

COSEWIC
Status Appraisal Summary

on the

Threaded Vertigo
Vertigo rowellii

in Canada

SPECIAL CONCERN
2022

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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Production note:

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COSEWIC Assessment Summary

Assessment Summary – May 2022

Common name

Threaded Vertigo

Scientific name

Vertigo rowellii

Status

Special Concern

Reason for designation

In Canada, this minute terrestrial snail is at the northern edge of its global range. The species is found in lowland areas around the Strait of Georgia and on southern Vancouver Island with most individuals living on the bark of Bigleaf Maple. The species is presumed to have poor dispersal abilities between trees and sites. Increases in the number of occupied sites and locations since the last assessment are due to increased search effort. Nonetheless, the index of area of occupancy remains below the threshold for Endangered and the extent of occurrence remains below the threshold for Threatened. The primary threats are loss of habitat and habitat degradation due to housing and urban development, logging, and roads and associated infrastructure. The species' limited distribution and ongoing threats support maintaining a status of Special Concern.

Occurrence

British Columbia

Status history

Designated Special Concern in April 2010. Status re-examined and confirmed in May 2022.



COSEWIC Status Appraisal Summary

Threaded Vertigo

Vertigo à crêtes fines

Vertigo rowellii (formerly *Nearctula* sp.1)

Range of occurrence in Canada (province/territory/ocean): British Columbia

SAS 6

Wildlife species:

Change in eligibility, taxonomy or designatable units:	yes <input checked="" type="checkbox"/> no <input type="checkbox"/>
<p>Explanation:</p> <p>Nekola <i>et al.</i> (2018) re-examined systematics of snails of the genus <i>Vertigo</i> based on analyses of nuclear DNA (ITS1 and ITS2) and mitochondrial DNA (CytB and 16S), supplemented by investigation of shell features. They resurrected the name <i>Vertigo (Staurodon) rowellii</i> (Newcomb, 1862) to include <i>Nearctula</i> of Turgeon <i>et al.</i> (1998) and Roth and Sadeghian (2003), as well as the unnamed “Hoko” <i>Vertigo (Nearctula</i> new sp. of Burke 2013). The type locality is “near Oakland, California”. MolluscaBase (2020) uses <i>Vertigo rowellii</i> (Newcomb, 1862) with <i>Vertigo (Staurodon) rowellii</i> as an accepted, alternate representation. The change in nomenclature does not affect the eligibility of the Canadian population.</p>	

Range:

SAS 7	Change in Extent of Occurrence (EOO):	yes <input checked="" type="checkbox"/> no <input type="checkbox"/> unk <input type="checkbox"/>
SAS 8	Change in Index of Area of Occupancy (IAO):	yes <input checked="" type="checkbox"/> no <input type="checkbox"/> unk <input type="checkbox"/>
SAS 9	Change in number of known or inferred current locations ¹ :	yes <input checked="" type="checkbox"/> no <input type="checkbox"/> unk <input type="checkbox"/>
SAS 10	Significant new survey information	yes <input checked="" type="checkbox"/> no <input type="checkbox"/>

¹ Use the IUCN definition of “location”

Explanation:

As of December 2020, there is a total of 76 records of the species from 42 sites in British Columbia (excluding a historical record with vague locality of “Victoria”). These include 48 new records and 22 new sites documented since the previous COSEWIC (2010) status report (Table 1). The above include six probably valid records from 2010 to 2020 (five from iNaturalist [2020] with photos, and one anecdotal sight record; D. Fraser pers. comm. 2020; Figure 1). Based on all 76 records, the EOO has increased slightly, by 14.5% (from 9,530 km² to 10,915 km², including ocean). The IAO has increased by 127.8% (from 72 km² to 164 km²; Figure 2). These increases reflect a better understanding of the species’ distribution rather than a range expansion. It is likely that there are more undocumented sites.

Concomitant with the increase in known occurrences, the number of threat-based locations has also increased to 42, assuming that each site is subjected to a separate combination of threatening events from residential development, road building, logging and wood cutting, and other site-specific threats. If prolonged and more frequent droughts were deemed the most plausible serious threat, then the number of locations would be smaller, as droughts would affect the entire region. However, habitat heterogeneity is likely to modulate the impacts, especially in moister stands. Furthermore, drought tolerance of the species is unknown. It ranges southward to California, suggesting that it can withstand warmer and drier conditions than presently experienced in British Columbia.

Since the COSEWIC (2010) assessment, awareness of the species by conservation organizations and the public has led to new records. The vast majority are from Salt Spring Island, obtained during Species at Risk surveys and additional site visits by Salt Spring Island Conservancy and other non-profit conservation groups operating on the island (L. Matthias pers. comm. 2020). On southern Vancouver Island, as part of Habitat Acquisition Trust’s Species at Risk program, Biolinx Environmental Research Ltd. conducted annual surveys in 2010–2017 for terrestrial gastropods in 15 Capital Regional District (CRD) parks. Threaded Vertigo was detected at two parks in 2010 (one and two individuals, respectively; Ovaska and Sopuck 2010), but not thereafter. The focus was Blue-grey Tailedropper (*Prophysaon coeruleum*) with overlapping habitat with Threaded Vertigo, but the survey method of artificial cover-objects was not well suited for detecting the largely arboreal Threaded Vertigo. Several other terrestrial gastropod surveys have been conducted within the CRD since 2009, including a multi-year study on Observatory Hill (Ovaska *et al.* 2014 – 2018), field verification surveys for Blue-grey Tailedropper status report update (COSEWIC 2016), and various surveys on Department of National Defence lands associated with environmental assessments (Ovaska and Sopuck unpubl. data 2015 – 2020). Threaded Vertigo was not specifically targeted or detected during these surveys.

Population Information:

SAS 11	Change in number of mature individuals:	yes <input type="checkbox"/> no <input type="checkbox"/> unk <input checked="" type="checkbox"/>
SAS 12	Change in population trend:	yes <input type="checkbox"/> no <input type="checkbox"/> unk <input checked="" type="checkbox"/>
SAS 13	Change in severity of population fragmentation:	yes <input type="checkbox"/> no <input checked="" type="checkbox"/> unk <input type="checkbox"/>
SAS 14	Change in trend in area and/or quality of habitat:	yes <input type="checkbox"/> no <input checked="" type="checkbox"/> unk <input type="checkbox"/>
SAS 15	Significant new survey information	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>

Explanation:

Efforts have focused on obtaining information on the species’ distribution, and very little is known on its abundance or demography. At one site (Kemp Lake, Sooke), up to 87 snails were detected on daily counts on the trunks of five Bigleaf Maple (*Acer macrophyllum*) that were monitored in April 2021 (R. Jorna pers. comm. 2021). The snails’ small size and largely arboreal habits make abundance estimates very difficult to obtain.

SAS 16**Threats:**

Change in nature and/or severity of threats:	yes <input type="checkbox"/> no <input checked="" type="checkbox"/> unk <input type="checkbox"/>
<p>Explanation:</p> <p>Threats have been clarified. As part of the preparation of the provincial recovery plan for the species (B.C. Ministry of Environment 2016), threats were assessed using the IUCN–CMP (International Union for Conservation of Nature–Conservation Measures Partnership) threats calculator across the distribution of the species, including unsurveyed habitats. The overall threat impact was assessed as “low” based on three “low” impact threats. The greatest impact was deemed to be from residential development (IUCN threat 1.1). There is potential for development of subdivisions and small-scale housing projects across the species’ Canadian range. Other threats were from road building and improvements (IUCN threat 4.1) resulting in habitat loss and edge effects (leading to habitat fragmentation and isolation of subpopulations), and from logging (IUCN threat 5.3) on private commercial forestry lands and from small-scale wood cutting on private lands. While Bigleaf Maple, favoured by the snails, may be retained during logging operations, more open stand creates drier, unfavourable conditions. Ecosystem modification by fire and fire suppression (IUCN threat 7.1), invasive, non-native invertebrate predators (IUCN threat (8.1), pollution (IUCN threat 9.3, 9.5), and climate change (IUCN threat 11.1, 11.2) were all assessed as potential threats with unknown impacts.</p> <p>A new threat—decline of Bigleaf Maple—may be applicable. Betzen (2018) attributed increases in mortality of Bigleaf Maple in Washington State, first documented beginning in 2011, to the effects of climate change (higher summer temperatures, vapour pressure deficits, decreased precipitation) and land development. However, it is uncertain if a similar decline is occurring in the range of Bigleaf Maple in Canada.</p>	

SAS 17**Protection:**

Change in effective protection:	yes <input type="checkbox"/> no <input checked="" type="checkbox"/> unk <input type="checkbox"/>
<p>Explanation:</p> <p>Many known occurrences are from parks and protected areas, reflecting survey bias towards these managed areas (COSEWIC 2010; B.C. Ministry of Environment 2016). A multi-species action plan has been prepared for the Gulf Islands National Park (Parks Canada Agency 2018). It contains no specific measures for Threaded Vertigo. The general actions for all species at risk include documenting opportunistic observations and increasing visitor awareness. Since the previous COSEWIC assessment, Threaded Vertigo has been recorded from two additional CRD regional parks (Mt. Wells, Bearhill) and a provincial park (Gowlland Tod) on southern Vancouver Island and from parks and protected areas, including Tuam Special Management Area, on Salt Spring Island. Within these areas, the species’ habitat is protected from development, but other activities, such as hazardous tree removal and infrastructure development, may still take place. There is no effective protection for known and potential occurrences on private lands, apart from voluntary stewardship by landowners working with local conservation organizations.</p>	

SAS 18**Rescue Effect:**

Change in evidence of rescue effect:	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>
<p>Explanation:</p> <p>Immigration remains undocumented but wind dispersal, more likely within than between Bigleaf Maple stands, is possible for this and other microsnails. However, rescue from the US continues to be unlikely.</p>	

SAS 19

Quantitative Analysis:

Change in estimated probability of extirpation:	yes <input type="checkbox"/> no <input checked="" type="checkbox"/> unk <input type="checkbox"/>
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Details:

Insufficient data for analysis

Summary and Additional Considerations [e.g., recovery efforts; summarize exactly what has changed since the previous assessment]

Since the previous assessment (COSEWIC 2010), the species has been listed as Special Concern on Schedule 1 of the *Species at Risk Act*. The taxonomy of the snails has been re-examined and the scientific name of the species changed from *Nearctula* sp.1 to *Vertigo rowellii*; the eligibility of the species remains unchanged. Awareness of the species since the assessment has led to an increase in the number of known occurrences, especially on Salt Spring Island, but systematic targeted surveys have not been conducted. Consequently, the known EOO has increased by 14.5% and the IAO by 127.8%. Additional undocumented occurrences most likely exist within the approximate area of the EOO. Threats have been clarified through the application of the IUCN–CMP threats calculator (B.C. Ministry of Environment 2016), with one possible new threat since identified.

Provincial (B.C. Ministry of Environment 2016) and federal (ECCC 2019) management plans have been completed. The provincial management plan (p. 20) listed the following management objectives:

1. “to secure protection (with no loss or degradation of habitat) for the extant sites of Threaded Vertigo;
2. to clarify the distribution of Threaded Vertigo within its range in British Columbia;
3. to assess and mitigate threats to extant sites and more broadly to low-elevation bigleaf maple dominated stands within the range of Threaded Vertigo; and
4. to address knowledge gaps, including, but not limited to: habitat requirements at the landscape, stand, and microhabitat scales; associations and roles within epiphytic communities, and relationships with mosses and other organisms; and reproductive and other life history features”.

Recommended management actions are provided but have yet to be implemented. The federal management plan includes the provincial management plan (Part 2) and an addition, consisting of a section of Effects on the Environment and Other Species (Part 2).

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Robert Forsyth and Laura Matthias generously shared their respective data on distribution records for Threaded Vertigo. Heidi Gartner provided records of the species in the Royal British Columbia Museum’s collection. Lea Gelling and Katrina Stipek provided records from the British Columbia Conservation Data Centre database. Rosemary Jorna shared her observations of the snails on her property. Sydney Allen (COSEWIC Secretariat) prepared the distribution maps and EOO and IAO calculations for this report. Dwayne Lepitzki, Co-chair of COSEWIC Mollusc Species Specialist Subcommittee and anonymous reviewers provided helpful comments on an earlier draft.

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- COSEWIC Secretariat: Sonia Schnobb and Jenny Wu (ATK); Sydney Allen (mapping).
- Other relevant contacts: Robert Forsyth, independent gastropod expert, Kamloops, British Columbia; David Fraser, COSEWIC non-government science member and landowner, Victoria, British Columbia; Laura Matthias, independent biologist, Nashville, Tennessee.

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WRITER OF SAS

Kristiina Ovaska

TECHNICAL SUMMARY

Vertigo rowellii

Threaded Vertigo

Vertigo à crêtes fines

Range of occurrence in Canada (province/territory/ocean): British Columbia

Demographic Information

Generation time (usually average age of parents in the population; indicate if another method of estimating generation time indicated in the IUCN guidelines (2011) is being used)	1 yr
Is there an [observed, inferred, or projected] continuing decline in number of mature individuals?	Unknown
Estimated percent of continuing decline in total number of mature individuals within [5 years or 2 generations, whichever is longer up to a maximum of 100 years]	Unknown
[Observed, estimated, inferred, or suspected] percent [reduction or increase] in total number of mature individuals over the last [10 years, or 3 generations, whichever is longer up to a maximum of 100 years].	Unknown
[Projected or suspected] percent [reduction or increase] in total number of mature individuals over the next [10 years, or 3 generations, whichever is longer up to a maximum of 100 years].	Unknown
[Observed, estimated, inferred, or suspected] percent [reduction or increase] in total number of mature individuals over any period [10 years, or 3 generations, whichever is longer up to a maximum of 100 years], including both the past and the future.	Unknown
Are the causes of the decline a. clearly reversible and b. understood and c. ceased?	Not applicable
Are there extreme fluctuations in number of mature individuals?	Unknown

Extent and Occupancy Information

Estimated extent of occurrence (EOO)	10,915 km ² (including ocean and clipped to Canadian jurisdiction)
Index of area of occupancy (IAO) (Always report 2x2 grid value).	164 km ² (for only known occurrences; inferred occurrences would increase IAO)
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. Unknown b. Yes

Number of "locations"* (use plausible range to reflect uncertainty if appropriate)	42 assuming that each known occupied site is impacted by different threatening events
Is there an [observed, inferred, or projected] decline in extent of occurrence?	No observed decline (known EOO has increased due to search effort). Decline could be projected due to threats.
Is there an [observed, inferred, or projected] decline in index of area of occupancy?	No observed decline (known IAO has increased due to search effort). Decline could be projected due to threats.
Is there an [observed, inferred, or projected] decline in number of subpopulations?	Unknown
Is there an [observed, inferred, or projected] decline in number of "locations"*?	Unknown. Decline could be projected due to threats.
Is there an [observed, inferred, or projected] decline in [area, extent and/or quality] of habitat?	Inferred and projected decline in area, extent, and quality
Are there extreme fluctuations in number of subpopulations?	Unlikely
Are there extreme fluctuations in number of "locations"*?	Unlikely
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 subpopulation)

Subpopulations (give plausible ranges)	N Mature Individuals
Total	Unknown

Quantitative Analysis

Is the probability of extinction in the wild at least [20% within 20 years or 5 generations whichever is longer up to a maximum of 100 years, or 10% within 100 years]?	Not done due to lack of data
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Threats (direct, from highest impact to least, as per IUCN Threats Calculator)

<p>Was a threats calculator completed for this species? Yes, in 2015 as part of the preparation of the provincial management plan (see Table 3 in B.C. Ministry of Environment 2016). Calculated impacts for all threat categories listed below were Low, cumulatively resulting in a Low overall threat impact.</p> <ul style="list-style-type: none"> i. Residential & Commercial Development (Tourism & recreational areas; IUCN threat 1.3) ii. Biological Resource Use (Logging & wood harvesting; IUCN threat 5.3) iii. Transportation & Service Corridors (Roads; IUCN threat 4.1) <p>Possible decline in Bigleaf Maple not included in previous threats assessment.</p> <p>What additional limiting factors are relevant? Habitat specialist; naturally patchy habitats; poor dispersal ability</p>
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* See Definitions and Abbreviations on [COSEWIC website](#) and [IUCN](#) for more information on this term.

Rescue Effect (immigration from outside Canada)

Status of outside population(s) most likely to provide immigrants to Canada.	Vulnerable/ Apparently secure (N3N5) in USA; not assessed in Washington (SNR) (NatureServe 2021 as <i>Nearctula</i> sp. 1 – Threaded Vertigo)
Is immigration known or possible?	Not known or known to be possible
Would immigrants be adapted to survive in Canada?	Yes
Is there sufficient habitat for immigrants in Canada?	Possibly
Are conditions deteriorating in Canada?+	Yes
Are conditions for the source (i.e., outside) population deteriorating?+	Unknown
Is the Canadian population considered to be a sink?+	No
Is rescue from outside populations likely?	No

Data Sensitive Species

Is this a data sensitive species?	No
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Status History

COSEWIC:
Designated Special Concern in April 2010. Status re-examined and confirmed in May 2022.

Status and Reasons for Designation:

Status:

Special Concern

Alpha-numeric codes:

Not applicable

Reasons for designation:

In Canada, this minute terrestrial snail is at the northern edge of its global range. The species is found in lowland areas around the Strait of Georgia and on southern Vancouver Island with most individuals living on the bark of Bigleaf Maple. The species is presumed to have poor dispersal abilities between trees and sites. Increases in the number of occupied sites and locations since the last assessment are due to increased search effort. Nonetheless, the index of area of occupancy remains below the threshold for Endangered and the extent of occurrence remains below the threshold for Threatened. The primary threats are loss of habitat and habitat degradation due to housing and urban development, logging, and roads and associated infrastructure. The species' limited distribution and ongoing threats support maintaining a status of Special Concern.

Applicability of Criteria

Criterion A (Decline in Total Number of Mature Individuals):
Not applicable. Insufficient data to reliably infer, project, or suspect population trends.

Criterion B (Small Distribution Range and Decline or Fluctuation):
Not applicable. While the EOO of 10,915 km² is below the threshold for Threatened and IAO (164 km²) of known occurrences is well below the threshold for Endangered, the population is not known to be severely fragmented, occurs at well over 10 locations, and is not known to experience extreme fluctuations even though the area, extent, and quality of habitat are inferred and projected to continue to decline.

+ See [Table 3](#) (Guidelines for modifying status assessment based on rescue effect).

Criterion C (Small and Declining Number of Mature Individuals):
Not applicable. Insufficient data to determine number of mature individuals.

Criterion D (Very Small or Restricted Population):
Not applicable. Number of mature individuals is unknown and typical thresholds for D2 Threatened are exceeded (> 5 locations and IAO > 20 km²).

Criterion E (Quantitative Analysis):
Not applicable. Analysis not conducted.

Table 1. Summary of confirmed records of Threaded Vertigo (*Vertigo rowellii*) from British Columbia. New records and sites refer to those obtained since the previous COSEWIC (2010) status report, which included records up to June 2009. Five records from iNaturalist and one anecdotal observation, one from Sunshine Coast and five from CRD on southern Vancouver Island, are included.

Area	Region	total # of records	Total # of sites [^]	# new records	# new sites [^]	First year	Last year
Vancouver Island	"Victoria"	na	na	na	na	1890-1920	1890-1920
Vancouver Island	North of Capital Regional District	6	6	0	0	1890-1920	2008
Vancouver Island	Capital Regional District	28	19	12	10	1998	2020
Salt Spring Island		35	11	35	11	2009*	2017
Saturna Island		1	1	0	0	2009	2009
Sunshine Coast		6	5	1	1	1996	2020
	<i>Total</i>	76	42	48	22		

[^]site = occurrences within 1 km in fragmented habitat or within 3 km in continuous habitat.

*November 2009 record from Mouat Regional Park did not make it to the COSEWIC (2010) status report, and hence is included here as a new site.

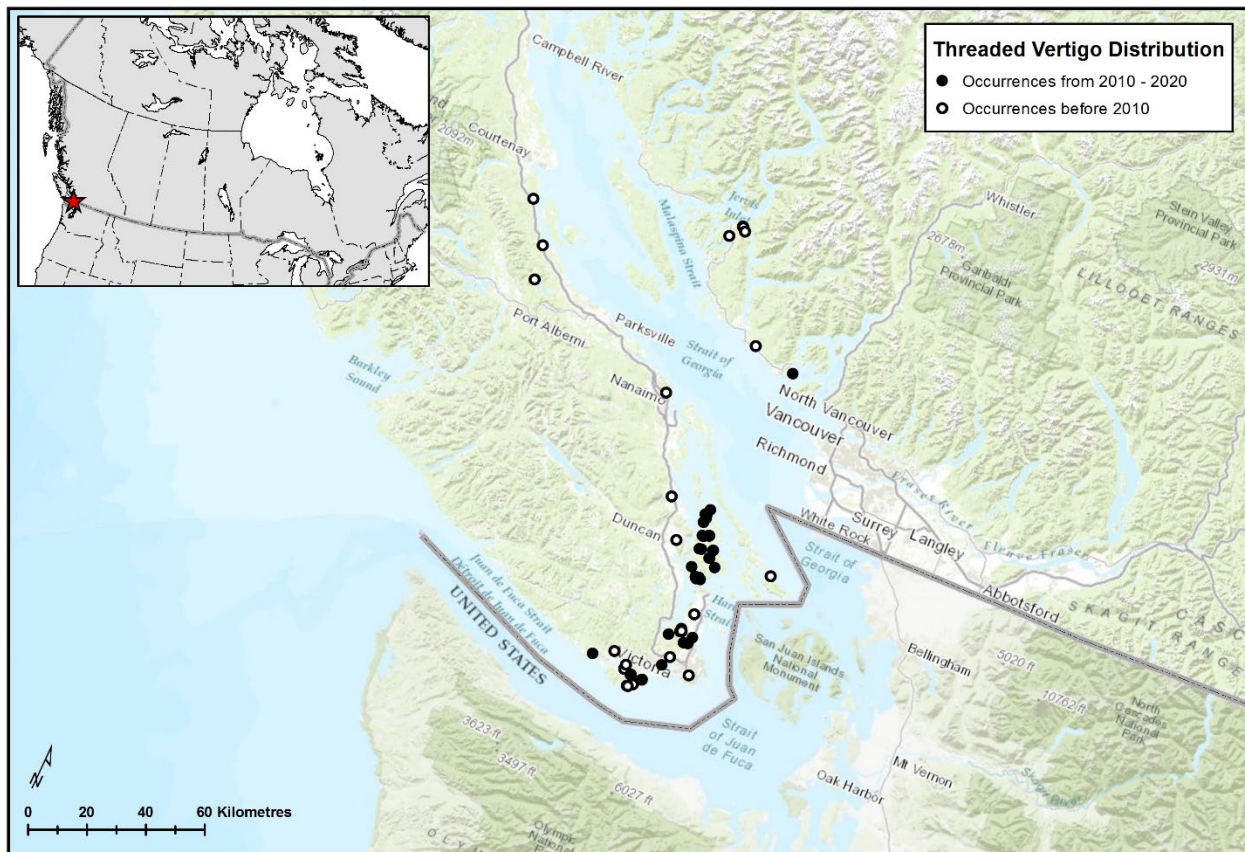


Figure 1. Distribution of Threaded Vertigo (*Vertigo rowellii*) in Canada. Lack of recent records from large areas of the distribution north of the Capital Regional District on Vancouver Island and from the Sunshine Coast on the mainland reflect paucity of search effort. Map prepared by Sydney Allen (COSEWIC Secretariat).

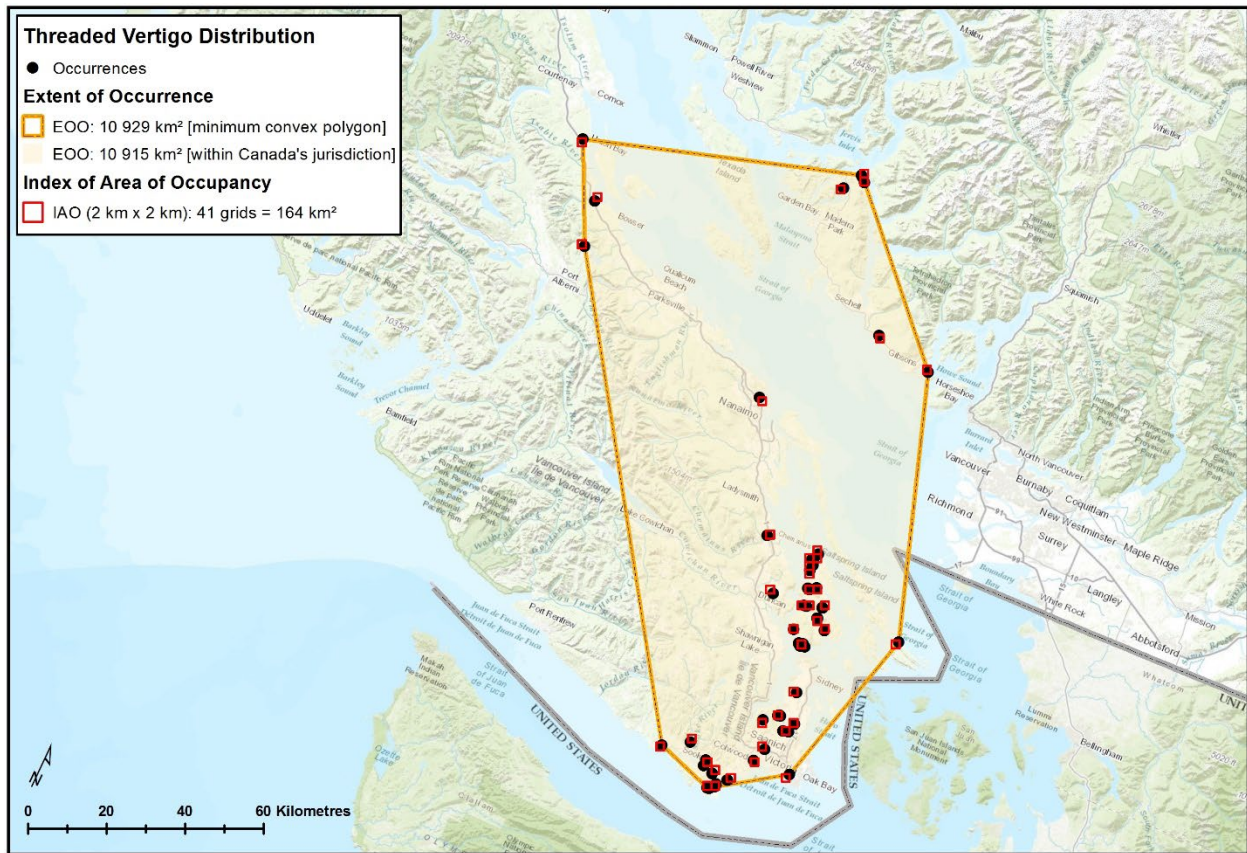


Figure 2. Extent of Occurrence (EOO) and Area of Occupancy (IAO) for Threaded Vertigo (*Vertigo rowellii*) in Canada, based on all records, as compiled in 2020. Map prepared by Sydney Allen (COSEWIC Secretariat).



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 (2022)

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.



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