rescue from outside populations likely?	No

Data Sensitive Species

Is this a data sensitive species?	No

Status History

COSEWIC: Extirpated by 1988. Designated Extirpated in April 1999. Status re-examined and confirmed in May 2000, April 2010, and May 2019.

Status and Reasons for Designation:

Status: Extirpated	**Alpha-numeric codes:** Not applicable
Reasons for designation: This butterfly occurred in one restricted area of oak savanna in southern Ontario. It was last recorded in 1988 and has not been seen since despite repeated surveys.	

Applicability of Criteria

Criterion A (Decline in Total Number of Mature Individuals): Not applicable
Criterion B (Small Distribution Range and Decline or Fluctuation): Not applicable
Criterion C (Small and Declining Number of Mature Individuals): Not applicable
Criterion D (Very Small or Restricted Population): Not applicable
Criterion E (Quantitative Analysis): Not applicable

Table 1. Frosted Elfin (*Callophrys irus*) records in Canada (Macnaughton *et al.* 2019).

Month	Day	Year	Observers	Adults	Subpopulation	Record Type	Unique ID	Data Source	Collection Number
May	22	1988	Alan Wormington	1	St. Williams, Norfolk County	specimen	BIO_15339	Biota of Canada, Alan Wormington Collection; Collection #	CBIF_034749
May	5	1987	Quimby F. Hess	3	St. Williams Forestry Nursery area, Lot 22, Norfolk County	2 on sand road + 1 at dead herb	TEA87_00905	TEA Summary 1987	
Jun	4	1986	Quimby F. Hess	1	St. Williams, Con. 6 roadside, Norfolk County	unknown	TEA86_01261	TEA Summary 1986	
May	9	1986	Mary Gartshore	8	St. Williams Forestry Nursery, Lot 22, Norfolk County	unknown	TEA86_01260	TEA Summary 1986	
May	23	1979	Jim Trowbridge	1	St. Williams, Norfolk County	specimen	BIO_16476	Biota of Canada; CNC	CBIF_073742
May	19	1979	W.J.D. Eberlie	1	St. Williams, Norfolk County	specimen	TEA17_21412	Brad Hubley Email 2015; TEA Summary 2017; ROM	BOC18095
May	12	1979	Sid Daniels	12	St. Williams, Norfolk County	12 seen flying near patches of Lupine scattered over 0.5sqmi	TEA79_01281	TEA Summary 1979	
May	10	1979	Jim Trowbridge	3	St. Williams, Norfolk County	specimen	BIO_16475	Biota of Canada; CNC	CBIF_073739
May	28	1978	Jim Trowbridge	4	St. Williams, Norfolk County	specimen	BIO_16474	Biota of Canada; CNC	CBIF_073741
May	27	1978	Jack E. Pilkington	present	St. Williams, Norfolk County		TEA78_00931	TEA Summary 1978	
May	25	1978	Anthony M. Holmes	present	St. Williams, Norfolk County		TEA78_00930	TEA Summary 1978	
May	19	1978	Jim Trowbridge	1	St. Williams, Norfolk County	specimen	BIO_16473	Biota of Canada; CNC	CBIF_073740
May	17	1978	Sid Daniels	5	St. Williams, Norfolk County	5 seen over an area of approximately half a mile square.	TEA78_00929	TEA Summary 1978	
May	16	1977	Jim Trowbridge	1 male	St. Williams, Norfolk County	specimen	BIO_00660	Biota of Canada; MMMN	CBIF_054644
May	8	1977	Jim Trowbridge	present	St. Williams, Norfolk County		TEA77_00823	TEA Summary 1977	
May	7	1977	Jim Trowbridge	present	St. Williams, Norfolk County		TEA77_00822	TEA Summary 1977	
Apr	30	1977	Jim Trowbridge	present	St. Williams, Norfolk County		TEA77_00821	TEA Summary 1977	
May	26	1976	Jim Trowbridge	present	St. Williams, Norfolk County		TEA76_00568	TEA Summary 1976	
May	12	1976	Jim Trowbridge	present	St. Williams, Norfolk County		TEA76_00567	TEA Summary 1976	
May	9	1976	Jim Trowbridge	present	St. Williams, Norfolk County		TEA76_00566	TEA Summary 1976	
Jun	3	1975	W.J.D. Eberlie	1	St. Williams, Norfolk County	specimen	TEA17_21411	Brad Hubley Email 2015; TEA Summary 2017; ROM	BOC18094
May	10	1974	Sid Daniels	present	St. Williams, Norfolk County		TEA74_00230	TEA Summary 1972 to 1974	
May	6	1973	Sid Daniels	present	St. Williams, Norfolk County		TEA73_00125	TEA Summary 1972 to 1974	
May	30	1971	Sid Daniels, O.J. Lewchyshyn, Darryl Stewart	present	St. Williams, Norfolk County		TEA71_00405	TEA Summary 1971	

Month	Day	Year	Observers	Adults	Subpopulation	Record Type	Unique ID	Data Source	Collection Number
May	28	1971	Sid Daniels, O.J. Lewchyshyn, Darryl Stewart	1	St. Williams, Norfolk County	specimen	TEA17_21410	Biota of Canada/ROM Database; TEA Summary 2017; ROM	BOC7080
May	9	1971	Sid Daniels, O.J. Lewchyshyn, Darryl Stewart	present	St. Williams, Norfolk County		TEA71_00403	TEA Summary 1971	
May	9	1970	Sid Daniels	present	St. Williams, Norfolk County	unknown	TEA70_00568	TEA Summary 1970	
May	26	1969	Sid Daniels	present	St. Williams, Norfolk County		TEA69_00120	TEA Summary 1969	
May	19	1969	Brian Ottaway	present	St. Williams, Norfolk County		TEA69_00118	TEA Summary 1969	
May	19	1969	Sid Daniels	present	St. Williams, Norfolk County		TEA69_00119	TEA Summary 1969	
Jun	4	1967	D.M. Wood	1	St. Williams, Norfolk County	specimen	BIO_16471	Biota of Canada; CNC	CBIF_073744
May	26	1966	K. O'Neill	4	St. Williams, Norfolk County		TEA13_11200	Layberry Excel 2013TEA Summary 2013; Paul D. Syme, now in CNC	

COSEWIC HISTORY

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) was created in 1977 as a result of a recommendation at the Federal-Provincial Wildlife Conference held in 1976. It arose from the need for a single, official, scientifically sound, national listing of wildlife species at risk. In 1978, COSEWIC designated its first species and produced its first list of Canadian species at risk. Species designated at meetings of the full committee are added to the list. On June 5, 2003, the *Species at Risk Act* (SARA) was proclaimed. SARA establishes COSEWIC as an advisory body ensuring that species will continue to be assessed under a rigorous and independent scientific process.

COSEWIC MANDATE

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assesses the national status of wild species, subspecies, varieties, or other designatable units that are considered to be at risk in Canada. Designations are made on native species for the following taxonomic groups: mammals, birds, reptiles, amphibians, fishes, arthropods, molluscs, vascular plants, mosses, and lichens.

COSEWIC MEMBERSHIP

COSEWIC comprises members from each provincial and territorial government wildlife agency, four federal entities (Canadian Wildlife Service, Parks Canada Agency, Department of Fisheries and Oceans, and the Federal Biodiversity Information Partnership, chaired by the Canadian Museum of Nature), three non-government science members and the co-chairs of the species specialist subcommittees and the Aboriginal Traditional Knowledge subcommittee. The Committee meets to consider status reports on candidate species.

DEFINITIONS
(2019)

Wildlife Species	A species, subspecies, variety, or geographically or genetically distinct population of animal, plant or other organism, other than a bacterium or virus, that is wild by nature and is either native to Canada or has extended its range into Canada without human intervention and has been present in Canada for at least 50 years.
Extinct (X)	A wildlife species that no longer exists.
Extirpated (XT)	A wildlife species no longer existing in the wild in Canada, but occurring elsewhere.
Endangered (E)	A wildlife species facing imminent extirpation or extinction.
Threatened (T)	A wildlife species likely to become endangered if limiting factors are not reversed.
Special Concern (SC)*	A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
Not at Risk (NAR)**	A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances.
Data Deficient (DD)***	A category that applies when the available information is insufficient (a) to resolve a species' eligibility for assessment or (b) to permit an assessment of the species' risk of extinction.

* Formerly described as "Vulnerable" from 1990 to 1999, or "Rare" prior to 1990.

** Formerly described as "Not In Any Category", or "No Designation Required."

*** Formerly described as "Indeterminate" from 1994 to 1999 or "ISIBD" (insufficient scientific information on which to base a designation) prior to 1994. Definition of the (DD) category revised in 2006.

Environment and Climate Change Canada
Canadian Wildlife Service
Environnement et Changement climatique Canada
Service canadien de la faune
Canada

The Canadian Wildlife Service, Environment and Climate Change Canada, provides full administrative and financial support to the COSEWIC Secretariat.