COSEWIC
Status Appraisal Summary

on the

Western Skink
Plestiodon skiltonianus

in Canada

SPECIAL CONCERN
2014

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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COSEWIC
Assessment Summary

Assessment Summary – November 2014

Common name
Western Skink

Scientific name
Plestiodon skiltonianus

Status
Special Concern

Reason for designation
The Canadian distribution of the species is within a densely populated region of the Southern Interior of British Columbia that is undergoing extensive development. Increased survey efforts within the past 10 years have resulted in the discovery of the species at new localities within the known range. Nevertheless, the range remains small and human activities and land use practices continue to threaten skink habitats.

Occurrence
British Columbia

Status history
Designated Special Concern in May 2002. Status re-examined and confirmed in November 2014.

COSEWIC
Status Appraisal Summary

Western Skink — Scinque de l'Ouest

Plestiodon skiltonianus

Range of occurrence in Canada: British Columbia

COSEWIC Status History:

Designated Special Concern in May 2002. Status re-examined and confirmed in November 2014.

Evidence (indicate as applicable):
Increased survey efforts have resulted in the finding of Western Skinks at new and previously known localities throughout much of the species' Canadian range in British Columbia. The range remains small and is located within populated areas of the southern interior of British Columbia, where human activities and land uses continue to threaten skink habitats.

Wildlife species:

Change in eligibility, taxonomy or designatable units: yes ☒ no ☐

Explanation:

Western Skinks were formerly known as *Eumeces skiltonianus*. Griffith *et al*. (2000), Schmitz *et al*. (2004), Brandley *et al*. (2005), and Smith (2005) presented evidence that *Eumeces* is not a monophyletic group and recommended the adoption of the genus name *Plestiodon* for all North American species (north of Mexico) formerly referred to as *Eumeces*. This change has been accepted by authorities (Crother 2012).

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:

Since the previous status report, the Western Skink has been detected at a number of localities within its known range in British Columbia. Research for a Master's of Science thesis (Vincer 2012) confirmed the presence of Western Skinks in Vaseux-Bighorn National Wildlife Area south of Penticton. Other surveys have confirmed previous sites and found new ones (e.g., Dulisse 2006). These have been mapped by the B.C. Conservation Data Centre (2014a) and by E-Fauna BC (Rutherford 2013). These sites and others (Rutherford 2002; Hawkes pers. comm. 2014) obtained since 2000 are included in Figure 1. The inclusion of previous records shows a similar core range (Figure 1), but the species may have disappeared from the western and northern extremities of its range (but see below).

There are no recent (since 1993) records of the Western Skink west of the Okanagan drainage (B.C. Western Skink Working Group 2013), and the species might have disappeared from the Similkameen Valley, where it occurred historically. Numerous surveys for snakes in the west Okanagan and Lower Similkameen Valleys over the past two decades have failed to locate Western Skinks, but no systematic surveys targeting this species have been conducted (B.C. Western Skink Working Group 2013). The most northern confirmed locality, by Shuswap Lake, is a sighting of a single lizard in 1969.

The extent of occurrence (EO) of Western Skinks in Canada is 25,086 km^2, using the minimum convex polygon method and localities confirmed since 2000, as shown in Figure 1. If all records, including those before 2000, are used, then the EO is 37,665 km^2. Others have reported a much smaller EO (<2000 km^2 in Ovaska and Engelstoft 2002; 1000-5000 km^2 in B.C. Conservation Data Centre 2014b), but a different method of calculation was used probably including only suitable habitat. The historical range would have been 33.4% larger, extending farther north (Shuswap Lake) and west (Similkameen Valley). There is uncertainty when the declines occurred or whether the species still persists in pockets of habitat in these areas.

Western Skinks are patchily distributed across the landscape and may occupy only 10% of the EO (B.C. Conservation Data Centre 2014b). In a mark-recapture study in British Columbia, recaptures of tagged individuals were all within 61 m of previous captures (Rutherford 2002), suggesting that home ranges are small and dispersal capabilities may be poor.

The index of area of occupancy (IAO) for Western Skinks is 248 km^2 (62 2x2 km grid cells), based on occurrence records since 2000, and 400 km^2, if all records, including those before 2000, are included. There is some justification for using the larger value, as historical sites have not been systematically resurveyed. However, Dulisse (2006) suggested that many historically occupied sites along the west arm of Kootenay Lake no longer have Western Skinks, but the timing of the possible declines is unclear. The smaller value, based on records since 2000, is almost certainly an underestimate, as unreported occurrences most likely exist. Many more than ten threats-based locations are expected because the timing and severity of the various threats depends on landownership. Some locations appear to have been lost based on lack of recent observations from a portion of the range and habitat loss and deterioration, but specific information is available.

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:

There have been no studies of population size or trends in this species. Quality of habitat continues to decline in areas with human population growth.

Threats:

Change in nature and/or severity of threats: yes ☐ no ☒ unk ☐

Explanation:

Threats have been clarified, but no new threats have been identified. A detailed assessment of threats was done by the B.C. Western Skink Working Group (2013) and by the BC Conservation Data Centre in 2012 (Gelling pers. comm. 2014) using the IUCN threats calculator (Master *et al*. 2009) (Appendix 1). The results of the two assessments were similar and identified a number of low-impact threats, which cumulatively resulted in a medium overall threat impact (Appendix 1). The most significant threats are from continued habitat loss due to residential, commercial, and agricultural development. Many skink populations occur on private lands, where development pressure can be intense (B.C. Western Skink Working Group 2013). In addition to having a direct impact on skink populations, these threats may reduce genetic variability, increasing extirpation risk and limiting the ability to adapt to changing environments (Delaney *et al*. 2013).

Protection:

Change in effective protection: yes ☐ no ☒

Explanation: No change.

Rescue Effect:

Change in evidence of rescue effect: yes ☐ no ☒

Explanation:

Western Skinks appear to be widespread, abundant, and secure in the US states bordering the species' range in British Columbia: They are ranked S5 in Washington (Hallock and McAllister 2005) and Idaho (Groves *et al*. 1997). Immigration into Canada is possible, and immigrants would probably be adapted to survive. However, given the small home ranges and limited dispersal ability of these animals, any rescue would be very slow, if it was effective at all.

Quantitative Analysis:

Change in estimated probability of extirpation: yes ☐ no ☐ unk ☒

Details: No quantitative analyses are available.

Summary and Additional Considerations:

Since the previous assessment, several new distribution records have been obtained for the Western Skink, but population sizes and trends remain unknown. The species continues to be under threat due to a number of factors, with residential, commercial, and agricultural development being the most important. A management plan that includes an assessment of threats has been prepared (B.C. Western Skink Working Group 2013). The management goal is to maintain stable or increasing populations with three objectives: clarifying distribution and abundance; identifying sites for habitat protection and threat mitigation; and addressing knowledge gaps such as movement patterns, habitat trends, population trends, and habitat suitability. In British Columbia, the BC *Wildlife Act* prohibits the collection, killing, harassment, and possession of all wildlife without a permit but does not protect habitat. The species is not listed under the provincial *Forest and Range Practices Act* or in the *Oil and Gas Activities Act*. It is listed as Special Concern on Schedule 1 of the *Species At Risk Act.*

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TECHNICAL SUMMARY

Plestiodon skiltonianus

Western Skink Scinque de l'Ouest

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(2008) is being used) From Ovaska and Engelstoft (2002)	5 yrs
Is there an inferred continuing decline in number of mature individuals? Inferred decline due to reduction in habitat. Some formerly occupied sites appear to no longer have Western Skinks, but the timing of declines is unclear.	Yes
Estimated percent of continuing decline in total number of mature individuals within 2 generations	Unknown
Estimated percent reduction in total number of mature individuals over the last 3 generations.	Unknown
Suspected percent reduction or in total number of mature individuals over the next 3 generations.	Unknown
Estimated percent reduction in total number of mature individuals over any 3 generations period, over a time period including both the past and the future.	Unknown
Are the causes of the decline clearly reversible and understood and ceased? Understood but not clearly reversible or ceased	No
Are there extreme fluctuations in number of mature individuals? Several studies in the US have reported large annual fluctuations in population size, attributed to habitat change and vegetation succession (Fitch 1936; Smith 1946;, Tanner 1957). However, the changes were not an order in magnitude and hence would not be considered extreme. Fluctuations in Canadian populations are unknown.	Unknown

Extent and Occupancy Information

Estimated extent of occurrence The smaller value is based on records since 2000, while the larger value includes all records, including historical records.	25,086 – 37,665 km²
Index of area of occupancy (IAO) (Always report 2x2 grid value). The smaller value is based on records since 2000 (62 grid cells), while	246 – 400 km²

the larger value includes all records, including historical records (100 grid cells).	
Is the population severely fragmented?	Unknown
Number of locations >> 10 locations are expected because the timing and severity of the various threats depends on landownership.	Unknown; >>10
Is there an inferred continuing decline in extent of occurrence? Apparent 33.4% decline based on lack of recent records from the northern and western extremity of the species' range. The timing of the decline is unknown and may be historical and not within past 15 years. Furthermore, historical localities have not been surveyed systematically.	Yes
Is there an inferred continuing decline in index of area of occupancy? Apparent decline of 38% (from 100 to 62 grid cells) may at least partially represent paucity of survey effort, as historical localities have not been surveyed systematically. The species appears to have disappeared from many sites along the West Arm of Kootenay Lake.	Yes
Is there an inferred continuing decline in number of populations?	Unknown
Is there an inferred continuing decline in number of locations?	Unknown
Is there an inferred continuing decline in area, extent and quality of habitat?	Yes
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 population)

Population	**N Mature Individuals**
Total Population size unknown but could be as low as 2500 (B.C. Conservation Data Centre. 2014b)	Unknown; possibly <10,000

Quantitative Analysis

Probability of extinction in the wild is at least 20% within 20 years or 5 generations.	Not done due to lack of data

Threats (actual or imminent, to populations or habitats)

Residential and commercial development, agriculture, energy production and mining, transportation development

Rescue Effect (immigration from outside Canada)

Status of outside population(s)?	Stable
Is immigration known or possible?	Possible
Would immigrants be adapted to survive in Canada?	Yes
Is there sufficient habitat for immigrants in Canada?	Unknown
Is rescue from outside populations likely?	No

Data-Sensitive Species

Is this a data-sensitive species? No.

Status History

Designated Special Concern in May 2002. Status re-examined and confirmed in November 2014.

Status and Reasons for Designation

Status: Special Concern	**Alpha-numeric Code:** Not Applicable
Reasons for Designation: The Canadian distribution of the species is within a densely populated region of the Southern Interior of British Columbia that is undergoing extensive development. Increased survey efforts within the past 10 years have resulted in the discovery of the species at new localities within the known range. Nevertheless, the range remains small and human activities and land use practices continue to threaten skink habitats.	

Applicability of Criteria

Criterion A (Decline in Total Number of Mature Individuals): Not applicable. Declines are suspected based on habitat trends and threats, but their magnitude is unknown.
Criterion B (Small Distribution Range and Decline or Fluctuation): Not applicable. IAO based on known localities is below the threshold value for endangered, but sub-criteria “a” and “c” do not apply, as there are more than 10 locations, the population is not severely fragmented, and there are no extreme fluctuations, as far as it is known.

Criterion C (Small and Declining Number of Mature Individuals): Not applicable. Population size is unknown.
Criterion D (Very Small or Restricted Population): Not applicable. Population size is unknown.
Criterion E (Quantitative Analysis): Not available due to lack of data.

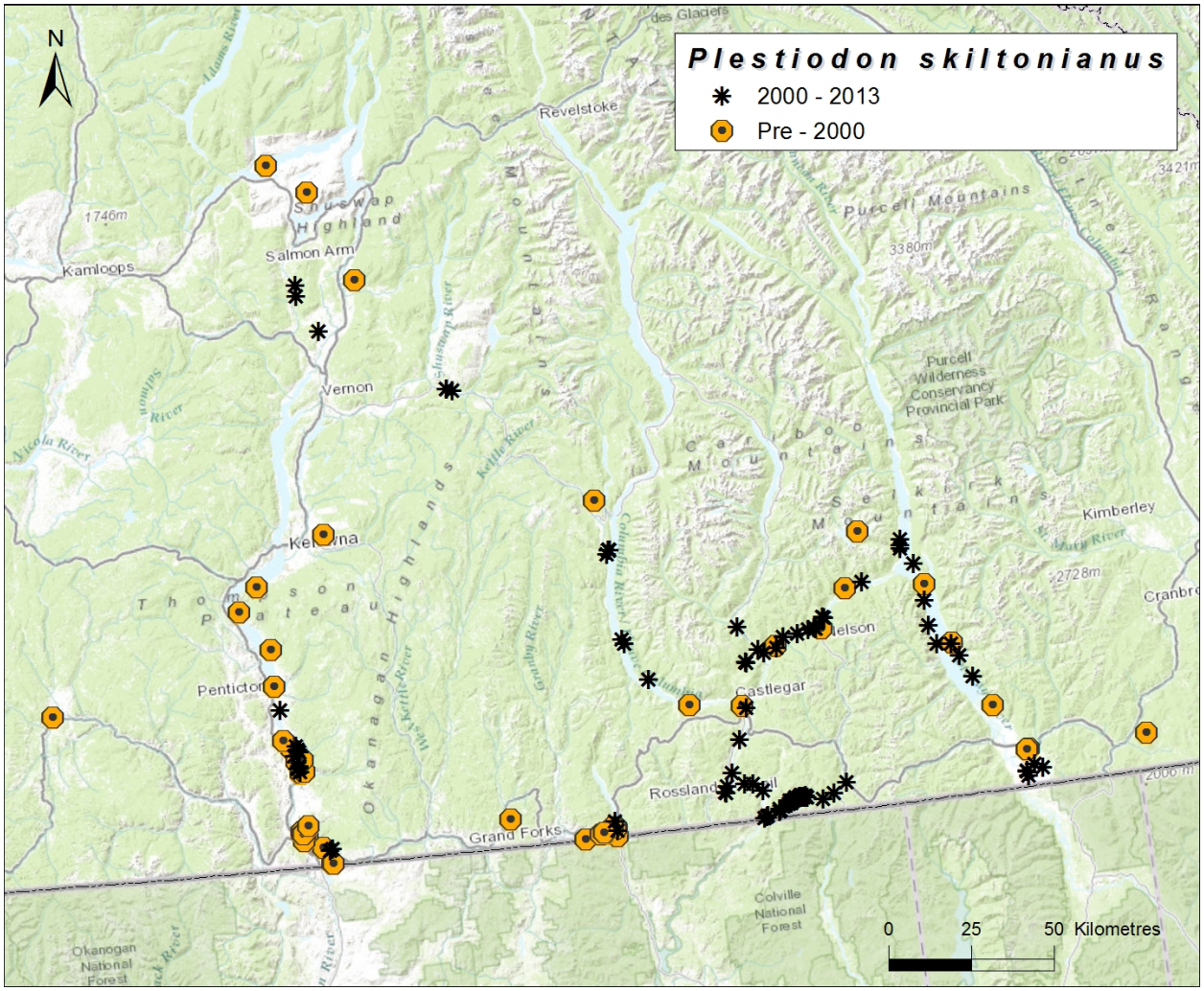

Figure 1. Distribution of *Plestiodon skiltonianus* in British Columbia. Map prepared by Jenny Wu, COSEWIC Secretariat.

Appendix 1. Threat assessment for the Western Skink using the IUCN threats calculator (Masters *et al*. 2009). Threat categories that do not apply to the species are omitted. Overall threat impact is "medium". Reproduced from B.C. Western Skink Working Group (2013; pp. 13-14).

Threat #	Threat description	Impact[a]	Scope[b]	Severity[c]	Timing[d]
1	Residential & commercial development	Low	Small	Extreme	High
1.1	Housing & urban areas	Low	Small	Extreme	High
1.2	Commercial & industrial development	Low	Small	Extreme	High
1.3	Tourism & recreation areas	Low	Small	Extreme	High
2	Agriculture & aquaculture	Low	Small[e]	Extreme[e]	High
2.1	Annual & perennial non-perennial crops	Low	Small	Extreme	High
2.3	Livestock farming & ranching	Low	Large	Slight	High
3	Energy production & mining	Low	Small	Extreme	High
3.2	Mining & quarrying	Low	Small	Extreme	High
4	Transportation & service corridors	Low	Small	Extreme	High
4.1	Roads & railroads	Low	Small	Extreme	High
4.2	Utility & service lines	Low	Small	Slight	High
5	Biological resource use	Negligible	Negligible	Not Scored	High
7	Natural system modifications	Low	Small	Slight	High
7.1	Fire & fire suppression	Low	Small	Slight	High
7.2	Dams & water management	Low	Small	Slight	Moderate
8	Invasive & other problematic species & genes	Unknown	Small	Unknown	High
8.1	Invasive non-native/alien species	Unknown	Small	Unknown	High
11	Climate change & severe weather	Unknown	Pervasive	Unknown	Moderate
11.2	Droughts	Unknown	Pervasive	Unknown	Moderate

[a] **Impact** – Calculated, based on scope, severity and timing.

[b] **Scope** – Proportion of the species that can reasonably be expected to be affected by the threat within 10 years. Usually measured as a proportion of the species' population in the area of interest. (Pervasive = 71–100%; Large = 31–70%; Restricted = 11–30%; Small = 1–10%; Negligible < 1%).

[c] **Severity** – Within the scope, the level of damage to the species from the threat that can reasonably be expected to be affected by the threat within a 10-year or 3-generation timeframe. Usually measured as the degree of reduction of the species' population. (Extreme = 71–100%; Serious)

[d] **Timing** – High = continuing; Moderate = only in the future (could happen in the short term [< 10 years or 3 generations]) or now suspended (could come back in the short term); Low = only in the future (could happen in the long term) or now suspended (could come back in the long term); Insignificant/Negligible = only in the past and unlikely to return, or no direct effect but limiting.

[e] Error in roll up of Threat 2 in the Recovery Plan; scope should be Large, Severity either slight or moderate.

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.

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Canada

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