

# COSEWIC Annual Report

presented to

**The Minister of the Environment**

and

**The Canadian Endangered  
Species Conservation Council  
(CESCC)**

from

**The Committee on the Status  
of Endangered Wildlife in Canada  
(COSEWIC)**

**2013-2014**

**COSEWIC**  
Committee on the Status  
of Endangered Wildlife  
in Canada



**COSEPAC**  
Comité sur la situation  
des espèces en péril  
au Canada

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## ITEM I – COSEWIC ACTIVITIES

### 1. Wildlife Species Assessment Meetings:

Section 15 (1) of the *Species at Risk Act* states: “The functions of COSEWIC are to (a) assess the status of each wildlife species considered by COSEWIC to be at risk and, as part of the assessment, identify existing and potential threats to the species and

- (i) classify the species as extinct, extirpated, endangered, threatened or of special concern,
- (ii) indicate that COSEWIC does not have sufficient information to classify the species, or
- (iii) indicate that the species is not currently at risk”.

Under Canada’s *Species at Risk Act* (SARA), the foremost function of COSEWIC is to “assess the status of each wildlife species considered by COSEWIC to be at risk and, as part of the assessment, identify existing and potential threats to the species”.

COSEWIC held two Wildlife Species Assessment Meetings in this reporting year (October, 2013 to September, 2014) from November 24 to November 29, 2013 and from April 27 to May 2, 2014. During the current reporting period, COSEWIC assessed the status or reviewed the classification of 56 wildlife species.

The wildlife species assessment results for the 2013-2014 reporting period include the following:

<u>Extinct:</u>	0
<u>Extirpated:</u>	0
<u>Endangered:</u>	23
<u>Threatened:</u>	12
<u>Special Concern:</u>	20
<u>Data Deficient:</u>	0
<u>Not at Risk:</u>	1
Total:	56

Of the 56 wildlife species examined, COSEWIC reviewed the classification of 40 that had been previously assessed. The review of classification for 25 of those wildlife species resulted in a confirmation of the same status as the previous assessment (see Table 1a).

**Table 1a. Confirmation of status for wildlife species previously assessed:**

EXTIRPATED	ENDANGERED	THREATENED	SPECIAL CONCERN
-----	1. Copper Redhorse	1. Coastal Giant Salamander	1. Banded Killifish (Newfoundland populations)
	2. Little Brown Myotis*	2. Dromedary Jumping-slug	2. Eastern Milksnake
	3. Mormon Metalmark (Southern Mountain population)	3. Loggerhead Shrike Prairie subspecies	3. Giant Threespine Stickleback
	4. North Atlantic Right Whale	4. Plains Bison	4. Green Sturgeon
	5. Northern Myotis*	5. Short-tailed Albatross	5. Harlequin Duck (Eastern population)
	6. Piping Plover <i>circumcinctus</i> subspecies		6. Steller Sea Lion
	7. Piping Plover <i>melodus</i> subspecies		7. Unarmoured Threespine Stickleback
	8. Porbeagle		8. Yellow Lampmussel
	9. Round Pigtoe		
	10. Sand-verbena Moth		
	11. Small-mouthed Salamander		
	12. Tri-colored Bat*		

\*Status assessed as Endangered under an Emergency Assessment February 3, 2012.

Data Deficient and Not at Risk: COSEWIC assessed one new wildlife species in May 2014 as Not at Risk: Northwestern Cellar Spider.

With the transmission of this report, COSEWIC provides assessments (see Table 1b) of 30 wildlife species newly classified as Extirpated, Endangered, Threatened and Special Concern to the Minister of Environment to consider whether to recommend to the Governor in Council (GIC) that they be added to Schedule 1 of SARA.

**Table 1b. Newly classified wildlife species for consideration of listing on Schedule 1 of SARA:**

EXTIRPATED	ENDANGERED	THREATENED	SPECIAL CONCERN
-----	1. Bocaccio	1. Audouin's Night-stalking Tiger Beetle	1. Caribou (Northern Mountain population)
	2. Caribou (Central Mountain population)	2. Eastern Waterfan	2. Cutlip Minnow
	3. Caribou (Southern Mountain population)	3. Hare-footed Locoweed	3. Grasshopper Sparrow <i>pratensis</i> subspecies
	4. Dakota Skipper	4. Rocky Mountain Tailed Frog	4. Mormon Metalmark (Prairie population)
	5. Eastern Tiger Salamander (Prairie population)	5. Sweet Pepperbush	5. Nahanni Aster
	6. Gypsy Cuckoo Bumble Bee	6. Western Bumble Bee <i>occidentalis</i> subspecies	6. Wandering Salamander
	7. Loggerhead Shrike Eastern subspecies	7. White Hake (Atlantic and Northern Gulf of St. Lawrence population)	7. Water Pennywort
	8. Oregon Branded Skipper		8. Western Bumble Bee <i>mckayi</i> subspecies
	9. Rainbow Trout (Athabasca River populations)		9. Western Grebe
	10. Tweedy's Lewisia		10. Western Waterfan
	11. White Hake (Southern Gulf of St. Lawrence population)		11. Wolverine
			12. Wood Bison

**Appendix I** provides the detailed results of COSEWIC's status assessment of each wildlife species, including the reasons for each designation. Status reports containing the information on which COSEWIC's status assessments are based will be available on the SARA Public Registry at the following address: [www.sararegistry.gc.ca](http://www.sararegistry.gc.ca).

As of May 2014, COSEWIC's assessments include 693 wildlife species in various risk categories, including 306 Endangered, 165 Threatened, 200 Special Concern, and 22 Extirpated (i.e. no longer found in the wild in Canada). In addition, 15 wildlife species have been assessed as Extinct.

## 2. Important Notes Regarding Status Assessments:

Section 27 of SARA states that the Governor in Council may, on the recommendation of the Minister, by order amend the List in accordance with subsections (1.1) and (1.2) by adding a wildlife species, by reclassifying a listed wildlife species or by removing a listed wildlife species, and the Minister may, by order, amend the List in a similar fashion in accordance with subsection (3).

Classification was reviewed for three wildlife species previously listed as Special Concern on Schedule 3 of SARA. COSEWIC confirmed the status of both the Giant Threespine Stickleback and the Unarmoured Threespine Stickleback as Special Concern. COSEWIC assessed the Hare-footed Locoweed as Threatened, resulting in a change of status category.

## 3. Other Species Assessment Activities:

### Emergency Assessments

Section 29 of SARA provides for the listing of a species based on an imminent threat to the survival of the wildlife species under an emergency basis. Section 30 (1) of SARA states that COSEWIC is to prepare a status report on the wildlife species and, within one year after the making of the order, COSEWIC must, in a report in writing to the Minister, (a) confirm the classification of the species; (b) recommend to the Minister that the species be reclassified; or (c) recommend to the Minister that the species be removed from the List.

As reported in COSEWIC's 2012 Annual Report to CESCC, on February 3, 2012 COSEWIC assessed the status of the Little Brown Myotis (*Myotis lucifugus*), the Northern Myotis (*Myotis septentrionalis*) and the Tri-colored Bat (*Perimyotis subflavus*) as Endangered on an emergency basis. COSEWIC confirmed the status of these wildlife species as Endangered based on a full status report at the Wildlife Species Assessment meeting in November 2013.

## 4. Wildlife Species Assessments returned by the Governor in Council (GIC) to COSEWIC for further information or consideration:

Section 27 (1.1) (c) of SARA provides for the Governor in Council to, on the recommendation of the Minister, refer an assessment of the status of a species back to COSEWIC for further information or consideration.

The North Pacific population of Humpback Whale was referred back to COSEWIC for further consideration (Canada Gazette Part 1, July 2012). The rationale and supporting documentation for the species referral were received from the Department of Fisheries and Oceans (DFO) on December 5, 2012.

### Rationale for Referral Back:

- The Pacific population of Humpback Whales was assessed by COSEWIC as Threatened in 2003. An updated status report was commissioned by the COSEWIC Marine Mammals Specialist Subcommittee during 2009-2010 and the population was reassessed by COSEWIC as Special Concern in May 2011. This change in status resulted from new information on abundance and trend for Humpback Whales in Canadian Pacific waters that indicated significant recovery from depletion due to commercial whaling. Field studies by Fisheries & Oceans Canada (DFO) during 2002–2006, but particularly during 2004–2006 as part of a North Pacific-wide international humpback study known as SPLASH, led to an abundance estimate of about 2145 humpbacks in BC waters and an annual population growth rate of around 4% per year.
- In December 2012, the Chair of COSEWIC received a letter from the Director General, Ecosystems Management, Fisheries & Oceans Canada, indicating that the update status report for Pacific Humpback Whales was being referred back to COSEWIC for the following reason:

"The May 2011 assessment of the Humpback Whale (North Pacific population) resulted in an assessment of Special Concern, a change from its previous assessment as Threatened. As part of the Fisheries & Oceans process on listing recommendations, the Department undertook public consultations on changing the status of the species. In the course of the consultations, the Department received information indicating that the structure of the population may be different than was previously understood. Some species experts expressed concerns that key data pertaining to the structure of the designatable unit was not considered in the assessment and in their view, such data would justify the identification of two designatable units in Canada."

### COSEWIC's Response:

The Chair of COSEWIC asked the Marine Mammals Specialist Subcommittee to review the material provided by DFO and determine whether there was evidence for two designatable units (DUs).

- Dr. John Ford, a member of the COSEWIC Marine Mammals Specialist Subcommittee prepared a report examining the evidence for two DUs. He was asked to write the report because he had been part of the research program that provided the new population estimates and recent analyses of population structure. Dr. Ford looked at evidence for two DUs based on the migratory destinations, regional movements, site fidelity, and mitochondrial DNA.
- Based on Dr. Ford's report, the Subcommittee concluded that the current evidence was not sufficient to divide the population into two DUs and the single DU used in the 2011 assessment should stand.

At the November 2013 COSEWIC Species Assessment Meeting, following a vote by the members, COSEWIC confirmed its previous reassessment of the species based on one DU as recommended by the COSEWIC Marine Mammals Specialist Subcommittee. The Chair of COSEWIC wrote to Minister Aglukkaq, Minister of the Environment (with copy to the Minister of Fisheries & Oceans Canada) dated December 17, 2013 providing COSEWIC's response to the referral back.

**Appendix II** provides COSEWIC's response to the referral back of the Humpback Whale (North Pacific population). Please see also the letter to the Minister of the Environment on the following website: [http://www.cosewic.gc.ca/eng/sct7/index\\_e.cfm?#rep](http://www.cosewic.gc.ca/eng/sct7/index_e.cfm?#rep)

## 5. Wildlife Species Selected for Status Report Preparation:

Section 15.1 (b) of SARA states that one of the functions of COSEWIC is to “determine when wildlife species are to be assessed, with priority given to those more likely to become extinct”.

Following COSEWIC's process for prioritizing new wildlife species for assessment (as outlined at: [http://www.cosewic.gc.ca/eng/sct0/appdx\\_e1\\_2\\_e.cfm](http://www.cosewic.gc.ca/eng/sct0/appdx_e1_2_e.cfm)), 14 wildlife species from COSEWIC's Species Specialist Subcommittees' candidate lists (four of which will be bundled as indicated in Item 2 below) were chosen by the Committee for status report commissioning (Table 2).

**Table 2. Status Reports to be commissioned in Fall, 2015**

COMMON NAME OF WILDLIFE SPECIES	SUBCOMMITTEE
Red-tailed Leafhopper	Arthropods
Bundle of Four Species:	
False-Foxglove Sun Moth	Arthropods
Smooth Yellow False Foxglove	Vascular Plants
Fern-leaved Yellow False Foxglove	Vascular Plants
Downy Yellow False Foxglove	Vascular Plants
Ute Ladies'-tresses	Vascular Plants
American Bumble Bee	Arthropods
Yukon Wild Buckwheat	Vascular Plants
Striped Whitelip	Molluscs
Smoker's Lung Lichen	Mosses & Lichens
Mudpuppy	Amphibians & Reptiles
Giant Lacewing	Arthropods
Mottled Horsehair Lichen	Mosses & Lichens
White-rimmed Shingle Lichen	Mosses & Lichens

## 6. COSEWIC Subcommittees:

Section 18 (1) of SARA requires COSEWIC to establish subcommittees of specialists to assist in the preparation and review of status reports on wildlife species considered to be at risk, including subcommittees specializing in groups of wildlife species and a subcommittee specializing in aboriginal traditional knowledge.

### Aboriginal Traditional Knowledge Subcommittee

COSEWIC's Aboriginal Traditional Knowledge Subcommittee is responsible for ensuring that Aboriginal Traditional Knowledge (ATK) is appropriately accounted for in COSEWIC's assessment process. The Subcommittee consists of members appointed by the Federal Minister of Environment. The Co-chairs of the ATK Subcommittee are members of COSEWIC and provide COSEWIC with their expertise on ATK.

The Subcommittee had another productive year. ATK source reports, which compile all potential sources of documented ATK for a given species, were completed for Western Painted Turtle, Rusty Blackbird, Ivory Gull, Burrowing Owl, River Redhorse, Westslope Cutthroat Trout, Harbour Porpoise, Ringed Seal, Cherry Birch, all Ladybeetle species in Canada and all Ash species in Canada. In addition, ATK assessment reports, which summarize the relevant content of documented ATK sources, were completed for the Narwhal, as well as a draft version of the Lake Sturgeon. These reports were prepared to inform species status assessments.

In addition, the ATK Subcommittee revised its guidance documents for the use of ATK in the COSEWIC process and continued with plans for an ATK Gathering Project on Narwhal.

COSEWIC extends its sincere gratitude to the members of the ATK Subcommittee for their ongoing commitment to ensuring COSEWIC assessments are informed by the best possible information.

### Species Specialist Subcommittees

COSEWIC's Species Specialists Subcommittees (SSCs) provide taxonomic expertise to the Committee. Each SSC is typically led by two Co-chairs and members are recognized Canadian experts in the taxonomic group in question, able to demonstrate high standards of education, experience, and expertise and have a demonstrated knowledge of wildlife conservation. Members are drawn from universities, provincial wildlife agencies, museums, Conservation Data Centres, and other sources of expertise on Canadian species. SSC members support the Co-chairs in developing candidate lists of species to be considered for assessment, commissioning status reports for priority species, reviewing reports for scientific accuracy and completeness, and proposing to COSEWIC a status for each species. Currently, COSEWIC has 10 SSCs: Amphibians and Reptiles, Arthropods, Birds, Freshwater Fishes, Marine Fishes, Marine Mammals, Molluscs, Mosses and Lichens, Terrestrial Mammals and Vascular Plants.

For more information please see [http://www.cosewic.gc.ca/eng/sct4/index\\_e.cfm](http://www.cosewic.gc.ca/eng/sct4/index_e.cfm)

SSC meetings take place annually in different locations in Canada or by teleconference held once or twice a year. Observers are invited to attend and public information sessions may also take place.

Aside from their continued work to ensure that high quality status reports are brought to each COSEWIC Wildlife Species Assessment Meeting, SSCs also periodically undertake special projects aimed at assisting the work of the SSCs. For example, the Amphibians & Reptiles SSC plans to update the rationale and refine the boundaries for the Amphibians & Reptiles Terrestrial Faunal Provinces map. A new map will assist the SSC in spatially delineating designatable units. The Marine Fishes SSC proposed an approach for assessing Chinook Salmon Designatable Units that COSEWIC approved in principle. Similarly, the Freshwater Fishes SSC is working on a Designatable Unit structure for Whitefish and Ciscoes.

COSEWIC is extremely grateful for the important work of the SSC members who provide their time and expertise on a volunteer basis.

## 7. COSEWIC Operations and Procedures:

Section 19 of SARA states that COSEWIC “may make rules respecting the holding of meetings and the general conduct of its activities.”

COSEWIC is guided in its activities by an Operations and Procedures Manual that is reviewed annually by COSEWIC’s Operations and Procedures Subcommittee, who recommend any necessary changes to the Committee for their approval. During this reporting period, the COSEWIC Operations and Procedures Manual was updated to reflect some minor changes in COSEWIC’s procedures. The most notable changes are as follows:

- Addition of two new members to the ATK Subcommittee to alleviate the workload.
- Addition of two new members for the Vascular Plants Specialist Subcommittee (from 10 to 12 members) and one new member for the Amphibians & Reptiles Specialist Subcommittee (from 9 to 10 members) to assist with the increased workload associated with reassessments. The number of members may be subsequently reduced if the workload decreases in the future.
- A Threats Classification and Assessment Calculator is now included in species status reports. Each Threats Calculator is completed with the collective input from SSC Co-chairs, jurisdictions, Secretariat staff and others who participate in teleconferences organized by the Secretariat. Dave Fraser, member from British Columbia, spearheaded this important undertaking for COSEWIC over the past few years. He has conducted workshops, attended subcommittee meetings, participated in numerous teleconferences and provided advice to SSC Co-chairs upon request. COSEWIC is very appreciative of his expertise, efforts and the considerable amount of time he has devoted to this task.

COSEWIC wishes to acknowledge the significant contributions of Dr. Simon Nadeau, member from Fisheries & Oceans Canada, who served as Chair of the Operations & Procedures Subcommittee from 2010 to 2014. Dr. Dwayne Lepitzki (Co-chair, Molluscs Specialist Subcommittee) will succeed him in that role.

## 8. Procedural Working Groups:

Section 18 (1) of SARA also allows COSEWIC to establish subcommittees to advise it or to exercise or perform any of its functions.

Procedural working groups are essential to ensuring COSEWICs operations and procedures are efficient, effective and clearly followed, thus maintaining the quality and consistency of COSEWIC status assessments and processes.

a) Press Release Working Group

This Working Group is active before and during each Wildlife Species Assessment Meeting on the production of each press release.

b) Criteria Working Group

This Working Group provides ongoing reviews and updates of COSEWIC criteria and their application based on changes to IUCN criteria.

c) New Species Priority Setting Working Group

This Working Group has developed a more consistent and stringent process for prioritizing new species for assessment by COSEWIC. The new prioritization process includes the use of RAMAS software that incorporates uncertainty and consideration of new criteria such as Existing Data and Search Effort and whether a proposed species can be bundled. The updated process was approved by COSEWIC and a revised template is being developed.

d) Species Bundling Working Group

This Working Group is overseeing a call for bids in Fall 2014 (subject to financial resources being available) for an Ecosystem Level Threat Analysis report for species in the South Okanagan. COSEWIC will be reassessing many species in that region in the near future, particularly vascular plants and birds. The information gathered for this report will potentially allow COSEWIC to bundle species with common threats for assessment. The aim is to build on what exists and also to provide a good historical analysis. The Working Group anticipates that in 2016 an interim report would be brought to COSEWIC.

e) Interpreting “Wild by Nature” Working Group

This Working Group was struck following a request from the Canadian Wildlife Service to provide COSEWIC’s definition (i.e. interpretation) of “Wild by Nature”. Its work is in progress.

f) Terrestrial Ecozones Working Group

A new working group was formed to review and update the COSEWIC Terrestrial Ecozones Maps.

## 9. Election – Chair of COSEWIC

Section 19(a) of SARA states that COSEWIC may make rules respecting the holding of meetings and the general conduct of its activities, including rules respecting the selection of persons to chair its meetings

Dr. Marty Leonard ended her second term as Chair of COSEWIC at the end of the August, 2014. Following procedures set out in the COSEWIC Operations and Procedures Manual, a nomination Committee was struck in April, 2013, in preparation for the election of a new Chair of COSEWIC. David Fraser, member from British Columbia, chaired the Nominating Committee comprised of several members of COSEWIC. At the Wildlife Species Assessment Meeting in April, 2014, he presented two candidates for the position including Dr. Eric (Rick) Taylor, Co-chair, Freshwater Fishes Specialist Subcommittee, the top ranked candidate. Members voted and Dr. Taylor was elected Chair of COSEWIC for a two-year (renewable) term of office (September 1, 2014 – August 31, 2016).

Dr. Taylor thanked the membership for electing him as Chair and expressed appreciation to the former Chair and others for their offers of support.

Dr. Marty Leonard was recognized for her outstanding contributions as Chair of COSEWIC since 2010.

## 10. COSEWIC Communications:

Insofar as resources allow, COSEWIC and its Chairs over the years have made every effort to inform managers and the public on the work of the Committee.

During the current reporting period, COSEWIC released two press releases outlining the results of the Fall 2013 and the Spring 2014 Wildlife Species Assessment Meetings. These releases can be found on the COSEWIC website at [www.cosewic.gc.ca](http://www.cosewic.gc.ca).

In addition, the Chair of COSEWIC, Dr. Marty Leonard, attended the following meetings and gave presentations on the work of COSEWIC:

- Participated in a teleconference on August 20, 2013 with the Executive Director, Canadian Bison Association, during which time Dr. Justina Ray, Co-chair, Terrestrial Mammals Specialist Subcommittee, spoke about the COSEWIC assessment process, particularly as it relates to Wood and Plains Bison, which were assessed November 2013.
- Participated in a teleconference with the Hunting and Trapping Organization chairs along with representatives of Wildlife Management Boards and Canadian Wildlife Service staff on October 22, 2013, related to the Peary Caribou recovery strategy, where Dr. Justina Ray gave a presentation on COSEWIC.
- Participated in a symposium at Lakehead University on extinction November 14 - 16, 2013 and spoke about how COSEWIC considers extinction risk when prioritizing and assessing species.
- Met with Sue Milburn-Hopwood, Director General for, the Canadian Wildlife Service, along with Donna Hurlburt, Co-chair of the ATK Subcommittee on October 31, 2013.
- Gave a presentation on the application of COSEWIC criteria to the Committee on the Status of Species at Risk in Ontario on December 10, 2013.
- Gave a presentation on COSEWIC activities and challenges to the Canadian Wildlife Directors Committee on May 9, 2014.
- Met with the Minister of the Environment on April 3, 2014, to discuss plans for the ATK Gathering Project on Narwhal and delays with COSEWIC appointments and meeting (event plan) approvals.

In addition, Dr. Simon Nadeau, member from Fisheries & Oceans Canada, made a presentation on February 11, 2014 to the Mining Association of Canada's Environment and Science Committee on the COSEWIC process and opportunities for early engagement in the process.

## **ITEM II – COSEWIC MEMBERSHIP**

Section 16 of SARA states that (1) COSEWIC is to be composed of members appointed by the Minister after consultation with the Canadian Endangered Species Conservation Council and with any experts and expert bodies, such as the Royal Society of Canada, that the Minister considers to have relevant expertise. (2) Each member must have expertise drawn from a discipline such as conservation biology, population dynamics, taxonomy, systematics or genetics or from community knowledge or aboriginal traditional knowledge of the conservation of wildlife species. (3) The members are to be appointed to hold office for renewable terms of not more than four years.

## 1. Membership Changes:

For a current list of members on COSEWIC, please see the COSEWIC website.

[http://www.cosewic.gc.ca/eng/sct6/sct6\\_4\\_e.cfm](http://www.cosewic.gc.ca/eng/sct6/sct6_4_e.cfm)

Members from the Federal, Provincial or Territorial jurisdictions are recommended to the Federal Minister of the Environment by the jurisdiction.

The Co-chairs of the ATK Subcommittee, as are all ATK Subcommittee members, are nominated by National Aboriginal Organizations with the exception of two of its members to be nominated by the ATK Subcommittee. Subcommittee members are appointed by the Minister of the Environment. Co-chairs are elected by the ATK Subcommittee membership and recommended to the Minister for appointment to that position. In 2013, Dan Benoit, member of the ATK Subcommittee, was elected Co-chair of the ATK Subcommittee to replace the former Co-chair, Dean Trumbley. He was subsequently appointed to that position for a four-year term by the Minister of Environment. Dr. Donna Hurlburt, Co-chair, was re-elected to that position by the ATK Subcommittee and has been recommended to the Minister for re-appointment to COSEWIC for a further four-year term of office, effective January 1, 2015.

Species Specialist Subcommittee Co-chairs and Non-government Science Members are recommended to the Minister of the Environment by COSEWIC following an in-depth review process.

A call for six Species Specialist Subcommittee Co-chairs and one Non-government Science member, with terms ending on December 31, 2014, was posted on the COSEWIC website between January 22 and February 19, 2014. Once the call was closed, Selection Committees comprised of both COSEWIC members and Species Specialist Subcommittee members scrutinized the applications following procedures for member selection set out in COSEWIC's Operations & Procedures Manual. The Chairs of each Selection Committee prepared reports summarizing the strengths and weaknesses of the applicants, which were discussed at the Spring 2014 Wildlife Species Assessment meeting. Candidates were ranked by COSEWIC members and their names and CVs were provided to the Federal Minister of the Environment and CESCC in May 2014 for consideration of appointment. As the Call for the Co-chair of the Arthropods Specialist Subcommittee was unsuccessful in attracting suitable applicants, the Call was reposted from 12 June to 10 July, 2014 and attracted two qualified applicants. Following selection by COSEWIC, the names and CVs of both ranked nominees for appointment were provided to the Federal Minister of the Environment and CESCC on August 26, 2014.

### ITEM III – WILDLIFE SPECIES ASSESSMENTS

In accordance with Section 25(1) of SARA when COSEWIC completes an assessment of the status of a wildlife species, it must provide the Minister and the Canadian Endangered Species Conservation Council with a copy of the assessment and the reasons for it. A copy of the assessment must also be included on the public registry.

Wildlife Species assessed since the last annual report, including status assigned, reasons for designation (including uncertainties if applicable) and COSEWIC criteria with alphanumeric codes are provided in Appendix I.

The status reports will be available in English and French on the Public Registry at the following address: <http://www.sararegistry.gc.ca/>

### ITEM IV – WILDLIFE SPECIES ASSESSED BY COSEWIC SINCE ITS INCEPTION

In accordance with Section 25(2) of SARA, COSEWIC must annually prepare a complete list of every wildlife species it has assessed since the coming into force of that section and a copy of that list must be included in the public registry.

*The Canadian Species at Risk* publication is available on the Public Registry <http://www.sararegistry.gc.ca>

It includes all wildlife species assessed by COSEWIC since its inception up to and including October, 2013.

#### APPENDICES

- 1 – Wildlife Species Assessment Results
- 2 – Response to Referral Back – Humpback Whale (North Pacific Population)

**APPENDIX I**

## COSEWIC Wildlife Species Assessments (detailed version), November 2013\*

Results are grouped by taxon and then by status category. The range of occurrence in Canada (by province, territory or ocean) and history of status designation are provided for each wildlife species.

### **Mammals**

**Little Brown Myotis** *Myotis lucifugus* **Endangered**  
Assessment Criteria A3be+4abe

#### Reason for Designation

Approximately 50% of the global range of this small bat is found in Canada. Sub-populations in the eastern part of the range have been devastated by White-nose Syndrome, a fungal disease caused by an introduced pathogen. This disease was first detected in Canada in 2010, and to date has caused a 94% overall decline in known numbers of hibernating *Myotis* bats in Nova Scotia, New Brunswick, Ontario, and Québec. The current range of White-nose Syndrome has been expanding at an average rate of 200-250 kilometres per year. At that rate, the entire Canadian population is likely to be affected within 12 to 18 years. There is no apparent containment of the northward or westward spread of the pathogen, and proper growing conditions for it exist throughout the remaining range.

Range YT NT BC AB SK MB ON QC NB PE NS NL

#### Status History

Designated Endangered in an emergency assessment on February 3, 2012. Status re-examined and confirmed in November 2013.

**North Atlantic Right Whale** *Eubalaena glacialis* **Endangered**  
Assessment Criteria D1

#### Reason for Designation

This long-lived, slowly reproducing whale species was driven nearly to extinction by commercial whaling but has been protected from whaling since 1935. The whales found in Canada are part of a single global population of the species, which is endemic to the North Atlantic Ocean. Since 1990, the total population has been increasing at a rate of approximately 2.4% per year. The total population in 2010, including all age classes, was estimated at 468 individuals, of which between 122 and 136 were adult females. The estimated number of mature individuals, after accounting for a male-biased sex ratio among adults, and for a small number of females that are incapable of reproducing, is between 245 and 272. The rate of population growth is lower than would be predicted based on the biology of the species and is limited by ship strikes and entanglements in fishing gear. Although measures have been implemented in both Canada and the United States to lessen ship strikes, they continue to occur and ship traffic is expected to increase significantly within the range of the species in coming decades. Further, adult females appear to be more prone to being struck than males. Limited efforts have also been made to reduce the incidence and severity of entanglements, but these events remain a major cause of injury and mortality.

Range Atlantic Ocean

#### Status History

The Right Whale was considered a single species and designated Endangered in 1980. Status re-examined and confirmed in April 1985 and in April 1990. Split into two species in May 2003 to allow a separate designation of the North Atlantic Right Whale. North Atlantic Right Whale was designated Endangered in May 2003 and November 2013.

**Northern Myotis** *Myotis septentrionalis* **Endangered**

Assessment Criteria A3be+4abe

Reason for Designation

Approximately 40% of the global range of this northern bat is in Canada. Sub-populations in the eastern part of the range have been devastated by White-nose Syndrome, a fungal disease caused by an introduced pathogen. This disease was first detected in Canada in 2010 and to date has caused a 94% overall decline in numbers of known hibernating *Myotis* bats in Nova Scotia, New Brunswick, Ontario, and Québec hibernacula compared with earlier counts before the disease struck. Models in the northeastern United States for Little Brown Myotis predict a 99% probability of functional extirpation by 2026. Given similar life history characteristics, these results are likely applicable to this species. In addition to its tendency to occur in relatively low abundance levels in hibernacula, there is some indication this species is experiencing greater declines than other species since the onset of White-nose Syndrome. The current range of White-nose Syndrome overlaps with approximately one third of this species' range and is expanding at an average rate of 200 to 250 kilometres per year. At that rate, the entire Canadian population will likely be affected within 12 to 18 years. There is no apparent containment of the northward or westward spread of the pathogen, and proper growing conditions for it exist throughout the remaining range.

Range YT NT BC AB SK MB ON QC NB PE NS NL

Status History

Designated Endangered in an emergency assessment on February 3, 2012. Status re-examined and confirmed in November 2013.

**Tri-colored Bat** *Perimyotis subflavus* **Endangered**

Assessment Criteria A2abe+3be+4abe

Reason for Designation

This bat is one of the smallest bats in eastern North America. Approximately 10% of its global range is in Canada, and it is considered rare in much of its Canadian range. Declines of more than 75% have occurred in the known hibernating populations in Québec and New Brunswick due to White-nose Syndrome. This fungal disease, caused by an invasive pathogen, was first detected in Canada in 2010, and has caused similar declines in Little Brown Myotis and Northern Myotis in eastern Canada and the northeastern United States. Most of the Canadian range of the species overlaps with the current White-nose Syndrome range, and further declines are expected as more hibernacula continue to become infected.

Range ON QC NB NS

Status History

Designated Endangered in an emergency assessment on February 3, 2012. Status re-examined and confirmed in November 2013.

**Plains Bison** *Bison bison bison* **Threatened**

Assessment Criteria C2a(i)

Reason for Designation

This bison occurs in only five isolated wild subpopulations in Canada. There are approximately 1,200 to 1,500 mature individuals, of which about half occur in one subpopulation located outside of the historical range. The total number of individuals has increased by 36% since the last assessment in 2004, but the total remains a tiny fraction of their numbers of 200 years ago. Currently they occupy less than 0.5% of their original range in Canada. This animal continues to face a number of threats to its persistence. Further increases in population size or the addition of new subpopulations is curtailed by fragmented or unsuitable habitat that is often managed to exclude bison. An overall decline is projected for wild subpopulations because they are managed to control or reduce population size and are subject to unpredictable but potentially catastrophic future events, mainly disease outbreaks and extreme weather.

Range BC AB SK

Status History

Designated Threatened in May 2004. Status re-examined and confirmed in November 2013.

**Steller Sea Lion** *Eumetopias jubatus* **Special Concern**

Assessment Criteria not applicable

Reason for Designation

This species is restricted to only five breeding locations (consisting of 7 rookeries) in British Columbia that occupy less than 10 km<sup>2</sup>, with approximately 70% of births occurring at a single location (Scott Islands). The population is increasing, but is sensitive to human disturbance while on land and is vulnerable to catastrophic events such as major oil spills due to its highly concentrated breeding aggregations. The species is near to qualifying for Threatened, but has recovered from historical culling and deliberate persecution.

Range BC Pacific Ocean

Status History

Designated Not at Risk in April 1987. Status re-examined and designated Special Concern in November 2003 and November 2013.

**Wood Bison** *Bison bison athabasca* **Special Concern**

Assessment Criteria not applicable

Reason for Designation

This bison only occurs in the wild in Canada. There are currently 5,136 to 7,172 mature individuals in nine isolated wild subpopulations. The population has increased since 1987, mostly due to the establishment of new wild subpopulations within the original range. About 60% of the overall population is included in Wood Buffalo National Park and surrounding areas, and is affected by two cattle diseases, bovine brucellosis and tuberculosis. Two wild subpopulations have recently experienced significant mortality events demonstrating the inherent vulnerability of small isolated populations. The Mackenzie herd decreased by 53% due to an outbreak of anthrax and the Hay-Zama decreased by 20% due to starvation during a severe winter. Further increases to the population size or the addition of new wild subpopulations is not likely, as recovery is constrained by fragmented or unsuitable habitat, road mortality, disease management associated with livestock and commercial bison operations, and disease outbreaks.

Range YT NT BC AB MB

Status History

Designated Endangered in April 1978. Status re-examined and designated Threatened in April 1988 and May 2000. Status re-examined and designated Special Concern in November 2013.

## **Birds**

**Piping Plover *circumcinctus* subspecies** *Charadrius melodus circumcinctus* **Endangered**

Assessment Criteria C2a(ii)

Reason for Designation

The interior subspecies of this shorebird is projected to decline over the longer term, particularly if concerted conservation efforts are relaxed. Overall numbers remain low and adult survival has been poor over the last decade. Threats from predation, human disturbance, and declines in habitat extent and quality continue.

Range AB SK MB ON

Status History

The species was considered a single unit and designated Threatened in April 1978. Status re-examined and designated Endangered in April 1985. In May 2001, the species was re-examined and split into two groups according to subspecies. The *circumcinctus* subspecies was designated Endangered in May 2001. Status re-examined and confirmed in November 2013.

**Piping Plover *melodus* subspecies**      ***Charadrius melodus melodus***      **Endangered**  
Assessment Criteria C2a(i)

Reason for Designation

Numbers of the eastern subspecies of this small shorebird remain extremely low and the population continues to decline, despite concerted conservation efforts. Threats from predation, human disturbance, and declines in habitat extent and quality also continue.

Range QC NB PE NS NL

Status History

The species was considered a single unit and designated Threatened in April 1978. Status re-examined and designated Endangered in April 1985. In May 2001, the species was re-examined and split into two groups according to subspecies. The *melodus* subspecies was designated Endangered in May 2001 and November 2013.

**Short-tailed Albatross**      ***Phoebastria albatrus***      **Threatened**  
Assessment Criteria D2

Reason for Designation

This species came close to extinction following decades of feather harvesting at its breeding colonies in the North Pacific. Since the end of the feather harvest, the population has increased significantly, although still well below historic numbers. The breeding population is, however, virtually restricted to two islands, one of which contains 85% of the breeding birds. The small breeding range makes the species highly susceptible to human activities or stochastic events.

Range BC Pacific Ocean

Status History

Designated Threatened in November 2003. Status re-examined and confirmed in November 2013.

**Grasshopper Sparrow, *pratensis* subspecies**      ***Ammodramus savannarum pratensis***      **Special Concern**  
Assessment Criteria not applicable

Reason for Designation

In Canada, this grassland bird is restricted to southern Ontario and southwestern Quebec. This subspecies has experienced persistent, long-term declines. It faces several ongoing threats including habitat loss, as pastures and hayfields are converted to row crops, habitat fragmentation, which increases predation rates, and mowing activities that destroy nests.

Range ON QC

Status History

Designated Special Concern in November 2013.

<b>Harlequin Duck</b>	<b><i>Histrionicus histrionicus</i></b>	<b>Special Concern</b>
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**Eastern population**Assessment Criteria not applicableReason for Designation

Though increases have been recorded in southern parts of its breeding range, the population size of this sea duck remains relatively small. Its tendency to congregate in large groups when moulting and on its marine wintering areas makes it susceptible to catastrophic events such as oil spills. Such threats are substantial and are likely increasing, and are of particular significance for populations of long-lived species such as this sea duck, which can be slow to recover. Its population also appears to rely on continued management efforts, particularly those involving restrictions on hunting.

Range NU QC NB NS NLStatus History

The Eastern population was designated Endangered in April 1990. Status re-examined and designated Special Concern in May 2001 and November 2013.

## **Amphibians**

<b>Eastern Tiger Salamander</b>	<b><i>Ambystoma tigrinum</i></b>	<b>Endangered</b>
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**Prairie population**Assessment Criteria B1ab(iii)c(iv)+2ab(iii)c(iv)Reason for Designation

This salamander is known from only six sites in Canada within a landscape modified by livestock production, pastures, and forage crops, and intersected by roads. There are recent records from only one of these sites, and the species may be extirpated from one site. The persistence of populations is precarious because of the salamander's small Canadian range, isolation of populations, and the tendency of salamander numbers to fluctuate widely among years, exacerbated by increasing frequency of droughts and other severe weather events.

Range MBStatus History

The Tiger Salamander (*Ambystoma tigrinum*) was originally assessed by COSEWIC in November 2001 as three separate populations: Great Lakes population (Extirpated), Prairie / Boreal population (Not at Risk), and Southern Mountain population (Endangered). In November 2012, Tiger Salamander was split into two separate species, Eastern Tiger Salamander (*Ambystoma tigrinum*) and Western Tiger Salamander (*Ambystoma mavortium*), each with two different populations that received separate designations. The Prairie population of the Eastern Tiger Salamander was designated Endangered in November 2013.

<b>Rocky Mountain Tailed Frog</b>	<b><i>Ascaphus montanus</i></b>	<b>Threatened</b>
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Assessment Criteria C1+2a(i)Reason for Designation

In Canada, this unusual stream-breeding frog is restricted to two unconnected watersheds, where it relies on small, forested fast-flowing streams. Habitat damage from sedimentation due primarily to roads, logging, and fires, and loss of terrestrial dispersal habitat from logging and wood harvesting are key threats. The total population is small, consisting of approximately 3000 adults, which increases the vulnerability of the population to environmental perturbations. Increases in habitat protection and a moratorium on mining in the Flathead River portion of the range resulted in a change of status from Endangered.

Range BCStatus History

Designated Endangered in May 2000. Status re-examined and designated Threatened in November 2013.

## **Fishes**

**Bocaccio** *Sebastes paucispinis* **Endangered**

Assessment Criteria A2b

Reason for Designation

This species is a long-lived rockfish with a maximum age for females in Canada of 52 years and a generation time of 20 years. Its life history makes it susceptible to overfishing. The current assessment has benefited from increased population information that covers the entire distribution in Canada and extends much further into the past. The population has been in continuous decline for 60 years and it has declined by 28% in the 10-year period since it was first assessed by COSEWIC. New surveys initiated since the last assessment indicate that these recent declines have occurred in areas of highest biomass off the west coast of Vancouver Island and in Queen Charlotte Sound. Fishery bycatch has been reduced but remains the main threat to the population.

Range Pacific Ocean

Status History

Designated Threatened in November 2002. Status re-examined and designated Endangered in November 2013.

**White Hake** *Urophycis tenuis* **Endangered**

**Southern Gulf of St. Lawrence population**

Assessment Criteria A2b+3b+4b; E

Reason for Designation

This population increased during the mid-1970s to a peak in the mid-1980s before undergoing a steep decline, which leveled out by the mid-1990s. The overall decline rate has been 91% over the past 3 generations. The area of occupancy followed a similar though less dramatic trend, and one segment of the population seems to have disappeared. The non-fishing adult mortality rate of the population increased dramatically in the 1990s and it remains extremely high. If this continues, the population is unlikely to be viable in the long term. Thus, numbers remain low, with minimal recovery, despite the cessation of fisheries directed toward this species. While fisheries were the primary cause of the decline, it appears that high non-fishing mortality, perhaps by Grey Seal predation, may be preventing recovery since then.

Range Atlantic Ocean

Status History

Designated Endangered in November 2013.

**White Hake** *Urophycis tenuis* **Threatened**

**Atlantic and Northern Gulf of St. Lawrence population**

Assessment Criteria Met criteria for Endangered, A1b, but designated Threatened, A1b, because abundance has stabilized over the past generation, in parallel with a reduction in fishing mortality.

Reason for Designation

Adults in this population are estimated to have declined by approximately 70% over the past three generations. Most of this decline occurred before the mid-1990s. The population has remained fairly stable since then, and there has been little overall trend in area of occupancy. Restrictions on fisheries since the mid to late 1990s over most of their range may be responsible for stabilizing their numbers.

Range Atlantic Ocean

Status History

Designated Threatened in November 2013.

**Cutlip Minnow** *Exoglossum maxillingua* **Special Concern**

Assessment Criteria not applicable

Reason for Designation

This small-bodied freshwater fish occurs across a relatively small area in eastern Ontario and Québec where it has been lost from two watersheds over the last 10 years. Much of the current range of this species is subject to threats from widespread habitat degradation and multiple invasive species.

Range ON QC

Status History

Designated Not at Risk in April 1994. Status re-examined and designated Special Concern in November 2013.

**Giant Threespine Stickleback** *Gasterosteus aculeatus* **Special Concern**

Assessment Criteria not applicable

Reason for Designation

This freshwater stickleback is of unusually large size and is currently known to exist in two small lakes that are in relatively remote areas. The populations could, however, quickly become Endangered if invasive species were to be introduced as has been observed in other stickleback populations.

Range BC

Status History

Designated Special Concern in April 1980. Status re-examined and confirmed in November 2013.

**Green Sturgeon** *Acipenser medirostris* **Special Concern**

Assessment Criteria not applicable

Reason for Designation

This is a large-bodied fish species that is slow to grow and mature. The number of individuals in Canadian waters is unknown, but is undoubtedly not large. This species is globally at risk, and known threats are fisheries by-catch in both Canada and the United States, and habitat loss and degradation owing to water extraction, industrial and recreational development, and construction of dams in the United States where all known spawning locations are found.

Range BC Pacific Ocean

Status History

Designated Special Concern in April 1987. Status re-examined and confirmed in November 2004 and November 2013.

**Unarmoured Threespine Stickleback** *Gasterosteus aculeatus* **Special Concern**

Assessment Criteria not applicable

Reason for Designation

This morphologically distinctive small-bodied freshwater fish is currently known to exist in only three very small lakes that are in a relatively remote area. The populations could, however, quickly become Endangered if invasive species were to be introduced as has been observed in other stickleback populations.

Range BC

Status History

Designated Special Concern in April 1983. Status re-examined and confirmed in November 2013.

## **Arthropods**

**Oregon Branded Skipper** *Hesperia colorado oregonia* **Endangered**  
Assessment Criteria B1ab(iii)+2ab(iii)

Reason for Designation

This species inhabits sparsely vegetated Garry Oak and coastal sand spit ecosystems that have undergone enormous historic losses. The populations of this skipper have likely undergone similar declines and only four of sixteen sites totaling less than 16 km<sup>2</sup> remain extant. This habitat is fragmented and disjunct. The greatest threats this skipper faces at present, however, are the application of Btk pesticide, used to control the invasive Gypsy Moth, and vegetation succession in the open habitats.

Range BC

Status History

Designated Endangered in November 2013.

**Sand-verbena Moth** *Copablepharon fuscum* **Endangered**  
Assessment Criteria B2ab(iii)

Reason for Designation

This moth and its host plant are habitat specialists dependent on coastal sand ecosystems, a rare and declining habitat along the West Coast of British Columbia. The species occurs at five small and isolated sites within a habitat that is highly threatened by erosion from increased winter storms and sea level rise, dune stabilization by invading vegetation, industrial and recreational development, recreational use, and the potential aerial application of pesticide to control the Gypsy Moth. The host plant and therefore the moth are facing continuing declines due to on-going erosion and degradation of coastal dunes.

Range BC

Status History

Designated Endangered in November 2003. Status re-examined and confirmed in November 2013.

**Audouin's Night-stalking Tiger Beetle** *Omus audouini* **Threatened**  
Assessment Criteria B1ab(iii)+2ab(iii)

Reason for Designation

This beetle is restricted to a small area in the Georgia Basin of southwestern British Columbia, within a narrow strip of coastal lowland around Boundary Bay and Greater Victoria. Major threats include habitat loss through agricultural and urban development, vegetation succession in open habitats, disturbance from recreational activities, and, in the longer term, sea level rise. There are fewer than ten known sites, and the discovery of more populations is unlikely. The species is flightless and thus dispersal is limited.

Range BC

Status History

Designated Threatened in November 2013.

## **Molluscs**

### **Yellow Lampmussel**

*Lampsilis cariosa*

**Special Concern**

Assessment Criteria not applicable

#### Reason for Designation

Populations still occur in the Sydney River watershed, Nova Scotia, and in the Saint John River watershed, New Brunswick. In addition, a new site has been found at Pottle Lake in Nova Scotia. While cumulative threat impacts from non-native species of fish and from industrial pollution are high, there is uncertainty about the timing and possibility of invasion by Zebra Mussels and the impact of non-native species of fish on host fish for the Yellow Lampmussel.

Range NB NS

#### Status History

Designated Special Concern in May 2004. Status re-examined and confirmed in November 2013.

## **Vascular Plants**

### **Tweedy's Lewisia**

*Lewisiopsis tweedyi*

**Endangered**

Assessment Criteria B1ab(v)+2ab(v); C2a(i,ii); D1

#### Reason for Designation

This showy perennial plant is known only from Washington and British Columbia. It exists in Canada as two small subpopulations and has undergone a decline of up to 30% in recent years, possibly due to plant collecting. The small population size and potential impact from changes in moisture regimes due to climate change place the species at on-going risk.

Range BC

#### Status History

Designated Endangered in November 2013.

## **Lichens**

### **Eastern Waterfan**

*Peltigera hydrothyria*

**Threatened**

Assessment Criteria C2a(i)

#### Reason for Designation

This rare lichen is endemic to Eastern North America. In Canada, it is known only from New Brunswick, Nova Scotia and Québec. It grows at or below water level in cool, clear, partially-shaded streams. It is threatened in the short term by disturbance from activities which cause stream siltation, alteration of microclimate and declines in water quality. In the longer term, changes in weather patterns that alter water levels and flow in its preferred habitat are another threat.

Range QC NB NS

#### Status History

Designated Threatened in November 2013.

**Western Waterfan*****Peltigera gowardii*****Special Concern**

Assessment Criteria not applicable

Reason for Designation

This lichen is endemic to western North America. There are only five known occurrences in Canada, all in British Columbia, and two former occurrences appear to be extirpated. This lichen is unique in growing at or below water level in clear, permanent, unshaded alpine or subalpine streams. Habitat loss is likely to result from temperature increases caused by climate change. Because of that change, larger plant species currently below the subalpine zone will be able to grow at higher elevations. Subalpine meadows are therefore predicted to become increasingly colonized by shading vegetation. Also, increasing drought will transform permanent watercourses into ephemeral streams.

Range BC

Status History

Designated Special Concern in November 2013.

\* The review of classification of the Bering Cisco (*Coregonus laurettae*) was completed. COSEWIC decided that a fully updated status report is required to assess the status of this wildlife species. The Northwestern Cellar Spider (*Psilochorus hesperus*) was withdrawn to incorporate more information on search effort, rescue potential, and number of locations.

21/02/2014

## COSEWIC Wildlife Species Assessments (detailed version), May 2014\*

Results are grouped by taxon and then by status category. The range of occurrence in Canada (by province, territory or ocean) and history of status designation are provided for each wildlife species.

### **Mammals**

<b>Caribou</b> <b>Southern Mountain population</b> Assessment Criteria A3a+4a; C1	<b><i>Rangifer tarandus</i></b>	<b>Endangered</b>
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#### Reason for Designation

This population is largely restricted to Canada, except for < 40 animals in Idaho and Washington. It occurs in 15 extant subpopulations in southeastern British Columbia. Two subpopulations have been extirpated since 2002. The current estimate for the population is 1,356 mature individuals, which has declined by at least 45% in the past three generations, and 27% since the last assessment in 2002. All but two extant subpopulations are estimated to contain fewer than 250 mature individuals, with 9 of these having fewer than 50, and 6 with fewer than 15 mature individuals. Dispersal within the ranges of 11 subpopulations is severely limited. Surveys have shown consistently high adult mortality and low calf recruitment, accelerating decline rates. Threats are continuing and escalating.

#### Range BC

#### Status History

The Southern Mountain population was designated Threatened in May 2000. This population was formerly designated as part of the "Western population" (now de-activated). Status re-examined and confirmed in May 2002. Following the Designatable Unit report on caribou (COSEWIC 2011), a new population structure was proposed and accepted by COSEWIC. This resulted in the new Southern Mountain population, composed of 17 subpopulations from the former Southern Mountain population of Caribou (COSEWIC 2002). The remaining subpopulations were assigned to the new Central and Northern Mountain populations. The Southern Mountain population was designated Endangered in May 2014.

<b>Caribou</b> <b>Central Mountain population</b> Assessment Criteria A2a+3a+4a; C1+2a(i)	<b><i>Rangifer tarandus</i></b>	<b>Endangered</b>
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#### Reason for Designation

This population is endemic to Canada and occurs in 10 extant subpopulations in east-central British Columbia and west-central Alberta in and around the Rocky Mountains. The current estimate for the population is 469 mature individuals and it has declined by at least 64% over the past 3 generations. One subpopulation in central British Columbia was confirmed extirpated in 2014, and an additional one in Banff in 2010. All extant subpopulations are estimated to contain fewer than 250 mature individuals, with 4 of these having fewer than 50. Two recognized subpopulations in 2002 have since split due to lack of dispersal within former ranges. All subpopulations have experienced declines of about 60% since the last assessment in 2002, and declines continue for all but one subpopulation, which has an unknown trend. Surveys have shown consistently high adult mortality and low calf recruitment, accelerating decline rates. Threats are continuing and escalating.

#### Range BC AB

#### Status History

Following the Designatable Unit report on caribou (COSEWIC 2011), a new population structure was proposed and accepted by COSEWIC. This resulted in the new Central Mountain population, composed of 12 subpopulations from the previous Southern Mountain population of Caribou (COSEWIC 2002). The Central Mountain population was designated Endangered in May 2014.

<b>Caribou</b>	<b><i>Rangifer tarandus</i></b>	<b>Special Concern</b>
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**Northern Mountain population**Assessment Criteria not applicableReason for Designation

This population occurs in 45 subpopulations ranging from west-central British Columbia to the Yukon and western Northwest Territories. Almost all of its distribution is in Canada, where it numbers about 43,000 - 48,000 mature individuals. There is little long-term (three generations) trend information, and many current estimates are based on survey data more than 5 years old. Currently 2 subpopulations are thought to be increasing, 7 are stable and 9 are declining. The condition of the remaining 27 subpopulations is unknown. The two largest subpopulations comprise > 15,000 animals, or 26-29% of the estimated population, and are thought to be stable. About half of the 45 subpopulations each contain < 500 individuals. All stable or increasing subpopulations are located in the northern part of the range, whereas 9 in the southern part of the range have declined by 27% since the last assessment. The status of northern subpopulations may be compromised in the future because of increasing threats, particularly land use change with industrial development causing shifts in predator-prey dynamics.

Range YT NT BCStatus History

The Northern Mountain population was designated Not at Risk in May 2000. This population was formerly designated as part of the "Western population" (now de-activated). Status re-examined and designated Special Concern in May 2002. Following the Designatable Unit report on caribou (COSEWIC 2011), a new population structure was proposed and accepted by COSEWIC. This new Northern Mountain population is composed of all 36 subpopulations in the previous Northern Mountain population of Caribou in addition to 9 subpopulations from the previous (2002) Southern Mountain population. The Northern Mountain population was designated Special Concern in May 2014.

**Wolverine*****Gulo gulo*****Special Concern**Assessment Criteria not applicableReason for Designation

This wide-ranging carnivore has an estimated Canadian population likely exceeding 10,000 mature individuals. Although population increases appear to be occurring in portions of the Northwest Territories, Nunavut, Manitoba and Ontario, declines have been reported in the southern part of the range, e.g. in British Columbia, and populations in a large part of the range (Quebec and Labrador) have not recovered. The species may be extirpated from Vancouver Island. Population estimates are very limited, and trends are not known. Most data are limited to harvest records, and harvest levels may be under-reported because many pelts used domestically are not included in official statistics. There is no evidence, however, of a decline in harvest over the last 3 generations. This species' habitat is increasingly fragmented by industrial activity, especially in the southern part of its range, and increased motorized access increases harvest pressure. Climate change is likely impacting animals in the southern part of the range, and this impact is expected to increase northward. The species has a low reproductive rate, is sensitive to human disturbance, and requires vast secure areas to maintain viable populations.

Range YT NT NU BC AB SK MB ON QC NLStatus History

The species was considered a single unit and designated Special Concern in April 1982. Split into two populations in April 1989 (Western and Eastern populations). The original designation was de-activated. In May 2014, the Eastern and Western populations were considered as a single unit across the Canadian range and was designated Special Concern.

## **Birds**

### **Loggerhead Shrike Eastern subspecies**

*Lanius ludovicianus ssp.*

**Endangered**

Assessment Criteria C2a(i); D1

#### Reason for Designation

In eastern Canada, this grassland bird species has been experiencing large-scale population declines and range contractions since at least 1970. There has been a 26% observed reduction in the number of mature individuals over the last 10 years in Ontario. These declines are primarily related to loss of suitable grassland habitat on both the breeding and wintering grounds. The Canadian population now numbers fewer than 110 mature individuals.

Range ON QC

#### Status History

The species was considered a single unit and designated Threatened in April 1986. Split according to subspecies (*excubitorides* and *migrans*) in April 1991, and each received separate designations. The *migrans* subspecies was de-activated in May 2014 in recognition of new genetic information indicating that some of the individuals in southeastern Manitoba should not have been included in the *migrans* subspecies. Further split into a new unnamed subspecies (Eastern subspecies, *Lanius ludovicianus ssp.*) in May 2014 and was designated Endangered.

### **Loggerhead Shrike Prairie subspecies**

*Lanius ludovicianus excubitorides*

**Threatened**

Assessment Criteria A2b

#### Reason for Designation

In the Prairie provinces, this grassland bird species has been experiencing large-scale population declines and range contractions, since at least the 1970s. Its population has declined by as much as 47% over the past 10 years. These declines are primarily related to loss of suitable grassland habitat on both the breeding and wintering grounds.

Range AB SK MB

#### Status History

The species was considered a single unit and designated Threatened in April 1986. Split according to subspecies in April 1991. The *excubitorides* subspecies retained the original Threatened designation from April 1986. Status re-examined and confirmed in May 2004 and May 2014.

### **Western Grebe**

*Aechmophorus occidentalis*

**Special Concern**

Assessment Criteria not applicable

#### Reason for Designation

Although population declines have occurred within this waterbird's Canadian wintering area on the Pacific coast, this could largely be the result of a southern shift in wintering distribution rather than a true loss in population size. Nevertheless, on a continental scale, wintering populations have undergone a 44% decline from 1995 to 2010 based on Christmas Bird Count data. Some of this decline may also be the result of declines on the Canadian breeding grounds. In addition, this species' propensity to congregate in large groups, both in breeding colonies and on its wintering areas, makes its population susceptible to a variety of threats, including oil spills, water level fluctuations, fisheries bycatch, and declines in prey availability.

Range BC AB SK MB

#### Status History

Designated Special Concern in May 2014.

## **Reptiles**

### **Eastern Milksnake**

*Lampropeltis triangulum*

**Special Concern**

Assessment Criteria not applicable

#### Reason for Designation

This large, non-venomous snake continues to be relatively widespread in southern Ontario and southwestern Quebec, but has suffered localized declines concurrent with expanding urbanization and intensification of agriculture. The life history characteristics of this species, including late maturation, longevity (up to 20 years), and relatively low reproductive potential, increase its vulnerability to various anthropogenic threats, including habitat loss, persecution and collection for the pet trade.

Range ON QC

#### Status History

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

## **Amphibians**

### **Small-mouthed Salamander**

*Ambystoma texanum*

**Endangered**

Assessment Criteria B1ab(iii,v)+2ab(iii,v)

#### Reason for Designation

The Canadian distribution of this salamander is restricted solely to Pelee Island. The entire Canadian range is only about 40 km<sup>2</sup>, and only three breeding sites are known. Although this species was first assessed as Endangered 10 years ago, there is little new information and new threats exist for this salamander. The continued existence of the population is precarious because of habitat degradation of wetland breeding sites. Predation and habitat destruction by recently introduced Wild Turkeys is a new threat to the existence of salamanders on Pelee Island.

Range ON

#### Status History

Designated Special Concern in April 1991. Status re-examined and designated Endangered in May 2004 and May 2014.

### **Coastal Giant Salamander**

*Dicamptodon tenebrosus*

**Threatened**

Assessment Criteria A3c+4c

#### Reason for Designation

The Canadian distribution of this salamander is restricted to the Chilliwack drainage system in southwestern British Columbia, where it occurs mainly in cool, clear mountain streams and surrounding riparian forest. Major threats include habitat loss, degradation and fragmentation due to forest harvest, road building, and encroaching residential development. These threats may be exacerbated by droughts and flooding events that are predicted to increase with climate change. Poor dispersal ability, low reproductive rate, late maturity, and long generation time increase the vulnerability of the species.

Range BC

#### Status History

Designated Special Concern in April 1989. Status re-examined and designated Threatened in November 2000 and May 2014.

**Wandering Salamander***Aneides vagrans***Special Concern**Assessment Criteria not applicableReason for Designation

The Canadian distribution of this terrestrial salamander is restricted mainly to low elevation forests on Vancouver Island and adjacent small offshore islands in southwestern British Columbia. These salamanders depend on the availability of moist refuges and large diameter logs on the forest floor, as found in intact forests. The salamanders are threatened by logging, residential development, and severe droughts, and storm events predicted under climate change. Low reproductive rate, poor dispersal ability, and specific habitat requirements contribute to the vulnerability of the species.

Range BCStatus History

Designated Special Concern in May 2014.

**Fishes****Copper Redhorse***Moxostoma hubbsi***Endangered**Assessment Criteria B1ab(i,iii,iv,v)+2ab(i,iii,iv,v)Reason for Designation

This long-lived, late-to-mature fish is endemic to Canada where it is known from only three locations, one of which is probably extirpated. The species is exposed to many threats, the most severe of which include habitat degradation and fragmentation, eutrophication, and impacts of invasive species.

Range QCStatus History

Designated Threatened in April 1987. Status re-examined and designated Endangered in November 2004 and May 2014.

**Porbeagle***Lamna nasus***Endangered**Assessment Criteria A2bReason for Designation

The abundance of this shark declined greatly in the 1960s after fisheries began targeting this species. A partial recovery during the 1980s was followed by another collapse in the 1990s. Numbers have remained low but stable in the last decade, since catch has decreased. Directed fisheries have been suspended since 2013, though there is still bycatch of unknown magnitude in Canadian waters and unrecorded mortality in international waters. This species' life history characteristics, including late maturity and low fecundity, render it particularly vulnerable to overexploitation.

Range Atlantic OceanStatus History

Designated Endangered in May 2004. Status re-examined and confirmed in May 2014.

**Rainbow Trout** *Oncorhynchus mykiss* **Endangered**  
**Athabasca River populations**  
Assessment Criteria A4bce

Reason for Designation

This fish is an obligate resident of clear, cold flowing water in the upper Athabasca River drainage of Alberta. Quantitative sampling over the last two decades demonstrates that the majority of sites are declining in abundance with an estimate of >90% decline over three generations (15 years). Threats are assessed as severe due to habitat degradation associated with resource extraction and agricultural practices. Additionally, ongoing climatic change and associated altered thermal regimes and hydrology, habitat fragmentation, introgression from non-native Rainbow Trout, and fishing threaten the species. Potential impact of invasive Brook Trout is a concern.

Range AB

Status History

Designated Endangered in May 2014.

**Banded Killifish** *Fundulus diaphanus* **Special Concern**  
**Newfoundland populations**  
Assessment Criteria not applicable

Reason for Designation

This species has a scattered distribution in insular Newfoundland and occupies a small area of occupancy. The species can be impacted negatively by turbidity and hydrological alterations that result from road, forestry, cottage, and hydrological development. It could become Threatened if these impacts are not managed or reversed with demonstrable effectiveness.

Range NL

Status History

Designated Special Concern in April 1989. Status re-examined and confirmed in May 2003 and May 2014.

## **Arthropods**

**Dakota Skipper** *Hesperia dacotae* **Endangered**  
Assessment Criteria B2ab(i,ii,iii,iv,v)

Reason for Designation

This butterfly is dependent on tall-grass and mixed-grass prairie habitats, which have suffered > 99% historical losses since the 1850s. The species occurs within fragmented patches of habitat in three population centres in Canada. It has a small home range and is associated with specific prairie plants, making it sensitive to conversion of prairie remnants to cropland, spring and summer haying, overgrazing, controlled burns, drainage of natural sites, and natural disturbances such as floods. The long-term persistence of this butterfly is dependent on appropriate management of its habitat, most of which consists of small fragments.

Range SK MB

Status History

Designated Threatened in November 2003. Status re-examined and designated Endangered in May 2014.

**Gypsy Cuckoo Bumble Bee** *Bombus bohemicus* **Endangered**  
Assessment Criteria A2abce

Reason for Designation

This large and distinctive bee is a nest parasite of other bumble bees. It had an extensive range in Canada and has been recorded from all provinces and territories except Nunavut. Although not known to be abundant, there has been a large observed decline in relative abundance in the past 20-30 years in areas of Canada where the species was once common, with the most recent records coming from Nova Scotia (2002), Ontario (2008) and Québec (2008). Significant search effort throughout Canada in recent years has failed to detect this species, even where its hosts are still relatively abundant. Primary threats include decline of hosts (Rusty-patched Bumble Bee, Yellow-banded Bumble Bee, and Western Bumble Bee), pesticide use (particularly neonicotinoids), and the escape of non-native, pathogen-infected bumble bees from commercial greenhouses.

Range YT NT BC AB SK MB ON QC NB PE NS NL

Status History

Designated Endangered in May 2014.

**Mormon Metalmark** *Apodemia mormo* **Endangered**  
**Southern Mountain population**  
Assessment Criteria C2a(i)

Reason for Designation

This butterfly is found in very small numbers within small habitat patches in the narrow valley bottoms of the Similkameen and Okanagan valleys of southern British Columbia. The valley bottoms are also an important transportation and utility corridor, and the butterfly is threatened by road maintenance and other land development activities, as well as the growth of invasive plants that shade out their host plants.

Range BC

Status History

Designated Endangered in May 2003. Status re-examined and confirmed in May 2014.

**Western Bumble Bee *occidentalis* subspecies** *Bombus occidentalis occidentalis* **Threatened**  
Assessment Criteria A2bce

Reason for Designation

This bumble bee ranges in Canada from British Columbia (south of approximately 55-57°N), through southern Alberta east to southern Saskatchewan. Approximately 30-40% of its global range is in Canada. Once considered one of the most common and widespread bumble bees in western Canada, this subspecies has experienced a significant (>30%) decline in recent years and has been lost from a number of sites in the southern portions of its range where it was once abundant. It has among the highest parasite loads (particularly the microsporidian *Nosema bombi*) of any bumble bee in North America. Ongoing threats to the species, particularly within the southern portions of its range, include pathogen spillover from commercially managed bumble bee colonies, increasingly intensive agricultural and other land use practices, pesticide use (including neonicotinoid compounds), and habitat change.

Range BC AB SK

Status History

Designated Threatened in May 2014.

**Mormon Metalmark** *Apodemia mormo* **Special Concern**  
**Prairie population**  
Assessment Criteria not applicable

Reason for Designation

This butterfly occurs in the remote badlands and grassland habitats of Grasslands National Park and adjacent community pastures. Because of extensive surveys in the last decade, the known population of this butterfly is now large enough that it no longer meets the criteria for Threatened. There are few direct threats to the butterfly, although the slow spread of non-native plants that may compete with host plants and overgrazing in areas outside of the park are of concern and may impact habitat quality.

Range SK

Status History

Designated Threatened in May 2003. Status re-examined and designated Special Concern in May 2014.

**Western Bumble Bee *mckayi* subspecies** *Bombus occidentalis mckayi* **Special Concern**  
Assessment Criteria not applicable

Reason for Designation

This subspecies ranges in Canada from northern British Columbia (north of approximately 55-57°N) through southern Yukon and westernmost Northwest Territories; at least 50% of its global range is in Canada. Recent surveys in northwestern Canada and Alaska suggest that it is still common. However, the southern subspecies of the Western Bumble Bee is experiencing a serious, apparently northward-moving decline, and because the causes of this decline are unknown, the northern subspecies faces an uncertain future. Recent studies in Alaska suggest that this subspecies has among the highest parasite loads (particularly the microsporidian *Nosema bombi*) of any bumble bee species in North America. Other potential threats include the unknown transmission of disease from exotic bumble bee species introduced for pollination in greenhouses (ongoing in the Yukon), pesticide use (including neonicotinoid compounds), and habitat change.

Range YT NT BC

Status History

Designated Special Concern in May 2014.

**Northwestern Cellar Spider** *Psilochorus hesperus* **Not at Risk**  
Assessment Criteria not applicable

Reason for Designation

This small, rare spider is one of only two native cellar spiders in Canada. The species has a restricted range within bunchgrass and Ponderosa Pine dominated ecosystems and is found only within a specific habitat within these ecosystems. It requires cool, humid microhabitats beneath large rocks that enable its survival in otherwise hot and dry environments. This species has limited dispersal ability and small population sizes within isolated rocky habitats. Sites and habitats are potentially at risk from urban and agricultural development, road construction, and utility corridor maintenance activities. However, overall threats to the specific rocky habitats of the species are considered to be low at present. Furthermore, there is extensive potential habitat in the Similkameen and Okanagan Valleys that has not been surveyed for the species. These considerations resulted in the designation of Not at Risk.

Range BC

Status History

Designated Not at Risk in May 2014.

## **Molluscs**

**Round Pigtoe** *Pleurobema sintoxia* **Endangered**  
Assessment Criteria B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)

Reason for Designation

This mussel species occupies a small area in the Lake St. Clair watershed and three other watersheds in southern Ontario, where its habitat has been declining in extent and quality. Urban development, agricultural runoff, and impacts from the Zebra Mussel and the Round Goby are threatening the survival of the species in Canada.

Range ON

Status History

Designated Endangered in May 2004. Status re-examined and confirmed in May 2014.

**Dromedary Jumping-slug** *Hemphillia dromedarius* **Threatened**  
Assessment Criteria B1ab(iii)+2ab(iii)

Reason for Designation

This relatively large slug is a member of a small group of slugs that are found globally only in western North America. In Canada, despite a great deal of searching, this species is known from fewer than 20 sites on southern Vancouver Island. There, it is restricted to moist, older-growth (>80 years old) forests. Populations are invariably small, and are fragmented by intervening logged areas and by the species' poor dispersal ability. Threats include further loss and fragmentation from forestry and the increased frequency and severity of droughts associated with climate change.

Range BC

Status History

Designated Threatened in May 2003. Status re-examined and confirmed in May 2014.

## **Vascular Plants**

**Hare-footed Locoweed** *Oxytropis lagopus* **Threatened**  
Assessment Criteria B1ab(iii)+2ab(iii)

Reason for Designation

This member of the pea family occurs in highly restricted habitat within a small area of rough fescue prairie on gravelly soils in southern Alberta and western Montana. Alberta occurrences represent a large portion of the world population. The plants face numerous threats including competition with invasive alien plant species, mining and quarrying, cultivation, oil and gas drilling, road development, and intensive livestock grazing, all of which have not been mitigated and are contributing to continuing habitat loss and degradation.

Range AB

Status History

Designated Special Concern in April 1995. Status re-examined and designated Threatened in May 2014.

**Sweet Pepperbush** *Clethra alnifolia* **Threatened**  
Assessment Criteria Met criteria for Endangered, B1ab(iii,v)+2ab(iii,v), but designated Threatened, B1ab(iii,v)+2ab(iii,v), due to the long lifespan of the species and the slow-acting main threat of competition from Glossy Buckthorn.

Reason for Designation

This disjunct Atlantic Coastal Plain clonal shrub is restricted to the shores of six lakes in a small area of southern Nova Scotia. Newly identified threats from the invasive exotic shrub Glossy Buckthorn and eutrophication have put this species at increased risk of extirpation. Shoreline development also remains a threat.

Range NS

Status History

Designated Threatened in April 1986. Status re-examined and confirmed in April 1998. Status re-examined and designated Special Concern in May 2001. Status re-examined and designated Threatened in May 2014.

**Nahanni Aster** *Symphotrichum nahanniense* **Special Concern**  
Assessment Criteria not applicable

Reason for Designation

The global population of this species is restricted to hot springs in Nahanni National Park Reserve. A very small range and population size make this endemic species susceptible to losses through natural alterations due to geothermal processes or to landslide events that may become more frequent as climate warms and permafrost melts.

Range NT

Status History

Designated Special Concern in May 2014.

**Water Pennywort** *Hydrocotyle umbellata* **Special Concern**  
Assessment Criteria not applicable

Reason for Designation

This species is known from only three disjunct lakeshore locations in southern Nova Scotia, one of which was discovered since the last assessment. Alterations and damage to shorelines from shoreline development and off-road vehicles are ongoing threats, and water level management is a potential threat at one lake. Increased competition from other plants caused by eutrophication is a potential major future threat.

Range NS

Status History

Designated Endangered in April 1985. Status re-examined and designated Threatened in April 1999. Status re-examined and confirmed in May 2000. Status re-examined and designated Special Concern in May 2014.

\*The assessment of Channel Darter (*Percina copelandi*) was deferred to a later meeting.

14/08/2014

**APPENDIX II**

## **Response of the Marine Mammals Specialist Subcommittee on the referral back to COSEWIC of the Humpback Whale (North Pacific population)**

### **Background**

The Pacific population of Humpback Whales was assessed by COSEWIC as Threatened in 2003. An updated status report was commissioned by the COSEWIC Marine Mammals Specialist Subcommittee during 2009-10 and the population was reassessed by COSEWIC as Special Concern in May 2011 (COSEWIC 2011a). This change in status resulted from new information on abundance and trend for Humpback Whales in Canadian Pacific waters that indicated significant recovery from depletion due to commercial whaling. Field studies by DFO during 2002–06, but particularly during 2004–06 as part of a North Pacific-wide international humpback study known as SPLASH, led to an abundance estimate of about 2145 humpbacks in BC waters and an annual population growth rate of around 4% per year (Rambeau 2008; Ford *et al.* 2009).

In December 2012, the Chair of COSEWIC received a letter from Sharon Ashley, Director General, Ecosystems Management, DFO, indicating that the update status report for Pacific Humpback Whales was being referred back to COSEWIC for the following reason:

"The May 2011 assessment of the Humpback Whale (North Pacific population) resulted in an assessment of Special Concern, a change from its previous assessment as Threatened. As part of the Department of Fisheries and Oceans process on listing recommendations, the Department undertook public consultations on changing the status of the species. In the course of the consultations, the Department received information indicating that the structure of the population may be different than was previously understood. Some species experts expressed concerns that key data pertaining to the structure of the designatable unit was not considered in the assessment and in their view, such data would justify the identification of two designatable units in Canada."

### **COSEWIC Definition of Designatable Units**

According to COSEWIC guidelines for recognizing Designatable Units (Appendix F5, Operations and Procedures Manual, COSEWIC 2011b), DUs should be discrete and evolutionarily significant units of the taxonomic species, where "significant" means that the unit is important to the evolutionary legacy of the species as a whole and if lost would likely not be replaced through natural dispersion. A population or group of populations may be considered discrete based on one or more of the following criteria: 1) evidence of genetic distinctiveness, 2) natural disjunction between substantial portions of the species' geographic range that limits movements between separate regions and favours the evolution of local adaptations, and 3) occupation of differing eco-geographic regions leading to local adaptations. In order to warrant DU status, discrete populations must have a measure of evolutionary significance. This could include 1) genetic characteristics that reflect deep intraspecific phylogenetic divergence between the populations, 2) ecological differences sufficient to give rise to local adaptations, and/or 3) evidence that the loss of a discrete population would result in an extensive gap in the range of the species in Canada.

## Relevant information available on population structure of Humpback Whales in Canadian waters

In the 2011 status report, the Marine Mammal SSC assessed the Pacific population of Humpback Whales in Canada as a single Designatable Unit (DU), as in previous assessments. The 2011 report recognized that differences in migratory destinations and mtDNA haplotype frequencies suggest that Humpback Whales in BC “may belong to two different subpopulations”, but it states that “for the current assessment all of the whales in British Columbia waters are considered a single population”. The report states that “future work that includes genetic and other analyses may provide a basis for recognizing multiple DUs in B.C. waters”, but that the available evidence was “not sufficient to justify more than one DU at present” (COSEWIC 2011a, p. 5).

In the following sections, additional information is provided on the population structure of Humpback Whales in Canadian Pacific waters and the question of whether the population comprises one or more DUs is considered in greater detail than in the 2011 status report. Two journal articles that have become available since the 2011 status report were considered in this reconsideration (Barlow *et al.* 2011; Baker *et al.* in press).

Three lines of information are available to assess population structure and DUs of Humpback Whales in Pacific Canadian waters: 1) winter migratory destinations based on photo-identification data, 2) regional movements and site fidelity of individuals within Canadian waters from photo-identifications, and 3) mtDNA haplotype frequencies from skin biopsies.

### 1) Migratory Destinations

Humpback Whales that feed in Canadian Pacific waters during summer are known to migrate in winter to breeding areas off the coasts of Hawaii, Mexico, and (rarely) Central America and the Ogasawara Islands south of Japan (Darling *et al.* 1996; Calambokidis *et al.* 2001). Because whales in these breeding areas differ significantly in mtDNA haplotype frequencies (Baker *et al.* 1994, 1998, in press), it can be inferred that such differences are reflected on their feeding areas in British Columbia (Calambokidis *et al.* 2001). Migratory movements of individual Humpback Whales between breeding and feeding areas in the North Pacific were examined during 2004-05 as part of the SPLASH study (Calambokidis *et al.* 2008; Barlow *et al.* 2011). For that analysis, feeding areas in coastal waters of the North Pacific were divided into 10 regions, and Canadian Pacific waters were split into two regions: Northern British Columbia (NBC), which includes the area from the Alaska border to latitude 50°N (near the northern end of Vancouver Island), and Southern British Columbia–Northern Washington (SBC–NWA), which includes waters from 50°N to 47°N off the southwest coast of Washington State, USA. Northern Washington and southern BC were treated as a single region because “the concentration of whales straddles the border and the same general areas were being sampled from effort originating on either side of the border” (Calambokidis *et al.* 2008). To better resolve migratory destinations for whales identified in Canadian waters only, original SPLASH data were re-analyzed to split SBC animals from those identified in Washington State.

The SPLASH data suggest that there is a steady transition in migratory destinations of Humpback Whales by latitude from Southeast Alaska southward to California (Table 1). Over 90% of whales in Southeast Alaska migrated to Hawaii, and this proportion declined to 85% in northern BC, 45% in southern BC, and 26% in Washington. No Humpbacks identified in Oregon–California (another of the 10 assigned feeding areas) migrated to Hawaii. In contrast, the proportion of animals migrating to Mexico increased with decreasing latitude, from 8% in Southeast Alaska to 15% in northern BC, 48% in southern BC, 70% in Washington, and 82% in Oregon – California. There is no indication of an abrupt shift in migratory destinations of Humpback Whales along the coast of British Columbia that might reflect a population division.

**Table 1. Proportion of Humpback Whales migrating to different breeding areas according to the feeding regions in which they were identified. Sample size (n) is the number of animals in each feeding region that matched to a breeding area by photo-identification. Source: Calambokidis *et al.* (2008) and SPLASH data.**

Feeding region	n	Hawaii	Breeding area	
			Mexico	Central Amer
Southeast Alaska	235	0.92	0.08	0
Northern BC	116	0.85	0.15	0
Southern BC	31	0.45	0.48	0.07
Washington	27	0.26	0.70	0.04
Oregon–California	143	0	0.82	0.18

## 2) Regional Movements and Site Fidelity within Canadian waters

Movement patterns and site fidelity could reveal whether there is underlying structure within the population of Humpback Whales using Pacific Canadian waters. Rambeau (2008) examined the Humpback Whale photo-identification data collected by Fisheries and Oceans Canada off the BC coast between 1992 and 2007 and found strong inter-annual site fidelity. Of 585 individual whales seen in more than one year, 25% were resighted within 25 km and 57% within 100 km of a previous year's sighting. To examine the extent of small-scale mixing and movement patterns along the BC coast, Rambeau (2008) set all whales observed north of 54°N (Dixon Entrance, between Haida Gwaii and Southeast Alaska) as a northern 'sub-population', then compared these to all whales identified south of 54°N by observing if and how the matching rate fell off to the south in 0.5° latitudinal bins. This comparison revealed that the rate of matching decreased linearly with increasing distance towards the south along the BC coast, with no evidence of an abrupt shift in demographic composition that might suggest a population division.

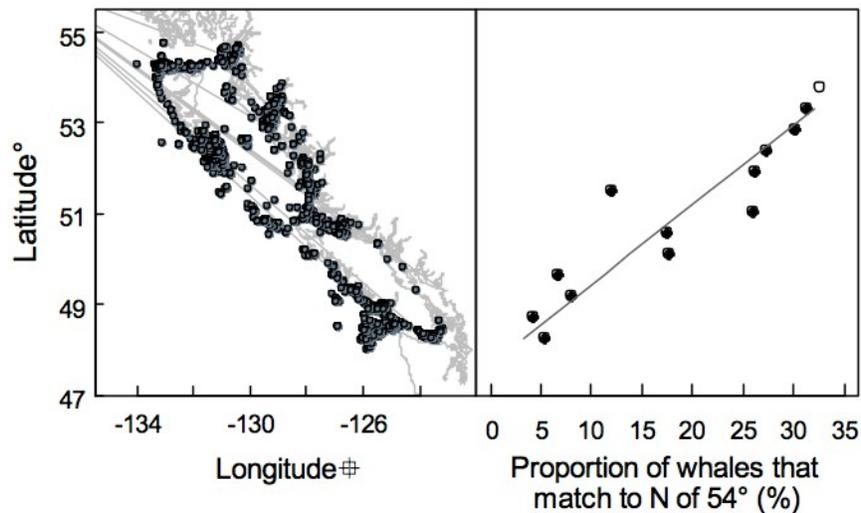


Figure 1. Proportion of Humpback Whales observed in  $0.5^\circ$  latitudinal bins below specified latitude that match to whales observed above  $54^\circ$  in British Columbia between 1992 and 2007 (right panel). Open circle is proportion of whales sighted above  $54^\circ$  that were re-sighted in multiple years. Left panel shows map of locations of whale identifications. Illustration from Rambeau (2008).

### 3) mtDNA Haplotype Frequencies

The SPLASH study examined the genetic population structure of Humpback Whales in the North Pacific using mtDNA haplotype frequencies (Baker *et al.* in press). This analysis showed that haplotype frequencies varied markedly among different feeding regions due to maternally directed site fidelity as well as among different breeding areas due to natal philopatry. As shown in Figure 2, haplotype frequencies varied significantly between the NBC and SBC–NWA feeding regions (pairwise  $F_{ST} = 0.127$ ,  $p < 0.001$ ; Baker *et al.* in press). Although this could be interpreted as suggesting that there is an abrupt transition in haplotype frequencies between these two adjacent regions, it is likely that non-random sampling of the whales within these regions has biased the pairwise  $F_{ST}$  test results.

Although Humpback Whales have a more-or-less continuous distribution along the coast of British Columbia in summer, most biopsy samples used for the above mtDNA analysis in the NBC region were collected in the northern portion of that region, particularly around Haida Gwaii. In the SBC–NWA region, only 3 of the 57 samples used to represent mtDNA haplotype frequencies were obtained in British Columbia waters – 95% were collected in Washington waters. Because the proportion of whales that migrates to Hawaii versus Mexico changes with latitude, and given that haplotype frequencies differ between these two breeding areas, the apparently sharp transition in genetic structure between the feeding regions in British Columbia and northwestern Washington is most likely an artifact of spatially biased sampling. It seems probable that there is a cline in haplotype frequencies along the coast of British Columbia that mirrors the transition in migratory destinations.

Unfortunately, no genetic data are available from whales sampled between northern Vancouver Island ( $50^\circ 30'N$ ) and southwestern Vancouver Island ( $48^\circ 35'N$ ), a distance of about 150 nautical miles (~275 km). Such data would be needed to make a rigorous assessment of the transition of haplotype frequencies along the BC coast.

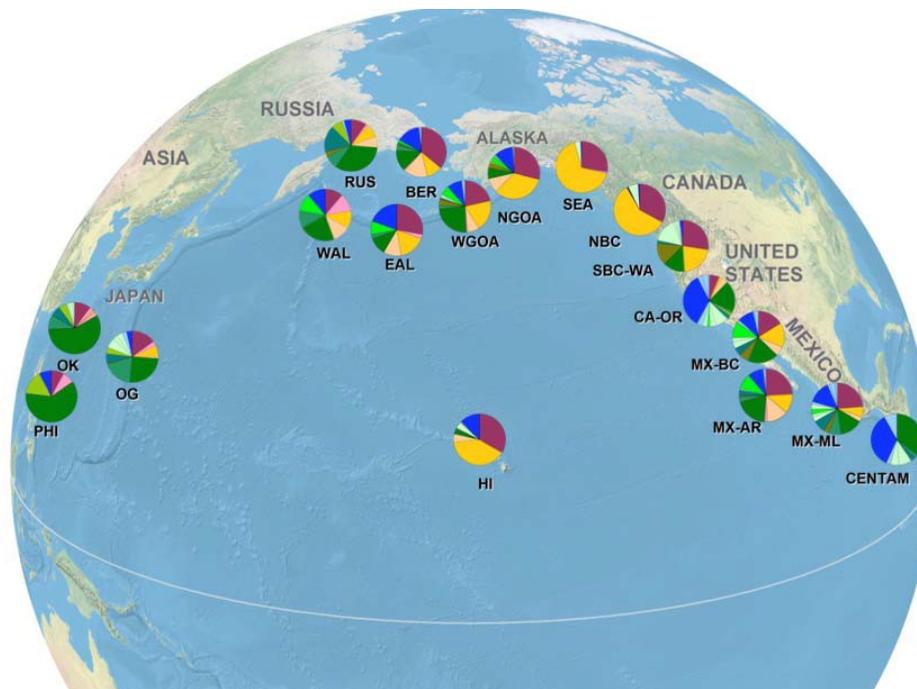


Figure 2. Frequencies of 28 mtDNA haplotypes (indicated by different colours) for Humpback Whales in 10 feeding regions and 8 breeding regions in the North Pacific. Figure from Baker *et al.* (in press).

## Conclusion

There is currently no clear evidence to support the division of the Humpback Whale population off Canada's Pacific coast into two DUs. Available information on movements and site fidelity in BC waters suggests a gradual demographic transition of individuals from north to south along the coast. There is no indication of an abrupt change in regional movement patterns that might reflect or signify a boundary between potential DUs. Similarly, there appears to be a steady latitudinal transition in migratory destinations of Humpback Whales along the coast, from predominantly Hawaiian migrants in the north to predominantly Mexican migrants in the south. Again, there is no evidence of an abrupt change in migratory destination that might represent a population division (DU identification) within BC waters. Finally, the significant differences in genetic structure of whales in the SBC–NWA and NBC regions described from the SPLASH study may be driven largely by non-random geographic sampling. The transition in mtDNA haplotype frequencies along the coast may represent a cline, which would be consistent with the patterns of site fidelity, regional movements, and changes in migratory destinations. In summary, the Humpback Whale population off the Canadian west coast does not meet any of the COSEWIC guidelines used to recognize multiple DUs.

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