

SARAH PALIN
GOVERNOR

GOVERNOR@GOV.STATE.AK.US



STATE OF ALASKA
OFFICE OF THE GOVERNOR
JUNEAU

P.O. Box 110001
JUNEAU, ALASKA 99811-0001
(907) 465-3500
FAX (907) 465-3532
WWW.GOV.STATE.AK.US

April 9, 2007

The Honorable Dirk Kempthorne
Secretary of Interior
U. S. Department of the Interior
Interior Building
1849 C Street, NW
Washington, DC 20240

Dear Secretary Kempthorne:

Today, the Alaska Department of Fish and Game wrote to the Alaska Region of the U.S. Fish and Wildlife Service (Service) to express our formal opposition to listing the polar bear under the Endangered Species Act as threatened in all or significant portions of its range. Because you and I personally discussed this important matter, I wanted to share our underlying rationale directly with you.

The State of Alaska opposes this listing because we believe the Service did not use the best available scientific and commercial information in making its proposed determination. The Service selectively used models of sea ice loss – the very foundation of the proposed listing – and did not consider other models that reveal starkly different, but equally valid, predictions of future summer sea ice loss. Further, the state opposes listing because it would harm existing and highly successful polar bear conservation measures under international agreements and treaties.

The state's letter is accompanied by data, analyses, and comments requested in the service's listing proposal and includes important information the Service did not fully consider, including 1) predictions of sea ice loss, 2) existing regulatory mechanisms for conservation of polar bears, 3) standards for a threatened listing, and 4) status, trends, and unsubstantiated assumptions concerning polar bear populations that supported the petition and status assessment.

The state stands by its earlier conclusion that polar bears are abundant, stable, and unthreatened by direct human activity. The 19 recognized subpopulations of polar bears worldwide are well managed through the Marine Mammal Protection Act and

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April 9, 2007
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international agreements. Listing the polar bear as threatened will damage existing successful conservation programs without offering any positive benefit for bears.

Let me renew my personal commitment to you to fully engage the State of Alaska in efforts to ensure the conservation of the polar bear. In the meantime, I hope you will encourage the Service to revise its finding in light of our information and to conclude that listing the polar bear as threatened is not warranted in any portion of its range.

Thank you, as always, for your personal consideration.

Sincerely,

A handwritten signature in black ink that reads "Sarah Palin". The signature is fluid and cursive, with a large, stylized "S" at the beginning and a distinct "Palin" at the end.

Sarah Palin
Governor

cc: Alaska Congressional Delegation
John Katz, Director of State/Federal Affairs and Special Council, Office of the
Governor
Denby Lloyd, Commissioner, Alaska Department of Fish and Game
Ken Taylor, Deputy Commissioner, Alaska Department of Fish and Game
Tina Cuning, Special Assistant, Alaska Department of Fish and
Game
Matthew A. Cronin, Ph.D., Research Associate Professor, University
of Alaska, Fairbanks

STATE OF ALASKA

SARAH PALIN, GOVERNOR

DEPARTMENT OF FISH AND GAME

OFFICE OF THE COMMISSIONER

P.O. BOX 115526
JUNEAU, AK 99811-5526
PHONE: (907) 465-4100
FAX: (907) 465-2332

April 9, 2007

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

ATTN: Polar Bear Finding

Dear Supervisor:

The State of Alaska opposes any listing under the Endangered Species Act of the polar bear as threatened in all or significant portions of its range. Our review of the Fish and Wildlife Service's 12-month finding on a petition to list polar bears reveals that the best available scientific and commercial information was not used as required in the proposed determination. To the contrary, the very foundation of the proposed listing is the selective use of models to predict loss of summer sea ice over the next 45 years. The models used by the Service do not consider other models that are at least equally valid and predict less loss of summer sea ice in the future. Furthermore, the disclaimers accompanying the models used by the Service regarding the limitations of their predictive ability were largely ignored.

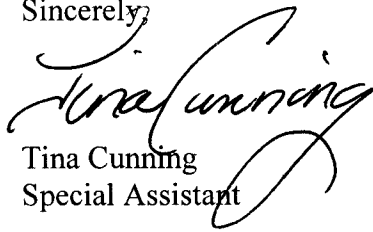
Accompanying this letter are the State of Alaska's consolidated state agency comments, additional data, and analyses as requested in the January 9, 2007, (Federal Register Vol. 72, No. 5) proposal to list the polar bear as threatened throughout its range pursuant to the Endangered Species Act. These include: 1) a thorough review of additional sea ice models and their predictions of sea ice loss, 2) additional information on existing regulatory mechanisms for conservation of polar bears, 3) clarification on the standards for a threatened listing, and 4) additional information on and clarification of the status, trends, and assumptions concerning polar bear populations that the Service used to support the petition and Status Assessment.

The State stands by its earlier conclusion that polar bears are abundant, stable, and unthreatened by direct human activity. The 19 recognized subpopulations of polar bears worldwide are well managed through international agreements and the Marine Mammal

Protection Act. The State of Alaska is deeply concerned that listing this species would harm many of the existing and highly successful polar bear conservation measures currently in place under these international agreements and treaties.

We appreciate and accept your offer to continue to participate in this process as a peer reviewer and look forward to cooperatively assessing further information received during the comment period. We urge the Service to carefully review the enclosed information and to revise its finding based upon this additional information to conclude that a listing of the polar bear as threatened is not warranted throughout any portion of its range.

Sincerely,

A handwritten signature in black ink, appearing to read "Tina Cunningham". The signature is written in a cursive style with a large, sweeping flourish at the end.

Tina Cunningham
Special Assistant

Enclosures: Issues 1-4 and Bibliography

Issue 1: Sea ice and climate change model predictions of habitat loss

Threatened Listing is Primarily Based on Factor A: Predicted Loss of Habitat

The proposed rule describes information that the Service evaluated to address the five factors identified in the Endangered Species Act (16 U.S.C. 533) (p.1070):

Under section 4(a) of the Act, we may list a species on the basis of any of five factors, as follows: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence.

The Service concluded that factor (A) is applicable (p. 1081): “*We find that polar bear populations throughout their distribution in the circumpolar Arctic are threatened by ongoing and projected changes in their sea ice habitat.*” (emphasis added)

The finding, based on predictions of receding sea ice (p. 1094), states:

Under Factor A . . . we find that the diminishing extent of sea ice in the Arctic is extensively documented. Further recession of sea ice in the future is predicted and . . . within the foreseeable future, the species is likely to become endangered throughout all or a significant portion of its range due to changes in habitat. (emphasis added)

The predicted loss of late summer sea ice habitat is the primary factor of the proposed threatened listing under the Endangered Species Act. We do not dispute that sea ice has recently been receding. However, the model selected by the Service to predict loss of sea ice appears to represent a ‘worst case’ rather than a ‘most likely’ scenario.

We find a wide range of sea ice and climate change is predicted among climate models that significantly differ with the Service’s conclusion of the likely timing and extent of sea ice recession. We do not believe that the Service used the best available scientific and commercial data as required by 16 U.S.C. § 1533(b). As noted by the US Supreme Court, “[t]he obvious purpose of the requirement that each agency ‘use the best scientific and commercial data available’ is to ensure that the ESA not be implemented haphazardly, on the basis of speculation or surmise.” *Bennett v. Spear*, 520 U.S. 154, 176 (1997). We urge the Service to review all available sea ice and climate change models, then use the best available science to model polar bear sea ice habitat and determine the impacts to polar bear populations (see Issue 4). We provide the following discussion and information that needs further consideration by the Service on sea ice models, predictions, and analyses.

Review of Sea Ice Modeling Used to Predict Habitat Loss

The proposed rule selectively discusses various sources of sea ice and climate change models (pp. 1071-1072) that predict timing of the retreat of Arctic sea ice, extent of summer ice, and estimates when ice-free September conditions may be reached.

For example, the discussion under “*The Overview of Arctic Sea Ice Change*” (p. 1071) cites results from a single climate model that were projected by the National Center for Atmospheric Research (NCAR, Holland et al., 2006): “*near ice free ice conditions may be reached as early as 2040.*” This is the most extreme time predicted for near ice free state in September. The Service did not give equal consideration to all seven different simulations (“ensemble members”) by the same model in the sea ice change projection experiment at NCAR. The ensemble members differed by perturbations of their initial state for enhancing robustness of modeling results through reducing their dependence on any random noise in initial state. While abrupt changes were a characteristic of the simulations in this model, the timing of the abrupt changes varied among ensemble members.

The late summer ice-out date of 2040, quoted above, is from the simulation with an early abrupt decrease. In contrast, the abrupt changes also appear as increases of ice coverage over several years in some of the simulations (Holland et al., 2006, Fig. 4). The average time by which the Arctic Ocean becomes ice-free in late summer in the seven ensemble members is 2050-2060. The use of the 2040 ice-out date appears to be an example of the Service choosing a ‘worst-case’ upon which to predict loss of near shore ice during late summer in order to support a finding of loss of habitat that is sufficient within the “foreseeable future” to justify a ‘threatened’ listing.

More importantly, the NCAR model is only one of approximately 15 models that were used by the Intergovernmental Panel on Climate Change (IPCC) in projecting late summer ice conditions through the 21st century. Zhang and Walsh (2006, *Journal of Climate*, 19, 1730-1747) analyzed the summer sea ice simulated by these 15 models under various scenarios of greenhouse gas forcing. Under all scenarios, the models show a wide range of late summer “ice-out” dates (**Figure 1**). For the ‘middle-of-the-road’ A1B scenario of greenhouse gas concentrations, the late summer ice-out date ranges from approximately 2030 to well into the 22nd century (Zhang and Walsh, 2006, p. 1741, Fig. 4). The mean value of the 15-model results of the A1B simulations show a late summer ice retreat by 2040 (2030-2050 time slice) that differs by only 100 to 200 miles from the 1980-2000 summer position of the major ice pack and shows a residual of late summer sea ice near the North Pole at the end of the 21st century (the 2080-2100 time slice). The abrupt transitions found in the NCAR model occur in only a minority of the A1B simulations. Holland et al. (2006) state that “...*six of an additional 15 models archived at the IPCC data center also exhibit abrupt September ice retreat in their A1B scenario runs*” (Holland et al., 2006, p. 4). In other words, nine of the other 15 models do not show the abrupt transitions in their A1B late summer sea ice scenarios.

Although these models are rigorous in their methodology, significant uncertainty and scientific debate remains as to when a new Arctic summer sea state will be realized (Serreze et al, 2007; Zhang and Walsh, 2006). The use of data points generated from a single model simulation, or even data from several simulations by an individual model, to infer a date of a late summer ice

Multyear (Summer Minimum) Ice Area Anomalies From 2000-2100 Under Scenario A1B

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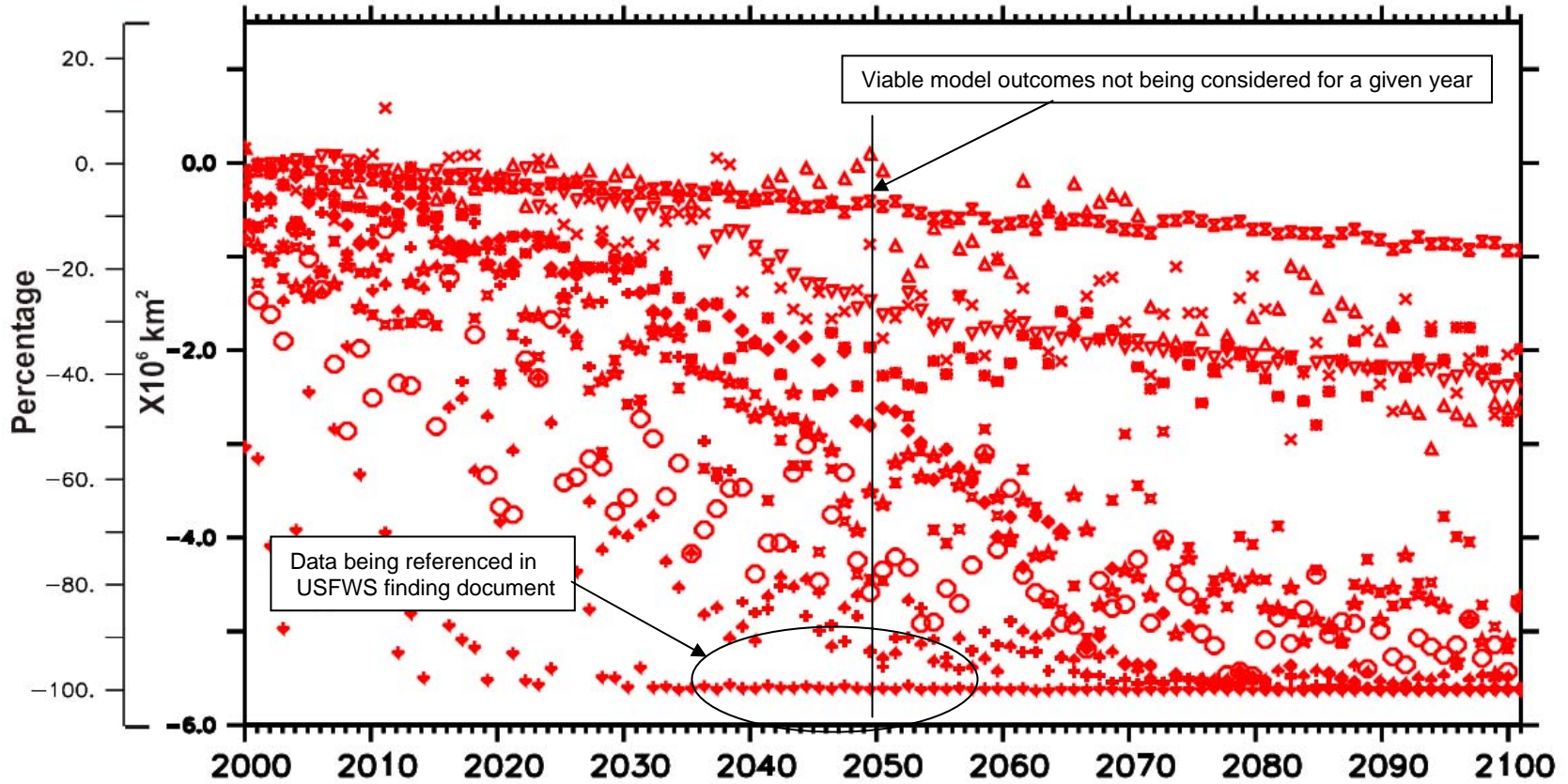


Figure 1; (used with permission from Zhang and Walsh, 2006) Graph showing significant variation in model projections using IPCC AR4 models and B1 simulations (see article for details and additional plots). It is important to note the significant range of viable model outcomes for any projected 'summer minimum year' which range from ice free to nearly no change from current ice area (see vertical line through data). This data set shows a "trend" of overall reduction in the 21 century, but individual model results should not be used to identify decadal scale variation, nor predicted date of an ice-free polar summer within this century. Also note the significant variation in model results from the observed value at year 2000 (value 0.0).

Reference; Zhang, X., and J. E. Walsh, 2006: Toward a seasonally ice-covered Arctic Ocean: Scenarios from the IPCC AR4 model simulations. *J. Climate*, 19, 1730-1747.

free Arctic, fails to acknowledge the broad distribution of viable outcomes. In fact, variation in “summer minimum” polar ice coverage predictions at the year 2040 range from 100 % loss to 0.0% loss (from current conditions) depending on which model is chosen (**Figure 1**). Or, put another way by Serreze et al, analyses of models based on a specific CO₂ level show “*a near-complete or complete loss . . . of September ice will occur anywhere from 2040 to well beyond the year 2100, depending on the model and the particular run for that model. Overall, about half of the models reach September ice-free conditions by 2100* (O. Arzel, T. Fichefet, H. Goosse, *Ocean Model*, 401 (2006))”.

The importance of the plot depicted in **Figure 1** cannot be overstated. This plot of late summer sea ice recession clearly shows that, given the wide variability in the viable model outcomes for a given year, it would be impossible to suggest the "foreseeable future" requirement is based on a defensible prediction of late summer sea ice in 2040, assuming the Service reevaluates all available data and analyzes it scientifically. This graph raises serious questions concerning the Service’s selective use of model results applied as the prediction that serves as the basis for the proposed rule.

Significant data gaps exist for ice model calibration and critical comparisons of historic Arctic ice data and the predictive model simulations. For example, Zhang and Walsh (2006) review historic data and state: “*Taking into consideration the accuracy of sea ice measurements in the real world we selected as a reference period 1979-99, years for which satellite remote sensing data were continuously available.*” Zhang and Walsh (2006, Table 2) also provide a statistical summary of the observed to modeled differences which show a standard deviation from observed of between 0.58 to 3.72, with an average of 1.78. They point out, “. . . *the large across-model standard deviation of model estimates relative to observation points to obvious model-dependent uncertainties.*” Given this level of variance is for the 20 year period when high resolution historic data are available, it is difficult to perceive how the Service can conclude that the statistical resolution of the ice data falls within acceptable minimums for determining a “foreseeable future.”

Continued data collection, improvement of model physics, and fine-tuning of the models will improve our level of certainty and will help make acceptable determinations and policy decisions. The Service is strongly encouraged to employ a rigorous probabilistic analysis of all available model output prior to a final determination. Additionally, given the importance of this work towards understanding future impacts to Arctic ecosystems, it is recommended that the federal and state governments and scientific community dramatically increase its effort in data collection and state-of-the-art model analysis. It is imperative that sufficient funding is provided to help reduce the level of uncertainty and provide the data needed for meaningful regulation.

Review of Climate Change Information as Basis of Predicting Ice Recession

The proposed rule bases its predictions of late summer ice-free timing on climate change information derived primarily from two reports cited in the 2006 Status Assessment. One is the 2001 report by the Intergovernmental Panel on Climate Changes (IPCC) and the other is the

2005 Arctic Climate Impact Assessment (ACIA). While the IPCC and ACIA reports are products of international scientists and experts, the reports are by no means representative of all valid assessments relevant to climate change and its potential impacts. In addition, the Service's 2006 Status Assessment selectively uses information referenced in the reports and from other authors. We request the Service reconsider its analysis and conclusions regarding climate change and related sea ice habitat decisions in light of the following additional analysis and information.

Climate change and a recent warming trend in portions of the Arctic are occurring. However, the causes and mechanisms are more diverse, complex, and debated among the scientists than is portrayed in the proposed rule (p. 1071-1072). There are as many broad ranging theories of the impacts as there are of the mechanics and causes. There is also no agreement among experts on how these changes fit into longer-term analysis of past and projected future climate conditions.

The 2005 ACIA used the average of 100-year records as a flat temperature baseline, but numerous studies indicate an increasing gradient of temperature for several hundred years. For example, Akasofu (in press) notes that the ice-core record disputes the ACIA flat line. Akasofu summarizes several publications that infer the period 1500-1900 was cool (Lamb, 1982; Gribbin (ed.), 1978; Crowley and North, 1991; Burroughs, 2001; Serreze and Barry, 2005). Akasofu states: *"The fact that an almost linear change has been progressing, without a distinct change of slope, from as early as 1800 or even earlier (about 1660, even before the Industrial Revolution), suggests that the linear change is natural change."* Other studies (see Bibliography) suggest a linear increase from at least 1800 to present. The linear trends from 1660-1996 for temperature of central England show significant warming (Burroughs, 2001). Since 1500, winter temperatures at Tallinn show warming (Tarand and Nordli, 2001). A mean temperature increase at De Bilt from 800 to present is demonstrated by van Egelen et al. (2001) with a relatively linear increase since 1800. Polyakov et al (2002) analysis of ice core data (discussed below) and Norwegian temperature records indicate similar linear trends.

Akasofu suggests that this linear temperature increase reflects the natural recovery from the "Little Ice Age." He notes that page 10 of the IPCC Report indicates current high temperatures are only similar to a high temperature occurring about 130,000 years ago. In contrast, Akasofu's review found that in *"all other interglacial periods (240,000, 330,000, 400,000 years ago), each period was warmer than the present one."* There is no explanation in the IPCC Report as to why it overlooked these other interglacial periods. We found numerous publications which support the following conclusion by Akasofu (in press): *"at the present time is that much of the prominent continental arctic warming and cooling in Greenland during the last half of the last century is due to natural change, perhaps to multi-decadal oscillations like Arctic Oscillation, the Pacific Decadal Oscillation, and the El Nino – Southern Oscillation."* In contrast, the IPCC report dismisses the linear change and fluctuations and, instead, states increases based on the ACIA average-derived flat line are mostly due to greenhouse effect.

Akasofu further notes that *"two prominent fluctuations occurred during the last 100 years. The first one was a temperature rise from 1910 to 1940 and the subsequent decrease from 1940 to about 1975 . . . The second one is the present rise after 1975. . . . Until some study can provide convincing results on this problem, we should not claim that the rise after 1975 is mostly due to*

the greenhouse effect.” He explains how Jones (1987, 1994) documented that the first temperature rise from 1910 to 1975 occurred only in the Northern Hemisphere, above 50° latitude (Serreze and Francis, 2006), and the rise after 1975 in the Northern Hemisphere is not apparent in the Southern Hemisphere, where the Antarctic shows a cooling trend from 1986-2005 (Hansen, 2006). These appear to be regional changes, complicating the IPCC claim of mostly greenhouse effect. Furthermore, the primary warming occurred in some regions, e.g., Siberia, Alaska, and Canada, while cooling in other regions, e.g., Greenland, during the same period. Furthermore, recent temperatures indicate a slowed increase or even a cooling trend in some locations that were recently warming.

A comparison of current rising air temperatures with historical temperature records to assess current melting of the Greenland ice sheet concludes *“that the average rate of warming was considerably higher within the 1920-1930 decade than within the 1995 to 2005 decade”* (P. Chylek, M.K. Dubey, and G. Lesins, 2006). Their review of other studies reveals that glacier acceleration during 1996-2005 (e.g., Rignot and Kanagaratnam, 2006) has occurred previously, and the Greenland mass may be stable or increasing (Zwally et al., 2005). Chylek et al conclude that the rate of warming 1995-2005 was lower than during 1920-1930 and, thus, found no direct evidence supporting claims that increased CO₂ is causing the Greenland ice sheet to melt.

Submarine-based sonar profiling in various reports show wide ranging ice-thickness results. For example, Holloway and Sou (2002) incorporated data from atmosphere, rivers, and ocean along with dynamics expressed in an ocean-ice-snow model. They conclude that model-derived overall thinning from the 1960s to the 1990s was less than previously theorized and that under-sampling results in misreading how varying winds redistribute Arctic ice and recurring patterns of ice shifts between central Arctic and peripheral regions.

In another study of the variability of Arctic sea ice, Koberle and Gerdes (2003) model sea ice of the Arctic and northern North Atlantic using a reanalysis of 50-year atmospheric forcing data from the National Centers for Atmospheric Research (NCEP-NCAR) beginning in 1948. These hindcast simulations consider surface wind stresses, surface heat, salt fluxes, and other data and other models that reproduce observed variability in Arctic sea ice with reasonable accuracy. They conclude there is *“no appreciable trend in sea ice volume”* in 1948-1998, despite a long, large decline in sea ice volume for 1965-1995. Wind stress forcing and ice export triggered by wind stress over the eastern Arctic contribute to the total sea ice volume variability. The authors state: *“these results make connecting ‘global warming’ to Arctic ice thinning very difficult”* and urge further studies to distinguish forced long-term trends of natural variability from those that are expected by global climate change due to other causes.

Similar conclusions are reached by Liu and Curry (2004) in studying trends in satellite-derived Arctic sea ice concentrations from 1978-2002 and modeling. They conclude that the magnitude of ice change and positive or negative trends in the western Arctic and eastern Arctic vary with the phases of the Arctic Oscillation and El Nino-Southern Oscillation. The authors state: *“to understand these regional trends and how sea ice may change as climate warms, we need to consider less understood large-scale processes and the potentially complex nonlinear coupling among large-scale processes, and local-scale processes such as river discharge into the Arctic Basin from Russia and Canada, and glacier discharge from the Greenland.”*

Wang and Key (2003) describe trends in satellite-derived cloud and surface properties 1982-1999 show the Arctic has warmed but also has become cloudier in spring and summer while cooling and less cloudy in winter. They infer that surface warming would be greater if seasonal cloud amounts were not changing and found a strong correlation with Arctic Oscillation that indicates the rise in surface temperature and changes in cloud amount are related to large-scale circulation rather than to local processes (e.g., evaporation). The correlations are positive in northern Europe and northern Russia but are negative over Greenland and northern Canada.

A study of upper ocean hydrography in the central Arctic Ocean (Morison et al, 2006) discusses results of other modeling studies and concludes a return since 2000 to climatological conditions near those that occurred prior to the dramatic changes in the 1990s in relation to the Arctic Oscillation. Melling and Riedel (2005) report a small trend to thinner seasonal pack ice in the Beaufort Sea based on sub-sea sonar observations, but with low statistical significance and increase since 1991 in the ice concentration at the monitoring site. Melling and Riedel further conclude that conventional ice reconnaissance over the last 36 years result in data that suggest little net change in ice conditions over the Beaufort shelves despite decreased summer ice over the southwestern Canada Basin. Lastly, they suggest that mechanisms other than air temperatures, such as snow cover, ice circulation and ridging, plausibly contribute to the variability and trend in seasonal ice thickness and extent.

Dyck et al (in press) determined that spring air temperatures around Hudson Bay basin 1932-2002 showed no significant warming trend and “*are more likely identified with the large-amplitude, natural climatic variability that is characteristic of the Arctic.*” They also found that it is difficult to identify any role of external forcing by anthropogenic greenhouse gases, and conclude that climate models are “*simply not skilful [sic] for the projection of regional sea-ice changes in Hudson Bay or the whole Arctic.*”

A study of paired oxygen-isotopic analyses of abiotic carbonate and benthic-ostracode shells from a core of lake sediments at Farewell Lake in the Alaska Range provided a quantitative record of growing season temperature for 2000 years, as reported by Hu et al (2001). In recognition of society’s concern about greenhouse warming, the authors urge this type of long term data is needed to understand climatic variability and the mechanisms that contribute to environmental change. Hu et al (2001) document three time intervals of comparable warmth: 0-300 AD, 850-1200, and post-1800. This is one of numerous studies that indicate the Little Ice Age culminated about 1700 and a marked cooling occurred around 600 AD. The results of Hu et al are similar to those based on tree-ring and glacial geomorphic data (Calkin et al, 2001; Calkin, 1988; Jacoby and D’Arrigo, 1989; and Wiles et al, 1999). Hu et al conclude that concurrent changes suggest large-scale teleconnections in natural climatic variability that are likely driven by atmospheric controls but must not be over-simplified when comparing climatic fluctuations.

In another study of factors affecting climate, Jiang et al (2005) present a high-resolution sea-surface temperature (SST) record based on diatom data from the North Icelandic Shelf that reveals a significant correlation with solar activity at multidecadal to centennial time scales. Their model experiments support “*a positive correlation between surface temperature and solar forcing, as indicated by our analysis of paleoclimatic data.*” Jiang et al (2005) conclude that this

correlation together with their global atmosphere-ocean model experiments support the hypothesis that solar forcing is an important constituent of natural climatic variability in the northern North Atlantic region (Jiang et al, 2005).

Soon (2005) also evaluates the role of solar radiation in the decadal, multidecadal, and longer-term variations of the Arctic surface air temperatures (SAT) and how that compares with increasing levels of anthropogenic CO₂. Soon describes significant correlations found by other studies between various solar and climatic variables and zonal winds linked to solar irradiance on annual to multidecadal periods. Among other important analyses, Soon concludes that solar forcing explains well over 75 percent of variance for the decadal-smoothed Arctic annual-mean or spring SATs and, in contrast, that *“a CO₂-dominated forcing of Arctic SATs is inconsistent with both the large multidecadal warming and cooling signals and the similar amplitude of warming trends between cold (winter) and relatively warmer (spring and autumn) seasons found in the Arctic-wide SAT records.”*

Wiles et al (2004) evaluated the geologic histories of 130 Alaskan glaciers with a record of solar variation. They describe a 200-year rhythm in the glacial record that suggests a solar influence in multi-decadal to century-scale cooling and an overall framework for the Little Ice Age.

Kaufman et al (2004) provide an extensive review of the spatio-temporal pattern of peak Holocene warmth based on 140 sites in the western hemisphere of the Arctic. They describe considerable information from other studies covering thousands of years concerning Holocene thermal maximum temperatures, warming across the western Arctic and northwest North America, cooling in the northeast and delayed warming in Quebec and Labrador linked to the Laurentide Ice Sheet. They note that a pattern of recurrent warming under positive radiative forcing may occur, indicating that natural factors affecting climate need to be considered.

Conclusion

The proposed rule concludes that the predicted climate change and resultant loss of sea ice habitat necessitates listing polar bears without acknowledging the lack of consensus among the scientific community. The 2006 Status Assessment describes the Service’s analysis of late summer sea ice and climate change (pp. 60-72), but a review of the literature that is cited in those discussions reveals that the wide range of available studies and analyses are only selectively included. More importantly, theories and studies whose conclusions are at variance with the ACIA conclusions were largely omitted. The omitted studies and their conclusions, along with many other available publications of similar results, are legitimate and significant for evaluating ice and climate changes. (See **Bibliography**)

For example, on page 61 of the Status Assessment, a long list of publications follows the simple statement that there is variability concerning *“sea ice extent and thickness.”* In that list, Polyakov et al (2002) is cited but their significant findings are not. Polyakov et al (2002) focused their research on assessing the concept of polar amplification of global warming through analysis of long term and comprehensive SAT records. They used previously unavailable long-term Russian SAT data and summer sea-ice extent and fast-ice thickness from the Kara, Laptev,

East Siberian, and Chukchi seas (SAT from maritime Arctic, fast-ice thickness from five locations off Siberian coast, and ice extent in arctic marginal seas). Polyakov et al conclude: *“Arctic and northern-hemispheric air-temperature trends over the 20th century, when multidecadal variability had little net effect on computed trends, are similar and do not support the hypothesis of the polar amplification of global warming simulated by GCMs [general circulation models].”* Their study recognizes changes in ice but also illustrates that intrinsic arctic variability obscures long-term changes, thereby limiting scientists’ abilities to identify complex feedbacks in the arctic climate system.

These analyses indicate that the Service’s reliance on interpretations of climate change in the IPCC and ACIA reports is inadequate. The Service should seek experts to assess the reports and should expand its assessment to include additional available models and studies. We also determined that the Status Assessment and proposed rule selectively use the science and climate modeling to present a scenario of maximum loss of Arctic sea ice in late summer. Consideration of additional modeling and alternative hypotheses is needed in order to base a final decision regarding predicted loss of summer sea ice habitat for polar bears on the best available science rather than on speculation or surmise.

The scientific and public debate that encompasses recent observations of climate change in the Arctic is at a heightened emotional level. Recently developed technologies have significantly increased the resolution of our observation capabilities. This heightened awareness of complex natural systems has afforded a number of key observations and development of scientific models that will undoubtedly improve our ability to predict future catastrophes. However, it is crucial that we stay grounded in the scientific method and not be fooled into believing that the complexity of the new models is directly correlative to their accuracy. It is clearly difficult to determine which scientist or group of scientists has the most reliable conclusions on which to base broad reaching policy decisions. We urge the Service to continue its important analysis of the data and work with the State of Alaska and other stakeholders to determine the vulnerability of polar bears in a changing Arctic climate. The Service will only be able to predict the future of sea ice for polar bear habitat after much additional data and modeling effort. We, collectively, are not yet at that threshold. The State of Alaska looks forward to working with the Service to gather and analyze the critical data needed to make meaningful decisions based on the best available scientific information.

To this end, we seek the Fish and Wildlife Service’s support of the following observations and recommendations provided by Dr. Larry Hinzman, Director, International Arctic Research Center, University of Alaska, Fairbanks (personal communication, 2007):

1. Observations: There are only a few processes interacting to cause the continued degradation of the sea ice, but a multitude of cascading impacts that accompanies the loss of sea ice. So, we need to improve our understanding of the interactions of the heat transfer processes so we can better quantify the rate of sea ice loss.
2. Rigorous Process Studies: We know that more heat is being transported to the Arctic through the Atlantic and Pacific Water inflows, but is that heat affecting sea ice loss? Is wind mixing increasing as ice disappears? Is that loss of ice changing the marine ecosystem substantially on related time scales?

3. More Advanced Numeric Models: We cannot really project impacts of the loss of sea ice until we can apply fully coupled models of oceanic circulation, with sea ice dynamics, with atmospheric interactions, and all of these dynamically coupled to land surface processes. We need a fully coupled Arctic System Model that can simulate all of the important components of the Arctic System with their interactions. This is an urgent research need that all of the national and international community should prioritize in order to fill the needed data and predictive capability.

Issue 2: Existing Regulatory Mechanisms to Address Sea Ice Recession

Threatened Listing is Based on Inadequacy of Existing Regulatory Mechanisms

As explained under Issue 1, the proposed rule describes information that the Service evaluated to address the five factors identified in the Endangered Species Act (16 U.S.C. 533) (p.1070). In addition to factor (A), the Service concluded (p.1086) that factor (D) applies: “*the inadequacy of existing regulatory mechanisms.*” On both pages 1086 and 1087, the Service states:

Regulatory mechanisms directed specifically at managing threats to polar bears exist in all of the range states where the species occurs, as well as between (bilateral and multilateral) range states. There are no known regulatory mechanisms effectively addressing reductions in sea ice habitat at this time.

The proposed rule describes the successful conservation measures under existing International Agreements among Canada, Denmark, Norway, the Russian Federation, and the United States; Inupiat of Alaska and Inuvialuit of Canada; United States and Russian Federation; and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in which all polar bear range states are members. The proposed rule also describes domestic regulatory mechanisms such as the Marine Mammal Protection Act; National Environmental Policy Act; Outer Continental Shelf Lands Act; Coastal Zone Management Act; Alaska National Interest Lands Conservation Act; Marine Protection, Research and Sanctuaries Act; and the regulatory mechanism implemented by Canada, Nunavut, Russian Federation, Norway, and Denmark/Greenland. The Service concludes (p. 1091) that national and international regulatory mechanisms “*for the most part, adequately addressed*” the “*short-term, site-specific threats to polar bears*” through range state laws, statutes, and other regulatory mechanisms.

The finding (p. 1095) states:

Under Factor D . . . we find that . . . The ultimate threat to the species is loss of habitat; however, this is not currently addressed at the national or international level. We conclude that inadequate regulatory mechanisms to address sea ice recession are a factor that threatens the species throughout all or a significant portion of its range.

Based on our evaluation of all scientific and commercial information available regarding the past, present, and future threats faced by the polar bear, we have determined that the polar bear is threatened by habitat loss and inadequate regulatory mechanisms to address sea ice recession.

We disagree with the Service’s finding that inadequate regulatory mechanisms exist for conservation of polar bear populations and their habitat. We discuss the reasons for this conclusion below and note two fundamental flaws:

1. The Service did not complete a thorough review and analyses that would have revealed that the conservation programs of the international community have resulted in a high degree of success in cooperative management among governments and users in achieving a sustainable

worldwide polar bear population. The Endangered Species Act requires the Service to not list a species until first “taking into account” the best available scientific and commercial information concerning the range nations’ programs. Such a review would confirm that, among other components, the economic incentives associated with managing sustainable uses of polar bear in other nations have resulted in improved conservation measures worldwide. A listing of polar bear under the Endangered Species Act in the United States will significantly and negatively interfere with these cooperatively managed conservation measures and programs throughout the international community, potentially negatively impacting the polar bear population.

2. The discussions of sea ice recession and lack of regulatory mechanisms are based on assumptions concerning causes of Arctic warming, largely implicating the role of emissions. We discuss the failure to consider best available science in determining the role of emissions and in predicting ice remission in the “foreseeable future” in Issue 1 and how the Service determined the “foreseeable future” in Issue 3. We discuss other national and international effort to address emissions below.

Regulatory Mechanisms Cannot Address Sea Ice Recession

If one were to assume for the sake of argument that current technology could accurately anticipate a cataclysmic event, such as a meteor strike or major volcanic eruption, that had the potential to threaten the survival of a given species, would the Service propose to list that species under the Endangered Species Act based on anticipation of the event because of factor D, “inadequate” regulatory mechanisms to control that event? Such a listing would be viewed as an unreasonable interpretation of the Act. It is more reasonable to suggest that the adequacy of regulatory mechanisms should be found “inadequate” only when cause and effect can be determined with a high degree of certainty and when current regulations are inadequate to conserve the species, protect the habitat, or otherwise prevent further decline and/or to aid recovery of the species.

For example, comprehensive data sets relating species population declines to mechanical destruction of unique forest habitat or urban expansion would be reasonable cause/effect interpretation. In the case of sea ice, the direct link of global warming to anthropogenic greenhouse gas increase in the atmosphere fails to account for the documented natural warming cycles that have had similar Arctic impacts throughout the polar bear’s evolutionary history. To propose to find factor (D) as a basis to list polar bear as threatened due to a perceived ability to stop recession of September sea ice by reducing greenhouse gas emissions is scientifically unsubstantiated and an improper application of the Act.

The petitioners, some climate models, and the polar bear Status Assessment make reference to greenhouse gas emissions as a cause of the summer sea ice recession. While Arctic sea ice has recently been diminishing and changing in its movements, the scientific community is not in agreement as to how much, if any, of the current recession is attributable to non-natural emissions. This is discussed in Issue 1 and scientifically debated in many of the papers listed in the attached Bibliography. If, on the one hand, the diminishment of sea ice is a result of such

natural phenomena as the earth's recovery from the "Little Ice Age," changes in Arctic area winds and ocean currents, or solar irradiation, then the polar bears too are responding to the changes in their natural environment, just as they have for 200,000+ years through other significant and long-term warming events. On the other hand, if emissions are contributing to the changes, the Service has no regulatory authority to control emissions. In fact, the United States has no regulatory authority over emissions outside its borders, and if all emissions in the United States ceased overnight, nearly 75 percent of the emissions world wide would continue and would continue to increase.

Diminishment of Existing Regulatory Mechanisms if Listed as Threatened under ESA

Each of the international agreements currently in effect for polar bears and our own Marine Mammal Protection Act provide conservation and management of polar bears that assures sustainable harvest, protection of habitat, and collection of biological information. These agreements also contribute to minimizing threats to polar bears through all or a significant portion of their range, resulting in sustainable management of harvests, minimized habitat intrusions, and enforcement to reduce poaching.

If polar bears are listed as 'threatened' under ESA in the United States, we no longer can contribute to the effective management of conservative hunting practices, particularly in the polar bear populations in Canada. The ability for polar bears to be hunted and hides legally imported into the United States creates a unique economic incentive for Nunavut residents and their communities to benefit economically and socially as well as for scientists to gain cooperation in the monitoring and conservation through setting of harvest quotas.

A significant portion of the world population of polar bears is subject to Canadian and Nunavut management authorities and only a small portion of polar bear habitat occurs in the United States. A listing as 'threatened' under the Endangered Species Act would automatically trigger a 'depleted' designation under the Marine Mammal Protection Act. Such a designation prohibits take of polar bear, which will prevent import of hides and prohibits subsistence harvest by Alaska Natives. Although the Service professes intent to write regulations to allow Alaska Natives to continue to harvest polar bears and to allow the import of hides, the likelihood of subsequent litigation to eliminate all hunting is nearly certain.

The sustainable management of hunting programs in Canada is largely tied to the economic incentives for its governments to implement and adhere to polar bear harvest quotas, which are otherwise entirely voluntary under the act establishing Nunavut. The conservation management includes establishment of male/female harvest ratios, protection of cubs, and others in co-management agreements. It also results in cooperative establishment of carrying capacity and programs that significantly reduce nuisance kills near communities and hunting camps. Elimination of these conservation measures by depriving the managers of incentives would result from a listing under the Endangered Species Act that prohibits the import of hides and will not benefit polar bears in Canada and other countries. It will also deprive Alaska Natives of traditional uses without benefiting polar bear populations or their habitat in Alaska.

The proposed rule also overlooked the significant role that the economic value of polar bears in Canada plays in many land use decisions both on the uplands and offshore. Development proposals are carefully and cooperatively assessed by the Nunavut and Canadian governments in order to reduce impacts on movements, denning, and habitat of polar bears. The involvement of local hunters in many of these decisions helps strengthen cooperative conservation measures desired by both the scientific community and the local governments in order to offset the economic needs of the local communities. It also helps insure that local knowledge contributes a valuable role in making those conservation and development decisions.

Foreign Programs and International Regulatory Mechanisms

The proposed rule discusses (p. 1086) the international agreements that provide conservation measures and programs for polar bears worldwide. The 1973 Polar Bear Agreement effectively agrees to measures to protect polar bear ecosystems and managements of populations based on best available science. As a result of the implementation of this agreement by Canada, Denmark, Norway, Russian Federation, and the United States, polar bears recovered from population depletion and are now managed sustainable populations throughout the majority of their range by combined foreign programs.

The proposed rule refers to inadequacies in the international community and needed measures to curb illegal harvests and protect denning and other habitats based on decade-old publications. We urge the Service to seek and carefully consider current information provided by Nunavut and other governments, which reveals increased success in recovering populations through reduced quotas and other land and bear management decisions improving over half the world's polar bear populations. Based on this current information, foreign programs and international regulatory mechanisms are adequate.

The Endangered Species Act requires that the Service first take into account the best available scientific and commercial information concerning the range nations' programs to determine negative impacts on those foreign populations before pursuing listing. The Act specifically prohibits the listing of a species until after such an analysis is completed. Such a review would confirm that the existing international agreements, including the recently ratified treaty with Russian Federation, provide essential conservation measures. In addition, the economic incentives associated with managing sustainable uses of polar bear in other nations have resulted in improved conservation measures worldwide. A listing of polar bear under the Endangered Species Act in the United States will significantly and negatively interfere with these cooperatively managed conservation measures and programs throughout the international community, potentially impacting the polar bear population. Canadian scientists and the Nunavut government strongly oppose the listing of polar bears under the Endangered Species Act, and the Service should not proceed in light of the negative impacts expected to result in their conservation programs.

National and State Existing Regulatory Mechanisms

The proposed rule overlooks numerous regulatory mechanisms that address polar bear habitat and initiatives that address developments and climate change. For example, climate change policy was ratified by the United States in the United National Framework Convention on Climate Change, which agrees to stabilize greenhouse gas emissions. The United States is also a member of the Arctic Council, along with Canada, Denmark, Finland, Iceland, Norway, Russia, Sweden, and six Arctic indigenous communities. The working groups of this Council focus on monitoring and providing scientific input to address pollution, shipping, climate, developments, and biodiversity. While the United States does not have its own climate change policy, there are many national, state, and local measures directed at reducing greenhouse gas emissions. Recognizing that the Endangered Species Act does not consider mechanism unless in effect, on the time scale selected by the Service it is reasonable to assume that additional regulatory mechanisms will become available. Congress is considering numerous measures dealing with greenhouse gasses, and the Supreme Court ruled April 2, 2007, that the Environmental Protection Agency has authority to regulate carbon dioxide emissions from motorized vehicles under the Clean Air Act. Although no one has regulatory authority or capability to change sea ice habitat itself, the Service should not ignore the many other regulatory mechanisms that directly address emissions and polar bear habitat.

The Alaska Comprehensive Wildlife Conservation Strategy, approved by the Fish and Wildlife Service, includes polar bears and other sea ice-dependent species. The plan contains proactive conservation measures to research and monitor wildlife population size and trend, distribution, habitats, and impacts of climate change, harvest, and other human activities. The plan provides the basis for increased conservation actions including international agreements and cooperation with other government agencies through research and monitoring. The Service should cooperate with the State of Alaska to develop and fund this program in order to implement State action plans in order to prevent species from being listed under the Endangered Species Act.

The State of Alaska has extensive and successful management experience in permitting of activities that occur on shore and near shore in the habitat that polar bears occupy. As described in the proposed rule, the existing activities managed by the State assuredly protect habitat and movements, and permitting of activities with close monitoring and stipulations have resulted in no incidental take for many years. The proposed rule recognizes the successful use of the existing regulatory mechanisms that the state currently applies in order to protect habitat and wildlife.

If polar bears are listed as 'threatened,' many of these activities will be required to undergo section 7 consultation with the Service. Such efforts will be costly to the Service, the State, the organization or business and will divert resources from field research to bureaucratic procedures that do nothing to provide additional protection for polar bears or their habitat. Attached is a sampling of some of these regulatory mechanisms and mitigation measures currently implemented by the Alaska Department of Natural Resources (DNR) for activities that could potentially involve polar bears or their habitat and other marine mammals. Similar regulations are in effect for air and water quality under other state agencies. This attached information is organized by DNR division.

Conclusion

It is incongruous for the Service to select factor (D) as a basis to list polar bears as threatened. All regulatory authorities that can act to conserve polar bears, protect their habitat, and manage uses that might affect the polar bears are already successfully doing so. In fact, the international effort that resulted in protection and sustainable management of polar bears is one of the world's conservation success stories, where cooperative conservation management returned an overharvested species to a healthy population worldwide.

The bottom line is that listing polar bears as 'threatened' will not reduce climate change, increase sea ice habitat in summer, or increase regulatory mechanisms to protect sea ice habitat. To the contrary, it will damage ongoing successful cooperative national and international conservation programs, and a listing will bury the Service in both litigation and bureaucracy necessary to conduct resulting section 7 consultations that do little for polar bears beyond the existing regulatory mechanisms. Instead of listing, we urge the Service to fully commit to assisting the State fulfill its State Comprehensive Wildlife Conservation Strategy and action plans, as well as to cooperate with the international community to fulfill the existing cooperative agreements and treaties.

Issue 3: Standards Necessary for Threatened Finding

Species, Subspecies, or Distinct Population Segment that is Likely to become Endangered within the Foreseeable Future Throughout All or a Significant Portion of its Range

As explained under Issues 1 and 2, the proposed rule describes information that the Service evaluated to address the five factors identified in the Endangered Species Act (16 U.S.C. 533) (p.1070). The Service concluded that factors (A) and (D) apply but that the other three factors do not: “(B) *overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; or (E) other natural or manmade factors affecting its continued existence.*” We reviewed the status and trends for the worldwide polar bear population and concur that these latter three factors do not apply under the Act. As discussed elsewhere, we also found significant omissions of factual information and unsupported conclusions throughout the final Status Assessment and proposed rule that were used in finding that factor (A) applies to polar bears.

In addition, we urge the Service to correctly apply the following terms and criteria required in making a finding of ‘threatened’ in the Endangered Species Act: “*likely,*” “*foreseeable future,*” and “*throughout all or a significant portion of its range*” (p. 1070). We provide further discussion of this issue below. Based on such reconsideration, we urge the Service to conclude that polar bears are not ‘threatened’ under the terms and criteria of the Endangered Species Act.

“Likely”

The loss or prospect of loss of individual animals or impact to their habitat is a cause for listing only if it meets the criteria in the Act. First, the species must be “likely” to be in danger of extinction within the foreseeable future. As described in the preceding discussion of climate models (Issue 1), the predicted loss of late summer sea ice varies widely in terms of timing and extent. The Service based its finding of ‘threatened’ on assuming population declines primarily based on predictions from a single climate model simulation among seven different simulations, all the remainder of which predict loss of sea ice years later. This model was only one of 15 models used by the IPCC in projecting ice conditions. The finding that “*near ice free ice conditions may be reached as early as 2040*” (NCAR, Holland et al., 2006) is not a reliable projection for the Service to use as best scientific data and cannot be labeled as “likely” to occur.

A close reading of many of the studies and reports cited throughout the proposed rule also reveals that the authors acknowledge their speculation of how possible ranges of sea ice recession may affect polar bear and their prey species. The authors acknowledge that polar bear subpopulation responses to climate change vary from region to region, including increasing numbers in some areas.

The population of polar bears worldwide is currently healthy, has significantly increased since the late 1960s, and there are not facts or established trends that suggest that the population will become endangered in 45 years with any degree of certainty, let alone a finding that it is “likely” to occur. The Service does not establish what a minimum viable population for the polar bear would be or show that such a level is likely to be reached within the foreseeable future. As

indicated in the proposed rule (p. 1081), polar bears survived warming and cooling periods that were more extreme than may currently be occurring. No arguments are presented to demonstrate that as the population responds to current ice recession, the threat of extinction is any greater or more “likely” than it was during two prior major warming periods that lasted thousands of years or during the several decades of warming that occurred early last century. Polar bears obviously demonstrated a resilience or survivability for climate changes during these periods. We note that the significance of studies and reports of several authors who describe the abilities of bears to successfully use alternate prey species and changing habitats appear to be downplayed in the proposed rule and, where pointed out by peer reviewers, were largely ignored in the Status Assessment. Similarly, studies that report on the improved habitat and prey species for polar bear in some regions due to regional Arctic warming were also downplayed. We urge the Service to apply their evaluation based on the best available science regarding the polar bears’ ability to survive as a species.

While we recognize global climate change necessitates close attention by scientists, resource users, and managers to assure continued conservation of polar bears, the scientific uncertainties of both the extent and effects of such change do not support a finding at this time that the polar bear is “likely” to become endangered with extinction.

“Foreseeable Future”

In order to make a finding that the species is “likely” to decline to the point that the population is “in danger of extinction,” both sea ice habitat conditions and polar bear population responses must be predicted, and one must be able to reasonably foresee future conditions with an acceptable amount of certainty. The predicted assessment of ice extent in September should be based on a thorough review of the numerous studies and modeling of variant climate projections. The Service evaluated the predicted late summer sea ice for the time span of three generations of polar bears, or 45 years, as the “foreseeable future.” As discussed in Issue 1, the Service selectively applied climate model simulations.

The Service’s decision to use 45 years is not a reasonable period of time to serve as the “foreseeable” future. The wide ranging uncertainty of future sea ice status based on the numerous predictions of complex Arctic climate changes is far more variable than the Service can predict for 45 years and/or from one polar region to another; e.g., Greenland is experiencing decreasing summer air temperatures in a cooling trend, and ice conditions along the Alaska and Siberian coasts are changing due to changing wind patterns. Thus, the Service has no defensible certainty in its predictions of ice conditions in 45 years, and use of those predictions, in turn, cannot reliably project how much and where the climate will warm, the ice will melt in late summer, and/or the resulting effect on polar bear populations in a significant portion of its range. Therefore, the Service cannot reliably conclude that polar bears are “likely” to be threatened with endangerment of extinction within the selected period of 45 years; the scientific uncertainties make it impossible to “foresee” either the status of sea ice or impacts on the polar bear that far into the future with any degree of confidence.

We do not agree with the Service’s decision to use three generations, or 45 years, to define “foreseeable future.” Because the Act does not define the term, the Service should apply a

period of time in which the best available science can be used to determine the future status of the populations with a reasonable degree of certainty. Within this foreseeable future, the Service must be able to assess the threats to and impacts on the population. Basing predictions on a set number of generations or life expectancy equates to using an arbitrary period of time that does not represent a future where the Service can “see” conditions with any degree of certainty.

The proposed rule discusses (p. 1070) the IUCN Polar Bear Specialist Group listing of the polar bear using the categories and criteria described in the IUCN Red List process. According to the proposed rule, the IUCN assesses population reductions of a certain percentage over the previous 10 years or three generations. At the June 2005 meeting: *“The Group concluded that the IUCN Red List classification of the polar bear should be upgraded from Least Concern to Vulnerable based on the likelihood of an overall decline in the size of the total population of more than 30% within the next 35 to 50 years.”* (IUCN 2006) The Group urged monitoring of polar bear subpopulations in order to quantitatively assess the effects of climatic warming. We agree that this is a priority effort. However, we disagree with the conclusions.

The IUCN prediction of a decline in the size of the total population of more than 30% within the next 35 to 50 years does not result in a population that is threatened with extinction. (e.g., 30% decline from 20,000-25,000 leaves 14,000-17,500) Furthermore, the IUCN Red List criteria of a flat percentage formula does not equate to the five factors under the Endangered Species Act. The Polar Bear Specialist Group proceedings reveal a concern that the respective management entities review harvest quotas carefully in light of possible climate impact to populations. The IUCN uses a fixed formula for its categorization of species, unlike the ESA that requires evaluation of the species and its habitat to make a reasonable assessment of the foreseeable risk. Whether or not sea ice recession and other population parameters are reliably predicted falls within the determination of “likely” and “in the foreseeable future” under ESA criteria but is not evaluated by the IUCN. We agree with the IUCN’s precautionary approach but its categorization is not applicable to evaluation of factors under ESA.

“Throughout All or A Significant Portion of its Range”

We reviewed available polar bear population information for the worldwide population and its subpopulations (Issue 4) and, in light of the uncertainty of climate modeling upon which to base projected impacts (Issue 1) at either a population or subpopulation level, conclude that neither the entire population nor any portion or subpopulation of polar bears on any portion of its range meets the criteria to be listed as ‘likely to be threatened with extinction within the foreseeable future.’ Recent guidance from the Solicitor’s Office (M-37013, March 16, 2007), recognizes the Service’ ability to list a species over a portion of its range, but such listing is not warranted now and not likely to be warranted in the foreseeable future for the polar bear.

The subpopulation that occupies the Western Hudson Bay is generally in the most southerly extension of the polar bear worldwide population’s range, along with the Southern Hudson Bay population. The Western Hudson Bay subpopulation is frequently used to attribute predicted declines due to climate change responses in other subpopulations, particularly the Southern Beaufort subpopulation. However, the Southern Hudson Bay subpopulation occupies area that extends even farther south than the Western Hudson Bay subpopulation, and despite similar

climatic conditions, does not show similar evidence of stress. Several recent studies indicate that the combined stresses of human activities, food availability, and habitat competition may have as much if not more influence causing the decreases in the Western Hudson Bay subpopulation than sea ice recession. These stresses include a high percentage of the population being subjected to repeat drugging and handling by researchers, intense vehicle access by tourists, and handling by the Polar Bear Alert Program at Churchill. In contrast, the Southern Hudson Bay subpopulation is reported to exhibit better body condition and be increasing even though it shares the southern half of Hudson Bay with the Western Hudson Bay subpopulation. Several authors are reported in the proposed rule to claim that loss of sea ice over central Arctic in late summer will lead to stress and decreased subpopulations similar to that occurring in the Western Hudson Bay subpopulation, but these theories must be evaluated in the context that the whole of Hudson Bay is currently ice free during late summer (Dyck et al, in press). Surveys of the Western Hudson Bay subpopulation did not include the entire range, so the population estimate is not scientifically definitive.

Further, even if a species ceases to exist in portions of its historical range, that “*does not necessarily mean that it is ‘in danger of extinction’ in a significant portion of the range where it currently exists.*” As recognized by the Solicitor and the Ninth Circuit, “[a] *species with an exceptionally large historical range may continue to enjoy healthy population levels despite the loss of a substantial amount of suitable habitat.*” (citing *Defenders of Wildlife v. Norton*, 258 F.3d 1136, 1143 (9th Cir. 2001)). The Secretary has broad discretion in determining what is “significant,” M-37013 at 10, and would not be required to find loss of range at the southern extreme of polar bear range significant even if such loss occurred. Because the polar bear is highly mobile, even if retreat of summer pack ice were to occur within the worst case scenario modeling used by Service in its analysis, such seasonal loss of habitat at the edges of its range would not indicate that the polar bear is likely to become extinct throughout “*a significant portion of its range.*”¹ 16 U.S.C. 1532(6) (definition of endangered). Further, because there is significant genetic flow between adjacent “*populations*” maintaining a high degree of genetic homogeneity, even a decline of winter ice would have to be very extensive before it could reasonably be considered to represent a “*significant portion*” of the range of the polar bear.

Species, Subspecies, or Distinct Population Segment

The Service proposed listing the polar bear as threatened throughout its range. As shown above and in our separate analyses, the proposed listing throughout the range of the polar bear is not warranted at this time because the record does not show that within the foreseeable future the polar bear is likely to become endangered throughout its range. Similarly, while the Endangered Species Act allows for the listing of subspecies or “*distinct population segments*” (DPS), 16 U.S.C. 1532(16), the Service cannot reasonably determine that any subspecies or DPS is likely to become endangered.

¹ The modeling under consideration by the Service focuses solely on late summer pack ice, and there is no evidence to show that polar bears would not continue to follow the advancing ice in winter, thus the absence of seasonal habitat would not make the polar bear “extinct” or “in danger of extinction” through a portion of its range.

Both the significant ranging behavior of the polar bear and the ranging behavior of its prey base² preclude a determination that any subspecies or DPS is likely to become endangered in the foreseeable future. The proposed listing considers the polar bear to consist of “19 relatively discrete populations,” 72 FR 1069, but these “populations” appear to be based more on the high home range fidelity of adult female bears than upon genetic data,³ and, in fact, it may be appropriate to break the bear population up into only major geographic regions where there is considerable genetic differentiation.⁴ The available scientific information does not support a finding that any of these four populations is likely to become endangered in the foreseeable future.

Under the Service’s DPS policy, 61 FR 4722, a population should be considered a DPS only if it is both discrete and significant, and authority to list DPS should be used “‘sparingly’ while encouraging the conservation of genetic diversity.” *Id.* at 4725; *see also Northwest Ecosystem Alliance v. United States Service*, 2007 WL 286581, *7, *11-12 (9th Cir. 2007) (upholding decision not to list where a population was determined to be discrete but not significant.). The 19 populations identified in the Service’s proposed listing do not qualify as DPS under this standard.

A population may be considered discrete only if:

1. It is markedly separated from other populations of the same taxon as a consequence of physical, physiological, ecological, or behavioral factors. Quantitative measures of genetic or morphological discontinuity may provide evidence of this separation. [or]
2. It is delimited by international governmental boundaries within which differences in control of exploitation, management of habitat, conservation status, or regulatory mechanisms exist that are significant in light of section 4(a)(1)(D) of the Act.

The 19 “populations” identified in the proposed listing, 72 FR 1069, do not satisfy these criteria. First, because of the extended ranging behavior of adult polar bears, and the even more pronounced ranging of subadults, there is significant overlap and genetic flow between populations. *See*, Cronin et al 2006. Second, many of the “populations” are within the same governmental boundaries as other “populations;” and even where there are different governmental boundaries -- because the proposed listing is based entirely on speculation regarding the loss of summer sea ice which would not be significantly affected by actions of individual governments -- differences in management of habitat, conservation status, and regulatory mechanisms are not significant. Second, even if a population is discrete, it must also

² *See* Derocher et al, 2004, p. 171, noting potential increase in bear populations in some areas if changes result in increased seal populations

³ *See* Cronin et al, *Can. J. Zool.* 84,655-660, 659 (2006)

⁴ *Id.* at 658 (noting considerable genetic differentiation between “the north polar basin; the Norwegian Bay area of northern Canada; the Canadian Arctic archipelago; and the areas in Canada and Greenland south of the Canadian Arctic archipelago, including Hudson Bay, Davis Strait, and the Foxe Basin”) *citing* Paetkau et. al., *Mol. Ecol.* 8: 1571-1584 (1999).

be “significant” based on the biological and ecological importance of a discrete population segment. Factors to be considered in determining significance are:

1. Persistence of the discrete population segment in an ecological setting unusual or unique for the taxon,
2. Evidence that loss of the discrete population segment would result in a significant gap in the range of a taxon,
3. Evidence that the discrete population segment represents the only surviving natural occurrence of a taxon that may be more abundant elsewhere as an introduced population outside its historic range, or
4. Evidence that the discrete population segment differs markedly from other populations of the species in its genetic characteristics.

Factor three is inapplicable, and because of the ranging behavior of the polar bear and extensive gene flow between the “populations” identified in the proposed rule, factors 1, 2, and 4, are not likely to be satisfied. If there are any distinct population segments, they are likely much larger than the “populations” identified in the proposed rule; and it is these larger DPS, not the individual “populations” identified in the proposed rule, that should be evaluated to determine whether a population is “likely to become endangered.” Because these larger populations face the same threats as the population as a whole and because larger populations are more resilient than smaller isolated populations, the analysis for any DPS identified should not be appreciably different than the analysis for the species as a whole.

This analysis is especially relevant to the polar bear “populations” present in Alaska. Within Alaska, as shown by Cronin et al at p 658 (2006), *“bears from the Chukchi Sea and Southern Beaufort Sea can be considered to be one interbreeding population.”* Because these “populations” are actually one “population,” the Southern Beaufort Sea population cannot be considered a DPS, and northerly seasonal retreat of the pack ice would have to be much more severe before resulting in a loss of “significant” range of the polar bear than if these populations were in fact separate populations as assumed by the Service.

Conclusion

Statutory and regulatory criteria for listing the polar bear as a threatened species have not been met at this time. The Service proposal to list a species with a healthy and apparently stable population which has experienced significant growth in recent decades is unprecedented, and given existing national and international protections, as well as the uncertainties regarding both ice modeling and polar bear adaptability to changing climatic condition, discussed above and in other sections, the Service lacks sufficient information to reasonably predict a decline in the polar bear population sufficient to endanger the survival of the species in significant portion of its range or to endanger the species throughout a significant portion of its range. The extinction of the species is neither “likely” nor “foreseeable.”

Issue 4: Population Related Data and Studies

The proposed rule solicits comments (p. 1064) concerning seven areas of information regarding polar bear population and biology, role of sea ice and climate, prey and food habits, effects of human activities, regulatory mechanisms, conservation programs, critical habitat, and the data and studies referenced in the proposal. We offer the following information and comments to assist the Service in making a final decision. We also request opportunities to continue to share and discuss information as the Service evaluates comments on the proposed rule in order to assure the Service has the best available science for its decision.

Independent Review

The IUCN Polar Bear Specialists Group is comprised of a small number of technical experts from around the world that met, hosted by the Fish and Wildlife Service, June 2005. The Group's membership appears to be largely self-selected among polar bear researchers, including several Service staff (*See* discussion on membership, p. 25, IUCN, 2006). Information published by members of the Group served as the basis of information contained in the Petition for the polar bear to be listed. In response to the petition, the Service staff conducted a status review of polar bear pursuant to the Endangered Species Act and prepared the 2005 draft Status Assessment. The same Service staff participated in selecting the peer reviewers and reviewed the peer reviewer comments on the draft. The same Service staff, in turn, decided what to accept or change in the final 2006 Status Assessment and will receive these comments on the proposed rule to evaluate the comments and make recommendations regarding a final rulemaking decision.

In other words, Service staff that ascribe to certain interpretations of available information are uniquely placed to selectively evaluate input by the public and other scientists, judge their own data, and make final regulatory decisions. In *Endangered Species Committee of the Building Industry Association of Southern California v Babbitt*, 852 F.Supp 32, 37 (D. D.C 1994), while overturning a listing decision on other grounds (failure to make the underlying controverted data available to the public), the court criticized the Secretary for relying in his review on input from an individual (Banks) who had been involved in review of the underlying report (by Atwood) and cautioned: "[t]he Court suggests that in analyzing Atwood's report and accompanying data, the Secretary should avoid any appearance of conflict of interest by assigning a different scientist to the task." We similarly urge the Service to select an independent panel to evaluate the available polar bear data, public comments, and final recommendations.

Polar Bear Population

The proposed rule reports the estimated world population is 20,000-25,000 (p. 1068), which is relatively constant since estimates made in the mid-1980s (Larsen 1984). Interestingly, these estimates were made a decade after the 1973 International Agreement and adoption of the Marine Mammal Protection Act, when hunting was significantly reduced. This was a dramatic increase from the world population estimate of 8,000-10,000 in 1965-1970 (Servheen 1989, citing Maksimov and Sokolov 1965, Cowan 1972). Neither the 1980s population estimate nor

earlier population information was provided in the proposed rule. Thus, the proposed rule failed to provide context necessary for considering long term trends.

The proposed rule discusses trend information derived from the IUCN Polar Bear Specialist Group, but omits available information concerning whether the populations are believed to be declining due to being above carrying capacity, overharvest, or other factors. After describing how little information is available on status and trends for one-third of the subpopulations, the rule concludes: “*based on environmental factors and observed patterns of population trends for some populations it is likely that most population will exhibit declines in the future.*” 72 FR 1064, 1070 (emphasis added) A similar claim (p 1080) states: “*Not all populations will be affected evenly in the level, rate, and timing of impact, but within the foreseeable future, it is predicted that all populations will be either directly or indirectly impacted.*” These generalized predictions are not supported by information elsewhere in the rule and other studies.

The proposed rule (p. 1080) breaks the subpopulations into three groups: five southerly (totaling 7,856), five characterized as open Arctic Basin populations (totaling 7,300-7,700), and six northerly (4,917), (and 3 unaccounted), then based on population estimates on page 1070 predicts “likely impacts” to each of those in ten, twenty, and thirty year increments, respectively. The IUCN Polar Bear Specialist Group concluded that the population is vulnerable based on the likelihood of an overall decline “*in the size of the total population of more than 30% within the next 35 to 50 years.*” (See IUCN 2006, p. 61) Neither of these assessments of projected impacts appears to calculate survivability of the bears or actual numerical or statistical decline in population or subpopulation numbers. Without better data on the number of animals in subpopulations, the Service has little basis to determine whether the populations are actually declining. While we collectively are concerned to pursue precautionary management for the conservation of polar bears, the assumptions and projections have too much uncertainty and the omission of analyses of many available scientific studies cause the data considered by the Service to be too limited to support listing the worldwide population of polar bears at this time.

The proposed rule discusses (p. 1070) the status and trends of each of 19 polar bear subpopulations. Of these subpopulations, the rule reports that seven can not be determined, five are declining, five are stable, and two are “severely reduced” but presently increasing (due to reductions in harvest). Of the five reported to be declining, the proposed rule states: “*two populations with the most extensive time series of data, Western Hudson Bay and Southern Beaufort Sea, are both declining.*” We discuss this assertion below:

Southern Beaufort Subpopulation

The statement that the Southern Beaufort subpopulation is declining is contradicted elsewhere in the proposed rule (p. 1076), explaining that the current estimates for the Southern Beaufort subpopulation are “*not statistically different*” from earlier population estimates. According to the 2006 IUCN report and Regehr et al (2006), the estimated population is 1500 based on preliminary analysis of mark-recapture data collected from 2001-2006. Amstrup et al (1986) reported an estimated population of 1800. These and other early estimates were based on uneven sampling and developing techniques. Furthermore, the population boundaries were since adjusted due to overlap part of the year with the Chukchi Sea and Northern Beaufort subpopulations. According to the Fish and Wildlife Service (71 FR 43926, 43930 (August 2,

2006)), the Southern Beaufort Sea population was estimated at 2,200 bears in 2002 and “*the most recent population growth rate was estimated at 2.4 percent annually based on data from 1982 through 1992, although the population is believed to have slowed its growth rate or stabilized since 1992.*” Careful monitoring and additional research are recommended to refine population information in order to be able to detect trends, but currently there appears to be no scientific evidence that the Southern Beaufort subpopulation is declining.

Western Hudson Bay Subpopulation

The Southern Hudson Bay and Davis Strait subpopulations are more southerly than the Western Hudson Bay subpopulation and are reported to be healthy. The reported decline in the Western Hudson Bay subpopulation apparently was based on a number of human-related actions and, according to the Nunavut, a decline is nearly impossible to verify because the sampling did not include the “summer retreat” area. Dyck et al (in press) compiled the reports of extensive bear/human interactions by Stirling et al (1977) at communities, high numbers of repeat drugging and marking documented by Ramsey and Stirling (1986), vehicles responses (Dyck and Baydack 2004), and the Polar Bear Alert Program that handles bears that approach town. Between the Alert Program and Canadian Wildlife Society research from 1977-1995, a minimum of 3558 bears were handled—about three times the population number according to Derocher and Stirling (1992). The tourist and research activities occur during the period when bears are either fasting or leaving their dens, thus Dyck et al conclude: “*It is plausible that these repeated bear-human interactions have adversely stressed the bears over the past 30 years.*” Dyck et al (in press) also review survey and health studies and hypothesize (in press, page 9) that the population may be near carrying capacity and intraspecific competition, in addition to human activity-induced stress, may be resulting in the observed physical responses.

Interestingly, the southern half of Hudson Bay is shared by the Western Hudson Bay subpopulation and the Southern Hudson Bay subpopulation (Derocher et al 1998). The Southern Hudson Bay subpopulation increased from 1963 to 1996 (Stirling et al 2004). Also, some of the climate models suggest complete loss of late summer sea ice for the circumpolar Arctic leading to extinction of polar bear, but Hudson Bay is always ice free in late summer. Data indicate there has been no statistical increase in air temperature in this area for 70 years (Dyck et al). As discussed above, the reduced bear population in Western Hudson Bay may be more a factor of human activities and excessive handling than loss of summer sea ice.

Conclusion

We concur that additional information is needed to assess each of the subpopulations throughout the Arctic and adhere strictly to sustainable management practices in administering hunting programs and developments in polar bear habitat. Because the bear denning, prey, and other population parameters vary for each region and each subpopulation, each subpopulation must be monitored and evaluated based on factors relevant to its area. While the subpopulations are managed relatively discretely, considerable genetics and movement data supports treating the worldwide population as one. As stated in the proposed rule, polar bears have survived warming and cooling periods of greater extremes than current. We encourage the Service to replace generalized assumptions that result in predictions of major declines in polar bear numbers with assessments of the likely responses of subpopulations to regional habitat changes. Furthermore,

we recognize that human impact on the world environment is a serious issue, and we must take precautionary steps to manage wildlife, but the facts available do not support the predictions of the “likely” demise of the polar bear in the “foreseeable future” throughout all or a significant portion of its range.

Recommended Actions

To reduce the uncertainty associated with the Service’s finding, the following actions should be considered when determining priorities for the conservation and management of polar bears:

1. Continue to refine the models that are used to project reductions in the extent of Arctic sea ice due to climatic changes; See Conclusions in Issue 1
2. Increase population monitoring of polar bear subpopulations to obtain precise and accurate estimates of abundance from which population trends can be ascertained.
3. Estimate polar bear survival and reproduction, body condition, and movements patterns in several subpopulations and determine the influence of sea ice dynamics (i.e., timing of break-up and freeze-up, spatial extent, thickness, distribution) on those parameters.
4. Assess the diet of polar bears in several subpopulations and monitor the distribution and abundance of prey species, and determine the influence of sea ice dynamics on those parameters.
5. Monitor bear hunting behavior to see how it changes relative to sea ice dynamics.
6. Monitor ringed seal body condition and productivity and other prey species relative to sea ice dynamics.
7. Conduct education/outreach projects in villages to reduce bear/human interactions.
8. Continue to assess the structure of the polar bear populations in order to determine if the designation of any Distinct Population Segments is appropriate.
9. Assess the cumulative and synergistic effects of other factors (e.g., disease, harvest, contaminants) that may negatively impact polar bears.
10. Integrate studies of polar bears, their prey, changes in sea ice, and ecosystem productivity into long-term multidisciplinary programs at the temporal and spatial scale of ecosystem complexity.

ISSUE 2: ATTACHMENT
EXAMPLES OF STATE REGULATORY MECHANISM

OFFICE OF PROJECT MANAGEMENT & PERMITTING

The Office of Project Management and Permitting (OPMP) houses the Large Project Permitting section and has the responsibility and authority for administering Alaska's Coastal Management Program (ACMP).

Large Project Permitting

The Large Project Permitting section (LPP) functions under AS 38.05.020(b)(9), which requires the Commissioner of DNR to coordinate permitting activities for all large resource development projects, and under AS 27.05.010(b), which requires DNR to be the lead agency for permitting all large mine projects. The LPP goal is to ensure that all aspects of a large project are considered during a single review and approval process. The LPP is currently coordinating the permitting of mining, oil and gas, and transportation projects, including British Petroleum's Liberty project, Bureau of Land Management planning for National Petroleum Reserve Alaska (NPRA) – Northeast, Bullen Point infrastructure corridor permitting, and Shell Oil Outer Continental Shelf exploratory activities.

The LPP assigns a project manager to serve as primary contact for a large project. The project manager coordinates the permitting activities of the state team assigned to work on the project. The LPP coordinates an interagency group, the Large Project Team, which works cooperatively with project applicants and operators, federal resource agencies, and the public to ensure that projects are designed, operated, and reclaimed in a manner consistent with the public interest. The project manager's primary responsibility is to ensure a coordinated process with minimum duplicity of efforts, often tailoring the process to fit specific project needs.

The goal of the Large Project Team is to coordinate the project review, timing, content, and completion of the required numerous permits, thus ensuring that projects are developed in an environmentally sound manner with a predictable permitting process for both the applicant and the public. The team reviews all complex technical documents generated during the process and provides coordinated comments. The team also coordinates stakeholder involvement and provides a single point of contact for the public. The team provides the public, agencies, and the applicant an opportunity to view the project as a whole. Finally, the team ensures that all agencies are coordinated in their monitoring, compliance, and enforcement efforts.

The requirement for federal authorizations usually triggers the requirement for an Environmental Impact Statement (EIS) pursuant to the National Environmental Policy Act (NEPA). The State usually participates as a cooperating agency in the EIS process, and the team endeavors to dovetail the state's permitting process with the EIS process. For example, during the Pogo Mine process, the public Draft EIS included drafts of all the major state permits. This process gave the public and government agencies the opportunity to see how the State's management decisions could be implemented on the ground and enabled them to comment on the project as a whole.

The Large Project Team also coordinates, to the extent possible, with local governments. For example, the team continues working closely with the City and Borough of Juneau throughout the permitting and EIS process for the Kensington Mine. The City's Conditional Use Permits are critical authorizations for the mine and may place additional stipulations on the project.

Alaska Coastal Management Program

The ACMP facilitates implementation of various polar bear conservation measures at several distinct levels during land and resource planning processes, as well as at the level of individual project planning and development. Below is a bulleted list of these OPMP responsibilities:

1. Pre-application assistance and meetings. The OPMP is tasked with arranging and scheduling meetings between a prospective developer and agency personnel that would be reviewing, critiquing, and, ultimately, writing permits to authorize a given development project. These meetings provide an invaluable opportunity for industry to meet face-to-face with agency scientists and resource managers. Oftentimes polar bear issues are brought to an applicant's attention at these meetings. Thus, when a developer is made aware of potential wildlife conflicts and/or potential adverse impacts of their planned project ahead of time, the finalized plan of operation or facility footprint is substantially modified before permit applications are even filed. At these meetings, prospective applicants are made aware, if they are not already, of the need to design and site facilities so as to be consistent with statewide standards and district enforceable policies. Applicants are also made aware of the oftentimes many distinct special-interest groups that need to be "kept in the loop" for the planning/approval process. This list typically includes subsistence oversight groups, Native Tribes, Native Councils, commercial or recreational fishing interests, and environmental groups, among others.
2. Requirements/Standards for submitted review materials. Applicants need to provide OPMP and review participants with:
 - (1) completed Coastal Project Questionnaire;
 - (2) map(s) identifying the project location and adjacent facilities, diagrams, technical data, and other relevant material;
 - (3) description of any man-made structures or natural features that are at or near the project site;
 - (4) an evaluation of how the proposed project is consistent with the state standards and with any applicable district enforceable policies, sufficient to support the consistency certification;

These materials are of paramount importance in assisting agency personnel and public review of a project for its potential impacts to coastal uses and resources. It is partially with these materials that a review participant can suggest alternative measures to improve a proposed development project. Similarly, the coastal consistency review process requirement for federal agencies to submit consistency evaluations along with draft plans (for example, OCS oil and gas leasing plans) enables a more thorough review and comment adjudication.

3. Public process/ public review. Most state and federal agency authorizations (permits) go through both public and agency review processes often coordinated by OPMP. This fulfills many agencies' responsibility for posting/distributing public notice. It also provides a key tool wherein Fish and Wildlife Service, Alaska Department of Fish and Game, other state agencies, the public, and the coastal district can raise attention to scientific, social, and environmental concerns relative to polar bear habitats, population dynamics, or other aspects

of a proposed plan or project. Plan adoption and/or individual authorizations for a given project must, through the coastal consistency review process that is adjudicated by OPMP, be deemed consistent with ACMP standards before said permit is issued or plan is adopted. Oftentimes the OPMP will negotiate and include specific alternative measures designed to minimize potentially adverse impacts to polar bears into a project description before it can be deemed consistent and permits can be written.

4. The OPMP assists coastal districts develop and adopt Program Plans and District Enforceable Policies. According to statewide standards of the ACMP as well as the local enforceable policies, the ACMP review process functions as a tool for adding restrictions or mitigating measures (in the form of Alternative Measures) to the issued authorizations.
5. The OPMP works to act as a facilitator to attempt to resolve conflicts among the resource agencies, an affected coastal resource district, and/or an applicant--before, during, or after a project is permitted.
6. Where the specific aspects of an activity that would otherwise be subject to authorization by the ADEC are not subject to that department's authorization because the activity is either a federal activity or is located on federal land or the OCS, the DEC can review, comment on, and/or add alternative measures to said activity *only* through the ACMP. Thus, the ACMP provides a valuable role in being the only venue for the State to comment on, allow, disallow, or make modifications to certain federal actions or private activities located on federal land or the OCS. This leverage is of paramount importance in areas that also happen to be crucially important as habitat for polar bears.
7. Specific Statewide standards and North Slope Borough District enforceable policies that have bearing on conserving polar bears and polar bear habitat include:
 - ▶ **11 AAC 112.230. Energy facilities.** (a)(1) The siting and approval of major energy facilities by districts and state agencies must be based, to the extent practicable, to minimize adverse environmental and social effects while satisfying industrial requirements;
 - ▶ **11 AAC 112.230. Energy facilities.** (a)(2) The siting and approval of major energy facilities ... must be based, to the extent practicable, to be compatible with existing and subsequent adjacent uses and projected community needs;
 - ▶ **11 AAC 112.230. Energy facilities.** (a)(11) The siting and approval of major energy facilities ... must ... minimize the probability, along shipping routes, of spills or other forms of contamination that would affect fishing grounds, spawning grounds, & other biologically productive or vulnerable habitats, including marine mammal rookeries and hauling out grounds...
 - ▶ **11 AAC 112.230. Energy facilities.** (a)(12) The siting and approval of major energy facilities ... must ... allow for the free passage and movement of fish and wildlife with due consideration for historic migratory patterns;
 - ▶ **11 AAC 112.230. Energy facilities.** (a)(13) Major energy facilities should be sited so that areas of particular ... environmental, or cultural value ... will be protected;
 - ▶ **11 AAC 112.270. Subsistence.** (a) A project within a subsistence use area designated by the department or under 11 AAC 114.250(g) must avoid or minimize impacts to subsistence uses of coastal resources. (b) For a project within a subsistence use area designated under 11 AAC 114.250(g), the applicant shall submit an analysis or evaluation of reasonably foreseeable adverse impacts of the project on subsistence use as part of (1) a consistency review packet submitted under 11 AAC 110.215; and

(2) a consistency evaluation under 15 C.F.R. 930.39, 15 C.F.R. 930.58, or 15 C.F.R. 930.76.

- ▶ **11 AAC 112.300. Habitats.** (b) (1) Offshore areas must be managed to avoid, minimize, or mitigate significant adverse impacts to competing uses such as commercial, recreational, or subsistence fishing, to the extent that those uses are determined to be in competition with the proposed use;
- ▶ **11 AAC 112.300. Habitats.** (b) (2)(B) Estuaries must be managed to avoid, minimize, or mitigate significant adverse impacts to competing uses such as commercial, recreational, or subsistence fishing, to the extent that those uses are determined to be in competition with the proposed use;
- ▶ **11 AAC 112.300. Habitats.** (b) (5)(A) Rocky islands and sea cliffs must be managed to avoid, minimize, or mitigate significant adverse impacts to habitat used by coastal species (5) rocky islands and sea cliffs must be managed to avoid, minimize, or mitigate significant adverse impacts to habitat used by coastal species;
- ▶ **11 AAC 112.300. Habitats.** (b) (6)(C) barrier islands and lagoons must be managed to avoid, minimize, or mitigate significant adverse impacts from activities that would decrease the use of barrier islands by coastal species, including polar bears and nesting birds;

North Slope Borough Coastal Management Program Enforceable Policies

- ▶ 2.4.4(a) Vehicles, vessels, and aircraft that are likely to cause significant disturbance must avoid areas where species that are sensitive to noise or movement are concentrated at times when such species are concentrated. Concentrations may be seasonal or year-round and may be due to behavior (e.g., flocks or herds) or limited habitat (e.g., polar bear denning, seal haul-outs). Horizontal and vertical buffers will be required where appropriate. Concern for human safety will be given special consideration when applying this policy.

DIVISION OF OIL AND GAS (DO&G)

Mitigation Measures

DO&G crafts mitigation measures and lessee advisories as part of its best interest finding process for areawide lease sales. The measures become enforceable terms of every lease and are included in stipulations of every permit issued in the area. Two lease sales will transpire in areas that polar bears occupy: North Slope Areawide and Beaufort Sea Areawide.

The North Slope Areawide Lease Sale Mitigation Measures and Lessee Advisories currently require:

- Before commencement of any activities, lessees shall consult with the USFWS (907-786-3800) to identify the locations of known polar bear den sites. Operations must avoid known polar bear dens by one mile. A lessee who encounters an occupied polar bear den not previously identified by USFWS must report it to the USFWS within 24 hours and subsequently avoid the new den by one mile. If a polar bear should den within an existing development, off-site activities shall be restricted to minimize disturbance.

- For projects in proximity to areas frequented by bears, lessees are encouraged to prepare and implement a human-bear interaction plan designed to minimize conflicts between bears and humans. The plan should include measures to:
 - A. minimize attraction of bears to facility sites;
 - B. organize layout of buildings and work areas to minimize interactions between humans and bears;
 - C. warn personnel of bears near or on facilities and the proper actions to take;
 - D. if authorized, deter bears from the drill site;
 - E. provide contingencies in the event bears do not leave the site;
 - F. discuss proper storage and disposal of materials that may be toxic to bears; and
 - G. provide a systematic record of bears on the site and in the immediate area.

- The Lessee is advised that the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 et seq.) protects endangered and threatened species and candidate species for listing that may occur in the lease sale area. Lessees shall comply with the Recommended Protection Measures for all endangered, threatened and candidate species developed by the USFWS to ensure adequate protection.

- Lessees are advised that they must comply with the provisions of the Marine Mammal Protection Act of 1972, as amended (16 USC 1361-1407). USFWS shares authority for marine mammals with the NMFS.

The Beaufort Sea Areawide Lease Sale Mitigation Measures and Lessee Advisories currently require:

- Operations must avoid known polar bear dens by one mile. Known den locations shall be obtained from the US Fish & Wildlife Service (907-786-3800) prior to starting operations. New dens encountered in the field must be reported to the above, and subsequently avoided by one mile. If a polar bear should den within an existing development, off-site activities shall be restricted to minimize disturbance.

- For projects in close proximity to areas frequented by bears, lessees are encouraged to prepare and implement bear interaction plans to minimize conflicts between bears and humans. These plans could include measures to: (a) minimize attraction of bears to the drill sites; (b) organize layout of buildings and work areas to minimize human/bear interactions; (c) warn personnel of bears near or on drill sites and the proper procedures to take; (d) if authorized, deter bears from the drill site; (e) provide contingencies in the event bears do not leave the site or cannot be deterred by authorized personnel; (f) discuss proper storage and disposal of materials that may be toxic to bears; and (g) provide a systematic record of bears on the site and in the immediate area. The ADF&G has offered to assist lessees in developing educational programs and camp layout and management plans as lessees prepare their lease operations plans.

- Seals: To protect hauled-out spotted seals, boat and barge traffic will be prohibited between July 15 and October 1 within one-half mile of the Piasuk River delta and

Oarlock Island.

- Lessees are advised that they must comply with the provisions of the Marine Mammal Protection Act of 1972 as amended.
- Sensitive Areas: Lessees are advised that certain areas are especially valuable for their concentrations of marine birds, marine mammals, fishes, or other biological resources; cultural resources; and for their importance to subsistence harvest activities. The following areas must be considered when developing plans of operation. Identified areas and time periods of special biological and cultural sensitivity include:
 - a. the Boulder Patch in Stefansson Sound, year round;
 - b. the Canning River Delta, January-December;
 - c. the Colville River Delta, January-December;
 - d. the Cross, Pole, Egg, and Thetis Islands, June-December;
 - e. the Flaxman Island waterfowl use and polar bear denning areas, including the Leffingwell Cabin national historic site located on Flaxman Island;
 - f. the Jones Island Group (Pingok, Spy, and Leavitt Islands) and Pole Island are known polar bear denning sites, November-April; and
 - g. the Sagavanirktok River delta, January-December.
 - h. Howe Island supports a snow goose nesting colony, May-August.

Additionally, the following Beaufort Sea Mitigation Measures and Lessee Advisories address bowhead whales:

- Whale Harvest Protection:
 - a. Permanent facility siting on Cross Island will be prohibited unless the lessee demonstrates to the satisfaction of the NSB, in consultation with the AEW, that the development will not preclude reasonable access to whales as defined in NSBCMP Policy 2.4.3(d) and in NSBMC 19.79.050(d)(1) and as may be determined in a conflict avoidance agreement, if required by the NSB. With the approval of the NSB, the director may authorize permanent facilities.
 - b. Permanent facility siting in state waters within three miles of Cross Island will be prohibited unless the lessee demonstrates to the satisfaction of the director, in consultation with the NSB and the AEW, that the development will not preclude reasonable access to whales as defined in NSBCMP Policy 2.4.3(d) and in NSBMC 19.79.050(d)(1) and as may be determined in a conflict avoidance agreement if required by the NSB.
 - c. Permanent facility siting in state waters between the west end of Arey Island and the east end of Barter Island (Tracts 40 through 45) will be prohibited unless the lessee demonstrates to the satisfaction of the director, in consultation with the NSB and the AEW, that the development will not preclude reasonable access to whales as defined in NSBCMP Policy 2.4.3(d) and in NSBMC 19.79.050(d)(1) and as may be determined in a conflict avoidance agreement if required by the NSB.
- Any tract or portion thereof in the Beaufort Sea areawide sale area may be subject to the March 1990 Beaufort Sea Seasonal Drilling Policy in conjunction with the

submission of a plan of operations permit application by the lessee. This measure will be reevaluated and updated periodically on the basis of experience and new information.

- a. Exploratory Drilling From Bottom-founded Drilling Structures and Natural and Gravel Islands: Subject to condition c below, exploratory drilling operations and other downhole operations from bottom-founded drilling structures and natural and gravel islands are allowed year-round in the Central Subsistence Whaling Zone (SWZ).⁵ In the Eastern SWZ, drilling is prohibited upon commencement of the fall bowhead whale migration until whaling quotas have been met.
- b. Exploratory Drilling Operations from Floating Drilling Structures: Subject to condition c, exploratory drilling below a predetermined threshold depth and other downhole operations from floating drilling structures is prohibited throughout the Beaufort Sea upon commencement of the fall bowhead whale migration until the whale migration mid-point.⁶

In addition to the above restriction, exploratory drilling above and below a predetermined threshold depth in the Eastern SWA from floating drilling structures is prohibited upon commencement of the fall bowhead whale migration until the whaling quotas have been met.

In the Central and Western SWZ, exploratory drilling above and below a predetermined threshold depth may be prohibited on a case-by-case basis until the whaling quotas have been met.⁷ The following criteria will be used to evaluate these operations: 1) proximity of drilling operations to active or whaling areas, 2) drilling operation type and feasible drilling alternatives, 3) number of drilling operations in the same area, 4) number of whaling crews in the area, and 5) the operator's plans to coordinate activities with the whaling crews in accordance with the subsistence harvest protection mitigation measure.

All non-essential activities associated with drilling are prohibited in the Central SWZ during the whale migration until whaling quotas have been met. Essential support activity associated with drilling structures occurring within active whaling areas shall be coordinated with local whaling crews in accordance with the subsistence harvest protection mitigation measure.

“Essential activities” include those necessary to maintain well control, maintain physical integrity of the drilling structure, and scheduled crew changes. Support

⁵ Subsistence Whaling Zones:

Eastern SWZ is that area within 20 nautical miles of the shoreline between 141° and 144° W longitude.

Central SWZ is that area within 20 nautical miles of the shoreline between 144° and 151° W longitude.

Western SWZ is that area within 20 nautical miles of the shoreline between 154° and 157° W longitude.

⁶ Migration Dates:

Eastern SWZ - September 1 - October 10 with the midpoint of the migration on September 20.

Central SWZ and Western SWZ - September 10 - October 20 with the midpoint of the migration on September 28.

Outside SWZ - Seaward of the Eastern SWZ - September 1 - October 10 with the midpoint of the migration on September

20; Seaward and west of the Central SWZ - September 10 - October 20 with the midpoint of migration on September 28.

The midpoint of the migration is when 50 percent of the whales have been deemed to have passed the drill site.

⁷ If upon review of the proposed operation using the above described criteria, the state determines that conflict with subsistence whaling activities may occur, additional drilling restrictions, similar to those imposed for the Eastern SWZ, may be imposed in the Central and Western SWZ's. In the Eastern SWZ, drilling is prohibited upon commencement of the fall bowhead migration until whaling quotas have been met.

craft include aircraft, boats, and barges. “Non-essential activity,” by exclusion, are those activities that do not fit the definition of essential activities. Both types of activities must be described by the operators in their exploration plans submitted for state review. To the extent feasible, mobilization or demobilization of the drilling structures should not occur during the whale migration. If operators propose to mobilize or demobilize during the whale migration, they must describe the activity in their exploration plan and must demonstrate why the activity must occur during the migration period.

- c. Exploratory Drilling in Broken Ice: Consistent with the May 15, 1984, “Tier 2” decision, lessees conducting drilling operations during periods of broken ice must:
 - (1) participate in an oil spill research program;
 - (2) be trained and qualified in accordance with Minerals Management Service standards pertaining to well-control equipment and techniques; and
 - (3) have an oil spill contingency plan approved by the state which meets the requirements of the “Tier 2” decision, including requirements for in situ igniters, fire resistant boom, relief well plans, and decision process for igniting an uncontrolled release of oil.
- Geophysical Activity: Except as indicated, the mitigation measures listed above do not apply to geophysical exploration on state lands. Geophysical exploration activities are governed by 11 AAC 96. In conducting offshore geophysical surveys, neither the lessees nor their agents will use explosives in open water areas.

Lessees or nonlessee companies may propose various operations, which include seismic surveys, in the sale area. Lessees may not have control over those activities not contracted by them. However, post-lease seismic surveys conducted or contracted by the lessee, are considered lease-related activities. Restrictions on geophysical exploration permits, whether lease-related or not, will depend on the size, scope, duration, and intensity of the proposed project and on the reasonably foreseeable effects on important species, specifically marine mammals.

Studies indicate that some geophysical activities may have an impact on the behavior of bowhead whales. Measures may be imposed on geophysical exploration permits in the vicinity of bowhead whale migratory routes during spring or fall migrations. See the community involvement and seasonal drilling mitigation measures. The extent of effects on marine mammals varies depending on the type of survey and gear used.

Copies of the non-proprietary portions of all Geophysical Exploration Permit Applications will be made available to the NSB, AEW, and potentially affected subsistence communities for comment.

- Subsistence whaling: Subsistence whaling activities occur generally during the following periods:

August to October: Kaktovik whalers use the area circumscribed from Anderson Point in Camden Bay to a point 30 km north of Barter Island to Humphrey Point east of Barter Island. Nuiqsut whalers use an area extending from a line northward of the Nechelik Channel of the Colville River to Flaxman Island, seaward of the Barrier Islands.

September to October: Barrow hunters use the area circumscribed by a western boundary extending approximately 15 km off Cooper Island, with an eastern boundary on the east side of Dease Inlet. Occasional use may extend eastward as far as Cape Halkett.

Additional Information

In June 2005 the IUCN/SSC World Conservation Union, Species Survival Commission, Polar Bear Specialist Group (PBSG) met for the 14th time. The PBSG meets every 3-5 years to review and exchange information on progress in polar bear research and management throughout the Arctic. The proceedings from the 2005 meeting include information on the following studies:

- Hypothetical oil spill study: The study used criteria that are less stringent than those discussed in the Beaufort Sea Areawide Oil and Gas Lease Sale Best Interest Finding. The results varied widely but conclusions indicate minimal risk to bears.
- Polar Bear Den Site Behavior and Response to Human Disturbance: The study looked at dens and the behavior of the females and cubs that emerged from the dens. Time spent near the dens was nearly identical to control groups, though perhaps slightly shorter (longer = better). Vigilant behaviors by females with dens near ice roads indicate that bears exposed to heavy truck traffic habituated to it and ceased to view it as threatening.
- Assessment of industrial sounds and vibrations received in polar bear dens: Based on the fact that the period of heaviest industrial activity on the North Slope coincides with the denning period, the effect of noise and vibration from equipment within dens was examined. The study tested equipment commonly used on the North Slope (Hagglunds BV206, Tucker Sno-Cat, Gravel Hauler (empty and loaded), front end loader, pick-up truck, and fuel truck). All noise sources were at or below background noise levels at 500 meters from the den site. Mitigation measures require that dens be avoided by one mile (1,609.3 meters). Researchers also noted that companies do observe the one mile requirement and do coordinate with Fish and Wildlife Service on newly discovered dens.

DIVISION OF MINING, LAND AND WATER

The Division of Mining, Land and Water (DMLW) has responsibility and authority to manage all commercial and recreational use of state land and resources on the North Slope. This swath of land includes an area north of the Brooks Range, west of the ANWR, and east of the NPRA, as well as scattered tracts of state owned and sleeted land located west of NPRA. This includes uplands, shorelands, tidelands, and submerged lands out to the three mile limit. In addition the DMLW manages water allocations on all lands, including on federal and private lands.

DMLW authority primarily comes from AS 38.05, 41.23, 46.15, and 46.17 and is overlapped by authorizations granted by DO&G for oil and gas leasing and authorizations granted by the Joint Pipeline Office for common carrier pipeline right of ways.

DMLW writes area plans and management plans for state lands through a public process to create the policy and guidance of how the lands will be managed. This includes consideration of sensitive habitats and development needs. DNR has not developed an Area Plan for state land in the Central Arctic but has developed the Northwest Area Plan for state land west of NPRA.

DMLW authorizes land uses through permits, leases, rights of way, sales, and other authorizations. All DMLW authorizations are granted in accordance with the plans. In addition, authorizations must first be deemed consistent with the Alaska Coastal Management Program plans and enforceable policies. DMLW will consider these plans and place any restrictions or mitigating measures in the authorizations through stipulations to protect the social or environmental concerns, inclusive of critical habitats.

Most all authorizations go through public and agency review process where ADF&G or the USFWS can bring attention to any additional environmental concerns about the project. DMLW will then address those concerns when creating the authorization.

DMLW has established a Special Use Area designation for all the general state lands north of the Umiat Meridian. This restricts all off road motorized use to the requirement of first obtaining a permit. Because of this, DMLW also determines when cross-country motorized use can occur on the tundra. This includes authorizing when and how ice roads can be built on the North Slope.

DMLW issues many approvals for activities on State-owned lands on the North Slope. Many of these approvals involve either cross country travel or ice road construction. Since these activities are typically within the coastal zone, most of the permits are subject to General Consistency Determinations GCD 19 or GCD 34. Both of these GCDs include the following condition:

Operations must avoid known polar bear dens by one mile. Known den locations shall be obtained from the U.S. Geological Survey ((907) 786-3800 or (800) 362-5148) prior to starting operations. New dens encountered in the field must be reported to the above, and subsequently avoided by one mile. (North Slope and Northwest Arctic Boroughs, Bering Straits CRSA)

DMLW occasionally issues land use permits or other authorizations for camps, shops, or other industrial sites. Permits for camps are often issued subject to GCD-23. This GCD includes the following stipulation to prevent access by bears to food and garbage:

Prior to removal, all garbage and debris will be stored so it does not attract wildlife. Food and refuse will be stored in bear-proof containers. Sites will be kept clean.

Other authorizations that DMLW issues often contain stipulations that address food and waste storage. Note that these are not always included. An example of such a stipulation is as follows:

22. Solid Waste.

a. All solid waste and debris generated from the activities conducted under this authorization shall be removed to a facility approved by the ADEC prior to the expiration, completion, or termination of the authorization or activities.

b. Paper products may be burned on site provided that measures (e.g. burn barrels, clearing of burn area to mineral soil) are taken to prevent wildfires.

c. Temporary storage and accumulation of solid waste (prior to its removal) shall conform to the following:

i. solid waste shall be stored in a manner that prevents a litter violation under AS 46.06.080;

ii. putrescible wastes (material that can decompose and cause obnoxious odors) shall be stored in a manner that prevents the attraction of or access to wildlife or disease vectors; and

iii. the premises shall be maintained free of solid waste that might create a health or safety hazard.

DMLW conducts frequent field inspections of oil and gas exploration and development projects on the North Slope. One of the items that we typically look at during our inspections is waste storage. Waste storage practices have improved drastically over the past five years. Bear-proof dumpsters are now being used on nearly all sites within the oil field. However, occasionally there are problems with waste storage. On a recent inspection, DMLW inspected 26 sites. Only one was not in compliance with the waste storage stipulation. However, one site did have a violation. At this site, the drill rig and dumpsters had been on site for 3 days. They had not installed the bear-proof covers on the dumpsters. Although bears had not made it into the dumpster, ravens had been getting into the food scraps. Company representatives stated they would correct the problem immediately. DNR inspectors will check this site to make sure the covers were installed.

DMLW's statutes and regulations are fairly general and are non-specific regarding polar bear related issues. For example, the authority for attaching stipulations to DMLW permits is 11 AAC 96.040 (b): "*Each permit is subject to any provisions the department determines necessary to assure compliance with this chapter, to minimize conflicts with other uses, to minimize environmental impacts, or otherwise to be in the interests of the state.*" Leasing statutes and regulations also do not have any specific language.

OFFICE OF HABITAT MANAGEMENT AND PERMMITTING

Below are the current polar bear stipulations attached to state lease sales (copied from the Beaufort Sea Areawide 2006 mitigation measures on the Oil and Gas website). Leasees are "encouraged" rather required to prepare bear interaction plans. OHMP is pursuing a requirement for these plans in the upcoming 10 year revisions to the areawide plans.

24b. Operations must avoid known polar bear dens by one mile. Known den locations shall be obtained from the US Fish & Wildlife Service (907-786-3800) prior to starting operations. New dens encountered in the field must be reported to the above, and subsequently avoided by one mile. If a polar bear should den within an existing development, off-site activities shall be restricted to minimize disturbance.

24c. For projects in close proximity to areas frequented by bears, lessees are encouraged to prepare and implement bear interaction plans to minimize conflicts between bears and humans. These plans could include measures to: (a) minimize attraction of bears to the drill sites; (b) organize layout of buildings and work areas to minimize human/bear interactions; (c) warn personnel of bears near or on drill sites and the proper procedures to take; (d) if authorized, deter bears from the drill site; (e) provide contingencies in the event bears do not leave the site or cannot be deterred by authorized personnel; (f) discuss proper storage and disposal of materials that may be toxic to bears; and (g) provide a systematic record of bears on the site and in the immediate area. The ADF&G has offered to assist lessees in developing educational programs and camp layout and management plans as lessees prepare their lease operations plans.

STATE PIPELINE COORDINATOR'S OFFICE

The SPCO administers pipelines authorized under AS 38.35, the Right-of-Way Leasing Act. Typically, right-of-way leases contain conditions and stipulations to protect fish and wildlife resources. An example of each is included below. In addition, construction and operation activities associated with common carrier pipelines on the North Slope are governed by the ACMP process, described above.

Example of Lease Conditions

11. Mitigative, Preventive, and Abatement Activities Required (a) The LESSEE will, at its own expense in accordance with the terms of this LEASE and in the manner set forth in the appropriate plans and programs developed pursuant to Stipulation 2.5.1:

- (1) maintain the LEASEHOLD and PIPELINE SYSTEM in good repair;
- (2) promptly repair or remedy any damage to the LEASEHOLD; and
- (3) promptly compensate for any damage to or destruction of property for which the LESSEE is liable, resulting from damage to or destruction of the LEASEHOLD or PIPELINE SYSTEM.

(b) The LESSEE shall prevent or, if the procedure, activity, event or condition already exists or has occurred, shall abate, as completely as practicable, using the BEST PRACTICABLE TECHNOLOGY AVAILABLE and in the manner set forth in the appropriate plans and programs developed pursuant to Stipulation 2.5.1, any physical or mechanical procedure, activity, event or condition:

- (1) that is susceptible to prevention or abatement;
- (2) that arises out of, or could adversely affect, PIPELINE activities; and
- (3) that causes or threatens to cause
 - (A) a hazard to the safety of workers or to the public health or safety (including but not limited to personal injury or loss of life with respect to any PERSON or PERSONS); or

(B) immediate, serious, or irreparable harm or damage to the environment (including but not limited to soil, sediments, water and air quality, areas of vegetation, fish or other wildlife populations or their habitats, or any other natural resource).

(c) Unless clearly inapplicable, the requirements and prohibitions imposed upon the LESSEE by this LEASE (including the Stipulations thereto) are also imposed upon the LESSEE's employees, and the LESSEE's agents and contractors and the employees of each of them. The LESSEE shall ensure compliance with this LEASE (including the Stipulations thereto) by its employees and by its agents and contractors, and the employees of each of them.

13. Orders and Notices (a) The COMMISSIONER may issue any order necessary to enforce or implement any provision of this LEASE. Before delivery of any such order, the COMMISSIONER shall confer with LESSEE, if practicable to do so, regarding the required action or actions included in the order. Any such order shall state in detail what is demanded of LESSEE and the reasons and basis for such demand.....

(i) In coordination with the FERC, and consistent with applicable State and Federal law, the COMMISSIONER may, by written order, require the LESSEE to make such modification of the PIPELINE SYSTEM as the COMMISSIONER determines is necessary to:

- (1) protect or maintain stability of the foundation and other earth materials;
- (2) protect or maintain integrity of the PIPELINE SYSTEM;
- (3) control or prevent significant damage to the environment (including but not limited to soil, sediments, water and air quality, areas of vegetation, fish or other wildlife populations or their habitats, or any other natural resource); or
- (4) remove hazards to public health and safety, including the activities of the LESSEE, the LESSEE's agents, and contractors, and the employees of each of them.

15. Temporary Suspension (a) The COMMISSIONER may, consistent with applicable State and Federal law, order the temporary suspension of any or all PIPELINE activities, if

- (1) an immediate temporary suspension of the activity or the activities is necessary to protect:
 - (A) public health or safety (including but not limited to personal injury or loss of life with respect to any PERSON or PERSONS); or
 - (B) the environment from immediate, serious or irreparable harm or damage (including, but not limited to harm or damage to soil, sediments, water and air quality, areas of vegetation, fish or other wildlife population or their habitats, or any other natural resource); or

Example of Lease Stipulations

2.5 DESIGN CRITERIA, Plans and Programs

2.5.1 The LESSEE shall submit DESIGN CRITERIA to the COMMISSIONER. The LESSEE shall also submit comprehensive plans and/or programs (including schedules where appropriate) which shall include but not be limited to the following:

(25) Human/Carnivore Interaction

Plan Purpose and Objective: This plan will provide design criteria and basic methodologies for various pipeline activities that will be used to minimize human/carnivore interactions and will describe the measures to be employed to

provide employees with adequate training and knowledge to deal with the potential dangers associated with interactions between humans and bears and other carnivores.

Performance Standard: The LESSEE shall minimize the occurrence of human-carnivore interactions during pre-construction, CONSTRUCTION, operation and maintenance, and TERMINATION activities by taking measures to prevent interactions between humans and carnivores. This plan shall contain personnel safety guidelines developed in consultation with the Alaska Department of Fish and Game (hereinafter “ADF&G”).

2.15.5.2 Zones of Restricted Activities

2.15.5.2.1 Activities of the LESSEE in connection with CONSTRUCTION, operation, maintenance and TERMINATION of the PIPELINE SYSTEM in key fish and wildlife areas and in specific areas where threatened or endangered species of animals are found may be restricted by the COMMISSIONER during periods of fish and wildlife breeding, nesting, spawning, lambing and calving activity, over-wintering, and during major migrations of fish and wildlife. The COMMISSIONER shall provide the LESSEE written notice of such restrictive action. At least annually, and as far in advance of such restrictions as is possible, the COMMISSIONER shall furnish the LESSEE an updated list of those areas where such actions may be required, together with anticipated dates of restriction.

2.15.5.3 Big Game Movements

2.15.5.3.1 The LESSEE shall design, construct and maintain both the buried and above ground sections of the PIPELINE so as to assure free passage and movement of big game animals.

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P.O. Box 115526, Juneau, AK 99811-5526; phone: (907) 465-6166.