COSEWIC
Status Appraisal Summary

on the

Sei Whale
Balaenoptera borealis

Pacific population

in Canada

ENDANGERED
2013

COSEWIC
Committee on the Status
of Endangered Wildlife
in Canada

COSEPAC
Comité sur la situation
des espèces en péril
au Canada

COSEWIC status appraisal summaries are working documents used in assigning the status of wildlife species suspected of being at risk in Canada. This document may be cited as follows:

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COSEWIC
Assessment Summary

Assessment Summary – May 2013

Common name
Sei Whale - Pacific population

Scientific name
Balaenoptera borealis

Status
Endangered

Reason for designation
Individuals off the coast of British Columbia are likely part of a northeastern Pacific population that was depleted by whaling. The infrequency of observations (visual and acoustic) suggests that numbers in Canada are currently very low (well below 250 mature individuals) and reports of this species are similarly rare in adjacent US waters to the north (Alaska) and south (Washington, Oregon, California). Threats to this species along the coast of British Columbia are poorly known, but may include ship strikes, anthropogenic noise, and long-term changes in climate (which could affect the abundance of their zooplankton prey).

Occurrence
Pacific Ocean

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

COSEWIC
Status Appraisal Summary

Balaenoptera borealis
Sei Whale
(Pacific population)
Jurisdictions: Pacific Ocean

Rorqual boréal
(Population du Pacifique)

Status History

COSEWIC: Designated Endangered in May 2003. Status re-examined and confirmed in May 2013.

Evidence (indicate as applicable):

Wildlife species:

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

Explanation:

There is no new information to indicate that the taxonomic or DU status of the Sei Whale (Pacific) population has changed.

Range:

Change in extent of occurrence (EO): yes ☐ no ☐ unk ☒
Change in index of area of occupancy (IAO): yes ☐ no ☐ unk ☒
Change in number of known or inferred current locations: yes ☐ no ☐ unk ☒
Significant new survey information yes ☐ no ☒

Explanation:

Search effort since the previous assessment (2003) has resulted in very few observations (see Population Information), all within the previously known range in Canadian waters.

Population Information:

Change in number of mature individuals: yes ☐ no ☐ unk ☒
Change in total population trend: yes ☐ no ☐ unk ☒
Change in severity of population fragmentation: yes ☐ no ☐ unk ☒
Change in trend in area and/or quality of habitat: yes ☐ no ☐ unk ☒
Significant new survey information yes ☒ no ☐

Explanation:

Extensive ship-based line transect surveys off the coasts of California, Oregon and Washington to 300 nautical miles offshore (about 131° W longitude) in 2005 and 2008 resulted in abundance estimates of 74 (CV=0.88) and 215 (CV=0.71) Sei Whales, respectively (Forney 2007; Barlow 2010). The US National Oceanic and Atmospheric Administration (NOAA) considered the best abundance estimate for the species in that study area to be the unweighted geometric mean of these two estimates, or 126 (CV=0.53) (Carretta *et al*. 2011). No reliable data are available on trends in abundance. Recent cetacean surveys in Alaska yielded very few Sei Whale sightings (Mizroch 2012).

Prior to the last status assessment in 2003, there had been minimal survey effort for this species in Pacific waters of Canada. Since then, dedicated shipboard cetacean surveys were undertaken by DFO each year during 2002-08. No Sei Whale sightings were made in over 28,000 km of transect survey effort (Ford *et al.* 2010a). However, of this survey effort only 13% included waters near or offshore of the continental shelf break (depths of >1000 m), where 96% of the Sei Whales taken by shore-based whaling in BC were found (Gregr and Trites 2001). One possible sighting was made in Dixon Entrance (54°24'N, 133°03'W) during small vessel surveys on 12 September 2008 (Cetacean Research Program, Pacific Biological Station, DFO, unpubl. data). Williams and Thomas (2007) undertook vessel-based cetacean surveys on the continental shelf of BC in 2004 and 2005 and reported one Sei Whale in 4400 km of survey effort. This sighting was off the southeastern side of Moresby Island, Haida Gwaii. A portion of Canada's offshore waters was surveyed in August 2012 during an IWC-POWER (Pacific Ocean Whale and Ecosystem Research) cruise in the eastern North Pacific (Mizroch, 2012). Two sightings of a total of four Sei Whales were made during 340 km of survey effort in Canadian waters. These sightings were approximately 300 km offshore, in the outer portion of Canada's EEZ. A few calls that resembled those of Sei Whales, but could not be distinguished with certainty from Fin Whale calls, were recorded by acoustic instruments moored at Union Seamount (49°34'N, 132°47'W, about 420 km west of Vancouver Island) and La Perouse Bank (48°32'N, 126°12'W), near the shelf break off southwestern Vancouver Island (Ford *et al*. 2010b).

Threats:

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

Explanation:

Commercial whaling from shore stations in B.C. ended after the 1967 whaling season and there has been no commercial hunting of Sei Whales by pelagic factory ships in the North Pacific since 1975. Therefore the species has been essentially protected from commercial whaling throughout the North Pacific for more than 35 years.

Anthropogenic threats identified in the 2003 status report include those facing most baleen whales: ship strikes, fisheries interactions, acoustic disturbance, habitat degradation, and pollution. There is no reason to believe that the nature or severity of these threats in BC has changed over the past decade. A possible ship strike of a Sei Whale near Washington State was reported by Douglas *et al*. (2008), although it could not be determined if this strike was ante- or post-mortem.

Fisheries and Oceans Canada's Recovery Strategy for Blue, Fin, and Sei Whales in Pacific Canadian waters (Gregr *et al*. 2006) considers ship strikes, chronic noise from shipping, and acute noise from low frequency active sonar and seismic exploration to be potentially the greatest current threats to these species. Pollution and entanglement in fishing gear are described as low risk threats to Blue, Fin and Sei Whales in Pacific Canadian waters.

While it is possible that the threat factors mentioned above have affected and are continuing to affect the Sei Whale population, these animals remain so rare in B.C. waters that it is very difficult to determine which, or whether any, of these factors is responsible for the apparently persistent failure of the species to recover. Given the apparent lack of recovery relative to other local whale populations, there may be additional threats/factors limiting the recovery of this species in this region.

The proposed expansion of shipping from the port of Kitimat would increase the threats from ship strikes and fuel and cargo spills (Fraser 2012). Two of the three shipping routes from Kitimat go through likely Sei Whale habitat (based on whaling data). In the years from 1982 through 2009 there were 12,224 transits (average 394/year) and this is expected to increase by 440 transits/year of bitumen oil and 312 transits/year of liquefied natural gas (LNG), potentially with additional LNG shipping within the same timeframe (Douglas Channel Energy partnership). Bitumen oil shipments could start as early as 2017 and LNG shipments by 2015 (Fraser 2012).

Protection:

Change in effective protection: yes ☐ no ☒

Explanation:

Despite the listing of the species under Schedule 1 of SARA as Endangered, there is no reason to believe that the protection provided as a result has led to a change in effective protection and conservation of the species. Given the nature of the current threats, the general prohibitions under SARA do not increase the protection previously provided to the species.

Rescue Effect:

Evidence of rescue effect: yes ☐ no ☒

Quantitative Analysis:

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

Details:

No quantitative analysis is available.

Summary and Additional Considerations:

A Recovery Strategy for the Sei Whale in Pacific Canada was finalized and published in June 2006 (Gregr *et al*. 2006). The recovery goal is "to attain a long-term viable population of sei whales that occasionally use Pacific Canadian waters", and recovery objectives are "by 2011, confirm the presence of sei whale(s) in Pacific Canadian waters. If confirmed, maintain or increase the relative proportion of sei whales that occur in Pacific Canadian waters compared to the whole population through to 2016."

List of authorities contacted to review the status appraisal:

*Denotes that information was provided by authority contacted.

National Marine Mammal Laboratory, NOAA, Seattle, WA: Sally Mizroch, cetacean research biologist. Contacted May 2, 2012 – unpublished data on results of recent cetacean surveys in Alaska, and September 27, 2012 – unpublished data from IWC–POWER surveys during 2012.

Marine Mammal SSC members

COSEWIC jurisdictions

Sources of information:

Barlow, J. 2010. Cetacean abundance in the California Current from a 2008 ship-based line-transect survey. NOAA Technical Memorandum, NMFS, NOAA-TM-NMFS-SWFSC-456. 19 p.

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COSEWIC 2003. COSEWIC assessment and status report on the Sei Whale *Balaenoptera borealis* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 27 pp.

Douglas, A.B., J. Calambokidis, S. Raverty, S.J. Jeffries, D.M. Lambourn, and S.A. Norman. 2008. Incidence of ship strikes of large whales in Washington state. Journal of the Marine Biological Association of the United Kingdom 88:1121-1132.

Ford, J.K.B., R.M. Abernethy, A.V. Phillips, J. Calambokidis, G.M. Ellis, and L.M. Nichol. 2010a. Distribution and relative abundance of cetaceans in western Canadian waters from ship surveys, 2002-2008. Can. Tech. Rep. Fish. Aquat. Sci. 2913: v + 51 p.

Ford, J.K.B., B. Koot, S. Vagle, N. Hall-Patch, and G. Kamitakahara. 2010b. Passive acoustic monitoring of large whales in offshore waters of British Columbia. Can. Tech. Rep. Fish. Aquat. Sci. 2898: v + 30 p.

Forney, K.A. 2007. Preliminary estimates of cetacean abundance along the U.S. west coast and within four National Marine Sanctuaries during 2005. U.S. Department of Commerce NOAA Technical Memorandum, NOAA-TM-NMFS-SWFSC-406. 27p.

Fraser, D., pers.comm. 2012. Personal communication to Randall Reeves, citing http://www.northerngateway.ca/news-and-media/northern-gateway-blogs/marine-safety/tanker-traffic-in-kitimat-today/.

Unit Head, Scientific Authority Assessment, Conservation Science Section, Ministry of Environment, Government of British Columbia, Victoria, BC

Gregr, E. J., and A. W. Trites. 2001. Predictions of critical habitat for five whale species in the waters of coastal British Columbia. Canadian Journal of Fisheries and Aquatic Science 58:1265-1285.

Gregr, E.J., J. Calambokidis, L. Convey, J.K.B. Ford, R.I. Perry, L. Spaven, M. Zacharias. 2006. Recovery Strategy for Blue, Fin, and Sei Whales (*Balaenoptera musculus*, *B. physalus,* and *B. borealis*) in Pacific Canadian Waters. *In* Species at Risk Act Recovery Strategy Series. Vancouver: Fisheries and Oceans Canada. vii + 53 pp.

Mizroch, S. 2012. Personal communication to John Ford. National Marine Mammal Laboratory, U.S. National Oceanic and Atmospheric Administration, Seattle.

Tillman, M. F. 1977. Estimates of population size for the North Pacific sei whale. Rept. Int. Whal. Commn., Special Issue 1:98-106.

Williams, R., and L. Thomas. 2007. Distribution and abundance of marine mammals in coastal waters of British Columbia, Canada. Report of the International Whaling Commission 9:15-28.

Author of status appraisal summary: John K.B. Ford [October 2012]

TECHNICAL SUMMARY

Balaenoptera borealis
Sei Whale — Rorqual boréal
(Pacific population) — (Population du Pacifique)
Range of occurrence in Canada (province/territory/ocean): Pacific Ocean

Demographic Information

Generation time (usually average age of parents in the population; indicate if another method of estimating generation time indicated in the IUCN guidelines (2008) is being used) [gen(r=0) = average age of mothers at pre-disturbance state, as estimated from a simplified Leslie matrix; Taylor et al. (2007)]	23.3 yr
Is there an observed, inferred, or projected continuing decline in number of mature individuals?	Unknown
Estimated percent of continuing decline in total number of mature individuals within 2 generations	Unknown
Inferred and suspected percent reduction in total number of mature individuals over the last 3 generations.	>70% decline due to historic whaling
Projected or suspected percent [reduction or increase] in total number of mature individuals over the next 3 generations.	Unknown
Inferred and suspected percent reduction in total number of mature individuals over any 3 generation period, over a time period including both the past and the future.	>70% decline due to historic whaling
Are the causes of the decline clearly reversible and understood and ceased?	The cause (whaling) has ceased but the decline is not clearly reversible, nor is the species' apparent failure to recover in BC waters understood
Are there extreme fluctuations in number of mature individuals?	No

Extent and Occupancy Information

Estimated extent of occurrence (based on historical whaling data primarily)	> 20,000 km^2
Index of area of occupancy (IAO) (based on historical whaling data primarily).	> 20,000 km^2
Is the total population severely fragmented?	No
Number of locations*	Not calculated
Is there an observed, inferred, or projected continuing decline in extent of occurrence?	No
Is there an observed, inferred, or projected continuing decline in index of area of occupancy?	No
Is there an observed, inferred, or projected continuing decline in number of populations?	No
Is there an observed, inferred, or projected continuing decline in number of locations*?	No
Is there an observed, inferred, or projected continuing decline in area, extent and/or quality of habitat?	No
Are there extreme fluctuations in number of populations?	No
Are there extreme fluctuations in number of locations*?	No

* See Definitions and Abbreviations on COSEWIC website and IUCN 2010 for more information on this term.

Are there extreme fluctuations in extent of occurrence?	No
Are there extreme fluctuations in index of area of occupancy?	No

Number of Mature Individuals (in each population)

Population	N Mature Individuals
North Pacific population	No recent estimate
Estimate of 126 Sei Whales from surveys in 2005 and 2008 from shore to 540 km off the west coast of the US (not including Alaska).	
Total in Canadian Pacific population	< 250

Quantitative Analysis

Probability of extinction in the wild is at least [20% within 20 years or 5 generations, or 10% within 100 years].	Not Available

Threats (actual or imminent, to populations or habitats)

COSEWIC 2003: Ship strikes, prey abundance, acoustic disturbance

DFO Recovery Strategy (Gregr *et al.* 2006): Ship strikes, chronic (e.g., shipping) and acute (e.g., seismic survey, military sonar) anthropogenic noise, pollution, climate change effects on trophic structure.

Rescue Effect (immigration from outside Canada)

Status of outside population(s): Uncertain. The most recent abundance estimate for the entire North Pacific is 8,600 animals in 1974 as compared with 42,000 in 1963 (Tillman 1977).	
Is immigration known or possible?	Yes, possible
Would immigrants be adapted to survive in Canada?	Unknown but likely
Is there sufficient habitat for immigrants in Canada?	Unknown
Is rescue from outside populations likely?	Unlikely given low numbers outside Canada

Status and Reasons for Designation

Status:	**Alpha-numeric Code:**
Endangered	A2ad; D1

Reasons for Designation:
Individuals off the coast of British Columbia are likely part of a northeastern Pacific population that was depleted by whaling. The infrequency of observations (visual and acoustic) suggests that numbers in Canada are currently very low (well below 250 mature individuals) and reports of this species are similarly rare in adjacent US waters to the north (Alaska) and south (Washington, Oregon, California). Threats to this species along the coast of British Columbia are poorly known, but may include ship strikes, anthropogenic noise, and long-term changes in climate (which could affect the abundance of their zooplankton prey).

Applicability of Criteria

Criterion A (Decline in Total Number of Mature Individuals): Meets Endangered A2ad. A decline of more than 50% in the total number of mature individuals over the past three generations (i.e., since 1942) is inferred and suspected based on the low numbers of individuals observed in recent surveys (a) and the high levels of historical commercial exploitation (d). The cause (whaling) is understood and has ceased but the decline is not clearly reversible given the apparent failure of the species to recover in British Columbia waters.
Criterion B (Small Distribution Range and Decline or Fluctuation): Not applicable as the extent of occurrence and the index of area of occupancy exceed the thresholds.
Criterion C (Small and Declining Number of Mature Individuals): Not applicable as there is no information on current population trend.
Criterion D (Very Small or Restricted Total Population): Meets Endangered under D1 as it is unlikely that the number of mature individuals exceeds 250.
Criterion E (Quantitative Analysis): Not performed.

Additional Sources of Information:

Gregr, E.J., J. Calambokidis, L. Convey, J.K.B. Ford, R.I. Perry, L. Spaven, M. Zacharias. 2006. Recovery Strategy for Blue, Fin, and Sei Whales (*Balaenoptera musculus*, *B. physalus,* and *B. borealis*) in Pacific Canadian Waters. *In* Species at Risk Act Recovery Strategy Series. Vancouver: Fisheries and Oceans Canada. vii + 53 pp.

Taylor, B.L., Chivers, S.J., Larese, J. and Perrin, W.F. 2007. Generation length and percent mature estimates for IUCN assessments of cetaceans., Southwest Fisheries Science Center, National Marine Fisheries Service, La Jolla Laboratory, Administrative Report LJ-07-01. 18 pp.

Tillman, M.F. 1977. Estimates of population size for the North Pacific sei whale. Report of the International Whaling Commission (Special Issue 1):98-106.

COSEWIC HISTORY

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) was created in 1977 as a result of a recommendation at the Federal-Provincial Wildlife Conference held in 1976. It arose from the need for a single, official, scientifically sound, national listing of wildlife species at risk. In 1978, COSEWIC designated its first species and produced its first list of Canadian species at risk. Species designated at meetings of the full committee are added to the list. On June 5, 2003, the *Species at Risk Act* (SARA) was proclaimed. SARA establishes COSEWIC as an advisory body ensuring that species will continue to be assessed under a rigorous and independent scientific process.

COSEWIC MANDATE

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assesses the national status of wild species, subspecies, varieties, or other designatable units that are considered to be at risk in Canada. Designations are made on native species for the following taxonomic groups: mammals, birds, reptiles, amphibians, fishes, arthropods, molluscs, vascular plants, mosses, and lichens.

COSEWIC MEMBERSHIP

COSEWIC comprises members from each provincial and territorial government wildlife agency, four federal entities (Canadian Wildlife Service, Parks Canada Agency, Department of Fisheries and Oceans, and the Federal Biodiversity Information Partnership, chaired by the Canadian Museum of Nature), three non-government science members and the co-chairs of the species specialist subcommittees and the Aboriginal Traditional Knowledge subcommittee. The Committee meets to consider status reports on candidate species.

DEFINITIONS
(2013)

Wildlife Species	A species, subspecies, variety, or geographically or genetically distinct population of animal, plant or other organism, other than a bacterium or virus, that is wild by nature and is either native to Canada or has extended its range into Canada without human intervention and has been present in Canada for at least 50 years.
Extinct (X)	A wildlife species that no longer exists.
Extirpated (XT)	A wildlife species no longer existing in the wild in Canada, but occurring elsewhere.
Endangered (E)	A wildlife species facing imminent extirpation or extinction.
Threatened (T)	A wildlife species likely to become endangered if limiting factors are not reversed.
Special Concern (SC)*	A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
Not at Risk (NAR)**	A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances.
Data Deficient (DD)***	A category that applies when the available information is insufficient (a) to resolve a species' eligibility for assessment or (b) to permit an assessment of the species' risk of extinction.

* Formerly described as "Vulnerable" from 1990 to 1999, or "Rare" prior to 1990.

** Formerly described as "Not In Any Category", or "No Designation Required."

*** Formerly described as "Indeterminate" from 1994 to 1999 or "ISIBD" (insufficient scientific information on which to base a designation) prior to 1994. Definition of the (DD) category revised in 2006.

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