Transfer of Polar Bear *Ursus maritimus* from Appendix II to Appendix I

Proponent: United States of America

Summary: The Polar Bear *Ursus maritimus* is the largest living member of the bear family or Ursidae. It occurs at high latitudes in Canada, Greenland/Denmark, Norway (specifically Svalbard area), the Russian Federation and the USA (Alaska), with vagrants recorded in Iceland. Polar Bears are strongly associated with marine environments where there is sea ice for all or part of the year, particularly in coastal regions, but also in the central Arctic basin in regions of permanent pack ice. Preferred habitat is ice that is periodically active, where wind and sea currents cause movements and fracturing of the ice followed by refreezing. It is in such areas that Polar Bears can most successfully hunt. Polar Bears feed primarily on seals, particularly Ringed Seals *Pusa hispida*, Bearded Seals *Erignathus barbatus*, other seals, and walruses *Odobenus rosmarus,* and also scavenge on the carcasses of whales. They will infrequently take terrestrial mammals, birds and vegetation when other food is unavailable but such foods are thought to be energetically insignificant. Polar Bears that have continuous access to sea ice are able to hunt throughout the year. However, in those areas where the sea ice melts completely each summer, Polar Bears spend several months on land relying largely on stored fat reserves until the return of the sea ice. Mating occurs in March to May, but implantation is delayed and birth is generally thought to occur from late November to mid-January. The average litter size is somewhere between one and two. Cubs are dependent upon mothers until 2.5 years of age. Age of first reproduction is normally five to six years for females. Generation time is approximately 15 years, but may range from around 10 years to around 15 years, depending on conditions.

The Polar Bear population is generally divided into 19 subpopulations, or stocks, of very unequal size. However, genetic differences between different subpopulations are small and there is considerable overlap between them. The current overall estimate (2009), taken by summing estimates for different subpopulations, is of a global population of 20 000–25 000. Around 65% of the population either occurs entirely in Canada or is in populations that are shared by Canada and adjacent territories (Alaska and Greenland).

Various attempts were made from the 1950s to the 1970s to produce global population estimates by extrapolating from surveys or den counts in limited parts of the range. These produced estimates ranging from 5000 to 20 000 bears, but are not considered reliable. Because of the lack of reliable historical data it is not possible to determine quantitative trends in overall population size from historical to present level. However, it is suspected that protective measures introduced in various parts of the range, notably in Norway and the then USSR in the 1950s and 1970s, allowed the Polar Bear population to increase slowly, at least in these areas.

The population is now believed to be slowly declining. An assessment by the IUCN/SSC Polar Bear Specialist Group (PBSG) in 2009 concluded that one of the subpopulations was increasing, three were stable and eight were declining. Data were insufficient to provide any assessment of current trend for the remaining seven subpopulations. A similar exercise in 2005 concluded that two populations were increasing, five were stable, and five declining, with insufficient data to provide trends for the remaining subpopulations. On the basis of the 2005 assessment, the Polar Bear has been classified by IUCN as Vulnerable based on a suspected population reduction of greater than 30% within three generations (taken as 45 years), owing to decline in area of occupancy, extent of occurrence and habitat quality.

The projected declines in extent and quality of habitat are based on observed and predicted changes in sea ice as a result of climate change. Recent modelling of the trends for sea ice extent, thickness and timing of coverage predicts dramatic reductions in coverage over the next 50–100 years. Observations have shown marked decreases in the extent of summer sea ice coverage in the past 10 years compared to long-term averages. Future changes in sea ice, however, are not expected to be uniform across the Polar Bear's range nor to follow a straightforward trajectory in time. Moreover, to date a direct relation between such changes and the population size of Polar Bears has been demonstrated for only the Western Hudson Bay subpopulation (though such

effects are expected in the near future for other populations). Other factors that may have an impact on recruitment or survival of Polar Bears include toxic contaminants, shipping, recreational viewing, oil and gas exploration, development and over-harvest. None of these other factors is believed to be a major threat to the population as a whole at present and only climate-related loss of sea ice is identified as a population level threat.

Polar Bears are subject to a range of management measures. At the international level, all range States (including Denmark on behalf of Greenland) are members of the Agreement on Conservation of Polar Bears, which came into force in 1976. The members held their second meeting in 2009 (the first was in 1981) and agreed to hold meetings every two years thereafter. There is also a series of bilateral agreements concerning shared Polar Bear populations. Polar Bears are legally hunted under various restrictions in Canada, Greenland and Alaska (USA). Numbers taken are regulated by quota in some areas and not in others. In Norway and the western Russian Federation no hunting is allowed except for that of problem animals and defence kills. Some hunting by native people in the Chukotka (Chukchi) region of the Russian Federation is theoretically allowed under the Agreement between the USA and the Russian Federation on the Conservation and Management of the Alaska-Chukotka Polar Bear Population, which came into force in 2007. However, as of December 2009 no quota had been established and no hunting allowed.

Currently, overall legal annual harvest is between 500 and 700 bears and is generally thought to be sustainable, but harvest levels of two subpopulations shared by Canada and Greenland—one small (Kane Basin) and one large (Baffin Bay)—are believed to be unsustainable, and illegal hunting in the Chukotka region, coupled with habitat reduction, is believed to be leading to a decline in the Chukchi Sea subpopulation. Some 60–70% of the harvest is of males.

Polar Bear products are in trade. The range of different products and units of measure used in records makes it difficult to relate trade data to a number of Polar Bears in trade. However, export of products from Canada (where most Polar Bear products in trade originate) for the period 2004–2008 is believed to represent roughly 300 Polar Bears per year. In the period 1992–2006, an average of just under 200 whole skins a year was recorded as exported by Canada. Greenland introduced a voluntary temporary ban on export of Polar Bear products in 2007.

Analysis: Regarding the biological criteria for inclusion in Appendix I set out in *Resolution Conf. 9.24 (Rev. CoP14)*, the global population of Polar Bears would not appear to be small, following the guidelines for the definition of a small population set out in Annex 5 to the Resolution, which suggests a figure of less than 5000 is an appropriate guideline of what might constitute a small wild population. The Polar Bear's area of distribution extends over several million square kilometers and is clearly not restricted.

The Polar Bear's population has not undergone a marked decline in the recent past, nor is there any evidence that the current Polar Bear population represents a marked decline from a (hypothesized) historical baseline. There is general agreement that the Polar Bear population is currently declining, but the rate of decline is slow, as evinced by the lack of change in overall population estimates in the past decade, and therefore does not appear to meet the definition of a marked ongoing decline as elaborated in Annexes 1 and 5 to *Resolution Conf. 9.24 (Rev. CoP14)*.

Annex 1 of *Resolution Conf. 9.24 (Rev. CoP14)* also refers to a marked decline in the population size in the wild projected on the basis of any one of a number of factors. Annex 5 of the Resolution notes that projection involves extrapolation to infer likely future values. Any future changes in the Polar Bear population remain conjectural. The current best estimate, and the basis for the current IUCN Red List categorization of the species as Vulnerable, suggests a decline in the next three generations (taken as 45 years) of more than 30% but less than 50% (as the latter in this case would have led to a categorization of Endangered under criterion A2 of the IUCN Red List Categories and Criteria ver 3.1).

The numerical guidelines in Annex 5 to *Resolution Conf. 9.24 (Rev. CoP14)* do not explicitly address projected future declines, but suggest a general guideline for a marked recent rate of decline as 50% or more over 10 years or three generations, whichever is the longer. Assuming this guideline figure can be applied to conjectured future declines, it would appear on current knowledge that the Polar Bear does not meet any of the biological criteria for inclusion in Appendix I.

Supporting Statement (SS)	Additional information
Taxonomy	
Range	
Canada, Greenland (Denmark), Norway, Russian Federation, USA	
IUCN Global Category	
Vulnerable A3c	*Assessed 2008. Categories and Criteria ver. 3.1.*

Biological criteria for inclusion in Appendix I

A) Small wild population

(i) Population or habitat decline; (ii) small sub-populations; (iii) concentrated geographically during one or more life-history phases; (iv) large population fluctuations; (v) high vulnerability

20 000–25 000 in 18 putative populations, with a 19th population possibly occurring in the central polar basin.	*Considerable overlap between putative populations exists and the genetic differences between them are small (Schliebe* et al., *downloaded Nov 2009).* *The IUCN/SSC PBSG (2009) noted: 'the total number of Polar Bears is still thought to be between 20 000 and 25 000. However, the mixed quality of information on the different subpopulations means there is much room for error in establishing that range*.'

B) Restricted area of distribution

(i) Fragmented or localized population; (ii) large fluctuations in distribution or sub-populations; (iii) high vulnerability; (iv) decrease in distribution, population, area or quality of habitat, or recruitment

Distributed throughout the circumpolar basin.	*In Canada, extent of occurrence estimated at 8.7 million km^2 and area of occupancy at 5.6 million km^2 (COSEWIC, 2008).*

Supporting Statement (SS)	Additional information
C) Decline in number of wild individuals **(i) Ongoing or historic decline; (ii) inferred or projected decline owing to decreasing area or quality of habitat, levels of exploitation, high vulnerability, or decreasing recruitment**	
Overall population size estimate has varied little in the past 15 years, although because of the extreme nature of the environmental conditions where the Polar Bear occurs, it is very difficult to characterize accurately the population or trends. Field studies over the past 30+ years indicate that the number of Polar Bears is decreasing throughout their range. The IUCN/SSC PBSG met in 2005 and evaluated the status of the Polar Bear. At that time two populations of 19 were categorized as increasing, five as stable, five as declining, six as data-deficient and one unknown. In 2009 the IUCN/SSC PBSG concluded that one of 19 subpopulations was currently increasing, three were stable and eight were declining. Data were insufficient to provide an assessment of the current trend for the remaining seven subpopulations. Polar Bears are completely dependent on sea ice which has been reduced by 8% in the past 30 years, while summer sea ice has been reduced by 15–20%. An additional decline of 10–50% of annual average sea ice extent is predicted by 2100. A half dozen climate models, the best at predicting observed changes in sea ice to date, predict the complete loss of summer sea ice in the Arctic in about 30 years. Many experts have concluded that Polar Bears will not survive in many subpopulations owing to the changes in the distribution, duration, and structure of sea ice.	*Overall population estimates have remained relatively unchanged for over 30 years. The IUCN Mammal Red Data Book (Thornback and Jenkins, 1982) gave a range of 18 500 to 27 000 in total and quoted an estimate from 1972 of around 20 000, derived by summing regional estimates. Trend at the time of writing was believed stable or increasing.* *It is difficult to assess global population levels earlier than this because the quality of information was generally poor. Various attempts were made, based on surveys of more or less limited areas, including: extrapolation from aerial surveys along the coast of Alaska in the 1950s, leading to a global estimate of 17 000–19 000 bears; extrapolation from aerial surveys in the Russian Arctic in the 1960s leading to a global estimate of 11 000–14 000; extrapolation from den counts in Russia resulting in a global estimate of 5000–10 000 in the 1960s (Uspenski, 1979).* *The current IUCN Red List Assessment (Schliebe* et al.*, downloaded Nov 2009, based on an assessment made in 2005) notes the overall population trend as declining and states: "There is little doubt that Polar Bears will have a lesser area of occupancy (AOO), extent of occurrence (EOO) and habitat quality in the future. However, no direct relation exists between these measures and the abundance of Polar Bears. While some have speculated that Polar Bears might become extinct within 100 years from now, which would indicate a population decrease of >50% in 45 years based on a precautionary approach due to data uncertainty, a more realistic evaluation of the risk involved in the assessment makes it fair to suspect population reduction of >30%." Polar Bear generation time is generally taken as 15 years but lower values have been observed.*
Trade criteria for inclusion in Appendix I	
The species is or may be affected by trade	
Polar Bear products are in trade but the range of different products and units of measure used in records make it difficult to relate trade data to an actual number of Polar Bears in trade. However, export of products from Canada (where most Polar Bear products in trade originate) for the period 2004–2008 is believed to represent roughly 300 Polar Bears per year. In the period 1992–2006, an average of just under 200 whole skins a year was recorded as exported by Canada. Greenland introduced a voluntary temporary ban on the export of Polar Bear products in 2007.	

Supporting Statement (SS)	Additional information
More detailed information is provided in the supporting statement.	

Other information

Threats

Habitat loss (see above).

The available scientific and commercial information indicates that harvest, increased bear–human interaction levels, defence-of-life take, illegal take, and take associated with live-capture programmes for scientific research are occurring for several populations. Loss of habitat will be likely to exacerbate the effects of use and trade in several populations. In addition, Polar Bear mortality from harvest and negative bear–human interactions may in the future approach unsustainable levels for several populations, especially those experiencing nutritional stress or declining population numbers as a consequence of habitat change.

The available scientific information indicates that disease and predation (including intra-specific predation) do not threaten the species throughout its range but may become more important in future as the effects of global warming are felt. Contaminant concentrations are not presently thought to have population level effects on most Polar Bear populations. Increased exposure to contaminants, however, has the potential to operate in concert with other factors to lower recruitment and survival rates.

The IUCN/SSC PBSG (2009) stated: 'the greatest challenge to conservation of Polar Bears is ecological change in the Arctic resulting from climatic warming. Declines in the extent of the sea ice have accelerated since the last meeting of the group in 2005, with unprecedented sea ice retreats in 2007 and 2008." The Group confirmed its earlier conclusion that unabated global warming will ultimately threaten Polar Bears everywhere. The IUCN/SSC PBSG also recognized that threats to Polar Bears will occur at different rates and times across their range although warming-induced habitat degradation and loss are already negatively affecting Polar Bears in some parts of their range. Subpopulations of Polar Bears face different combinations of human threats. The PBSG recommends that jurisdictions take into account the variation in threats facing Polar Bears.'

In Canada, where four of 13 subpopulations were reported in 2008 to be declining, these declines were ascribed to over-harvest in two cases (Baffin Bay, Kane Basin) and climate change in two cases (Western Hudson Bay, Southern Beaufort Sea) (COSEWIC, 2008).

The PBSG noted that the population of Polar Bears in Baffin Bay, shared between Greenland and Canada, may simultaneously be suffering from significant habitat change and substantial over-harvest, while at the same time interpretations by scientists and local hunters disagree regarding population status. Similarly, the Chukchi Sea Polar Bear population, which is shared by the Russian Federation and the USA is likely to be declining as a result of illegal harvest in the Russian Federation and one of the highest rates of sea ice loss in the Arctic. Consistent with its past efforts to co-ordinate research and management among jurisdictions, the PBSG recommended that the Polar Bear populations in Baffin Bay and the Chukchi Sea be reassessed and that harvests be brought into balance with the current sustainable yield (IUCN/SSC PBSG, 2009).

Polar Bear harvest is male-biased (60–70% of the take) (IUCN/SSC PBSG, 2009). Some concern has been expressed that excessive take of males could lead to an impairment in recruitment owing to an Allee effect (Molnár et al.*, 2008), although such impairment has yet to be demonstrated in a wild population of Polar Bears.*

Conservation, management and legislation

Detailed information is provided in the supporting statement.

The following information (much of which is also in the supporting statement), is

Supporting Statement (SS)	Additional information
	derived from the website of the IUCN/SSC PBSG. *Within **Canada**, the authority for the management of Polar Bears lies with the seven provincial and territorial jurisdictions in which they occur. While the governments of the Provinces and Territories have the authority for management, the decision-making process for some is shared with Aboriginal management boards (e.g. Nunavut Wildlife Management Board) as part of the settlement of land claims. In most Canadian jurisdictions, hunting seasons, quotas, and protection of family groups have been legislated; however, only Manitoba prohibits the hunting of Polar Bears. Although Ontario and Québec have no enforced quotas, only native people may hunt Polar Bears. Over 80% of the hunting of Polar Bears in Canada occurs in Nunavut and the Northwest Territories, where management agreements and/or memoranda of understanding have been developed with local communities to ensure that all human-caused mortality is sustainable. Programmes to monitor and analyse the annual human-caused mortality of Polar Bears are in place in all jurisdictions. Recently the government of Nunavut reduced the harvest quota in Western Hudson Bay because of a documented population decline (IUCN/SSC PBSG, 2009).* *Harvest of Polar Bears in **Greenland** was undertaken without quotas until 2006, when the Government of Greenland introduced quotas. National regulations for Polar Bear management are fixed by law in* Executive Order no. 21 of 22 September 2005 on the Protection and Hunting of Polar Bears*. The Government of Greenland sets annual quotas taking into account: International agreements, biological advice provided by Greenland Institute of Natural Resources, harvest statistics, and consultations with the Hunting Council. The quota is divided between relevant municipalities by the Agency of Fisheries, Hunting and Agriculture in consultation with the Hunting Council, and they are set for three years. During the three years of regulations, the quotas have been reduced to ensure sustainable harvest. In 1985, Greenland obtained authority to issue CITES permits. In early 2007, the CITES Management Authority obtained a negative non-detrimental finding for Polar Bear, as a result of which Greenland introduced a voluntary temporary ban on export of Polar Bear products. In October 2009, the governments of Greenland, Nunavut and Canada signed a memorandum of understanding with the purpose of ensuring conservation and sustainable management of the Kane Basin and Baffin Bay populations that are shared between Canada and Greenland.* *Polar Bears are fully protected in **Norway** and can only be killed in self-defence.* *The Polar Bear was totally protected in **Russia** (USSR) in 1957. The only permitted take of Polar Bears is catching cubs for public zoos and circuses. An Agreement between the Government of the USA and the Government of the Russian Federation on the conservation and management of the Alaska-Chukotka Polar Bear population was signed in 2000. The Agreement came into force in September 2007. According to*

Supporting Statement (SS)	Additional information
	the Agreement, native renewal of limited subsistent take of Polar Bears by native people of Chukotka (Russia) is possible. However, at present a quota has not been fixed (which is obligatory for such hunting according to the Agreement) and hunting has not yet started. *Under the 1972* Marine Mammal Protection Act of 1972 *(MMPA) hunting of Polar Bears in the **USA** is prohibited except by coastal-dwelling Alaska Natives for subsistence and handicraft purposes, provided the take is not wasteful. Under the MMPA, harvest quotas are not set unless Polar Bear populations are defined as "depleted" (below optimum sustainable population level). The U.S. Fish and Wildlife Service has primary responsibility for harvest management, and works co-operatively with Alaska Native user groups (e.g. the Alaska Nanuuq Commission, North Slope Borough) to address harvest issues co-operatively under existing user group agreements. In addition, international co-ordination is required for harvest management since both the southern Beaufort Sea stock (SBS) and the Chukchi/Bering seas stock (CS) are shared with Canada and the Russian Federation, respectively. In 1988, the Inupiat of Alaska and Inuvialuit of Canada developed and implemented an Inupiat-Inuvialuit (I-I) conservation agreement for the SBS population. The Agreement was re-negotiated, and signed again in 1999. It establishes sustainable harvest limits and allocates quotas (which are reviewed annually) between the jurisdictions. It is not legally binding but has resulted in greater involvement by user groups in harvest management and conservation, as well as in generally sustainable harvest levels, although the reduction in estimated size of the SBS population is likely to require reduction of existing harvest levels in the future.*

Similar species

Captive breeding/artificial propagation

Other comments

Reviewers:
J. Aars, E. Born, A. Derocher, M.E. Obbard,I. Stirling, Ø. Wiig

References:
COSEWIC (2008). http://www.cosewic.gc.ca/eng/sct5/index_e.cfm. Viewed 21 December 2009.

Molnár, P. K., Derocher, A. E., Lewis, M. A. and Taylor, M. K. (2008). Modelling the mating system of polar bears: a mechanistic approach to the Allee effect. *Proc. R. Soc. B.* 275, 217–226.
IUCN/SSC Polar Bear Specialist Group (PBSG). (2009). *In litt* to IUCN/TRAFFIC Analyses Team. Cambridge, UK.
Schliebe, S., Wiig, Ø., Derocher, A. and Lunn, N. (2008). *Ursus maritimus*. In: IUCN 2009. *IUCN Red List of Threatened Species*. Version 2009.2. www.iucnredlist.org. viewed December 21 2009.
Thornback, J and Jenkins, M. (1982). *The IUCN Mammal Red Data Book, Part I*. IUCN, Cambridge and Gland, Switzerland.
Uspenski, S. M. (1979). *Der Eisbär* Thalarctos maritimus. Die Neue Brehm-Bücherei. A. Ziemsen Verlag. Wittenberg Lutherstadt, Germany. 112 pp.