# **COSEWIC Status Appraisal Summary**

on the

# **Spotted Bat** Euderma maculatum

in Canada

**SPECIAL CONCERN** 2014

Committee on the Status

COSEWIC 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:

COSEWIC acknowledges Brian Slough for writing the status appraisal summary on the Spotted Bat, *Euderma maculatum*, in Canada, prepared under contract with Environment Canada. This status appraisal summary was overseen and edited by Justina Ray, Co-chair of the COSEWIC Terrestrial Mammals Specialist Subcommittee.

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Également disponible en français sous le titre Sommaire du statut de l'espèce du COSEPAC sur L'oreillard maculé (*Euderma maculatum*) au Canada.

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# Assessment Summary - November 2014

### Common name

Spotted Bat

# Scientific name

Euderma maculatum

### Status

Special Concern

# Reason for designation

This distinctly patterned bat is found in the dry intermontane grasslands of southern British Columbia. A cliff-roosting bat, its patchy distribution and specialized roosting needs suggest a relatively small population size. The main threats to foraging habitat in valley bottoms or roosting locations are urban development, land conversion for orchards and vineyards, roads, mining and exploration, recreational activities (e.g., rock climbing), and light and noise pollution. This bat may be susceptible to White-nose Syndrome if this disease spreads west. Its specialized habitat requirements and slow reproductive rate will affect recovery.

### Occurrence

British Columbia

# Status history

Designated Special Concern in April 1988. Status re-examined and confirmed in May 2004 and November 2014.



Euderma maculatum

(see below).

Spotted Bat Oreillard maculé

Range of occurrence in Canada: British Columba

# **Current COSEWIC Assessment:**

Designated Special Concern in April 1988. Status re-examined and confirmed in May 2004 and November 2014.

| Evidence (indicate as applicable):  |   |
|---|---|
| Wildlife species:   |   |
| Change in eligibility, taxonomy or designatable units:  | yes □ no ⊠  |
| Explanation:  |   |
| There is no change.   |   |
|   |   |
| Range:  |   |
| Change in Extent of Occurrence (EO):  | yes ⊠ no □ unk □  |
| Change in Index of Area of Occupancy (IAO):   | yes □ no □ unk ⊠  |
| Change in number of known or inferred current locations*:   | yes ⊠ no ∐ unk ∐  |
| Significant new survey information  | yes ⊠ no ∐  |
| Explanation:  |   |
| EO was calculated as 10,600 km <sup>2</sup> in the last status report and AO was obeen few directed surveys of this species since the last status report. Of the known distribution. Sarell <i>et al.</i> (2011) reported a significant wester detection at Sebring Creek, Carpenter Lake, west of Lillooet. Other persistence of this species, using acoustic and visual surveys, within p | pportunistic records have increased<br>ly range extension with an auditory<br>wise, surveyors have reported the |

Based on BC Ministry of Environment (2013; Figure 2) EO of the Spotted Bat in Canada is 59,005 km<sup>2</sup> (Figure 1), and the IAO (2x2 grid) was calculated as 472 km<sup>2</sup>, including 4 observations from the BC CDC dataset (B.C. Conservation Data Centre, unpubl. data 2014) not shown by BC Ministry of Environment (2013; Figure 2). The number of current locations that is each subject to a potential threatening event is unknown, but has likely increased since the last assessment as a result of some additional records and is certainly > 10.

Ferguson 2007, Sarell *et al.* 2011, Lausen pers. comm. 2014). Although there is confidence in the delineation of the core distribution, search effort in some potential areas within and outside this distribution is still lacking

\* Use the IUCN definition of "location"

| 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              |
| Change in trend in area and/or quality of habitat: | yes ☐ no ⊠ unk ☐ |
| Significant new survey information                 | yes              |
| Explanation:                                       |                  |

As of 2004, there were 80 records of Spotted Bats in British Columbia (COSEWIC 2004), and recent records assembled by the B.C. Conservation Data Centre (unpubl. data 2014) have increased that number to at least 93. However, these do not include all occurrence data for this species that have been received to date (Stipek, pers. comm. 2014).

Since the series of roost emergence counts reported in COSEWIC (2004), Iredale and Ferguson (2007) recorded incidental observations at Seton Lake and the Back Valley. Sarell *et al.* (2011) reported 3 confirmed and 9 potential auditory detections, but did not specify the locations of confirmed detections, except for the Sebring Creek site, which represented a westward extension to the known range. Lausen (pers. comm., 2014) captured two lactating females near previously known roosts in south Okanagan during one night of effort, and 7 individuals, including 4 lactating females and 2 volant juveniles, on the Fraser River near Lillooet in 2014. In the latter site, Spotted Bats were the only bat species captured and appeared to be abundant; by contrast there was no evidence of this species in 6 other surveyed sites in the area. Reproduction by Spotted Bats in B.C. had previously been reported by Leonard and Fenton (1983).

The BC Ministry of Environment (2013) cautions that surveys for Spotted Bats have not been systematic and that some regions such as the north Okanagan Valley and Fraser Valley have received little survey attention. Areas that have been surveyed were typically chosen due to a perceived high habitat potential for roosting, which includes cracks and crevices on cliff faces (BC Ministry of Environment 2013; Lausen, pers. comm. 2014).

The reasons for designation from the May 2004 COSEWIC assessment included the statement "It is considered the easiest and best censused species of bat in Canada", which is now known to be incorrect. The occurrence and abundance of Spotted Bats across their range was estimated in the past using maternity roost emergence surveys and other standard survey methods. However, roost locations in much of the species' range in BC outside the Okanagan Valley are either unknown or inaccessible. Standard bat capture methods often employ low-level mist nets, whereas intense effort using elevated mist nets is required to capture Spotted Bats (Rodhouse *et al.* 2005, Luce and Keinath 2007). The common acoustic survey method for bat detection using zero-crossing technology is inadequate for differentiating the lower frequency calls of the Spotted Bat (11-18 kHz) from background noise (Lausen pers. comm. 2014). Time expansion bat detecting systems, which provide full spectrum sonograms and high quality recording of Spotted Bat calls, have only been available for practical use (portability and affordability) for the past 5 years. Nevertheless, field workers may miss the signature of Spotted Bats if their detector is set to default settings or adjusted to settings that are too high to detect this species.

Spotted Bats are naturally patchy in distribution, and they tend to be found, even at relatively high abundance levels, where low-elevation and extensive cliff habitats occur in dry habitats, and are absent in large intervening areas (Luce and Keinath 2007, Lausen pers. comm. 2014). In summary, it is uncertain whether the Spotted Bat population in Canada numbers fewer than 1,000 mature individuals, as concluded by COSEWIC (2004). Overall survey effort for Spotted bats has been insufficient to reliably estimate numbers.

| Threats:  |   |
|---|---|
| Change in nature and/or severity of threats:  | yes   |
| Explanation:  |   |
| COSEWIC (2004) concluded that there were no obvious the Spotted Bats and actual or imminent threats were limited to foraging habitat, and impact of pesticides on the moth pre-   | disturbance to cliff roosting sites, loss of riparian   |
| BC Ministry of Environment (2013) used IUCN-CMP (World Partnership) unified threats classification system (Conservassess the threats to this species. The overall cumulative in based on 6 Low Impact (Level 1) threats: urban develope roads, mining and exploration, renewable energy (e.g., climbing) and light and noise pollution. An additional threat bottoms, where specialized roosting habitats are located.  | rvation Measures Partnership (2010) in order to mpact of multiple threats was considered Medium, ment, land conversion for agricultural purposes, wind turbines), recreational activities (e.g., rock   |
| White-nose Syndrome, caused by the fungus <i>Pseudogymr</i> threat of unknown magnitude. This pathogen has caused hibernating bats in eastern North America (see COSEWIC Syndrome.org 2014). The vulnerability of Spotted Bats to unknown, but may be low if the species hibernates in cliffs as speculated by Nagorsen and Brigham (1993). One yea (pers. comm. 2014) in the National Wildlife Area on Vaseu 2013 in mid-October, and for the first time in 2014 in mid-M from the area or hibernated locally for 5 months. A lack of g British Columbia suggests that this species does not migra | population declines in several species of cave-2013), and has been spreading west (White-nose of this disease, if it reaches British Columbia, is or crevices in B.C. or the U.S., rather than caves, in (2013-14) of acoustic data collected by Lausen in Lake, detected Spotted Bats for the last time in larch. This means that individuals either migrated genetic diversity across Oregon, Washington, and |
|   |   |
| Protection:   |   |
| Change in effective protection:   | yes ∐ no ⊠  |
| Explanation:  |   |
| Over 90% of Spotted Bat range occurs outside of prof<br>Environment 2013). Spotted Bat is listed as a species at r<br>enabling habitat management tools as per the Identified W<br>Columbia 2004); one Wildlife Habitat Area has been approforestry and range activities for this species (BC Ministry of   | isk under the BC Forest and Range Practice Act,<br>Vildlife Management Strategy (Province of British<br>roved at Criss Creek near Kamloops to manage  |

| Rescue Effect  |  |
|--|--|
| Change in evidence of rescue effect:   | yes ⊠ no □   |
| Explanation:   |  |
| Global status is Apparently Secure (G4). The NatureServe rar Spotted Bat range in British Columbia, is S3. It is ranked S2 (NatureServe 2014). Spotted Bats are not widespread in Was have been recorded in 7 counties in the eastern part of the state be more common than formerly believed in Washington and survey methods (Rodhouse et al. 2005, Luce and Keinath 2006).  | or S3 in all other US states in the bat's range<br>hington state, and are not well surveyed. They<br>ate (Hayes and Wiles 2013; Figure 2), but may<br>Oregon due to the ineffectiveness of standard  |
| Movements of individuals between British Columbia and Wasl a string of records extending northward through the Washir border (Figure 2). Therefore, it seems likely that there are so State (Wiles 2014). Similar habitat-related threats are evident the area is somewhat less intensively developed than the BC s in the far eastern part of Washington (Pend d'Oreille county; F but so far Spotted Bats have not been detected on the adjaced 2014).   | ngton side of the Okanogan Valley to the BC me movements between BC and Washington on the Washington side of the border, although side of the valley (Wiles 2014). The two records igure 2) are located in high cliff density habitat,   |
| COSEWIC (2004) invoked rescue effect as a reason to consi<br>Threatened. It is unknown whether any population exchange to<br>Valley is sufficient to rescue the BC population should it declin<br>rescue is not addressed in the BC Management Plan (BC Mi   | that may occur across the border in Okanagan e or disappear. The possibility of demographic  |
|  |  |
| Quantitative Analysis:   |  |
| Change in estimated probability of extirpation:  | yes  |
| Details:   |  |
| None   |  |
| Summary and Additional Considerations: [e.g., recovery effo  | rts]   |
| Less than 5% of the Spotted Bat's global range is in Canac southern BC (Bunchgrass, Ponderosa Pine and Interior Doug suitable cliffs and crevices that offer protection, suitable the feeding areas and water sources may be limiting and may exp this species. Expansion of human population and land conve lack of monitoring of Spotted Bat populations, distributions, or such changes. The overall population trend is unknown, at believed to have been insufficient to estimate occurrence and identified by the BC Ministry of Environment, leading to an over | las-fir biogeoclimatic zones). The availability of simal conditions for roosting, and proximity to plain the apparently discontinuous distribution of rsions continue to occur in this area of BC, but habitats precludes understanding of impacts of and previously used survey methods are now abundance. Six low-impact threats have been |

The Spotted Bat is now ranked S3S4 (vulnerable to apparently secure) in British Columbia (B.C.).

Ministry of Environment 2013).

A recent genetic study that applied microsatellite (N = 17) and mitochondrial markers (control region) to 118 museum and recently collected samples across the species' range (western North America, Canada to

from the United States is unclear. A Management Plan with a threats assessment was published in 2013 (BC

Mexico) found a total of 16 haplotypes. Specimens from BC, Washington and Oregon were characterized by only a single haplotype, while 10 haplotypes occurred in the southwestern U.S. (and not in northwestern North America) (Walker *et al.* 2014).

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\*Denotes that information was provided by authority contacted.

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Gary Wiles, Washington Department of Fish and Wildlife

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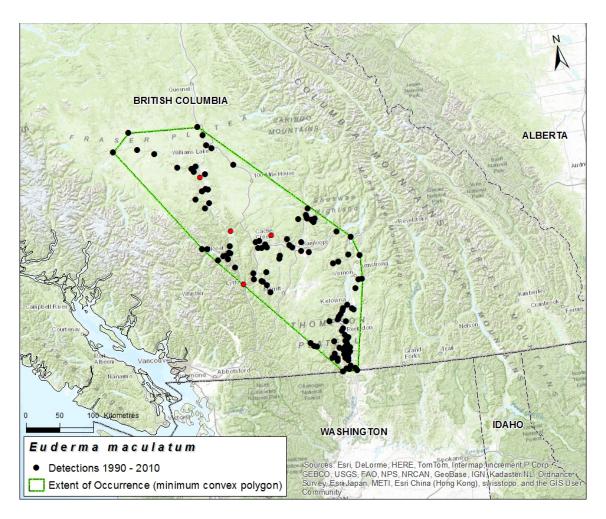


Figure 1. Extent of occurrence of the Spotted Bat in Canada. Data from B.C. Ministry of Environment (2013). Red points are additional observations from the B.C. Conservation Data Centre (B.C. CDC unpubl. data 2014).

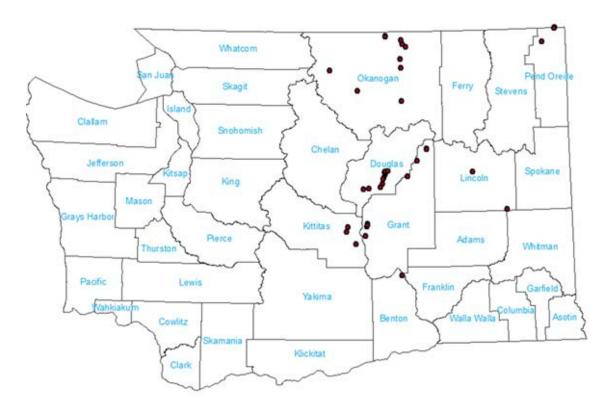


Figure 2. Spotted Bat records in Washington since 1991. Source: Washington Department of Fish and Wildlife (Wiles, pers. comm. 2014).

# **TECHNICAL SUMMARY**

Euderma maculatum

Spotted Bat Oreillard maculé

Range of occurrence in Canada: 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)  | Unknown |
|--|---------|
| 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]  | 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] period, 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?   | Unknown |
| Are there extreme fluctuations in number of mature individuals?  | No      |

# **Extent and Occupancy Information**

| Estimated extent of occurrence  | 59,005 km²                     |
|---|--------------------------------|
| Index of area of occupancy (IAO) (Always report 2x2 grid value).  | 472 km²                        |
| Is the population "severely fragmented" i.e., >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 large distance? | No                             |
| Number of locations* (use plausible range to reflect uncertainty)   | Unknown, but many more than 10 |
| Is there an [observed, inferred, or projected] continuing decline in extent of occurrence?  | No                             |
| Is there an [observed, inferred, or projected] continuing decline in index of area of occupancy?  | No                             |

<sup>\*</sup> See Definitions and Abbreviations on <a href="COSEWIC website">COSEWIC website</a> and <a href="IUCN 2010">IUCN 2010</a> for more information on this term.

| Is there an [observed, inferred, or projected] continuing decline in number of subpopulations?                 | Unknown |
|--|---------|
| Is there an [observed, inferred, or projected] continuing decline in number of locations*?                     | No      |
| Is there an [observed, inferred, or projected] continuing decline in [area, extent and/or quality] of habitat? | No      |
| Are there extreme fluctuations in number of subpopulations?  | 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 subpopulation)

| Subpopulation (give plausible ranges) | N Mature Individuals |
|---------------------------------------|----------------------|
|                                       |                      |
|                                       |                      |
| Total                                 | Unknown              |

# **Quantitative Analysis**

| Probability of extinction in the wild is at least [20% within 20 years or 5 | N/A |
|---|-----|
| generations, or 10% within 100 years].                                      |     |

# Threats (actual or imminent, to populations or habitats)

Urban development, land conversion for agricultural purposes, roads, mining and exploration, renewable energy (e.g., wind turbines), recreational activities (e.g., rock climbing), light and noise pollution, and potential for flooding in valley habitats.

# Rescue Effect (immigration from outside Canada)

| Status of outside population(s) most likely to provide immigrants to Canada? | S3 in Washington      |
|--|-----------------------|
| Is immigration known or possible?  | Unknown, but possible |
| Would immigrants be adapted to survive in Canada? Yes                        |                       |
| Is there sufficient habitat for immigrants in Canada?  Yes                   |                       |
| Is rescue from outside populations likely?                                   | Unknown               |

# **Data-Sensitive Species**

| Is this a data-sensitive species? |  |
|-----------------------------------|--|
| No                                |  |

## **COSEWIC Status History**

Designated Special Concern in April 1988. Status re-examined and confirmed in May 2004 and November 2014.

## **Recommended Status and Reasons for Designation**

| Recommended Status: | Alpha-numeric Code: |
|---------------------|---------------------|
| Special Concern     | Not applicable      |

# Reasons for Designation:

This distinctly patterned bat is found in the dry intermontane grasslands of southern British Columbia. A cliff-roosting bat, its patchy distribution and specialized roosting needs suggest a relatively small population size. The main threats to foraging habitat in valley bottoms or roosting locations are urban development, land conversion for orchards and vineyards, roads, mining and exploration, recreational activities (e.g., rock climbing), and light and noise pollution. This bat may be susceptible to White-nose Syndrome if this disease spreads west. Its specialized habitat requirements and slow reproductive rate will affect recovery.

# **Applicability of Criteria**

Criterion A (Decline in Total Number of Mature Individuals):

Not applicable. No declines

**Criterion B** (Small Distribution Range and Decline or Fluctuation):

Not applicable. IAO is below 500 km<sup>2</sup>, but is likely underestimated. EO > 2000 km<sup>2</sup>.

Criterion C (Small and Declining Number of Mature Individuals):

Not applicable. Population may be small, but no evidence of decline.

Criterion D (Very Small or Restricted Population):

Not applicable. Population numbers unknown, but may be small overall.

**Criterion E** (Quantitative Analysis):

Not applicable. No quantitative analysis.



#### **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 (2014)

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 Canada

Environnement Canada Canadä

Canadian Wildlife Service canadien de la faune

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