

**Ontario Species at Risk Evaluation Report for Eastern
Persius Duskywing (*Erynnis persius persius*)**

Committee on the Status of Species at Risk in Ontario
(COSSARO)

Assessed by COSSARO as Extirpated

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Final

Hespérie Persius de l'Est (*Erynnis persius persius*)

L'hespérie Persius de l'Est est une sous-espèce rare à l'échelle mondiale de l'hespérie Persius (*Erynnis persius*), qui elle est plus répandue. De couleur foncée, cette sous-espèce est présente dans l'Est de l'Amérique du Nord et indigène dans le Sud-Ouest de l'Ontario, où elle a été signalée uniquement dans la réserve de conservation St. Williams et le parc provincial The Pinery. L'hespérie Persius de l'Est a été observée pour la dernière fois dans la province en 1979, et semble être en déclin dans la majorité de son aire de répartition nord-américaine.

Cette espèce est considérée comme une spécialiste à l'égard de l'habitat. On la retrouve exclusivement dans les savanes de pins et de chênes et les terrains boisés qui contiennent des lupins, la seule plante hôte connue de l'hespérie en Ontario. Cet habitat a subi des pertes et des dégradations à grande échelle en Ontario, ce qui a certainement contribué au déclin de l'hespérie Persius de l'Est. Le cerf de Virginie, qui broute les lupins, et l'utilisation d'insecticides sont d'autres menaces responsables de ce déclin.

Malgré les importantes recherches effectuées dans l'habitat de l'hespérie Persius de l'Est pendant une trentaine d'années, soit 37 générations, la présence de l'espèce n'a pas été confirmée. Depuis 1979, elle aurait été vue deux fois en Ontario. Mais comme l'hespérie Persius de l'Est ressemble beaucoup aux autres hespéries, on ne peut l'identifier avec certitude sans spécimen de référence. Elle est souvent signalée ou identifiée à tort dans son aire de répartition.

L'hespérie Persius de l'Est est considérée comme une espèce disparue en Ontario, car il n'existe pas assez de données permettant de conclure qu'il reste des individus de l'espèce en Ontario.

Cette publication hautement spécialisée «COSSARO Candidate Species at Risk Evaluation for Eastern Persius Duskywing» n'est disponible qu'en anglais conformément au Règlement 671/92, selon lequel il n'est pas obligatoire de la traduire en vertu de la Loi sur les services en français. Pour obtenir des renseignements en français, veuillez communiquer avec le ministère des Richesses naturelles et des Forêts au recovery.planning@ontario.ca.

Executive summary

The Eastern Persius Duskywing is a globally rare eastern North American subspecies of the more widely occurring Persius Duskywing (*Erynnis persius*). It is a dark skipper, native to southwestern Ontario, where it has been documented only from St. Williams Conservation Reserve and Pinery Provincial Park. The Eastern Persius Duskywing was last observed in Ontario in 1979, and appears to be declining across most of its North American range.

This species is a habitat specialist, restricted to pine-oak savanna and woodland that contain lupines, the skipper's only known host plant in Ontario. Widespread loss and degradation of this habitat has occurred historically in Ontario, and undoubtedly contributed to the decline of this duskywing. Other threats contributing to its decline include browsing of lupines by White-tailed Deer and insecticide use.

Substantial survey effort has been made in Eastern Persius Duskywing habitat over three decades, and yet this species has not been confirmed in 37 generations. Since 1979, two unconfirmed sightings have been reported in Ontario. However, Eastern Persius Duskywing is very similar to related duskywings, and cannot be conclusively identified without a supporting voucher specimen. The species is frequently erroneously reported and/or identified across its range.

The Eastern Persius Duskywing is designated Extirpated in Ontario because there is insufficient information to conclude that any individuals of this species remain in Ontario.

1. Background information

1.1. Current designations

- GRANK: G5T1T3 (G5T2, rounded Global Status)
- NRANK Canada: NX (February 2009)
- COSEWIC: Endangered (April 2016)
- SARA: Endangered (Schedule 1)
- ESA 2007: Extirpated (MONTH YEAR)
- SRANK: SX (ranked in 2009)

1.2. Distribution in Ontario

The Eastern Persius Duskywing was last recorded in Ontario in 1979 (COSEWIC 2006). Confirmed specimens have been collected from Pinery Provincial Park and St. Williams Conservation Reserve. Sight records are sometimes reported in suitable habitat, but these have not been confirmed. Eastern Persius Duskywing is difficult to identify without a voucher specimen, preferably a male, since identification requires examination of the genitalia. The identification of this group is challenging, and even specimens in some collections are erroneously reported as *E. persius persius* (NatureServe 2016). The species may also once have occurred in similar habitat in other areas of southern Ontario but no specimens are known from these locations (COSEWIC 2006).

The Eastern Persius Duskywing is ranked SX in Ontario. Targeted surveys in suitable habitat have been frequently completed by knowledgeable observers in Norfolk County and at Pinery Provincial Park (C. Jones pers.comm. 2016).

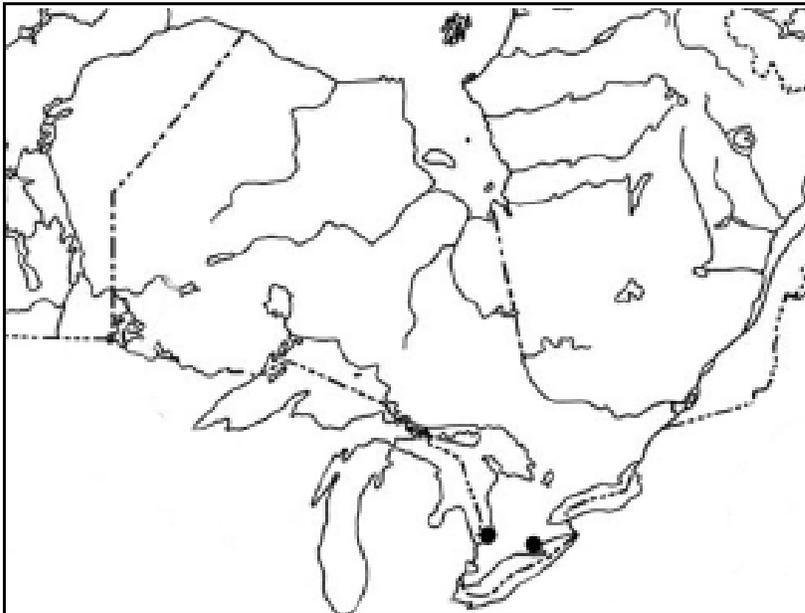


Figure 1. Historical occurrences of Eastern Persius Duskywing, based on confirmed specimens. Source: COSEWIC 2006 (reproduced with permission).

1.3. Distribution and status outside Ontario

The Eastern Persius Duskywing has been reported throughout the northeastern US, through New England and across the southern extent of the Great Lakes to Michigan and Indiana (see Figure 1 in COSEWIC 2006). It is declining across much of its range, which is likely not nearly as continuous as in the past. The Eastern Persius Duskywing is of conservation concern (S1-S3) in almost every jurisdiction where it occurs, and is now thought to be extirpated from Maine. The greatest concentration of the subspecies' remaining population is now in lower Michigan (where it is considered Threatened) and in central Wisconsin (NatureServe 2016).

1.4. Ontario conservation responsibility

Currently, there are no known extant populations of the Eastern Persius Duskywing in Ontario (see Section 2.1.4 below). The historical proportion of the global population in Ontario is unknown, but was certainly below any threshold for status modification.

1.5. Direct threats

There are no currently known populations of this subspecies (see Section 2.1.4 below). Historical threats are listed below.

Habitat loss and degradation are probably the primary threats to this specialist species. Since European settlement, substantial areas of Ontario prairie and savanna have been converted to agricultural and urban land uses (Bakowsky and Riley 1994). Fire suppression and tree planting also further degraded prairie and savanna habitat in many areas, including St. Williams Conservation Reserve and Pinery PP. White-tailed Deer have been overabundant throughout much of southern Ontario, and deer herbivory may have reduced lupine populations (Hess 1992 cited in COSEWIC 2006).

Since the last observation of the Eastern Persius Duskywing, habitat quality at both known sites has probably improved. At Pinery PP, habitat has been restored by prescribed burns, deer herd reduction, and the establishment of deer exclosures surrounding lupine plantings (COSEWIC 2016). Savanna restoration has also been initiated at St. Williams Conservation Reserve (SWCRCC 2010).

Insecticide use, including Gypsy Moth spraying, has also contributed to the decline of this and other duskywings across northeastern North America (NatureServe 2016). The spraying of *Bacillus thuringiensis* (Bt) at St. Williams in 1988 may have eliminated a small population of Eastern Persius Duskywing that occurred there (P. Carson cited in COSEWIC 2006).

1.6. Specialized life history or habitat use characteristics

Eastern Persius Duskywing is a habitat specialist. It occurs in pine-oak barrens, savannas, open woodlands, and prairies, which have greatly declined in extent since the European settlement of Ontario. The persistence of these open habitats is also dependent on disturbances such as wildfire and drought.

Within this rare habitat, Eastern Persius Duskywing requires populations of its only known larval host plant in Ontario, Sundial Lupine (*Lupinus perennis*, S3) (COSEWIC 2006, COSEWIC 2016, NatureServe 2016). A minimum patch size of about 20 m² is apparently required to sustain populations (COSEWIC 2006).

2. Eligibility for Ontario status assessment

2.1. Eligibility conditions

2.1.1. Taxonomic distinctness

Yes. *Erynnis persius persius* has been identified as one of four distinct subspecies of the widely distributed *E. persius* for over 150 years (Scudder 1863). There has been no recent taxonomic, systematic, or genetic work on this species.

2.1.2. Designatable units

No. All *E. p. persius* documented from Ontario are found only in southwestern Ontario, and its Ontario range is contiguous with its eastern North American range. A second subspecies (*E. p. borealis*) is found in the western US and Canada, and is a resident in Ontario's Hudson Bay Lowlands (Hall et al. 2014). This second subspecies is not under assessment by COSSARO.

2.1.3. Native status

Yes. The Eastern Persius Duskywing has been consistently recorded over several years at two Ontario sites, and is considered native to Ontario by all recent significant sources (Layberry et al. 1998, COSEWIC 2006, Hall et al. 2014, NHIC 2016).

2.1.4. Occurrence

The Eastern Persius Duskywing was formerly a regularly occurring species in Ontario. There have been no confirmed observations of the Eastern Persius Duskywing in Ontario since 1979 (COSEWIC 2006, 2016). A 1986 observation from Walpole Island and a 2005 observation from Port Franks were not supported with voucher specimens (NHIC 2016; COSEWIC 2016). Additional discussion about the species' current status is found in Section 3.4.2.

2.2. Eligibility results

The Eastern Persius Duskywing (*Erynnis persius persius*) is eligible for status assessment in Ontario.

3. Ontario status assessment

3.1. Application of endangered/threatened status in Ontario

3.1.1. Criterion A – Decline in total number of mature individuals

Does not apply. No extant populations known.

3.1.2. Criterion B – Small distribution range and decline or fluctuation

Does not apply. No extant populations known.

3.1.3. Criterion C – Small and declining number of mature individuals

Does not apply. No extant populations known.

3.1.4. Criterion D – Very small or restricted total population

Does not apply. No extant populations known.

3.1.5. Criterion E – Quantitative analysis

Not available.

3.2. Application of Special Concern in Ontario

Does not apply. No extant populations known.

3.3. Status category modifiers

3.3.1. Ontario's conservation responsibility

Not applicable. See Section 1.4.

3.3.2. Rescue effect

Population rescue from sources outside Ontario is considered unlikely. As a species specialist of patchy areas of savanna and open woodland, the Eastern Persius Duskywing is capable of dispersing over short distances. Individuals have been found eight kilometres from known lupine populations, and the subspecies is considered to be a fairly good short-range colonizer (Kons and Borth 1997 cited in COSEWIC 2006, NatureServe 2016). However, the closest extant populations of Eastern Persius Duskywing in Michigan are approximately 150 km from habitat at Pinery PP.

Although habitat restoration is occurring at Pinery PP and St. Williams Conservation Reserve, recolonization would also require dispersing individuals to locate relatively rare and isolated patches of larval host plants. Reported range-wide population declines of this subspecies further reduce the probability of that populations will naturally re-

establish in Ontario.

3.4. Other status categories

3.4.1. Data deficient

Not applicable.

3.4.2. Extinct or extirpated

The Eastern Persius Duskywing has not been reported in Ontario in 37 years, which is equivalent to 37 generations. The decline and degradation of its Ontario habitat has been well documented. Although habitat restoration has occurred in some areas since the species' last observation in the 1980s, there remains relatively little habitat available to support this species (C. Schmidt, pers.comm. 2016).

Surveys have been also completed by knowledgeable observers in previously occupied habitat (COSEWIC 2006). Knowledgeable individuals survey suitable habitat in the St. Williams area annually during the flight period of this duskywing, and no individuals have been found (C. Jones, pers. comm. 2016).

The Eastern Persius Duskywing is considered both rarer and more fragile than the lupine-feeding Karner Blue, since the duskywing has only one brood of offspring per year ("univoltine"), rather than two, making it less able to recover from disturbances or stochastic events. Given the frequent surveys that have occurred in previously occupied habitat, and the absence of documented reports of this species for over three decades, the balance of evidence suggests that the Eastern Persius Duskywing should be considered extirpated in Ontario.

3.4.3. Not at risk

Not applicable.

4. Summary of Ontario status

The Eastern Persius Duskywing (*Erynnis persius persius*) is assessed as Extirpated in Ontario because there is sufficient information to conclude that there are no individuals of this species remaining in Ontario.

5. Information sources

Bakowsky, W., and J. L. Riley. 1994. A survey of the prairies and savannas of southern Ontario. Pages 7-16 in Proceedings of the Thirteenth North America Prairie Conference.

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NatureServe. 2016. [NatureServe Explorer: An online encyclopedia of life \[web application\]](#). Version 7.1. NatureServe, Arlington, Virginia. Accessed: November 10, 2016.

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Appendix 1: Technical summary for Ontario

Species: Eastern Persius Duskywing (*Erynnis persius persius*)

Demographic information

Demographic attribute	Value
Generation time. Based on average age of breeding adult: age at first breeding = X year; average life span = Y years.	1 year
Is there an observed, inferred, or projected continuing decline in number of mature individuals?	Unknown. No extant population known.
Estimated percent of continuing decline in total number of mature individuals within 5 years or 2 generations.	Unknown. No extant population known.
Observed, estimated, inferred, or suspected percent reduction or increase in total number of mature individuals over the last 10 years or 3 generations.	Unknown. No extant population known.
Projected or suspected percent reduction or increase in total number of mature individuals over the next 10 years or 3 generations.	Unknown. No extant population known.
Observed, estimated, inferred, or suspected percent reduction or increase in total number of mature individuals over any 10 years, or 3 generations, over a time period including both the past and the future.	Unknown. No extant population known.
Are the causes of the decline (a) clearly reversible, and (b) understood, and (c) ceased?	a. No b. Partially understood c. No
Are there extreme fluctuations in number of mature individuals?	No

Extent and occupancy information in Ontario

Extent and occupancy attributes	Value
Estimated extent of occurrence (EOO).	500 km ²
Index of area of occupancy (IAO).	8 km ²

Is the total population severely fragmented? i.e., is >50% of its total area of occupancy is 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?	No. No extant population known.
Number of locations.	2
Number of NHIC Element Occurrences Note: there are 3 EOs in the NHIC database, but one of these specimens was reviewed and discounted (COSEWIC 2006). The Pinery PP specimen was held in a private collection and is accepted by COSEWIC 2006, but is not present in the NHIC data. A Walpole Island observation is present as an NHIC EO but has not been accepted in COSEWIC 2006 due to absence of a voucher specimen.	Effectively 2
Is there an observed, inferred, or projected continuing decline in extent of occurrence?	Unknown. No extant population known.
Is there an observed, inferred, or projected continuing decline in index of area of occupancy?	Unknown. No extant population known.
Is there an observed, inferred, or projected continuing decline in number of populations?	Unknown. No extant population known.
Is there an observed, inferred, or projected continuing decline in number of locations?	Unknown. No extant population known. own
Is there an observed, inferred, or projected continuing decline in [area, extent and/or quality] of habitat? Extent and quality of suitable habitat at Pinery PP have both increased in the last two decades. Habitat restoration has also been initiated at St. Williams CR.	Probably not.
Are there extreme fluctuations in number of populations?	No
Are there extreme fluctuations in number of locations?	No
Are there extreme fluctuations in extent of occurrence?	No
Are there extreme fluctuations in index of area of occupancy?	No

Number of mature individuals in each sub-population or total population (if known)

Sub-population (or total population)	Number of mature individuals
<i>Pinery Provincial Park, Ontario</i>	<i>Unknown</i>
<i>St. Williams Conservation Reserve</i>	<i>Unknown</i>

Quantitative analysis (population viability analysis conducted)

Not applicable.

Threats

- i. 7.1 Habitat loss and degradation due to fire suppression.
- ii. 7.3 Other ecosystem modifications including natural succession, and herbivory of host plants.
- iii. 9.3 Application of pesticides.

No threat calculator was completed for this species.

Rescue effect

Rescue effect attribute	Value
Status of outside population(s) most likely to provide immigrants to Ontario	Rare and declining
Is immigration of individuals and/or propagules between Ontario and outside populations known or possible?	Unknown, considered unlikely
Would immigrants be adapted to survive in Ontario?	Yes
Is there sufficient suitable habitat for immigrants in Ontario?	Unknown
Are conditions deteriorating in Ontario?	Overall yes, but probably not at known sites; habitat restoration has occurred at both locations
Is the species of conservation concern in bordering jurisdictions?	Yes
Is the Ontario population considered to be a sink?	No
Is rescue from outside populations likely?	No

Sensitive species

This is not a data sensitive species.

Appendix 2: Adjoining jurisdiction status rank and decline

Information regarding rank and decline for Eastern Persius Duskywing (*Erynnis persius persius*)

Note: although trends are unquantified, populations across the eastern North American range are thought to be declining due to habitat loss, degradation, and insecticide use (NatureServe 2016).

Jurisdiction	Subnational rank	Population trend	Sources
Ontario	SX	Last observation in 1987	NatureServe 2016
Quebec	Not present	Not available	NatureServe 2016
Manitoba	Not present	Not available	NatureServe 2016
Michigan	S3	Threatened, probably declining	NatureServe 2016
Minnesota	S1	Probably declining	NatureServe 2016
Nunavut	Not present	Not available	NatureServe 2016
New York	S1	Endangered, “probably extirpated” (COSEWIC 2006)	NatureServe 2016
Ohio	Not present	Not available	NatureServe 2016
Pennsylvania	S1	Special Concern, probably declining	NatureServe 2016
Wisconsin	SNR	Unknown, probably declining	NatureServe 2016

Acronyms

COSEWIC: Committee on the Status of Endangered Wildlife in Canada

COSSARO: Committee on the Status of Species at Risk in Ontario

ESA: Endangered Species Act

GRANK: global conservation status assessments

IAO: index of area of occupancy

MNRF: Ministry of Natural Resources and Forestry

NHIC: Natural Heritage Information Centre

NNR: Unranked

NRANK: National conservation status assessment

SARA: Species at Risk Act

SNR: unranked

SRANK: subnational conservation status assessment

S1: Critically imperiled

S3: Vulnerable

SX: Extirpated

IUCN: International Union for Conservation of Nature and Natural Resources

CDSEPO: Le Comité de détermination du statut des espèces en péril en Ontario