



CONVENTION ON MIGRATORY SPECIES

Distribution: General

UNEP/CMS/ScC17/Doc.9
4 October 2011

Original: English

17TH MEETING OF THE
SCIENTIFIC COUNCIL
Bergen, 17-18 November 2011
Agenda Item 17.2

SPECIES OF AQUATIC MAMMALS FOR WHICH AGREEMENTS ARE NOT ANTICIPATED DURING THE COMING TRIENNIUM BUT WHICH MAY REQUIRE ATTENTION BY THE SCIENTIFIC COUNCIL

(Submitted by William F. Perrin, Conference-appointed Councillor for Aquatic Mammals)

Narwhal (*Monodon monoceros*)

1. There has been much published on the adverse effects on the polar bear of reduction of Arctic sea-ice due to climate change (e.g. Ainley *et al.* 2003, Derocher *et al.* 2004, Regehr *et al.* 2007, Stirling and Parkinson 2006, Wiig 2005), and the topic has received much attention in the popular press and by the NGOs. However, recent research suggests that the narwhal is likely to be the most sensitive of the seven Arctic marine mammals¹ to ongoing climate change (Laidre *et al.* 2008). It is narrowly distributed in the Atlantic Arctic and remains hunted in Canada and Greenland; some catch limits may be too high to be sustainable (Jefferson *et al.* 2008). It is a specialized feeder on Greenland halibut (*Reinhardtius hippoglossoides*), which may move northward away from specific narwhal feeding sites with cold bottom temperatures at depths $\geq 1000\text{m}$ (Laidre *et al.* 2008, 2010). Migration to foraging sites may be mediated by cultural transmission, with the whales arriving at traditional feeding grounds no longer inhabited by prey. In addition, anatomical evidence and physiological modelling has suggested that the extreme morphological and physiological adaptations enabling year-round Arctic residency by narwhals limit behavioural flexibility for responding to alterations in sea ice (Williams *et al.* 2011); they are likely performing at or near their physiological capacity. For example, in Baffin Bay only 3-10 percent of the ice-packed foraging grounds contain suitable breathing holes within maximum swimming distance of each other, and warmer temperatures are creating more icebergs and larger floes that will change the reliability of known breathing holes for the slow-swimming narwhals. Potential threats also include habitat degradation from oil exploration and development and increased shipping in the high Arctic as the NW and NE passages open up.

2. The narwhal is classified as Near Threatened in the IUCN Red List (Jefferson *et al.* 2008). The status of the species is currently under review by the IUCN Cetacean Red List Authority, including evaluation of threat imposed by sea-ice changes caused by climate change.

¹ Narwhal (*Monodon monoceros*), beluga (*Delphinapterus leucas*), bowhead whale (*Balaena mysticetus*), ring seal (*Phoca hispida*), bearded seal (*Erignathus barbatus*), walrus (*Odobenus rosmarus*) and polar bear (*Ursus maritimus*).

3. The species is presently included in CMS Appendix II. Because of the apparent extreme vulnerability of the narwhal to ongoing sea-ice change in the Arctic, it is recommended that Parties be urged to consider proposing listing of the species in Appendix I.

Killer whale (*Orcinus orca*)

4. The killer whale exists in a number of geographical forms, including resident, transient and offshore forms in the North Pacific (Ford 2009) and several morphologically distinct ecotypes in the Antarctic (Pitman and Ensor 2003). Recent genetic studies suggest that some of these forms may be distinct species and others subspecies (Morin *et al.* 2010). The U.S. Government has recognized the resident killer whale of the eastern North Pacific as an unnamed subspecies (Krahn *et al.* 2004) and listed the southern resident population of Puget Sound as Endangered under its Endangered Species Act (NOAA 2005) because of its small size and the potential for extinction due to demographic stochasticity, depletion of prey, and habitat pollution. Similarly, the Committee on the Status of Endangered Wildlife of Canada (COSEWIC) has listed the southern resident killer whales as Endangered (and the northern resident population as Threatened), citing low and declining abundance, reduced availability of their principal prey (chinook salmon), and threat by increasing physical and acoustical disturbance, oil spills and contaminants (COSEWIC 2001, 2008).

5. The killer whale is presently included in Appendix II. Considering that the resident subspecies of the North Pacific is endangered in a significant portion of its range (Puget Sound), it is recommended that Parties be urged to consider proposing inclusion of it in Appendix I.

6. Range States: United States, Canada, Russian Federation.

Action requested:

The 17th Meeting of the Scientific Council is invited to:

- a) Take into account the background information submitted by the Conference-appointed Councillor for Aquatic Mammals, on the Narwhal (*Monodon monoceros*) and the Killer whale (*Orcinus orca*); and
- b) Decide whether both species should be proposed for listing in Appendix I of CMS.

Literature cited

- Ainley, D. G., C. T. Tynan and I. Stirling. 2003. Sea ice: a critical habitat for polar marine mammals and birds. Pages 240-266 in D. N. Thomas and G. S. Diekmann, editors. Sea ice: an introduction to its physics, chemistry, biology and geology. Blackwell, Oxford, UK.
- COSEWIC. 2001. COSEWIC assessment and update status report on the Killer Whale *Orcinus orca* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 47 pp.
- COSEWIC. 2008. COSEWIC assessment and update status report on the Killer Whale *Orcinus orca*, Southern Resident population, Northern Resident population, West Coast Transient population, Offshore population and Northwest Atlantic / Eastern Arctic population, in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. viii + 65 pp.
- Derocher, A. E., N. J. Lunn and I. Stirling. 2004. Polar bears in a warming climate. *Integrative and Comparative Biology* 44:163-176.
- Jefferson, T. A., L. Karczmarski, K. Laidre, G. O'Corry-Crowe, R. R. Reeves, L. Rojas-Bracho, E. R. Secchi, E. Stocken, B. D. Smith, J. Y. Wang and K. Zhou. 2008. *Monodon monoceros* in IUCN 2010. IUCN Red List of Threatened Species. Version 2010.4. www.iucnredlist.org (13 May 2011).
- NOAA. 2005. Endangered and threatened wildlife and plants: Endangered status for southern resident killer whales. *Federal Register* 70(222):66903-99912.
- Ford, J. K. B. 2009. Killer whale *Orcinus orca*. Pages 650-657 in W. F. Perrin, B. Würsig and J. G. M. Thewissen (eds). *Encyclopedia of marine mammals*. Second edition. Academic Press, Amsterdam.
- Krahn, M. M., M. J. Ford, W. F. Perrin, P. R. Wade, R. P. Angliss, M. B. Hanson, B. L. Taylor, G. M. Ylitalo, M. E. Dahlheim, J. E. Stein and R. S. Waples. 2004. 2004 status review of southern resident killer whales (*Orcinus orca*) under the Endangered Species Act. NOAA Technical Memorandum NMFS-NWFSC-62, 73 pp.
- Laidre, K. L., I. Stirling, L. F. Lowry, Ø. Wiig, M. P. Heide-Jørgensen and S. H. Ferguson. 2008. Quantifying the sensitivity of Arctic marine mammals to climate-induced habitat change. *Ecological Applications* 18(2) Supplement:S97-S125.
- Laidre, K. L., M. P. Heide-Jørgensen, W. Ermold and M. Steele. 2010. Narwhals document continued warming of southern Baffin Bay. *Journal of Geophysical Research* 115:C10049, doi:10.1029/JC005820.
- Morin, P.A., F. I. Archer, A. D. Foot, J. Vilstrup, E. E. Allen, P. Wade, J. Durban, K. Parsons, R. Pitman, L. Li, P. Bouffard, S. C. Abel Nielsen, M. Rasmussen, E. Willerslev, M. T. Gilbert and T. Harkins. 2010. Complete mitochondrial genome phylogeographic analysis of killer whales (*Orcinus orca*) indicates multiple species. *Genomic Research* 20:908-916.
- Pitman, R. L. and P. Ensor. 2003. Three forms of killer whales (*Orcinus orca*) in Antarctic waters. *Journal of Cetacean Research and Management* 5:131--139.
- Regehr, E. V., N. J. Lunn, S. C. Amstrup and I. Stirling. 2007. Effect of earlier sea ice breakup on survival and population size of polar bears in western Hudson Bay. *Journal of Wildlife Management* 71:2673-2683.
- Wiig, Ø. 2005. Are polar bears threatened? *Science* 309:1814-1815.
- Williams, T. M., S. R. Noren and M. Glenn. 2011. Extreme physiological adaptations as predictors of climate-change sensitivity in the narwhal, *Monodon monoceros*. *Marine Mammal Science* 27:334-349.