Ontario Species at Risk Evaluation Report for Silver-haired Bat

Chauve-souris argentée

(*Lasionycteris noctivagans*)

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

Assessed by COSSARO as *Endangered*

November 2023
Final

Executive summary

The Silver-haired bat is a dark colored bat, with black skin membranes and black to dark brown fur (van Zyll de Jong 1985). The fur often has grey or silver-frosted tips, giving it the silvery appearance for which it is named. This large-bodied bat is found across Canada in the summer months and during fall migration. Some individuals overwinter in British Columbia and southern Ontario, but most migrate out of Canada annually. This seasonal migration exposes individuals to a variety of threats including risk of mortality at wind energy facilities. There is considerable uncertainty regarding the rates of decline for these bats across Canada, and population estimates are non-existent. Declines in carcass counts at wind energy facilities suggest declines may be significant for this species, but evidence to assess risk is low, and more research is needed. Other threats to this species are unknown. Silver-haired Bat is assessed as Endangered under criterion A4b; evidence suggests a significant decline is occurring, likely much higher than 50% needed to meet the criterion.

1. Eligibility for Ontario status assessment

1.1. Eligibility conditions

1.1.1. Taxonomic distinctness

The Silver-haired bat is recognized as a distinct taxon. There are no subspecies of and no known distinctions between populations.

1.1.2. Designatable Units

The Silver-haired bat has a single contiguous distribution across North America and therefore comprises a single designatable unit.

1.1.3. Native status

The Silver-haired bat is native to Canada and Ontario.

1.1.4. Occurrence

The Silver-haired bat is known to occur in Ontario. Species occurrences of Silver-haired bats are not currently tracked in Ontario.

1.2. Eligibility results

The Silver-haired bat is eligible for status assessment in Ontario.

2. Background information

2.1. Current designations

- GRANK: G3G4
- IUCN: Least concern
- NRANK Canada: N5B,NUN,NUM
- COSEWIC: Endangered
- SARA: Not listed (under consideration)
- ESA 2007: Not listed
- SRANK: S4

2.2. Distribution in Ontario

The Silver-haired bat is widely distributed in North America (Figure 3), found from the northern boreal (Wilson et al. 2014) to the state of Tamaulipas, Mexico (Ceballos 2014). The species migrates seasonally from northern summer ranges to southern wintering

areas outside of Canada; however, some Silver-haired Bats overwinter in British Columbia and around the Great Lakes.

It occurs across most of Canada, from British Columbia to New Brunswick and Nova Scotia, but appears uncommon in Atlantic Canada (McAlpine et al. 2021). The species occurs throughout the continental United States. The northern and southern limits of its distribution are poorly delineated. In Ontario the species range extends across the province and north to the edge of the Hudson Bay Lowlands.

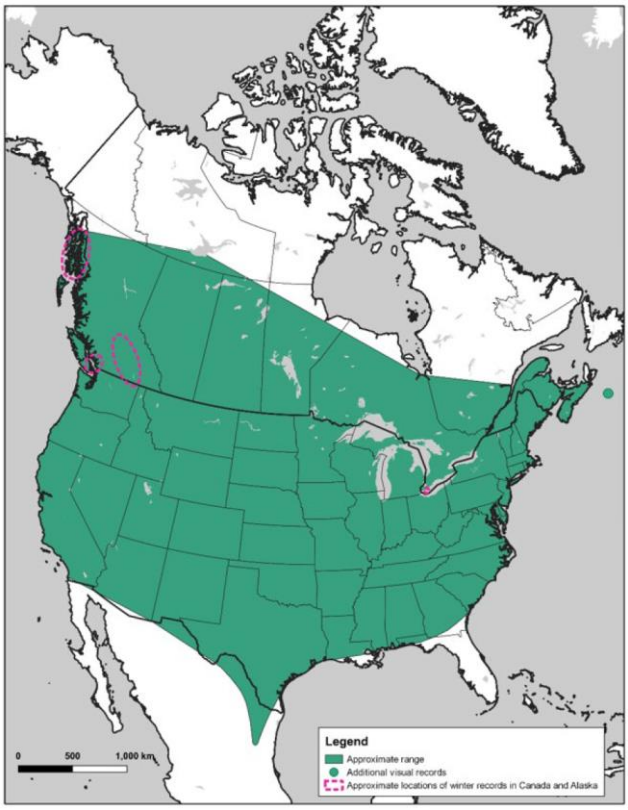

Figure 1: Distribution map of Silver-haired bats in North America Sources: COSEWIC 2023, Nagorsen and Nash 1984, Parker et al. 1997, Lucas and Hebda 2011, Stantec Consulting Ltd 2012, Blejwas et al. 2014, Wilson et al. 2014,

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

Silver-haired bats are seasonal latitudinal migrants, and available evidence suggests broad mixing across their range. As such any part of their range could be considered biologically relevant. For the purpose of assessing the broader biologically relevant geographic range outside Ontario, we considered the immediately surrounding jurisdictions; those jurisdictions further south may also be relevant.

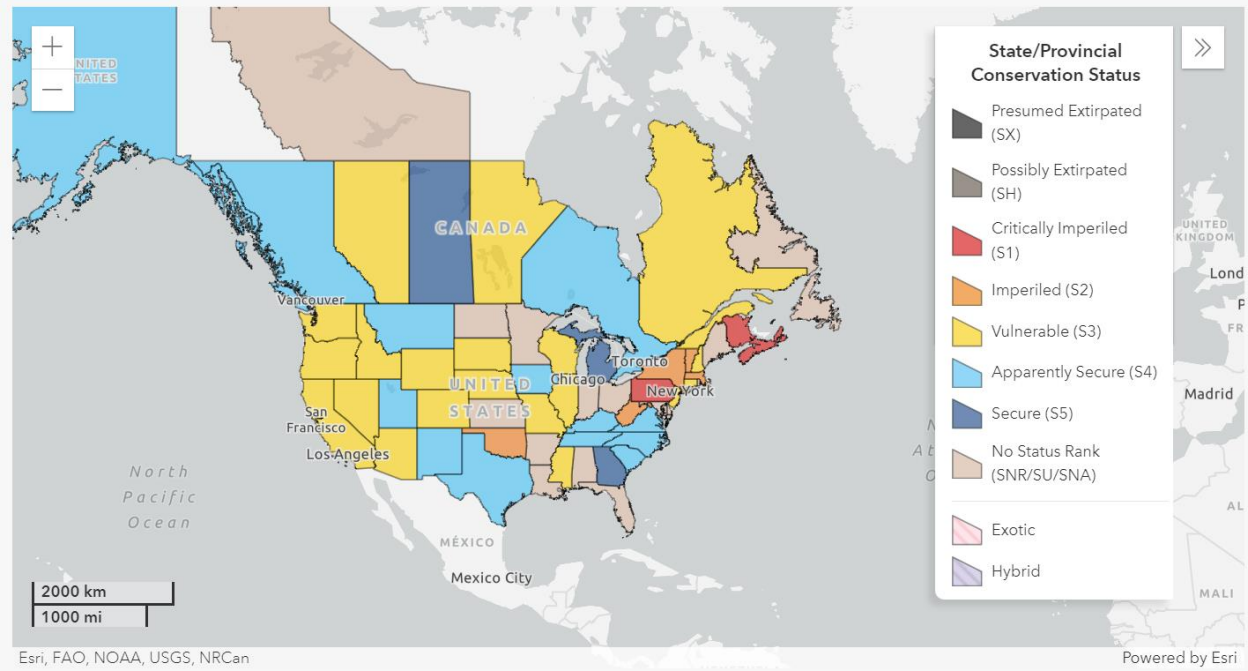

Table 1. Condition of the Species in Adjacent Jurisdictions and Broader Biologically Relevant Geographic Range

Adjacent Jurisdictions	Biologically Relevant to Ontario (n/a, yes, no)	Condition	Notes & Sources
Quebec	Yes	S3	Natureserve 2023
Manitoba	Yes	S3S4B	Natureserve 2023
Minnesota	Yes	SNR	Natureserve 2023
Wisconsin	Yes	S3	Natureserve 2023
Michigan	Yes	S5	Natureserve 2023
Indiana	Yes	SU	Natureserve 2023
Ohio	Yes	SNR	Natureserve 2023
Pennsylvania	Yes	S1	Natureserve 2023
New York	Yes	S2S3B	Natureserve 2023

2.4. Ontario conservation responsibility

Ontario represents a small portion of the species' overall range, likely less than 25%. Currently there are no estimates of the total number of mature individuals across their range or in Ontario.

2.5. Direct threats

Far and away the most significant direct threat to the species is collisions with wind energy infrastructure. Mortality at wind facilities has been found to be significant for several species worldwide, contributing to declines in populations. Population-level effects have only been assessed for one species in North America (Hoary bat, Frick et

al 2017). Recent work by Davy et al 2023 suggested that declines in Ontario resulting from wind turbines constituted evidence of strong declines in Silver-haired bats based on modeled a 91% decline in fatalities during the period of the study (2010-2017). A number of hypotheses for the decline were tested, as well as a number of contributing factors to mortality explored. Mitigation measures to reduce mortalities were found to be highly effective, as has been reported elsewhere (Arnett et al 2011). Without any estimates of Silver-haired bat populations in Southern Ontario (where the study took place), or across the rest of the province, it is difficult to ascertain the overall effect on the risk to the species' population, but it is expected to be significant. It is not known the extent of decline during the assessment period (2013-2023), and further investigation along with population estimates are needed.

2.6. Specialized life history or habitat use characteristics

Roosting by Silver-haired Bats occurs primarily under bark and in the cavities of trees, making them reliant on habitats where large, decaying trees are available. Silver-haired Bats roost in a variety of large diameter coniferous and deciduous trees (Bohn 2017). Unlike lasiurines, where use of anthropogenic structures is rare, Silver-haired Bats may occasionally roost in or on buildings, especially during migration when natural roosting sites may be scarce (Schowalter et al. 1978; McGuire et al. 2012). riparian zones may be especially important as stopover habitat and migration corridors through otherwise inhospitable terrain (Barclay et al. 1988).

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

Qualifies as endangered under A4b. There are currently no population estimates for the species in Ontario or in North America, and evidence of threats to the population is uncertain. Indices of population trends are not sufficient to estimate declines of the last 10 years or 3 generations, nor for the next 10 years. However, evidence does suggest a significant decline is occurring, likely much higher than 50% needed to meet the criterion.

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

Does not apply.

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

Does not apply.

3.1.4. Criterion D – Very small or restricted total population

Does not apply.

3.1.5. Criterion E – Quantitative analysis

Does not apply.

3.2. Application of Special Concern in Ontario

Does not apply.

3.3. Status Category Modifiers

3.3.1. Ontario's conservation responsibility

Ontario's conservation responsibility is relatively low, with a small proportion of the overall breeding population in Ontario, likely less than 25%.

3.3.2. Status modification based on rescue effect or level of risk in broader biologically relevant range

There is potential for rescue effect. However, risks to the species are likely similar in many parts of its North American range. At this time there is scant evidence that Ontario acts as a sink for the overall population.

3.4. Other status categories

3.4.1. Data deficient

May apply, as records of occurrence are too infrequent or too widespread to make any conclusions about extent of occurrence, population size, threats, or trends.

3.4.2. Extinct or extirpated

Not applicable.

3.4.3. Not at risk

Not applicable.

4. Summary of Ontario status

Silver-haired Bat (*Lasionycteris noctivagans*) is assessed as Endangered under criterion A4b.

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

5. Information sources

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Appendix 1: Technical summary for Ontario

Species: Silver-haired bat (*Lasionycteris noctivagans*)

Demographic information

Demographic attribute	Value
Generation time based on the IUCN Generation Calculator and also uses Pacifici et al. (2013) for the upper value of 4 years.	Estimated at 2-4 yrs (3 generations = 6–12 years)
Is there an observed, inferred, or projected continuing decline in number of mature individuals?	Possibly, but uncertain
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. Unknown b. Unknown c. Unknown
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). *If value in COSEWIC status report is not applicable, then use geocat.kew.org. State source of estimate.*	Unknown
Index of area of occupancy (IAO). *If value in COSEWIC status report is not applicable, then use geocat.kew.org. State source of estimate.*	Unknown
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	a. No b. No

Extent and occupancy attributes	Value
(b) separated from other habitat patches by a distance larger than the species can be expected to disperse?	
Number of locations. *See Definitions and Abbreviations on COSEWIC and IUCN websites for more information on the term "location". Use plausible range to reflect uncertainty if appropriate.*	Unknown
Number of NHIC Element Occurrences *Request data from MNRF.*	NA
Is there an observed, inferred, or projected continuing decline in extent of occurrence?	Unknown
Is there an observed, inferred, or projected continuing decline in index of area of occupancy?	Unknown
Is there an observed, inferred, or projected continuing decline in number of sub-populations or EOs?	Unknown
Is there an observed, inferred, or projected continuing decline in number of locations?	Unknown
Is there an observed, inferred, or projected continuing decline in [area, extent and/or quality] of habitat?	Unknown
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
Ontario	Unknown

Quantitative analysis (population viability analysis conducted)

Not available

Threats

Key threats (based on COSEWIC 2020) were identified as:

I. Energy production & mining (IUCN 3) – very high - high impact. Collisions with wind turbines are a significant threat, killing many Silver-haired Bats (but not as great an issue as other sympatric and ecologically similar species). Wind energy developments are forecasted to increase significantly.
II. Natural system modifications (IUCN 7) – high - medium impact

III. Pollution (IUCN 9) – medium – low impact
IV. Agriculture & aquaculture (IUCN 2) - low impact
V. Transportation & service corridors (IUCN 4) – low impact
VI. Biological resource use (IUCN 5) – low impact
VII. Invasive & other problematic species and genes (IUCN 8) – low 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	Variable, with similar threats to Ontario
Is immigration of individuals and/or propagules between Ontario and outside populations known or possible?	Yes
Would immigrants be adapted to survive in Ontario?	Yes
Is there sufficient suitable habitat for immigrants in Ontario?	Yes
Are conditions deteriorating in Ontario?	Unknown
Is the species of conservation concern in bordering jurisdictions?	Variable
Is the Ontario population considered to be a sink?	Unknown
Is rescue from outside populations likely?	Unknown

Sensitive species

No.

Acronyms

APP: Algonquin Provincial Park
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