



6 April 2006

Supervisor
U.S. Fish and Wildlife Service
Marine Mammals Management Office
1011 East Tudor Road
Anchorage, Alaska 99503

Re: Proposed up-listing of polar bear to “threatened status” under the
U.S. Endangered Species Act

Please consider the attached in regards to the up-listing of polar bears to “threatened status” under the U.S. Endangered Species Act, as petitioned by the Center for Biological Diversity and other interested parties. I am writing the attached review of the petition in my capacity as Manager of Wildlife Research, Department of Environment, Government of Nunavut Territory, Canada.

The conclusions contained in this report reflect my professional opinions. The comments and information provided herein have been reviewed by senior representatives of the Government of Nunavut, but do not necessarily represent the position or view of the Government of Nunavut. After reviewing the petition, it was felt that the most appropriate submission from Nunavut on this proposal should come from an objective scientific review.

Any of the references listed in the comments are available to support the review upon request. Thank-you for considering these comments.

Sincerely,

A handwritten signature in blue ink, appearing to be 'MKT', is written over a horizontal line.

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MKT.pdm

Preface

My initial comments speak to my interpretation of the context, motivation, and consequences (if successful) of the petition of the Center for Biological Diversity (CBD) to up-list polar bear to “threatened” status under the U.S. Endangered Species Act of 1973. The petition is well-written and the authors show capacity for scholarship and research in development of their thesis that polar bears will first become endangered, then extinct, unless intervention in current management practices does not occur. This progression is essential to the petition of the Center for Biological Diversity; because if it is not true, it would not be correct to consider polar bears as “threatened” (by definition) under the U.S. Endangered Species Act. Unfortunately, the Center for Biological Diversity and their partners in this petition (Greenpeace Inc.) are not research institutions. They are special interest groups. Conservation legislation provides them with tools to advance their agenda and values, which includes protection but not hunting. For that reason, their petition should be reviewed critically by the U.S. Fish and Wildlife Service (USFWS) because it is a legal argument and not an objective summary of the relevant information.

Conservation of polar bears requires international cooperation, as several populations are shared between countries and as problems such as contaminants and climate change are a potential threat to the whole of the Arctic. Since 1965, an international group of scientists specializing in studying polar bears has been coordinating research and management of polar bears throughout the Arctic under the auspices of the International Union for Conservation of Nature and Natural Resources (IUCN) or World Conservation Union. Five countries—Canada, Denmark, Norway, the United States, and the former U.S.S.R.—signed the *International Agreement on the Conservation of Polar Bears* in Oslo, Norway, in 1973. The agreement came into effect in 1976.

At present, the polar bear is one of the best managed of the large arctic mammals. If all the arctic nations continue to abide by the terms and intent of the Polar Bear Agreement, the future of polar bears is secure. One of the main reasons for the high quality of our co-management programs is the high economic and societal value of the polar bear resource, particularly to the Inuit of northern Canada (Freeman and Wenzel 2006; Dowsley and Taylor 2006*a,b*). Un-tanned polar bear pelts sell for up to \$3,000 CAD, depending on their size and quality. This can make up a significant portion of an Inuk hunter’s cash income. Within the annual quota assigned to each coastal village in the Northwest Territories and Nunavut, hunters are also allowed to allocate a number of hunting tags to non-resident sport hunters, who are guided on a polar bear hunt by local Inuit hunters for fees that are normally in the range of \$18,000 to \$35,000 CAD per hunt (Wenzel and Bourgouin 2002). This is an important source of cash income for small settlements in northern Canada. The annual economic value of the guided sport hunt (\$2.5-3.0 million) and the hides (\$0.5 million) is approximately \$3.0-3.5 million in Canada.

If polar bears are up-listed to “threatened” status under the U.S. Endangered Species Act, there would be an immediate, negative effect on U.S. polar bear sport hunters and the traditional economy of Inuit hunters who guide them, because U.S. sport hunt trophies would no longer be allowed to be imported into the U.S. Such action may result in a

cascading effect on the economic value of fur sales in Canada and abroad. A finding of “threatened” could initiate a CITES and European Union Wildlife Trade Regulations review for polar bears and result in the loss of international trade between Canada and importers of products of our polar bear resource. The implications of these developments to Inuit hunters are obvious. What may be less apparent, however, are the implications for conservation of the polar bear itself.

Currently, Inuit and all northern residents are united in their efforts to keep accidental, defense, and illegal kills to an absolute minimum. Nunavut has developed Polar Bear Memoranda of Agreement with all Nunavut communities for every polar bear population within Nunavut to ensure sound conservation practices. Canadian federal, provincial, and territorial governments invest several million dollars each year into the research and co-management activities required to ensure polar bears are managed according to “sound conservation practices using the best available scientific data,” as per the *International Agreement for the Conservation of Polar Bears*. This significant investment in research and management is strongly supported by aboriginal harvesters who benefit from safe harvesting at levels close to the maximum sustainable yield. The loss of economic benefit may result in a de-valuing of polar bears by both institutions and hunters. Research money for monitoring and collection of essential demographic information, as well as local attitudes toward defense issues, will likely be negatively impacted by a loss of economic value. Ironically, inappropriate up-listing could actually work against conservation of polar bears by disrupting the economic foundation of many of the current management systems. A failure or even reduction in the level of effort put into monitoring polar bear populations could put populations at risk.

My comments above speak to the motivation of the Center for Biological Diversity and consequences of a successful petition, but not to the content of the petition.

Response to the Content of the Petition

Polar bears have become the poster-species for doomsday prophets of global catastrophe from anthropogenic climate change. It makes a great story because it is simple and intuitive. However, the reality is much more complex. Predicted effects of climate change on polar bears must take into account the differences in latitude and ecological circumstances of the various populations. The same papers that warn of possible negative effects on polar bears from climate change also suggest that polar bear habitat in some areas will likely improve (e.g., Derocher et al. 2004). It seems clear that things in the Arctic will change, but not all changes will be negative for polar bears.

The petition admits that there is only evidence for deleterious effects from climate change for one polar bear population (Western Hudson Bay [WH]) at the southernmost extreme of polar bear range (Fig. 1). The petition argues that the likelihood of change in other areas is reason enough to find that polar bears should be regarded as a species at risk of imminent extinction. I hope the review considers the precedent set by accepting this argument. Climate change will affect all species to some extent, including humans. If the likelihood of change is regarded as sufficient cause to designate a species or population as “threatened,” then all species around the world are “threatened.”

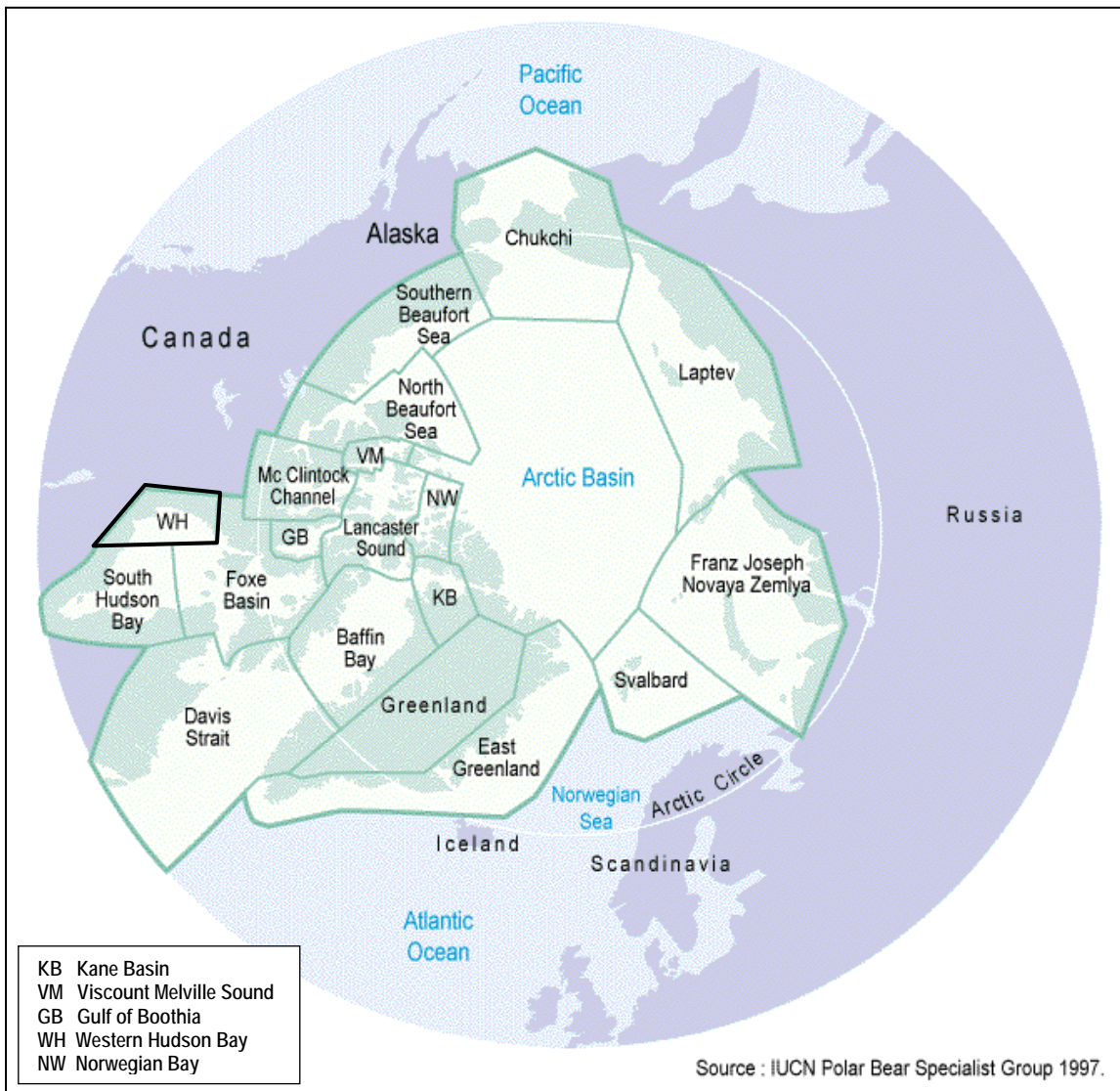


Fig. 1. Circumpolar distribution of polar bear populations. The Western Hudson Bay population (WH), for which data on negative impacts of climate change exist, is highlighted. Polar bears of WH comprise approximately 4% of the world total population polar bears.

Climate change from global warming is accepted in the north, where we have seen the effects clearly for some time. There is increasing evidence that the causes and mechanisms of climate change are complex and difficult to study because of the scale, magnitude, and synergist interaction of celestial, volcanic, atmospheric, and oceanographic forces. How it all works and who is to blame is beyond my expertise and the scope of these comments. My point, in raising these facts, is that climate change cannot be compared to the simplicity of a pipe from a factory that drains waste into a river. Climate change cannot be stopped or reversed by turning a valve or up-listing a species. Maintaining a particular ecological status quo in a time of changing ecosystems is probably not realistic or even a desirable goal. I am concerned that the up-listing of

this well-managed, economically valuable species in response to unpublished results of negative impacts of global warming on polar bear survival for a single population (WH) would irreparably harm the management practices in place to protect polar bears from remaining sources of human-caused mortality.

Polar bears are believed to have evolved from grizzly bears during the Pleistocene era some 200-250,000 years ago (Amstrup 2003). Polar bears were well developed as a separate species by the Eemian interglacial approximately 125,000 years ago. This period was characterized by temperature fluctuations caused by entirely natural events on the same order as those predicted by contemporary climate change models. Polar bears obviously adapted to the changing environment, as evidenced by their presence today. That simple fact is well known and part of the information contained in the reference material cited throughout the petition, yet it is never mentioned. This fact alone is sufficient grounds to reject the petition. Clearly polar bears can adapt to climate change. They have evolved and persisted for thousands of years in a period characterized by fluctuating climate. No rational person could review this information and conclude that climate change pre-destined polar bears to extinction.

Derocher et al. (2004) provides a rational but speculative consideration of anticipated effects of climate change on polar bears. The evidence from long term studies of the WH polar bear population provides strong evidence for both an effect of climate change and the mechanism by which demographic rates have been reduced by diminished sea ice cover. However, initial mark-recapture results from the neighboring Southern Hudson Bay (SH) population do not support these results (M. Obbard, personal communication at the Canadian Federal/Provincial Polar Bear Technical Committee meeting, February 6-8, 2006, St. Johns, Newfoundland). Population densities in the Davis Strait (DS) population were sufficiently high in 2005 that a mark-recapture team was able to capture and mark 628 individuals in a single season. Both the SH and DS populations are at a more southern latitude than the WH population. Note that the WH population is also impacted by an aggressive polar bear control program, tourism activities, and aboriginal hunting during the open water season when bears are onshore. The widely mentioned WH decline has yet to be published, and is based on sampling that did not include a substantive portion of the WH summer retreat area. The adult female natural survival estimate from the current WH mark-recapture analysis has been questioned because it did not decline over the same period in which effects of climate change were detected in recruitment, and because the known recovery of the WH population from low numbers in the 1950s and 1960s would not have occurred if natural survival was actually that low.

A decline of polar bears in WH is not disputed. That said, the situation in WH is not typical of most polar bear populations. The analysis of these data in relation to climate change is still in progress, and what the data have to tell us may not be as simple as the petition proponents suggest. Evidence is accumulating that climate change effects are currently not present, or are not as pronounced, in more southern and even neighboring populations.

The petition does not mention the current over-harvest problem in the Baffin Bay (BB) population. The BB population is shared and harvested by Greenland and Canada

(Nunavut) and is currently declining as a result (PBSG Status Report 2006). Greenland recently initiated a quota system, and although the combined Nunavut-Greenland quotas still exceed the estimated sustainable kill by a wide margin, co-management discussions are progressing. The decline is not due to climate change, and steps are being taken to address the problem. A loss of the economic value from polar bear harvesting could make reaching an agreement more difficult because the financial incentive to Inuit hunters for demonstrating conservative management practices would no longer be a factor.

The petition of the Center for Biological Diversity restricted its literature review to a fairly narrow subset of the available information. Information from Nunavut's recent management changes is included, and I recognize an included table as one I prepared. However, other relevant scientific papers, reports, status determinations, and communications explaining our information and rationale seem to have mainly escaped the attention of the proponent. These published and unpublished reports speak to population demography, space-use ecology, population delineation, and articles by other authors on physiological ecology (Derocher and Taylor 1994; Ferguson et al. 1997, 1998, 1999, 2000*a*, 2000*b*, 2001; Lee and Taylor 1995; Messier et al. 1994; Plante et al. 2001; Taylor 1994; Taylor and Lee 1995; Taylor et al. 1987*a*, 1987*b*, 2001, 2002, 2005, 2006).

The references listed above suggest that each polar bear population is unique with respect to seasonal cycles, sea ice conditions, prey base, summer-retreat areas, and fidelity. The 20 existing populations of polar bears are not all identical to the two populations that constitute the majority of the examples in the petition. In this respect, I agree with the petitioners that each population should be considered independently. It may be, in the future, that some polar bear populations will no longer be viable, or will exist as fragile remnants of former numbers. However, as Derocher et al. (2004) suggest, other populations may be enhanced and become more numerous. The status of each population (and management prescriptions) should be determined based on their individual ecological and demographic characteristics. This is why the IUCN/SSC Polar Bear Specialists Group (PBSG) provides population specific status information. The operational definition of polar bear populations is that they are essentially independent demographic units.

The timing of the petition was unfortunate. The PBSG met in June, 2005, and developed an updated status report as part of the group's deliberations. The draft report is nearing completion and will be part of the proceedings of this meeting. The report is based on both published and unpublished data that were apparently not available to the petition proponents. The petition repeatedly cites the 2002 PBSG status table so the updated 2005 status table is clearly relevant. I am assuming that the USFWS review will consider the most recent status report because representatives of the USFWS, who are also PBSG members, are participating in its development. To facilitate the review, I will also attach or provide by separate mail relevant manuscripts that are in review or in press. These include manuscripts by myself and colleagues with final analysis of results for the Kane Basin (KB), Lancaster Sound (LS)–Norwegian Bay (NB), and Gulf of Boothia (GB) population inventories (Fig. 1).

The petition refers repeatedly to *the best available science*; however, the proponents ignore any information that does not support the proposal to up-list polar bears, including recent literature that deals directly with the question of status. I hope the review does not maintain this unfortunate perspective by restricting itself to only the information provided by the Center for Biological Diversity.

Response to the Particulars of the Petition:

The petition is 154 pages long, and claims to provide:

- a review of the current status and distribution of the species;
- an explanation for how climate change will cause the species to go extinct;
- documentation of the threats that oil and gas pose to polar bear populations;
- documentation of the threats that persistent halogenated hydrocarbons pose to polar bear populations; and
- a demonstration that existing domestic and international law are insufficient to address these threats.

Specific comments, in support of my previous assertions, are as follows:

1) *Climate change effects on polar bears.*—The life history and distribution sections neglect several important references, as mentioned above. The petition is also particularly deficient in failing to consider the mitigating effects of the seasonal cycle in polar bear feeding and nutrition. Polar bears do not feed at constant rates all year long. Most of their annual energy intake appears to occur as hyperphagia in the late spring and early summer on juvenile ringed seals. Polar bears are well adapted to this feast-and-famine feeding regimen (Lunn and Stirling 1985; Watts and Hansen 1987; Ramsay and Stirling 1988; Derocher and Stirling 1990; Derocher et al. 1990). Polar bears appear to be able to alter their metabolism during periods of food deprivation at any time of the year (Nelson et al. 1983), and Atkinson and Ramsay (1995) and Derocher et al. (1990) demonstrated that polar bears, unlike other bears, can shift as needed into a hibernation-like metabolic pattern when confronted by a period of food shortage. Clearly polar bears, more than any other bear species, are adapted to buffer effects of seasonal disruptions in feeding due to climate change. Taylor et al. (2001) found that annual movements of polar bears appeared to function to ensure that they were in good hunting areas during the critical late spring and early summer period. The relevance of this nutritional strategy is that ice cover after the hyperphagic period may not have effects much beyond behavioral and distributional changes to accommodate the open water.

Polar bear densities have historically been low in areas dominated by heavy, multi-year ice. Examples include Viscount Melville Sound (Taylor et al. 2002), Norwegian Bay, and the Arctic Basin. The proponents fail to mention that the Arctic basin is not counted as a polar bear population because very few bears have been seen in this area. The edges are used as summer retreat habitat, but during the ice covered season polar bears are mainly found over continental shelf areas. The Queen Elizabeth Islands (QE) population is no longer regarded as a population. Rather, it is regarded as just a part of the Arctic Basin, and no population is ascribed to this area.

In the petition, much is made of the reduction in ice coverage of the Arctic Basin, but this does not represent much in the way of habitat loss to polar bears. If the Arctic basin pack ice continues to decline, polar bears from neighboring populations may be forced to seek onshore summer retreat areas. This transition will likely entail reduced survival and recruitment as new seasonal movement patterns become established. There would have to be increased effort put into managing bear-human interactions as more bears summer on shore. However, such a transition would not necessarily lead to the extinction of these populations. Adaptation and transition will likely be required for every population if the projected climate change scenarios are realized. Polar bears are intelligent and quick to adapt to new circumstances (Stirling and Derocher 1989), and, as commented above, are physiologically capable of adapting to food stress.

Changes in ice conditions in high latitude areas that currently have relatively low prey and polar bear densities may be enhanced by more annual and active ice (i.e., non-permanent ice cover). As ice cover diminishes, more sunlight will enter the water column resulting in higher primary productivity which could also increase the biomass in trophic levels upon which polar bears directly rely. Reductions in availability of marine prey because of earlier open water and later freeze up may also be partially mitigated by increased terrestrial feeding, although this has not been demonstrated and appears not to have been the case in WH.

Although the impacts of climate change may not be entirely negative, it is true that the changing conditions will pose difficult challenges for wildlife managers and conservation authorities. Population boundaries may change to accommodate shifts in distribution. Changes in the demographic characteristics of populations will require a responsive and conservative approach to harvest management; however, no evidence was presented by the proponents and no evidence exists that suggests that both bears and the conservation systems that regulate them will not adapt and respond to the new conditions. Polar bears have persisted through many similar climate cycles.

2) *Oil and Gas Development*.—Impacts or “take” from oil and gas development are tightly regulated in areas where oil and gas extraction are occurring. In most areas of Canada, all anthropogenic mortality is taken from sustainable quota levels. In other words, accidental mortality is taken off the quota. In Alaska, the allowable take is identified prior to the issuance of a permit to ensure that a worst case scenario is within conservation limits. Although oil is toxic and a threat to polar bears (Stirling 1990), oil spill simulations by the USGS (Durner et al. 2001) suggest that few bears would actually encounter oil if a major spill or blow-out occurred in Alaska (where marine oil operations are currently an issue for polar bears). Oil and gas development do pose risks to individual polar bears, but not to polar bear populations unless current management protocols are abandoned.

3) *Contaminants*.—The PBSG conducts circumpolar contaminant tissue sampling every five years. These studies have shown that most species of contaminants are declining in most polar bear populations. Although contaminant levels in some populations have been shown to be correlated to reduced immune function, there has never been a demonstration of demographic effects from contaminants on any polar bear population.

There is no evidence that current or historical contaminant levels have had any impact on polar bear population dynamics except for incidental reports of a few individuals that died from point source poisoning. Contaminants are, of course, not good for polar bears, and levels are sufficient that continued monitoring is indicated; however, the notion that polar bears are headed for extinction because of environmental contaminants is not supported.

4) *International and National Conservation Systems.*—The International Agreement for the Conservation of Polar Bears has been independently reviewed several times in the recent past and found to be effective (e.g., Stirling 1986; Presterud and Stirling 1994). The Inuvialuit-Inupiat Co-management Agreement was also recently reviewed and found to be working well. The U.S. Marine Mammal Protection Act is criticized as deficient because it does not have the authority to regulate global greenhouse emissions. Does the U.S. Endangered Species Act provide this authority?

Appendix E of the petition seems to argue that unless the existing legislation can provide absolute protection for polar bear habitat and also reverse climate change, then polar bears are doomed to extinction. This is nonsense; the argument is not rational because the conclusion simply restates the premise. For the most part, polar bear populations have increased or remained stable under the current regulatory regime. Reductions to some populations due to over-hunting were identified, and these populations appear to have recovered or are recovering (e.g., Taylor et al. 2002, 2006). For example, the proponents claim that there has been no management response to indications of over-hunting in the Nunavut population of M'Clintock Channel (MC). In fact, a harvest moratorium was imposed in 2002, which lasted until 2005 when the former population quota (22 per year) was reduced to 3 per year until the population had recovered to former numbers (Taylor et al. 2006). The petition proponents report the reduction from 22 per year to moratorium to 3 per year as an increase in the quota of 3 bears. The proponents are familiar with the new population estimates for MC (although Appendix C seems entirely uninformed regarding the Gulf of Boothia (GB) population estimates that were completed and released at the same time). The new GB estimates show the population is a robust 1500, not 900 as formerly assumed. Life may be good, but good news about polar bear populations does not seem to be welcomed by the Center for Biological Diversity.

Concluding Statement

The future is always uncertain, and it is appropriate to be concerned about the effects of climate change, development, and contaminants on arctic wildlife, including polar bears. However, the Center for Biological Diversity and associated interest groups (e.g., Greenpeace) do not acknowledge the existing research and management structures and initiatives in place to ensure that polar bear populations persist in perpetuity. Identification of an effect on one population out of 20 is not sufficient to declare a species headed for extinction; the evidence presented by the proponents does not meet the criteria of the test for the Endangered Species Act category: "Threatened."

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