

**Ontario Species at Risk Evaluation Report for
Dukes' Skipper
Hespérie de Dukes
(*Euphyes dukesi*)**

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

Assessed by COSSARO as Special Concern

November 2022

Executive summary

Dukes' Skipper (*Euphyes dukesi*) is a large skipper with a 31-37mm wingspan. Two subspecies of Dukes' Skipper are recognized (*E. dukesi dukesi* and *E. dukesi calhouni*), with the global range of Dukes' Skipper occurring within central and eastern North America. *Euphyes dukesi dukesi* (the subspecies that occurs in Ontario) occurs in two geographic areas. The southern Great Lakes area extends from southwestern Ontario into southeastern Michigan, northeastern Indiana and northern Ohio. The Great Lakes geographic area appears disjunct from the southern portion of the subspecies range in the lower Mississippi Valley. Dukes' Skipper is ranked S2 and designated as Threatened in Michigan and is ranked S3 in Ohio. This species is not ranked in Indiana.

Dukes' Skipper is only found in the Municipality of Chatham-Kent and Essex and Lambton Counties in southwestern Ontario. Twenty-eight subpopulations have been documented in Ontario, with 12 subpopulations identified as extant and 16 historical. Little is known about the population sizes or trends of this species in Ontario.

Dukes' Skipper habitat in Ontario includes hardwood forest swamps, with natural clearings or edges containing large patches of sedges (*Carex* spp.). Larval host plants in Ontario are reported to be Lake Sedge (*Carex lacustris*) and Shoreline Sedge (*Carex hyalinolepis*). Adults will make short distance movements from their woodland habitat into adjacent open habitats in search of nectar plants, which in Ontario can include Swamp Milkweed, Common Milkweed, thistles (*Cirsium* spp.), Common Dogbane, Dense Blazing Star, Virginia Mountain Mint and Cup Plant.

Threats to Dukes' Skipper in Ontario are related to the rapid growth and spread of invasive Common Reed (*Phragmites australis*) throughout Dukes' Skipper habitats. Common Reed spreads quickly and out-competes native species, thereby reducing the area, extent and quality of Dukes' Skipper host plants and habitat. Other lower impact threats related to land development, agricultural practices and water level fluctuations have also been documented.

Dukes' Skipper is classified as Special Concern in Ontario. Dukes' Skipper does not meet thresholds for Endangered or Threatened, however the number of individuals and available habitat is likely to decline further from increased colonization by Common Reed. The status of this species is consistent with the definition of Special Concern under the Endangered Species Act, 2007.

1. Eligibility for Ontario status assessment

1.1. Eligibility conditions

1.1.1. Taxonomic distinctness

Dukes' Skipper (*Euphyes dukesi*) is a large skipper with a 31-37mm wingspan. Two subspecies of Dukes' Skipper are recognized (*E. dukesi dukesi* and *E. dukesi calhouni*), both occurring in central and eastern North America (COSEWIC 2022).

1.1.2. Designatable units

Twenty-eight subpopulations of Dukes' Skipper occur in southwestern Ontario (12 extant and 16 historical), all of which are assessed as one designatable unit (COSEWIC 2022). Information on discreteness or evolutionary significance among these subpopulations is not available (COSEWIC 2022).

1.1.3. Native status

Dukes' Skipper is native to Ontario.

1.1.4. Occurrence

The global range of Dukes' Skipper is within central and eastern North America. *Euphyes dukesi dukesi* (the subspecies that occurs in Ontario) occurs in two geographic areas. The southern Great Lakes area (which includes lands adjacent to Lake Michigan, Lake Huron and Lake Erie) extends from southwestern Ontario into southeastern Michigan, northeastern Indiana and northern Ohio (COSEWIC 2022). The Great Lakes geographic area appears disjunct from the southern portion of the subspecies range in the lower Mississippi Valley, which ranges from central Missouri and southern Illinois to eastern Texas, through Louisiana east to southeastern Virginia and Georgia (COSEWIC 2022).

1.2. Eligibility results

Dukes' Skipper (*Euphyes dukesi*) is eligible for status assessment in Ontario.

2. Background information

2.1. Current designations

- GRANK: G3G4 (NatureServe 2022)
- IUCN: Not listed
- NRANK Canada: N2
- COSEWIC: Special Concern (May 2022)

- SARA: Not listed
- ESA 2007: Not at risk
- SRANK: S2 (ranked in 2009)

2.2. Distribution in Ontario

Dukes' Skipper is only found in the Municipality of Chatham-Kent and Essex and Lambton Counties in southwestern Ontario (COSEWIC 2022). COSEWIC (2022) reports 28 documented subpopulations in Ontario, with 12 subpopulations identified as extant and 16 historical.

2.3. Distribution, status and the broader biologically relevant geographic range outside Ontario

Dukes' Skipper occurs within central and eastern North America, with occurrences in southeastern Michigan, northern Ohio and northeastern Indiana. Dukes' Skipper is ranked S2 and designated as Threatened in Michigan and is ranked S3 in Ohio. This species is not ranked in Indiana.

For the purposes of this assessment, the broader biologically relevant geographic range (BBRGR) for Dukes' Skipper is considered to include Michigan, Ohio and Indiana. These jurisdictions represent a generally contiguous distribution of *Euphyes dukesi dukesi* and also potential source populations associated with rescue effect.

Table 1. Condition of the Species in Adjacent Jurisdictions and Broader Biologically Relevant Geographic Range.

Adjacent Jurisdictions	Biologically Relevant to Ontario (n/a, yes, no)	Condition	Notes & Sources
Michigan	Yes	S2 Threatened	NatureServe 2022
Ohio	Yes	S3	NatureServe 2022
Indiana	Yes	NSR	NatureServe 2022

2.4. Ontario conservation responsibility

Less than one percent of Dukes' Skipper global range occurs within Ontario (COSEWIC 2022), and therefore Ontario's conservation responsibility is presumed to be low.

2.5. Direct threats

A threats assessment was conducted by COSEWIC (2022), which assigned an overall threat impact as high. Known threats are listed below from highest to lowest.

Natural System Modifications (High-medium impact)

The rapid growth and spread of invasive Common Reed (*Phragmites australis*) throughout Dukes' Skipper habitats are the highest threat to the species and has been documented at 7 of 12 extant sub-populations in Ontario (COSEWIC 2022). Common Reed can takeover small wetlands or wet areas, eventually developing into dense monocultural stands (Schweitzer et al. 2018). Common Reed spreads quickly and out-competes native species, thereby reducing the area, extent and quality of Dukes' Skipper host plants and habitat (COSEWIC 2022). Other invasive and non-native wetland plant species, such as Purple Loosestrife, Flowering Rush and Narrow-leaved Cattail may also be threatening Dukes' Skipper habitat by out-competing native host plants and restricting waterflow through wetlands (COSEWIC 2022).

Residential and Commercial Development (Low impact)

Land development can result in direct loss of habitat and can also negatively impact habitats adjacent to a development. Although development in wetlands is not typically permitted in Ontario, development and site alteration in wetland areas has the potential to impact habitat of Dukes' Skipper.

Agriculture and Aquaculture (Low impact)

Agricultural fields are located adjacent to numerous Dukes' Skipper subpopulations (COSEWIC 2022). Dukes' Skipper and its host plants are vulnerable to water table fluctuations that result from agricultural drainage or irrigation (COSEWIC 2022).

Climate Change and Severe Weather (Low impact)

Increased rainfall may result in water level fluctuations which can contribute to erosion and direct loss of Dukes' Skipper habitat (COSEWIC 2022). Wave action associated with severe storms has resulted in substantial erosion along the northern shore of Lake Erie, resulting in extensive losses of wetland habitat at Point Pelee National Park (COSEWIC 2022). This loss of wetland habitat has the potential to directly eliminate suitable habitat for Dukes' Skipper.

2.6. Specialized life history or habitat use characteristics

Dukes' Skipper habitat in Ontario includes hardwood forest swamps, with natural clearings or edges containing large patches of sedges (*Carex spp.*) (COSEWIC 2022). Larval host plants in Ontario are reported to be Lake Sedge (*Carex lacustris*) and Shoreline Sedge (*Carex hyalinolepis*) (Hall et al. 2014). Adult Dukes' Skipper are primarily observed in open-canopy or woodland-edge habitats, and rarely in closed-canopy, shaded woodlands (Calhoun 1995). Schweitzer et al. (2018) reports that

Dukes' Skipper requires canopy cover, shade or partial shade as an essential characteristic of suitable habitat.

Adults will make short distance movements from their woodland habitat into adjacent open habitats in search of nectar plants (Wormington 2016). Calhoun (1995) reported a preference for white and purple flowers in Florida. Documented nectar sources in Ontario include Swamp Milkweed, Common Milkweed, thistles (*Cirsium* spp.), Common Dogbane, Dense Blazing Star, Virginia Mountain Mint and Cup Plant (COSEWIC 2022).

Dukes' Skipper undergoes complete metamorphosis and develops through four distinct life stages: egg, larva (five instars), pupa, and adult. In Ontario, Dukes' Skipper typically has only one generation per year, with the earliest records from June 22 and the latest records from September 26 (COSEWIC 2022). From hatching through the death of the adult stage, a Dukes' Skipper is thought to live about a year or less (Barton 2005). The estimated lifespan of an adult Dukes' Skipper in the wild is approximately three weeks (Barton 2005).

Dukes' Skipper does not migrate. Little is known about the dispersal ability of Dukes' Skipper in Canada or the United States (COSEWIC 2022). Adults of both sexes are described as slow flying, and information from other similar species suggests a maximum dispersal distance of two kilometers (COSEWIC 2022).

2.7. Existing Conservation and Recovery Actions

Dukes' Skipper is not designated as at risk in Ontario. Conservation and recovery actions for this species have not been initiated.

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

Not applicable. Number of mature individuals in Ontario is unknown.

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

Not applicable. Meets Endangered B1 and B2 (EOO 4,121 km² and AOO 132 km²) and there is b) inferred and projected decline in (i) extent of occurrence, (ii) index of area of occupancy, (iii) quality of habitat (due to invasive Common Reed); and (iv) number of subpopulations (due to invasive Common Reed out-competing host plants), but the rate of spread by Common Reed is uncertain and number of locations exceeds threshold for Threatened and Endangered.

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

Not applicable. Insufficient information available on number of mature individuals.

Number of mature individuals in Ontario is likely declining due to habitat loss; however no data is available.

3.1.4. Criterion D – Very small or restricted total population

Not applicable. Number of mature individuals unknown. AOO and number of locations exceed thresholds.

3.1.5. Criterion E – Quantitative analysis

Not applicable. Insufficient data to complete analysis.

3.2. Application of Special Concern in Ontario

Criteria of Special Concern applies. Dukes' Skipper does not meet thresholds for Endangered or Threatened, however number of individuals and available habitat likely to decline further from increased colonization by Common Reed.

3.3. Status category modifiers

3.3.1. Ontario's conservation responsibility

Does not apply. Ontario's conservation responsibility for this species is low. Less than 1% of global range of this sub-species occurs in Ontario.

3.3.2. Status modification based on level of risk in broader biologically relevant geographic range

The broader biologically relevant geographic range of this species is considered to include Michigan, Ohio and Indiana. Dukes' Skipper is listed as S2 in Michigan and is ranked S3 in Ohio and NSR in Indiana. This species generally occurs in low numbers throughout its range and is designated as Threatened in Michigan. No status modifiers based on BBRGR have been applied.

3.3.3. Rescue Effect

The potential for rescue effect from adjacent jurisdictions is unknown. Little is known about the dispersal capabilities of Dukes' Skipper; however a maximum dispersal distance of 2km is inferred from data available for similar species (Selby 2005 and COSEWIC 2013). The nearest population of Dukes' Skipper in Michigan is approximately 12km from the nearest Ontario sub-population (COSEWIC 2022), which may be beyond the dispersal capabilities of this species.

3.4. Other status categories

3.4.1. Data deficient

Not applicable.

3.4.2. Extinct or extirpated

Not applicable.

3.4.3. Not at risk

Not applicable.

4. Summary of Ontario status

Dukes' Skipper (*Euphyes dukesi*) is classified as Special Concern in Ontario. Dukes' Skipper does not meet thresholds for Endangered or Threatened, however the number of individuals and available habitat is likely to decline further from increased colonization by Common Reed.

The status of this species is consistent with the definition of Special Concern under the Endangered Species Act, 2007.

5. Information sources

Barton, B. 2005. *Euphyes dukesi*. Animal Diversity Web. Website: https://animaldiversity.org/accounts/Euphyes_dukesi/ (accessed October 2022).

Calhoun, J.V. 1995. The Biogeography and Ecology of *Euphyes dukesi* (Hesperiidae) in Florida. *Journal of the Lepidopterists' Society* 49:6-23

COSEWIC. 2013. COSEWIC assessment and status report on the Dun Skipper (*vestris* subspecies), *Euphyes vestris vestris* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 69 pp.

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

Hall, P.W., C.D. Jones, A.E. Guidotti and B. Hubley. 2014. The ROM Field Guide to Butterflies of Ontario. Royal Ontario Museum, Toronto, Ontario. 488 pp.

Schweitzer D.F., M.C. Minno and D.L Wagner. 2018. Rare, Declining, and Poorly Known Butterflies and Moths (Lepidoptera) of Forests and Woodlands in the Eastern

United States. 2nd Edition. Forest Health Technology Enterprise Team, Morgantown, West Virginia. 517 pp.

Selby, G. 2005. Ottoe Skipper (*Hesperia ottoe* W.H. Edwards): a Technical Conservation Assessment. USDA Forest Service, Rocky Mountain Region.

Wormington, A. 2016. The Butterflies of Point Pelee National Park, Ontario. Ontario Nature Guide Number 2 of Ontario Natural History Press: Leamington, Ontario. 137 pp

Appendix 1: Technical summary for Ontario

Species: Dukes' Skipper (*Euphyes dukesi*)

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 years.
Is there an observed, inferred, or projected continuing decline in number of mature individuals?	Inferred and projected decline in number of mature individuals based on ecosystem modifications from the spread of Common Reed at subpopulation #1, 14, 16, 19, 23, 24, 26.
Estimated percent of continuing decline in total number of mature individuals within 5 years or 2 generations.	Unknown
Observed, estimated, inferred, or suspected percent reduction or increase in total number of mature individuals over the last 10 years or 3 generations.	Unknown.
Projected or suspected percent reduction or increase in total number of mature individuals over the next 10 years or 3 generations.	Unknown
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
Are the causes of the decline (a) clearly reversible, and (b) understood, and (c) ceased?	a. No (spread of Common Reed is not clearly reversible) b. Partially (the scope and severity of the threats needs further clarification) c. No (spread of Common Reed and other threats continue)
Are there extreme fluctuations in number of mature individuals?	No

Extent and occupancy information in Ontario

Extent and occupancy attributes	Value
<p>Estimated extent of occurrence (EOO). <i>If value in COSEWIC status report is not applicable, then use geocat.kew.org. State source of estimate.</i></p>	4121 km ²
<p>Index of area of occupancy (IAO). <i>If value in COSEWIC status report is not applicable, then use geocat.kew.org. State source of estimate.</i></p>	132 km ²
<p>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?</p>	<p>a. Unknown b. Yes</p>
<p>Number of locations. <i>See Definitions and Abbreviations on COSEWIC and IUCN websites for more information on the term "location". Use plausible range to reflect uncertainty if appropriate.</i></p>	12-20 extant and historical
<p>Number of NHIC Element Occurrences <i>Request data from MNRF.</i></p>	188 records linked to Element Occurrences
<p>Is there an observed, inferred, or projected continuing decline in extent of occurrence?</p>	<p>Yes. Inferred and projected decline in habitat quality based on ecosystem modifications from the spread of Common Reed at peripheral subpopulations #1, 19, 23, 24.</p>
<p>Is there an observed, inferred, or projected continuing decline in index of area of occupancy?</p>	<p>Yes. Inferred and projected based on ecosystem modifications from the spread of Common Reed at subpopulation #1, 14, 16, 19, 23, 24, 26.</p>
<p>Is there an observed, inferred, or projected continuing decline in number of sub-populations or EOs?</p>	<p>Yes. Inferred, and projected based on ecosystem modifications from the spread of Common Reed at subpopulation #1, 14, 16, 19, 23, 24, 26.</p>
<p>Is there an observed, inferred, or projected continuing decline in number of locations?</p>	<p>No. Number of locations will likely increase</p>

Extent and occupancy attributes	Value
	based on variable rate of spread of Common Reed both within and among habitats at the 12 known extant subpopulations.
Is there an observed, inferred, or projected continuing decline in [area, extent and/or quality] of habitat?	Yes. Observed, inferred and projected based on ecosystem modifications from the spread of Common Reed at subpopulation #1, 14, 16, 19, 23, 24, 26.
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
<ul style="list-style-type: none"> 1. Windsor 2. Upper Big Creek Woods 14. Saint Joachim 16. Belle River 19. Wheatley Provincial Park 20. Kopegaron Woods Conservation Area 21. Mersea Road 6 23. Hillman Marsh Conservation Area 24. Point Pelee National Park 26. Walpole Island 27. Reid Conservation Area 28. Brigden 	Unknown

Quantitative analysis (population viability analysis conducted)

Probability of extinction in the wild is unknown.

Threats

A threats calculation for this species was conducted by COSEWIC (2022) and assigned the overall threat impact as High.

Natural systems modifications (High-Medium impact)

Residential & commercial development (Low impact)

Agriculture & aquaculture (Low impact)

Climate change & severe weather (Low impact)

Biological resource use (Unknown impact)

Human intrusions & disturbance (Unknown impact)

Pollution (Unknown impact)

Rescue effect

Rescue effect attribute	Value
Does the broader biologically relevant geographic range for this species extend beyond Ontario?	Yes
Status of outside population(s) most likely to provide immigrants to Ontario	Michigan – S2 Imperiled. Assessed as Threatened Ohio – S3 Vulnerable
Is immigration of individuals and/or propagules between Ontario and outside populations known or possible?	Unknown
Would immigrants be adapted to survive in Ontario?	Yes
Is there sufficient suitable habitat for immigrants in Ontario?	Yes
Are conditions deteriorating in Ontario?	Yes
Is the species of conservation concern in bordering jurisdictions?	Yes. Threatened in Michigan.
Is the Ontario population considered to be a sink?	No
Is rescue from outside populations likely?	Unknown

Sensitive species

This is not a data sensitive species.

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
EO: Element occurrence (as defined by NHIC)
EOO: extent of occurrence
GRANK: global conservation status assessments
IAO: index of area of occupancy
IUCN: International Union for Conservation of Nature and Natural Resources
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
S2: Imperiled
S3: Vulnerable
S4: Apparently Secure
S5: Secure
IUCN: International Union for Conservation of Nature and Natural Resources
CDSEPO: Le Comité de détermination du statut des espèces en péril en Ontario