COSEWIC Status Appraisal Summary

on the

Pacific Water Shrew Sorex bendirii

in Canada

ENDANGERED 2016

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:

COSEWIC would like to acknowledge Sarah Bird and Luke Crevier for writing the status appraisal summary on Pacific Water Shrew, *Sorex bendirii*, in Canada, prepared under contract with Environment Canada. This report was overseen and edited by Graham Forbes, Co-chair of the COSEWIC Terrestrial Mammals Specialist Subcommittee (TM SSC) with input from the TMSSC, jurisdictions, and COSEWIC Members.

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Également disponible en français sous le titre Sommaire du statut de l'espèce du COSEPAC sur le Musaraigne de Bendire (Sorex bendirii) au Canada.

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Assessment Summary – May 2016

Common name Pacific Water Shrew

Scientific name Sorex bendirii

Status Endangered

Reason for designation

This shrew is restricted to British Columbia's Lower Mainland and adjacent low valleys. It is rare there, associated with freshwater streams and adjacent wet habitats. Urban development, agriculture, and forestry have reduced the amount and quality of habitat. There is an inferred and projected ongoing decline in habitat and subpopulations in much of its range in Canada.

Occurrence

British Columbia

Status history

Designated Threatened in April 1994 and in May 2000. Status re-examined and designated Endangered in April 2006. Status re-examined and confirmed in April 2016.



Pacific Water Shrew Musaraigne de Bendire Sorex bendirii

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

Status History

COSEWIC:

Designated Threatened in April 1994 and in May 2000. Status re-examined and designated Endangered in April 2006. Status re-examined and confirmed in April 2016.

Wildlife Species:

Change in eligibility, taxonomy or designatable units:

yes 🗌] no	\boxtimes
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Explanation:

The Pacific Water Shrew (*Sorex bendirii*) was described in 1884 based on morphological characters. Comparisons of variation in nuclear and/or cytochrome-b mitochondrial genomes of Pacific Water Shrew and the closely related Water Shrew (*S. palustris*) has recently confirmed the Pacific Water Shrew as a valid species (O'Neill *et al.* 2005; Hope *et al.* 2014). Three subspecies of Pacific Water Shrew are recognized but there is some debate about the validity of two subspecies (*S. b. bendirii*, *S. b. palmeri*) because they have limited variation (0.7%) in the cytochrome-b sequence (O'Neill *et al.* 2005). Notwithstanding, only one subspecies (*S. b. bendirii*) occurs in Canada (COSEWIC 2006) and there is no evidence to warrant recognition of more than a single designatable unit in Canada.

Range:

Change in Extent of Occurrence (EOO):	yes 🖂 no 📋 unk 📋
Change in Index of Area of Occupancy (IAO) :	yes 📋 no 📋 unk 🖂
Change in number of known or inferred current locations ¹ :	yes 🖂 no 📋 unk 📋
Significant new survey information	yes 🗌 no 🖂

Explanation:

In Canada, the range of the Pacific Water Shrew is restricted to extreme southwestern British Columbia (Environment Canada 2014; Figure 1). Two specimens recorded since the 2006 status report near Squamish, BC have extended the northern range limit for the species, and the EOO from 3350 km² to 6140 km² (Pacific Water Shrew Recovery Team 2009). The new records are approximately 90 km from a nearest previous record and it is unknown, but possible, that Pacific Water Shrew exist in the area between. The increase in EOO likely reflects sampling effort, rather than a recent increase in range. Survey work that has been conducted since the last status report has not provided significant new information, other than an extension of

¹ Use the IUCN definition of "location."

EOO. Six visual records in the Skagit Valley area adjacent to the Lower Fraser Valley exist but it is unclear if these represent important habitat beyond the valley (where almost all records exist) because some of these records are unconfirmed (COSEWIC 2006; Pacific Water Shrew Recovery Team 2009). Visual records are suspect because of similar external features between Pacific Water Shrew and Water Shrew (COSEWIC 2006), but are included in Figure 1 and 2.

Targeted surveys and significant trapping effort indicate that the species is rare (Galindo-Leal 1994; Wilk *et al.* 2010; Environment Canada 2014; Ministry of Environment 2015); for example, in seven separate surveys within the EOO since 2005, only one Pacific Water Shrew was captured (Ministry of Environment 2015). Trapping data are limited because most successful captures were derived from incidental captures, such as captures in fish surveys using minnow traps. New trapping methods and non-invasive detection methods (e.g., environmental DNA) may increase availability of range and population data in future reports (Hobbs pers comm. 2015) but, at present, records for this species are very limited and its abundance and range is restricted.

There have been approximately 160 records of Pacific Water Shrew in Canada since 1888, but most of these occurred before the 1980s, and many records lack accurate geographical data (COSEWIC 2006; Environment Canada 2014; BCCDC 2016). Six records are visual records and verification from trapping is required (COSEWIC 2006; Pacific Water Shrew Recovery Team 2009). There have been 48 records between 1991 -2014 (Environment Canada 2015), and several since 2014 (BCCDC 2015b). The emphasis on records since 1991 is arbitrary but reflects that changes in populations of small mammals and habitat, as well as search effort, likely corresponds to an estimate of persistence for that site over the last 20 - 25 years. The same 1991 starting period was applied in this status report for mapping EOO, and both historical (1888 - 1990), and recent (1991 - 2015) data are indicated. However, for the number of locations, we present a range because extirpation has not been proven. The previous COSEWIC report (2006) identified 44 sites, based on records with geographical data, since 1888. In this status report, we recognize a maximum of 45 locations, with the addition of the Squamish location. The number is an overestimate because an unknown number of locations have been lost since 1888; some locations are now major urban areas. Locations are based on various threats associated with habitat loss and fragmentation; the number of locations reflects the isolated condition of each location that are subject to different levels, and causes, of habitat loss (Threats section). The IAO has been calculated as 164 km²

(Figure 2).

Confirming extirpation for sub-populations is is difficult when so few individuals were ever caught at any site. The process used to identify occupancy in the Recovery Plan (Environment Canada 2014) was based on review of air-photos of sites where records existed and expert opinion on whether habitat remained that may support Pacific Water Shrew. Critical habitat in the recovery plan was identified using 48 records (since 1991) to produce 23 sub-populations. A sub-population was identified if records were separated for > 1 km by unsuitable habitat, or > 5km apart with suitable habitat between sub-populations. The different levels and types of threat in these 23 sub-populations likely vary and we consider them to be locations. Combining both methods suggests that the number of locations is a range of 23 - 45. The 1 km x 1 km resolution grid on 23 sub-populations of suitable habitat equated to 141, 1 km² squares that contained some proportion of critical habitat (Environment Canada 2014).

The species was not selected as part of COSEWIC's Aboriginal Traditional Knowledge (ATK) gathering process, and no ATK is known.

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 🗌 no 🗌 unk 🛛
Change in trend in area and/or quality of habitat:	yes 🖂 no 📋 unk 📋
Significant new survey information	yes 🗌 no 🛛

Explanation:

No data are available on Pacific Water Shrew abundance and population trends in Canada. Population estimates are not available because most capture data are from incidental captures.

Threats:

Change in nature and/or severity of threats:

yes 🖂 no 🗌 unk 🗌

Explanation:

The Pacific Water Shrew Recovery Team (2009) listed three threats as being of high severity: urban development, forestry, and agriculture. These threats create habitat loss, degradation, or fragmentation and are considered to be substantial and imminent threats that isolate sub-populations into small areas that are surrounded by development (BCCDC 2015b). Threats associated with urban and agricultural development include removal of riparian vegetation and debris, alteration of water courses, release of pollutants, and creation of barriers (Environment Canada 2014). Much of the EOO is private land. Forestry activities beyond buffer strips can alter hydrology, and increase herbicide and fertilizer runoff into streams. Most (86%) freshwater streams in the lower mainland have been impacted; 15% are paved or culverted, and 23% are classified as threatened, and 48% are endangered, based on the degree of degradation (Fisheries and Oceans Canada 1997).

The type of threats have not changed since the last status report, but the severity of threats (habitat loss, degradation, and fragmentation) is suspected to have increased because urban development in the area has increased (Pacific Water Shrew Recovery Team 2009; Fraser pers comm. 2015). No quantification of the impact on the species is available but the BCCCDC (2015b) notes the approximately 11% increase in the human population in the Greater Vancouver and Fraser Valley districts since 2005 resulted in a decline in the amount of habitat. The remaining habitat for Pacific Water Shrew is particularly at risk from linear corridor developments such as highways, utility lines, and proposed pipelines because the green spaces comprises some of the last corridors of undeveloped land in the lower mainland (BCCCDC 2015b; Fraser pers comm. 2016).

Most of the Canadian population of Pacific Water Shrew is believed to be severely fragmented. Fragmentation was a major concern in the previous status report, and, in the Recovery Plan, the definition of critical habitat is based on fragmentation effects, and recovery efforts focus on minimizing fragmentation (COSEWIC 2006; Environment Canada 2014). As per COSEWIC guidelines, severe fragmentation exists when >50% of its total area of occupancy is in habitat patches that are smaller than would be required to support a viable population, and/or are separated from other habitat patches by a large distance. Pacific Water Shrew inhabit wet older seral stage forests and are mainly associated with waterways, and in Canada, most records are from lower elevation environments (COSEWIC 2006). The best habitat needed to maintain the species was identified as permanent, minimum 1.5 km-long waterways with 100 m of riparian forest (each side) containing downed woody debris (Environment Canada 2014). These habitats are now rare in the parts of the EOO that contain >75% of the species' records. The 23 locations (critical habitat in the Recovery Plan) are mainly narrow riparian corridors of 1 - 2 km length, and most are > 15 km apart (Environment Canada 2014). Half of the higher range of locations (e.g., 45) likely do not meet even these minimum conditions. Dispersal ability is not well known but it is very unlikely that significant movement occurs between locations (COSEWIC 2006; Environment Canada 2014). There have been several records in the United States of Pacific Water Shrew being caught > 100m from standing water, but these sites were mainly wet forest, or had ephemeral streams (COSEWIC 2006). In the EOO, most of the landscape outside of the locations lack forest and there has not been records of the species in agricultural environments. Their use of waterways engineered with culverts and channelization is unknown.

The number of locations is a range of 23 – 45. An estimate that a minimum length of 1.6 km of quality habitat would suffice was based on data from another species (Water Shrew), and this threshold was used to identify

critical habitat (Environment Canada 2014) but it is not known if this is sufficient to maintain these 23 locations. More than half of the 45 locations likely are not viable or extant.

Protection:

Change in effective protection:

yes 🖂 no 📋 unk 📋

Explanation:

No Pacific Water Shrew occurrence has been found in Parks Canada protected areas (Nantel pers comm. 2015). The 2009 Provincial Recovery Strategy for the Pacific Water Shrew includes three Wildlife Habitat Areas which protect a total of 45.3 ha, consisting of 21.7 and 23.6 ha of core area and management zones, respectively.

Although more land has been protected, only 20% of the Pacific Water Shrew's habitat is estimated to exist on public land. A total of 14 of 16 proposed areas for critical habitat were on private land (BCDC 2015b) and the areas that lack habitat protection for the Pacific Water Shrew are urban, private lands that are most at risk from current threats to the species.

The Federal Addition to the Recovery Strategy for the Pacific Water Shrew identifies 23 polygons of Critical Habitat (Environment Canada 2014). Some of this land is publically-owned by a federal or provincial jurisdiction, and may eventually be protected. Critical Habitat occurring on private land may be protected if a Federal Order by the Minister of Environment is undertaken (SARA Public Registry 2015), which had not occurred, as of winter 2016.

A set of guidelines for Pacific Water Shrew in urban and rural areas was published in order to educate developers and land planners about threats to the species, and suggest methods to mitigate the impacts of new developments on Pacific Water Shrew habitat (Craig *et al.* 2010). While the document does not add to the legal protection of the species, it contributes to on-the-ground efforts to raise awareness about the threats to the Pacific Water Shrew and theoretically contributes to the species' recovery in Canada.

Rescue Effect:

Change in evidence of rescue effect:

yes 🗌 no 🖂

Explanation:

There is no evidence of an increased rescue effect since the last status report. Little is known about Pacific Water Shrew populations in Washington, and there have been no studies examining the possibility of a rescue effect (Fleckenstein pers comm. 2015). The species is ranked S4 (apparently secure) in Washington (Nature Serve 2016). However, given the Pacific Water Shrew's limited dispersal ability, any rescue effect across the border is unlikely due to the distances between U.S. and Canadian populations and the fragmentation in the intervening habitat (Environment Canada 2014).

Quantitative Analysis:

Change in estimated probability of extirpation:

yes 📋 no 📋 unk 🖂

Details:

A population viability analysis has not been conducted because population data are unavailable.

Summary and Additional Considerations: [e.g., recovery efforts]

The Canadian range of the Pacific Water Shrew comprises roughly 5% of the global range and is limited to southwestern British Columbia (Pacific Water Shrew Recovery Team 2009). Most historical (<1991) and recent records occur in the most populated and developed region of the province. Within its range, the shrew is apparently rare.

Little new information is available since the last status report. Recent captures of two specimens in Squamish extended the northern limit of the known range of the Pacific Water Shrew further north than previously expected (Nagorsen pers comm. 2015). A comparison of historical and recent records was used to infer a decline in habitat and population size of the species (COSEWIC 2006; Figure 1) and although new data on abundance are not available, a decline in habitat is inferred since that report; threats continue to increase in severity as the growing human population in the lower mainland increases development pressures on shrew habitat, and contributes to habitat fragmentation (Fraser pers comm. 2015). The range in Canada is considered to be severely fragmented.

Recovery efforts for the Pacific Water Shrew include increased habitat protection, research into new survey techniques, creation of Best Management Practices documents, and the development of federal and provincial Recovery Strategies that denote Wildlife Habitat Areas and Critical Habitat. The implementation of protection on private land, where most records have been made, has not occurred.

Pacific Water Shrew in Canada are categorized as critically imperilled at national (N1), and sub-national (S1) levels (Nature Serve 2016), and in British Columbia's Conservation Framework, the species is categorized as 'red-listed' and 'highest priority' (BC Conservation Data Centre 2015b).

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Author of SAS: Sarah Bird and Luke Crevier

TECHNICAL SUMMARY

Sorex bendirii

Pacific Water Shrew

Musaraigne de Bendire

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 year
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; b) understood; and c) ceased?Population size and range limited by habitat loss and degradation that is unlikely to cease in next 10 years.	a. No b. Yes c. No.
Are there extreme fluctuations in number of mature individuals?	Unknown, but unlikely

Extent and Occupancy Information

Estimated extent of occurrence	6140 km²
Increase from 3350 km ² due to capture of 2 specimens in one new location.	
Index of area of occupancy (IAO) (Always report 2x2 grid value).	164 km ²
Is the 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?	Yes a. Unknown, but suspected b. Yes

Most records are in highly developed private land with ongoing development pressure. Habitat patches contain riparian forest and wetlands but are isolated in a matrix of urbanization, stream channelization, and agriculture. Population viability within patches is unknown but is suspected to be unviable in many locations because only a few animals have been recorded in each location, habitat amount is small, and dispersal between patches appears to be unlikely.	
Number of "locations" [*] (use plausible range to reflect uncertainty if appropriate)	23 - 45
Locations reflect subpopulations because of fragmentation. Threats to habitat are numerous and vary within sites. The higher value reflects historical data and likely is an overestimate; the lower value was based on amount of habitat remaining on historical and recent sites.	
Is there an [observed, inferred, or projected] decline in extent of occurrence?	No
The observed increase in EOO likely reflected better sampling, rather than range expansion.	
Is there an [observed, inferred, or projected] decline in index of area of occupancy? New records beyond the main distribution suggest a wider distribution but some of these records are visual and require confirmation; also, most records still exist within areas with	Uncertain
ongoing habitat loss.	
Is there an [observed, interred, or projected] decline in number of subpopulations? Inferred decline based on ongoing development in most locations. Species is rare and most of the population exists in small, isolated locations that likely are not viable. (see cells 16,17; locations reflect sub-populations).	Yes
Is there an [observed, inferred, or projected] decline in number of "locations"*?	Yes
Inferred decline; the new location in Squamish is likely offset by inferred loss of locations in the Fraser Valley, where most records exist.	
Is there an [observed, inferred, or projected] decline in [area, extent and/or quality] of habitat?	Yes
Inferred decline in habitat area and quality due to ongoing development in most of the EOO.	
Are there extreme fluctuations in number of subpopulations?	Unknown

^{*} See Definitions and Abbreviations on COSEWIC website and IUCN (Feb 2014) for more information on this term

Are there extreme fluctuations in number of "locations"?	Unknown
Are there extreme fluctuations in extent of occurrence?	Unknown, but unlikely
The increase in EOO likely reflected better sampling, rather than range expansion. Even though sampling is sparse, there is unlikely to have been large changes in EOO in last 10 years.	
Are there extreme fluctuations in index of area of occupancy?	Unknown

Number of Mature Individuals (in each subpopulation)

Subpopulations (give plausible ranges)	N Mature Individuals
Total	Unknown

Quantitative Analysis

Probability of extinction in the wild is at least [20% within 20	N/A; Population viability analysis not
years or 5 generations, or 10% within 100 years].	conducted

Threats (direct, from highest impact to least, as per the IUCN Threats Calculator)

A threats assessment exercise was conducted in the 2009 Recovery Strategy, with similar design as the IUCN Threats Calculator.

High Level of Concern:

- i. Permanent habitat loss and habitat fragmentation from urban development (roads, housing, commercial, industrial activities that impact areas adjacent to, and/or within riparian habitat)
- ii. Short-term habitat degradation/alteration from forest harvesting
- iii. Semi-permanent habitat loss from agriculture
- iv. Water quality degradation from development
 - Medium Level of Concern:
- v. Water quality degradation from pollution
 - Medium-Low/Low Level of Concern:
- vi. Predation from domestic cats
- vii. Trapping mortality
- viii. Climate and natural disasters (such as sudden flood/sediment events)

Habitat specificity is a limiting factor for Pacific Water Shrew. The species is limited to low elevation floodplain and wetland habitats, much of which is on private land where protection is more difficult. These habitat requirements make the Pacific Water Shrew vulnerable to habitat degradation. As the shrew habitat is increasingly fragmented from development activities, the shrew's dispersal between habitat patches is impeded (Pacific Water Shrew Recovery Team 2009).

Rescue Effect (immigration from outside Canada)

Status of outside population(s) most likely to provide immigrants to Canada.	S4 (Washington)
Is immigration known or possible?	Possible, but unlikely
Would immigrants be adapted to survive in Canada?	Yes
Is there sufficient habitat for immigrants in Canada?	Unknown
Are conditions deteriorating in Canada?+	Yes
Are conditions for the source population deteriorating? ⁺	Unknown
Is the Canadian population considered to be a sink? ⁺	N/A
N/A; Unlikely that dispersers are entering Canada and able to be impacted	
Is rescue from outside populations likely?	No
Dispersal events not well known and extensive development in border area likely limits rescue.	

Data Sensitive Species

Is this a data sensitive species? No

Status History

COSEWIC: Designated Threatened in April 1994 and in May 2000. Status re-examined and designated Endangered in April 2006. Status re-examined and confirmed in April 2016.

Status and Reasons for Designation:

Status:	Alpha-numeric codes:
Endangered	B2ab(iii,iv)

Reasons for designation:

This shrew is restricted to British Columbia's Lower Mainland and adjacent low valleys. It is rare there, associated with freshwater streams and adjacent wet habitats. Urban development, agriculture, and forestry have reduced the amount and quality of habitat. There is an inferred and projected ongoing decline in habitat and subpopulations in much of its range in Canada.

Applicability of Criteria

Criterion A (Decline in Total Number of Mature Individuals): Not applicable. Declines in total number of mature individuals unknown.

⁺ See Table 3 (Guidelines for modifying status assessment based on rescue effect)

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

Meets Endangered B2b(iii,v).

B1: Meets Endangered B2ab(iii,v). B1: Application uncertain because Extent of Occurrence is greater than the 5000 km² threshold but its increase from 3350 km² occurred with addition of two specimens from one locality, and all remaining occurrences are in a small area < 4000 km².

Meets Endangered under B2: Index of Area of Occupancy is 164 km², below the threshold of 500 km². Subcriterion "a" is met, as species is severely fragmented, based on wide separation of suitable habitat patches and apparently small subpopulations, the majority of which may not be viable over the long term. Subcriterion "b(iii,iv)" is met based on inferred and projected declines in area, quality, and quantity of habitat, and number of subpopulations.

Criterion C (Small and Declining Number of Mature Individuals): Not applicable. Extent of population declines unknown.

Criterion D (Very Small or Restricted Population): Not applicable. Population size unknown.

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



Figure 1. Location of Pacific Water Shrew (*Sorex bendirii*) in Canada. Recent records refers to specimens recorded between 1991 – 2015 from Environment Canada (2015) and BCCDC (2015b) (Map: Alain Fillion, COSEWIC).



Figure 2. Extent of Occurrence (EOO) and Index of Area of Occupancy estimates for Pacific Water Shrew (*Sorex bendiril*) in Canada. Recent records refers to specimens recorded between 1991 – 2015 from Environment Canada (2015) and BCCDC (2015b). The EOO is shown for recent records with and without the new location near Squamish, British Columbia (Map: Alain Fillion, COSEWIC).



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 (2016)

	(1010)
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 and Climate Change Canada	Environnement et Changement climatique Canada
	Canadian Wildlife Service	Service canadien de la faune



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