

Minutes of the 18th Working Meeting of the IUCN/SSC Polar Bear Specialist Group, Anchorage, Alaska, 7 - 11 June 2016

Closed sessions

Tuesday, June 7

1. Welcome

Introductory remarks

The 18th Working Meeting of the IUCN/SSC Polar Bear Specialist Group (PBSG) was called to order by D. Vongraven, Chair of the Group, at 09:00 in Room 309 of the Headquarters of the Alaska Unit of the National Park Service building in Anchorage, Alaska. No observers or invited specialists were present.

2. Formal matters

Request for media attendance

Chair Vongraven reported that there was one media request for permission to attend and report on the meeting (Erica Goode, New York Times). Ms. Goode had also contacted individual members about interviews as she is apparently working on an extended article about polar bears. A large majority of the members voted to allow her to attend the open sessions with the invited experts and observers.

Press releases

Chair Vongraven asked if members felt the PBSG should issue press releases. N. Lunn noted that in the past the group has prepared press releases, but it was noted by others that these tended not to be widely picked up by the media. A. Derocher suggested it might be more effective for the PBSG to continue writing press releases on important topics but to then put them on the web site rather than using the traditional press release route. This would mean that the material could be readily available to both the press and the public for an extended period of time. There was general agreement on placing releases on the website.

Agenda and Proceedings for the meeting

Chair Vongraven asked for comments on the meeting agenda. No additional comments were made and the agenda, as distributed ahead of the meeting, was accepted and a schedule for rapporteurs was established. T. Atwood volunteered to coordinate the reports from the individual rapporteurs (J. Aars, S. Amstrup, A. Derocher, G. Durner, A. Jessen, N. Lunn, M. Obbard, E. Richardson, K. Rode, I. Stirling, G. Thiemann, F. Ugarte, J. Wilder, and G. York) from all the sessions into a single document for the Proceedings. At the special meeting in 2014 (Fort Collins, Colorado) it was agreed that the Proceedings of the PBSG meetings would include minutes, status stable, and reports on research and management in a single document. It was also agreed that it would be most useful to continue publication of the Proceedings in the IUCN Occasional Paper series, as has been the practice following past

meetings. The tentative goal for completion of the contents for the Proceedings was set for October. Additional material for possible inclusion in the final Proceedings, such as Resolutions, will be discussed as the issues come up through the meeting. G. Durner agreed to help with coordination of the final document for eventual publication as the Proceedings of the meeting.

Resolutions

Chair Vongraven asked whether there were any issues requiring a resolution from the PBSG. J. Wilder stated that the Range States occasionally needs reminded to act on aspects of the Circumpolar Action Plan, and perhaps a resolution from the PBSG would help to maintain their engagement. E. Regehr and Chair Vongraven suggested revisiting the need for resolutions at the end of the meeting as additional issues are likely to come up in subsequent days.

3. Report from Range States meeting in 2015

A summary of the 2015 Range States meeting was presented. N. Lunn noted that the extensive list of tasks from the Range States comprised a huge commitment and is, in reality, the work of the Range States and not simply “advice” from the PBSG. The tasks are abundant in number and many are quite large (although there is some overlap) and it would require a very large effort on the part of individuals, or groups of individuals, to complete. As such, it would be better done by the Range States themselves and the PBSG could consider providing advice on how they might proceed, or possibly advise on the final product. K. Laidre noted that list is long but the PBSG did not formally agree to take on the tasks at the 2015 meeting.

4. Advice to the Range States

To date, the PBSG has been the official advisor for the Range States but members agreed the relationship needs revisiting in order to achieve positive results for both parties. With regards to the 2015 Range States meeting, several members felt the PBSG needs to prioritize tasks identified by the Range States and then suggest how to approach the most important ones. Specific knowledge gaps need to be identified as part of the prioritization exercise. J. Wilder, E. Regehr, K. Laidre, K. Rode, and E. Richardson agreed to form a subgroup to assess the work that would be needed to actually accomplish the tasks using the information base already in existence. Additionally, they will make a general estimate of how much work will be required to address the tasks. The Range States needs to recognize that a high level of commitment will be needed to achieve even the highest priority goals, such as the likely need for specific contracts and putting tasks into planning documents for individuals for annual work assessments. The objectives are simply too large to expect individual scientists, or groups of scientists, to be able to achieve the tasks in their spare time. Successful completion of some goals will likely require new budgets and person-year commitments. Several members commented that there needs to be communication to the Range States that the PBSG does not have the capacity to take on individual unfunded tasks.

Two particular priorities the Range States sought advice on were further clarification of the so-called “Arctic Basin subpopulation”, and an estimate of the costs of implementing the priorities in the Circumpolar Action Plan. A. Derocher noted the importance of looking at data on movements of satellite collared bears from subpopulations such as the Northern Beaufort Sea, Southern Beaufort Sea, Chukchi Sea, and Barents Sea because it is clear that some of the time, bears are distributed well north of the presently recognized northern boundaries of those subpopulations. This means that the area of this hypothetical subpopulation is probably much smaller than shown on present maps and likely does not contain many resident bears. A. Derocher, G. York, and G. Thiemann will review the available information on the movements of bears from relevant subpopulations in order to provide a brief report on what might be needed to enhance our understanding of this issue. It is important to address this reasonably soon because there is an impression held by some that there are more bears than may be the case.

The subgroup reporting on human-polar bear conflicts has made an interim report back to the Range States but the final report has not yet been completed.

It was agreed that, if practical, all the subgroup reports done in response to the Range States request should be parts of a single report back to Range States.

5. Capacity issues

Funding for support of a program officer for the PBSG

At the special meeting in 2014, members discussed whether there was a need for a Program Officer who could manage and do much of the important, but time-consuming, work required of the PBSG. It was noted that the PBSG membership simply does not have the capacity at the moment to address the numerous requests being made by the Range States. It was estimated that the total cost of a Program Officer would be in the vicinity of \$150K/year for 5 years and a request for this support was made to the Range States. The Range States was able to commit to approximately \$20-30K/year. It was noted that it may be difficult to convince the Range States of the need for a Program officer at the PSBG because it may be difficult to quantify the direct benefit to the Range States. There was discussion of the possibility of soliciting funding/sponsorships from the private sector. The general consensus was that several lines of funding would likely be needed to support a Program Officer position and acquiring those funds would require substantial effort.

G. York noted that a formal proposal identifying tasks that groups like non-governmental organizations (NGOs) might be interested in addressing was not drafted after the 2014 special meeting. He suggested that if the goal of a Program Officer is to be achieved, it will likely need to be shaped toward an NGO option rather than governments, and this may be a role for NGOs to help. Members expressed a need to more clearly identify the roles of this position in such areas as communications, coordination, and related tasks. Additionally, it was suggested that a Working Group be established to develop an outline for the position, using the previous working document as a starting point. A Working Group was not named.

A. Derocher suggested that a trust account managed through a non-profit organization or a University is a possibility for administering the position. Chair Vongraven noted that it will be difficult to both find a single sponsor for such a project or to find and administer a larger number of smaller supporting groups.

6. Terms of Reference

E. Regehr led a review of a document drafted in advance of the meeting that contained revisions to the current Terms of Reference (ToR) (to add more structure and clarity). The redrafting was led by E. Regehr and involved a small group of members – J. Aars, A. Jessen, K. Laidre, N. Lunn, M. Obbard, I. Stirling, D. Vongraven, Ø. Wiig, and G. York.

Responsibilities of the chair and co-chair

The document was drafted with wording (replacement text to the existing ToR) that the PBSG would be led by a chair and a co-chair, where the co-chair would report to the chair and should be more appropriately called a deputy chair. Discussion recognized the benefit of additional help for the chair but focused on whether this would be best met with a chair/deputy chair model or a co-chair model where both co-chairs had equal standing within the PBSG and also with IUCN.

Membership preferred the co-chair model (equal standing) but felt that there must be clear delineation of responsibilities/roles of each so that there was no confusion either between the co-chairs or among the members. It was agreed that the ToR would reflect a co-chair model but that wording should be retained to allow for a single chair to avoid having to redraft the ToR. It was also agreed that while the responsibilities of the co-chairs need to be clear, there should be a degree of flexibility retained to allow co-chairs to take on responsibilities for areas of particular interest to them rather than a structure that commits one co-chair to be responsible for “A”, “B”, and “C”, and the other for “D”, “E”, and “F”.

Nomination of the chair and co-chair

The members discussed proposed replacement text on the process and timing of nominations. There was a general view that the group is small enough that it is not necessary to overly formalize processes to allow for some flexibility. While it was encouraged that nominations for co-chairs occur 14 days in advance of the meeting, there was agreement that there was no need to make this a strict requirement. There is an intention to allow members not present to be able to vote via email and thus there needs to be some cut-off point for nominations. There was consensus among the members that nominations would close at the start of the meeting.

There was discussion on the election process and whether there is a need for it to be organized by a subcommittee. It was considered important that the election process be run by a group of individuals that do not include nominated members. However, it was felt that this could be facilitated by an ad hoc subcommittee rather than by creating a formalized subcommittee.

While the members agreed that there should be a limit to consecutive terms that an individual could be co-chair, there was difference of opinions as to whether co-chairs should be limited to one consecutive term or two. There was agreement that this was a very important issue and a vote of members in attendance was held by a show of hands: A majority of members voted for co-chairs being limited to two consecutive terms.

Members

There was discussion on the PBSG membership regarding proportional representation of each country. A graph of members from each country was presented and it was suggested that the membership section of the ToR may need to be adjusted to consolidate requirements for membership, selection of new members, and participation.

The members reviewed new text for the ToR with respect to the process of new candidate members. There was a general view that there should not be a time limit with respect to identifying or appointing new members when vacancies exist. The entire membership is dissolved following the IUCN quadrennial cycle but there may be a need(s) for additional members outside of this 4-year cycle. The formation of a subcommittee to help identify/review potential candidates would be of benefit. While it was agreed that it would be important for a subcommittee to assist in the selection process of members, it was less clear whether this subcommittee should work with the co-chairs in advance of the meeting so that the incoming co-chairs have a list of candidates to appoint or whether this subcommittee and the new co-chairs start the process after the election of the co-chairs. There was general agreement that there would be benefit to having a list prepared in advance. It was recognized that only the outgoing co-chairs would fully know the contributions to the group made by each member, thus there would need to be considerable reliance on the outgoing co-chairs for recommendations.

So long as individuals were qualified and the membership was not at maximum, it was agreed that new members could be added at any time and not be restricted to the IUCN quadrennial cycle.

While there was no language in the suggested new text, the members agreed it was important to include some wording to the effect that PBSG members are appointed because of their expertise and not to formally represent Range State countries. It was recognized that wording is critical because many of the current members are employees of Range State countries that support their participation. It was felt that a strong message of what the members represent is far better than a statement of what the members do not represent.

E. Regehr indicated that he would revise the document to reflect the discussions and that the wording is not intended to change the fundamentals of the ToR but rather to tighten up the language. He planned to revise the language and recirculate the document during the meeting for the members to revisit on the final day.

Financial

A new ToR section regarding financial matters of the group was discussed. While the co-chairs are responsible for the financial operations, it is important that all members know where funds come from and how they are spent. A financial subcommittee should be created that helps with financial matters. While the members agreed that they wanted to know about funds received/dispensed, there was some disagreement as to how the funds should be managed. Regardless of the host institution, the funds must be managed through an auditable account. The members agreed that the financial subcommittee should review and provide recommendations on best option with respect to institutional options.

The group discussed whether or not incoming funds from any source would need to be reviewed by the members in advance of acceptance. It was noted that we collectively do a lot of things on trust and collegial governance. It was felt that for most incoming sources there are unlikely to be issues that acceptance would compromise the group's independence. It was felt that the financial subcommittee and co-chairs should be able to determine whether or not incoming funds need to be approved in advance by the members. Before the meeting, Ø. Wiig, who was unable to attend, sent an e-mail asking that financial details for use of all funds be provided in a transparent format, as such details so far have not been available to the members.

Other matters

The group discussed additional suggested text with respect to observers and invited specialists. There was general consensus that while a number of individuals would like to attend and observe the meetings, the meetings of the PBSG are not public meetings or conferences. There was agreement that invited specialists are still important but that the language of the ToR should no longer include observers.

E. Regehr reiterated his intention of revising the document and circulating to the members during the meeting in order that it can be revisited while members are in Anchorage.

7. Website

Chair Vongraven reviewed the group's website and changes that have been made. He noted that there will be a new domain name (www.iucn-pbsg.org) and that it has been redesigned and rewritten in new script. He described it as being more dynamic and using a modern platform but not yet ready for launch.

There were questions as to who was going to manage and maintain it in order for the site to remain active. It was noted that a website subcommittee had been formed during the special meeting in 2014 with the objective to modernize the site, and subcommittee members could help with keeping it active. Additional comments included that member blogs, especially when new papers come out, can make a significant contribution to activity on the site. Another suggestion would be some sort of rolling new science banner on the home page.

Wednesday, June 8

8. Status table

L. Peacock led a discussion of the PBSG status table focused on the IUCN/SSC status table definitions from the Red List Criteria. There was general agreement from the members that the IUCN/SSC definition of subpopulation is sufficient for the purposes of the PBSG.

Members agreed to remove “standard” and “conservation” from the definition for Methods.

N. Lunn suggested that the detailed text accompanying the status table should include new information on how estimates are derived. L. Peacock advocated the removal of specifics on genetic exchange. Members discussed whether IUCN/SSC definitions should be followed to the word and the consensus was that the PBSG should use some flexibility on the interpretation of definitions.

There was extended discussion on whether the definitions of “Static”, “Increasing”, and “Declining” should be changed. The general feeling was that the definitions were reasonable because they are broad indices of subpopulation change that are not dependent on measures of lambda. Additional discussion focused on whether changes should be made to the removals columns. Some members felt that while harvest needs to be documented, 4 columns for various harvest metrics seem excessive. It was agreed that the 4 columns should remain.

It was noted that the status table estimate on abundance used by the PBGS includes all age classes of bears. This differs from the IUCN definition of abundance, which is the inclusion of only adult individuals.

There was discussion about how to reconcile the status of the Northern and Southern Beaufort Sea subpopulations given the movement of the eastern boundary separating the two to 133°W. No resolution was reached and this sparked a larger consideration of how and when subpopulation boundaries should be assessed.

The Status Table Subcommittee will distribute the draft status table and revised definitions to members and seek updates to subpopulation text sections. The deadline for comments to status table is Aug 15, 2016.

9. CITES

Chair Vongraven provided an update on recent developments regarding polar bears under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). In May 2014, CITES conducted a Significant Trade Review and reached the conclusion that current international trade was considered to be sustainable. The Chair informed the group that no new proposal would come from the United States to uplist polar bears to Appendix I at the upcoming COP17. A. Jessen informed the group that the European Union is considering a motion that would ban international trade in all Appendix I and II species, including polar bears. The chair suggested the group seek input from the IUCN on the matter. A. Jessen will obtain and circulate the draft resolution from the European Union (EU). The PBSG will consider submitting a letter to CITES pending review of the draft resolution.

10. Effects of handling polar bears

K. Rode provided a presentation on evaluating the short and long-term responses of polar bears to capture and collaring. She reviewed previous studies on polar bear movement rates (recovery to normal movements), body weight, body condition, and reproduction. A recent USGS-led study in the southern Beaufort Sea found that polar bear movement rates returned to near normal in 2-3 days and were fully normal within 5 days. There was no difference in body condition between bears caught once vs. those handled multiple times. Capture as cubs did not affect future body size and there were no effects of collars on reproduction of adult females. Since 1987, when tiletamine/zolazepam was adopted as the standard immobilizing drugs, capture-related mortality rate has been 0.1%. All mortality was related to predation and drowning, no drug-related mortality.

There was agreement that the USGS study was valuable and important. The group discussed the potentially mortal effects of capture on bears that are severely compromised by age or disease. There was consideration of individual animal welfare concerns vs. population-level impacts. The group discussed the frequency of collaring injuries and the need for better collaring materials and sizing standards. E. Regehr suggested that researchers examine trap effects where possible, to explicitly model survival in the first interval after capture.

11. Elections

The group sought nominations for the two new co-chair positions and Red List coordinator for the next quadrennial cycle. The group discussed the implications of the draft revisions to the ToR and concluded that D. Vongraven was eligible for nomination because he has not served two full terms as chair. There was general discussion of how best to engage absent members in the nomination and election process.

The group decided that the deadline for nominations of Chair/Co-Chair, Red List Coordinator and new members will be Thursday, June 9, at the end of the open session. Voting will be open. The two candidates with the most votes will be elected as co-chairs.

F. Ugarte nominated E. Regehr for the position of IUCN Red List Coordinator. E. Regehr accepted the nomination. J. Aars nominated K. Laidre for co-chair. K. Laidre considered the offer and respectfully declined because of workload in upcoming 4 years; however, she noted she was willing to consider the position in the future. A decision was made to defer taking further nominations for co-chair until Thursday (June 9) so that an email could be sent to absent members to seek additional nominations.

A number of potential new members were identified. The group discussed the possibility of expanding the size of the membership but decided, by majority vote, to maintain the current limit of 35. The chair suggested that the new co-chairs approach current members (especially those that are not active contributors) to affirm they want to continue their membership. G. York volunteered to contact absent members and invite them to vote on and add new suggestions for members.

Open sessions

Thursday, June 9

The session started with a welcome and introduction to invited experts and observers. The first session consisted of oral presentations, the contents of which are given in the National Progress Reports chapter. Here follows a brief summary of the discussion following the presentations.

12. National reports on research

Canada. A. Derocher presented summaries of research in Canada by various institutions in the period 2009-2016. The presentation consisted of brief summaries of published papers. After the presentation, S. Amstrup asked if there were observations from long term studies indicating that thinner ice is better polar bear habitat for hunting seals than multiyear ice. A. Derocher answered with an example from the Viscount Melville Sound area, where there were very few polar bears and seals over multiyear ice in 1991. The area today has less multiyear ice and more seasonal ice, but there are still very few seals and polar bears. I. Stirling added that the area's low density of seals and polar bears, despite having more seasonal ice and less multiyear ice could be due to the water being transported from the Polar Basin, where the productivity is low. E. Richardson commented that Viscount Melville Sound is still a desert compared with other areas in Arctic Canada. A. Derocher wrapped up the discussion about Viscount Melville Sound by mentioning that results from the Beaufort Sea show that old ringed seals are an important part of the polar bear diet. Therefore, if new habitat opens up, many years are probably needed to build up enough prey for polar bears.

K. Rode asked about the potential for bias in the diet study related to prey size and ability to detect kills. A. Derocher answered that there may be a bias, as a dead bearded seal with multiple bear tracks around it is easier to spot than a ringed seal pup.

Greenland. K. Laidre presented a summary of research in Greenland carried out by the Greenland Institute of Natural Resources, in collaboration with colleagues from Canada, USA, and Norway. Her presentation focused on the nearly finished assessments of Kane Basin and Baffin Bay, however results were not presented for these subpopulations because they had not been publicly released. She also detailed new studies initiated in southeast Greenland including two seasons of captures in 2015-16 and a local knowledge interview survey. Her presentation ended with summaries of pollution studies carried out by the University of Aarhus.

J. Wilder asked about the reason for lower densities of polar bears close to settlements in east Greenland. K. Laidre answered that this could be explained by bears trying to avoid areas where human activities like hunting are intensive. A. Derocher asked if the telemetry and genetic data were used to define the border between the subpopulations in Baffin Bay and Davis Strait. K. Laidre answered that the assessment is using the current boundary, which is

based on genetics and telemetry, and that there was no anticipation of changing the boundary. S. Amstrup referred to the various studies showing a high contaminant load for polar bears in east Greenland and asked if this is reflected in the condition of the bears handled in east Greenland in 2015 and 2016. K. Laidre answered that the bears she handled were generally in good condition and F. Ugarte added that the contaminant studies are from northeast Greenland, while the tagging effort the past two years was in southeast Greenland.

A question was posed as to whether the studies will provide information on the distribution of the East Greenland subpopulation. K. Laidre answered that work is ongoing, but there seems to be some segregation between polar bears offshore in the pack-ice in northeast Greenland and those in the fjords of southeast Greenland. A. Derocher asked if there were plans for genetic comparisons between polar bears in the northeast and southeast, and K. Laidre answered that the material for the analysis has been compiled and the analyses will be done soon.

A. Derocher wanted to know about prey items observed in southeast Greenland. K. Laidre explained that ringed seals, which were present at high densities in the fjords, were the most common prey. Prey items included also bearded seals. E. Regehr asked about sea ice models to look at living condition in the fjords. A. Derocher and J. Aars expressed that it is difficult to obtain sea ice data with good resolution from fjords.

Norway. J. Aars summarized the research carried out in the Svalbard region by the Norwegian Polar Institute and their collaborators, mainly from Canada.

A. Derocher wondered if killed prey were seen during the aerial survey over the sea ice north of the Barents Sea. J. Aars explained that kills of harp seals were common, as were sightings of harp seals basking on the sea ice, at times several meters away from the ice edge. E. Richardson was interested in geo-locator tags and asked whether these have given information about early emergence from maternal dens. J. Aars answered that the data showed bears leaving dens, but it was hard to know if those were maternity or temporary dens. The geo-locator tags should provide up to 4 years of data, which may help to determine the frequency of use of temporary dens.

S. Amstrup asked for clarification regarding presence of polar bears in Kalsøya during years with little sea ice. J. Aars explained that on the island of Hopen, there are polar bears only when there is sea ice, while in Karlsøya there are always polar bears. E. Regehr wanted to know the distance swam by a female polar bear with two cubs, which was a repeat of the same route used by the female in years with and without cubs. J. Aars clarified that the female and her cubs swam about 20 km, at a third of the speed used by the female when she was alone.

G. Durner wanted to know about the density of bears observed during the aerial survey over the continental shelf and beyond. J. Aars explained that, contrary to what is usually assumed, not all deep-sea areas are characterized by low productivity; he has observed productive areas with abundant marine mammals over deep water. S. Amstrup asked a final question regarding the visibility during the aerial survey, compared with the previous survey from 2004. J. Aars

answered that there were numerous days with fog and bad weather in both surveys, but he was not able to compare the two surveys yet.

Russia: S. Belikov explained that there are three different research groups in Russia. Unfortunately, the other Russian members were unable to attend, and the presentation only included the results of his research group. The others will hopefully be included later in the proceedings.

After the presentation, S. Amstrup mentioned that it was interesting to hear about observations of grey whale carcasses available for polar bears in Chukotka and asked if there has been an increase in whale strandings. S. Belikov did not have data on an increase of cetacean strandings, but local knowledge indicates that killer whale predation has increased and there are more stranded grey whales. A question was posed about the extent of interactions between brown bears and polar bears. S. Belikov answered that he has not personally observed interactions and believes that locals likely have more information. He has heard that when interactions occur, brown bears usually displace polar bears. He noted that there seems to be an increase of brown bears along the northern coast, and more interactions should be expected.

M. Ekker asked if there were Russian plans for aerial surveys in the Russian region of the Barents Sea, as Norway did not get permission to survey Russian waters in 2015. S. Belikov said that there is no opportunity to carry out projects with high financial costs. The Norwegian-Russian cooperative group will meet in the fall of 2016 and hopefully provide information about a future Russian survey in the Barents Sea.

United States. E. Regehr presented a summary of U.S. Fish and Wildlife Service studies. T. Atwood, G. Durner, and K. Rode presented summaries of U.S. Geological Survey research.

With reference to the demographic model presented by E. Regehr, L. Peacock asked what types of density-independent effects may affect populations. E. Regehr answered that a density-independent effect could be simply that there isn't enough time on the ice regardless of density. S. Amstrup mentioned that density-dependent and density-independent effects are not necessarily completely separate.

A. Derocher asked if the demographic model can be used in areas other than the Beaufort-specifically in areas where there is less data available. E. Regehr responded that one of the primary advantages of the model is that the assumptions are explicit. Including density dependence in the models provided an opportunity to better understand population dynamics. E. Regehr noted that there are sufficient data from some subpopulations to adapt this model for application. S. Amstrup stated that, for populations with sufficient data, the model can help determine key indices to measure in areas where polar bears are very difficult to study.

On the topic of denning behavior by Chukchi Sea bears on Wrangel Island, S. Belikov asked whether some denned on the Chukotkan and Alaskan coasts. K. Rode responded that 57-62% denned on Wrangel, 15% denned on the Chukotkan coast, 15% denned on the pack ice, and very few on the Alaska coast in recent years. K. Rode noted that the data presented were

collected from 1986-1995 and 2008-2015 and should account for some annual variation in denning locations.

13. Discussion of the boundary change in the Beaufort Sea

M. Branigan (invited specialist, Northwest Territories Department of Environment and Natural Resources) gave a presentation titled “Canadian Beaufort Sea Boundary Change Process” to explain the background and data used to support the change of the eastern boundary separating the Northern and Southern Beaufort Sea subpopulations. The process of considering a boundary shift included community meetings to discuss recommendations and a discussion at the Polar Bear Technical Committee (PBTC) meeting in 2008, where 3 boundary options were identified based on available science. The 3 options were presented to communities and they chose the option that was furthest to the west (133°W), which corresponds to the 50/50% probability contour identified in the Amstrup et al. (2004) publication.

In 2009, an analysis was initiated that resulted in the Griswold et al. (2010) report used to adjust the 2004-2006 abundance estimate of the Southern Beaufort Sea subpopulation from 1,526 to 1,215 individuals. In 2014, the PBTC accepted the adjusted subpopulation estimate by including it in the status table. M. Branigan stated that the next step is for the PBSG to reflect the boundary change in the map associated with the PBSG status table. If new analyses indicate the need for more discussion about the boundary, it can be brought forward.

A. Derocher stated that data suggested the boundary should be further east. There was an apparent demarcation of the population near a polynya. M. Branigan replied that they used the best science available at the time and it took some time to get to a decision from the communities. Now there appears to be some change in where it is thought the boundary should be, but a large amount of effort went into getting to this decision. There is a lot of ambiguity in the boundary between the Southern and Northern Beaufort Sea subpopulations. E. Richardson mentioned that some information on bear movements may not have been weighted heavy enough in the options that were presented to communities.

E. Regehr stated that we do not have a consistent method for dealing with issues like adjusting boundaries. For example, what information do we bring to bear on boundary decisions? How do we deal with seasonality of movements? And how do we deal with consideration of how these boundaries get used relative to manage versus science. These are important issues to consider. S. Amstrup noted that it may be the case that decisions about boundaries determined primarily from community involvement may not agree with boundaries that are based on other information. It’s likely that none of the subpopulations currently fit the IUCN definition, and our thinking has to evolve in a climate change world.

P. Molnár (invited specialist, University of Toronto) asked if a 50% probability contour should be the place to draw a boundary between subpopulations? Is it possible that there may not be any boundary when it comes to management? Rather than assigning subpopulations based on where they move, base them how much they contribute to the population dynamics of a given subpopulation. He also noted that which subpopulation is harvested from is

affected by seasonality. A. Derocher asked if, for consistency, the western boundary of the Southern Beaufort Sea subpopulation should be changed to the 50/50% probability contour – which is at Barrow? He noted that this is not where the PBSG boundary is, but it is the boundary used in the US-Russia treaty.

M. Branigan stated that if a new boundary is being considered on the western side, then a new analysis should be conducted. The eastern boundary change was based on the best available science at the time, but a new analysis should be conducted for any new boundary change being considered.

S. Amstrup noted that there was discussion previously about the western boundary. A. Derocher remarked that there was a situation in which a boundary shift was suggested in the absence of data to support it but that request was denied. M. Branigan showed a resolution by the PBSG in 2014 that stated Canadian officials had taken unilateral action to adjust the boundary. M. Branigan indicated that resolution failed to acknowledge that boundary adjustment was made using the best available science at the time and by working with affected communities.

K. Rode presented maps of bear locations in the Chukchi and Southern Beaufort Sea subpopulations relative to the northern PBSG boundaries of the populations. S. Amstrup noted that boundaries on maps are not relevant under all circumstances but in places where we have analyses that provide probabilities, it allows harvest to be allocated after the fact. A. Derocher mentioned that other forms of data can be used to inform the delineation of boundaries. For example, genetic and isotopic data that can help inform probabilities derived from spatial data. He noted that there are a lot of issues and we do not have a clear solution. In some instances, we do see geographic barriers that influence distribution. The boundary lines for subpopulations are not arbitrary, but rather are very much based on fidelity of bears to certain areas.

Co-Chair nominations

Per the decision made on Wednesday, June 8, a final call was made to members to nominate candidates for the co-chair positions. The nominees were N. Lunn, D. Vongraven, and G. York.

Friday, June 10

14. Sea ice session

Recent patterns of sea ice conditions

Harry Stern (invited specialist from the Polar Science Center, University of Washington) led off the session with a presentation on the history of sea ice observations and recent patterns of ice conditions. He noted that the historical record of ice observations dates back to the earliest explorers, with the modern record beginning with the advent of satellite-collected imagery in 1979. After 2001, ice began to change significantly in the Beaufort – Chukchi area in summer, which has led to an increase in ship transits. He also discussed a recent analysis of

ice dynamics for the 19 PBSG subpopulations, which used National Snow and Ice Data Center data, 1979-2014. The analysis largely focuses on changes in the dates of sea ice retreat and advance. He noted that the Barents Sea has experienced the largest change (earlier melt and later freeze-up).

K. Rode asked a question about ice distribution in winter in Barents Sea. J. Aars responded that warm currents routinely affect ice in the Barents Sea, which is now several degrees warmer, which in turn, explains why fjords in west Svalbard are now open even in winter. V. Sahanatien (invited specialist, Nunavut Department of Environment) asked if the analysis also examined potential effects on polar bear subpopulations. H. Stern and K. Laidre both replied no, the analysis examined ice trends. E. Richardson asked if a break-point analysis was conducted on the trend data and whether variance in the metrics was examined. H. Stern replied that they did not conduct a break-point analysis, although others have done so. In some areas, the trend is linear, while others show a pronounced shift.

E. Regehr mentioned the importance of developing biologically relevant standard metrics, specifically those that include linkages to life history. Population projections need to evaluate effects of management actions and can bring biologically relevant sea ice metrics into analyses to test hypotheses. S. Klenzendorf (invited specialist, World Wildlife Fund) asked if analyses were conducted from an ecoregion perspective. H. Stern replied no, all analyses were focused on the subpopulation units. A. Derocher asked about challenges resolving low concentration ice during the melt and freeze-up periods. H. Stern discussed some of the issues associated with discriminating water from ice using satellite imagery.

Assumptions and uncertainties associated with sea ice projections

Dave Douglas (invited specialist, U.S. Geological Survey) gave a presentation focused on projections of future ice extent and assumptions and uncertainties associated with those projections. He described work to model predictions to assess how polar bears will be distributed at the end of the 21st century, including which areas bears are likely to seek terrestrial refugia. Future distribution will be influenced by emissions of greenhouse gases (GHG), prey availability food web integrity, the ability of bears to migrate seasonally, and the distribution of terrestrial food. He presented projections based on the main Representative Concentration Pathway (RCP) scenarios, which reflect a wide degree of possible futures and many possible outcomes. He reviewed the use of ice projections to model future polar bear population status in Amstrup et al. (2008, 2010) and in Atwood et al. (2015, 2016). These modeling efforts highlight the importance of mitigating GHG emissions for conserving sea ice habitat. He noted that several issues with sea ice models, including sometimes extensive variation between individual models and poor spatial resolution of models for some areas of the Arctic.

K. Laidre suggested that an important extent of the approach would be to examine the responses of different “ecotypes” of bears (e.g., those living in fjords). D. Douglas agreed. N. Lunn asked if Hudson Bay retains habitat through the end of the century under the most optimistic emissions scenario. D. Douglas responded that ice is projected to be absent for at least 4 months. A. Derocher asked about whether the approach was able to capture sufficient

variation and, in particular, the potential for several sequential bad years. D. Douglas replied that variation is captured by using a suite of models, and back-to-back bad years were not explicitly modeled.

Climate change uncertainty and commitment

Kyle Armour (invited specialist, University of Washington) gave a presentation that highlighted uncertainties associated with future conditions. Specifically, he discussed the sources of uncertainty, when critical ice habitat thresholds may be crossed, and when we may be committed to crossing those thresholds. He presented projections for western Hudson Bay using different warming scenarios and the role of aerosols in influencing those projections. He also discussed when we are likely to be committed to crossing a threshold of >180 ice-free days.

Questions addressed various issues pertaining to the role of aerosol forcing and uncertainty in general for the future.

15. National reports on management

Canada

N. Lunn presented the Canadian Management Report. He noted that the PBSG is now considered a permanent member of the PBTC. S. Belikov asked if it was correct that the polar bear hunters in Baffin Bay are from both Greenland and Canada, but the export of the harvested bears does not take place because of voluntary restrictions. N. Lunn replied that yes, it was a voluntary non-detriment (NDF) finding by Canada out of concern for the sustainability of the harvest. E. Regehr asked for clarity on the distribution of harvest numbers for the Western Hudson Bay subpopulation. N. Lunn responded that 4 go to Manitoba and 24 go to Nunavut. The allotment of 4 bears to Manitoba is for defense only; there is no harvest in Manitoba. A. Derocher asked if there was a switch from the 2:1 male:female sex ratio of harvest in Nunavut. N. Lunn replied that Markus Dyck would be the best person to contact regarding that question. F. Ugarte asked if Canada allowed the export of bears from the Kane Basin subpopulation. N. Lunn replied that while Canada does allow the export of hides from Kane Basin, Inuit from Nunavut have not harvested any bears from this subpopulation in the last several years. S. Klenzendorf asked if there is any land use planning going on in areas of the high Arctic that are likely to function as long-term ice refugia. N. Lunn responded that there is some land use planning in Nunavut, a proposal in Lancaster Sound for a Marine Protected Area, and several other initiatives.

Greenland

A. Jessen presented the Greenland Management Report. Greenland has decided on a Country total allowable harvest (TAH) of 140 bears across the subpopulations. A key challenge is that Greenland is a vast area to manage and resources are limited. With regards to human-bear conflict, the Ittoqqortoormiit/Scoresby Sound area is the most problematic. S. Belikov asked if defense of life and property kills are included in the quota. A. Jessen responded that they are not included in the quotas. Conflict situations are relatively new and they appear to increase over time then they may be included in the quota. Currently, bears that are killed due to conflict are confiscated and the remains are burned or given to science. P. Molnár asked

how often compliance officers discover issues and how non-compliance issues are handled. A. Jessen responded that fortunately problems are rare. When they occur all materials are confiscated and meat is given to a different community. Furthermore, serious infractions are referred to law enforcement. J. Wilder thanked Greenland for the progress on conflict work, particularly the testing of rubber bullets and bear spray. Quantitative evidence on deterrents will be a significant conservation benefit range-wide and he hoped the results spur other countries to broaden their current regulation of potential deterrents. L. Peacock asked what happens to cubs when sows are illegally taken or taken in defense. A. Jessen stated that it is exceptionally rare. Cubs under 2 years old are killed by law enforcement and older cubs are released.

Norway

M. Ekker presented the Norwegian Management Report. A new white paper has been released on the development of Svalbard that maintains ambitious environmental goals for the region. Information was provided on resource extraction activities. Namely, that oil leases are offered every two years and Norway is in the process of updating sea ice maps and having discussions to restrict leases in areas of seasonal ice. Discussions are ongoing, but some leases have been offered in areas with historical winter ice. S. Amstrup mentioned that regarding resource extraction/exploration activity, there was quite a lot of talk in Moscow during the Range States of significant new studies funded by the oil and gas industry in Russia, and asked if there is a status update on those studies. M. Ekker responded that studies continue and Norway has a very strict protection and monitoring system. Currently, exploration activities have declined due to the low price of oil. Information on tourism activities were discussed, including the fact that the number of cruise passengers has doubled from approximately 15,000 passengers in 1997 to 30,000 in 2015. Additionally, winter tourism (including snowmobiling) has doubled over recent years. Human removal of polar bears from Svalbard has shifted dramatically from historic highs of 800-900 bears to few removals in recent years. When defense kills do occur, the skins are confiscated by the Governor for use by government agencies. A. Derocher asked if the strong increase in tourism traffic and landings has resulted in a trend towards increasing human-bear interactions. M. Ekker responded that was not his impression. He noted that in the white paper mentioned earlier, there is a discussion of the potential for human-bear conflict to increase as tourism increases. J. Aars mentioned that despite the increase in tourism, there has been a decrease in the number of conflict kills. This is for two reasons: people are behaving better and the Governor of Svalbard does not kill bears anymore. They put every effort into moving the bear, even if it breaks into cabins. This makes a big difference. Prior to 2000, they frequently killed bears involved in conflict with humans. J. Wilder noted that since 2008 there has been a marked increase in tourist landings and asked what is driving that increase. M. Ekker responded that it is clearly not price. J. Aars responded that it is probably due to more areas with no ice and increased landing opportunities for ships.

Russia

S. Belikov presented the Russian Management Report. Russia plans to split the Kara and Barents Sea subpopulations when the Russian Red Book is updated. The harvest moratorium

is still in effect for all of Russia, including Chukotka. There are two areas where liquefied natural gas (LNG) is being produced and shipped across the Northern Sea Route to the east and west (through the southeast Barents Sea and the southwest Kara Sea). S. Amstrup asked for clarification on whether it is LNG or natural gas concentrate that is being produced and shipped. S. Belikov replied that it is LNG.

United States

E. Regehr presented the U.S. Management Report. The next meeting in support of the U.S.-Russia Bilateral Agreement will be in Anchorage, Alaska, in 2016. The U.S. Fish and Wildlife Service recently published a polar bear deterrence manual. J. Wilder asked if the manual was in the public domain. E. Regehr responded that it is publicly available. The U.S. Fish and Wildlife Service and the North Slope Borough Department of Wildlife Management co-fund polar bear patrols in coastal communities. A. Jessen asked what happens to bears that are killed due to self-defense concerns. E. Regehr responded that the animal is recovered by the U.S. Fish and Wildlife Service and hides are typically used for education purposes. A. Jessen asked if there are no legal limits on polar bear take in the U.S. E. Regehr responded that there is no stated harvest limit as long as take is not wasteful. The Inuvialuit-Inupiat Joint Polar Bear Commission has a voluntary agreement on take but there is no legal mechanism to enforce that agreement. A quota for the Chukchi Sea is imminent. S. Klenzendorf asked if there will be a new aerial survey for the Southern Beaufort Sea subpopulation and whether there is a commitment by co-managers to abide by the new results of that effort. E. Regehr responded that a survey is being planned but he cannot speak to a commitment by the Inuvialuit-Inupiat Joint Polar Bear Commission. A. Derocher asked if there is a process to resolve which boundary to use under the U.S.-Russia agreement to delineate the Chukchi Sea and Southern Beaufort Sea subpopulations. E. Regehr responded that there are ongoing discussions regarding the boundary issue, and it may be possible to have a smaller management area under the agreement. S. Amstrup asked if the harvest limits in the Southern Beaufort Sea will remain voluntary and the quota in the Chukchi Sea will be legally binding. E. Regehr responded that yes, the Chukchi Sea quota will be legally binding and the Southern Beaufort Sea limit will not.

15. Putting the “eco” in eco-toxicology

Thea Bechshøft (invited specialist, University of Alberta) gave a presentation on the importance of emphasizing ecological processes and relationships when conducting ecotoxicology research. The presentation represents a summary of a paper that was submitted to a journal and should be out later this year. P. Molnár noted that per the presentation, 66% of studies published use samples from harvested bears and only 22% of studies use samples from bears caught for research. He asked if anyone has reported differences between those two groups. T. Bechshøft responded that is a topic of frequent discussion but, as yet, no one has assessed if differences exist. She noted that harvest has a male bias and dealing with potential differences between sexes and sample collection methods (i.e., harvest versus capture) remains a challenge.

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16. The Red List process

E. Regehr gave a presentation on the most recent IUCN Red list Assessment. The last IUCN Red List Assessment for polar bears was done in 2008, and there is a long history of polar bears being listed as “vulnerable” under the Red List. A main goal of the recent assessment was to perform a data-based sensitivity analysis evaluating the response of the global population to sea ice loss. The analysis had three parts: i) estimate generation length from field data, ii) derive a habitat metric by summarizing remotely sensed sea ice data, and iii) use models and simulations to project polar bear abundance by subpopulation over three generations. A standardized sea ice metric was developed for use across all subpopulations (Stern and Laidre, 2016).

The assessment projected polar bear response to sea ice changes starting in 2015 and extending out to three generation lengths. Three approaches were used to project outcomes, including one-to-one proportional relationship between ice and polar bear abundance for each subpopulation suggesting that declines in ice are linked to declines in carrying capacity. This approach has a basis in IUCN as it has been done for other species. The second approach was based on a global relationship between ice and population size using two estimates of abundance per subpopulation. The third approach was based on an ecoregion specific relationship between ice and population size estimated from linear models using longer time series for well-studied subpopulations. The output of all 3 models was percent change in mean global population size which is what is needed to inform the categorization in the Red List assessment. The assessment used more liberal estimates of subpopulation size than in the PBSG status table for the purpose of informing this analysis.

All subpopulations exhibited declines in sea ice metrics. The first approach resulted in 30% decline in mean global population size; the second approach resulted in a 4% decline and the third approach resulted in a 43% decline. In approach 3, it appears that the well-studied subpopulations are driving the results. Those well-studied subpopulations are in decline, so they have a significant impact on the results for their respective ecoregion. Across scenarios, median probability of a mean global population size greater than 30% was 0.71.

The assessment highlights variability in the current status of polar bear subpopulations. Over near and mid-term, there is likely to be variability in the impacts of sea ice loss on polar bears. Over long-term, bears will be negatively affected by sea ice loss. There was broad consistency in the outcome of these estimates and those of similar efforts (Amstrup et al. 2007, 2008, 2010; Atwood et al. 2015). As a result of this analysis, polar bears were listed as “vulnerable” under the IUCN Red List.

S. Amstrup stated that we owe E. Regehr a debt of gratitude for carrying the weight on this analysis, and noted that projections for sea ice loss and polar bear responses have higher variability in more recent time periods and greater certainty the further they are projected out. E. Richardson mentioned that for some populations like Western Hudson Bay, which is declining in relation to sea ice loss, really bad ice years seem to be the primary driver of decline. E. Regehr noted that the response of populations to variability is not balanced, and

bears may need several good years to recover from one bad year. That said, we tend to think of polar bears as a long-lived K-selected species that are slow to recover, but from demographic modeling there are some surprisingly high population growth rates. Brown bears and black bears can survive relatively high harvest rates. This relates back to the potential that we may be underestimating the resilience of polar bear subpopulations.

A. Derocher complimented the work and asked if there is not non-linearity incorporated in this analysis. E. Regehr responded that the analysis did incorporate the potential for non-linear responses. P. Molnár asked what kind of delay in population response there might in the approach used. E. Regehr stated that he felt any delay is unlikely to result in a meaningful difference in model outcomes. S. Amstrup noted that in the Bayesian models, he assumed that sea ice loss might be linear and that there would be thresholds for polar bear responses—this is a pattern seen across many species.

17. Human-polar bear conflict

Update from the Range States Conflict Working Group

G. York and V. Sahanatien gave a presentation on work conducted by the Range States Human Conflict Working Group. The Working Group was established in 2009 at Range States meeting in Tromsø, Norway. In 2015, a two-year implementation plan of the Conflict Working Group was endorsed. The group is currently working to finalize a data sharing agreement between countries, terms of reference for the functioning of the Working Group, and a requirements document describing the needs for the Polar Bear-Human Interaction Management System (PBHIMS) database. Challenges the Working Group face are a lack of data sharing agreement, unfilled vacancies of delegates appointed to the group, and lack of financial resources.

The PBHIMS database is being used to document conflict, unusual occurrences, and natural mortalities. The respective countries have been working to enter relevant data into the database, with the intention that the information be shared across jurisdictions to address questions of how, when, and where human-polar bear conflict is occurring so that actions can be taken to mitigate future conflict. For example, all the data from Nunavut should be entered into PBHIMS by September of 2016. There appears to be increasing incidents of human-polar bear conflict in several areas and there is a need to understand the drivers of increasing conflict.

Efficacy of bear deterrent spray on polar bears

J. Wilder gave a presentation on the efficacy of bear deterrent spray on polar bears. He related a story of two people using bear spray to deter an adult female polar bear and her yearling at Pond Inlet, Nunavut. Although the evidence is limited, it provides further evidence that bear spray does appear to be effective on polar bears—bears were deterred in 14 of the 15 cases where bear spray has been used. The one unsuccessful case appeared to be a result of the wind carrying the spray away from rather than towards the bear. There was a discussion about the importance of being mindful of the expiration date of bear spray. The expiration date is typically 3 years, because the propellant used to spray the deterrent loses its strength over time. S. Belikov commented that on Wrangel Island, females with cubs most commonly came close to their base camp, and they used a variety of deterrents on those bears

including turning on a motor from a four-wheeler. He recommended carrying multiple deterrents. There was discussion of the need for research to better understand the effectiveness of repeated use of deterrents on the same bear. For example, do they lose their effectiveness over time? This is a concern because in Churchill, Manitoba there are a number of bears that get captured every year for coming into conflict with people.

Bear attacks in North America

T. Smith (invited specialist, Brigham Young University) gave a presentation on the frequency of bear attacks in North America. There were 682 bear conflicts documented from 1880-2015 (4.8 attacks per year). These conflicts involved about 1500 people: 350 of the conflicts were non-contact incidents and 332 were attacks. Eighty-seven percent of attacks were by grizzly bears, 10.5% black bears, and 1.2% polar bears. Over time, there has been an increase in bear attacks that is correlated with human population growth. The majority of bear attacks on people involve injuries to the head and neck. Most incidents occur with groups of 2 or less individuals. There is a lot of conflicting information on how to respond to bear encounters and we need to develop a clear message based on what the data indicate. There was discussion as to whether the response to a bear should differ for children versus adults. T. Smith indicated that there have been no attacks on children by black, brown, or polar bears, but the potential for attacks on children should remain a concern.

Potential impacts of human recreation

J. Fortin (invited specialist, University of Montana) presented the details of a new research survey intended to examine the potential for conflict between human recreational activities and polar bears throughout their range. The PBSG members were invited to provide comments on the survey questions and to suggest potential survey participants.

18. Updates from zoos and other facilities

R. Meyerson (invited specialist, Toledo Zoo) spoke to the group about the Association of Zoos and Aquaria (AZA) and the Species Survival Program (SSP) for polar bears. She provided an overview of the number of polar bears on exhibit in the United States and the opportunity for zoos to contribute to polar bear conservation, education, and research. She discussed several recent research collaborations and the role of the SSP in facilitating ex-situ research and in-situ applications.

M. Owen (invited specialist, San Diego Zoo) described some recent captivity-based research in support of polar bear conservation and management. Research projects included the development of collar-based sensors to detect polar bear activities, seasonal dynamics of stress hormones, examination of sensory ability, metabolic studies, and estimation of isotopic discrimination factors.

N. Pilfold (invited specialist, San Diego Zoo) described a recent analysis of mass loss rates in polar bears held in a temporary holding facility near Churchill, Manitoba. The study used data from 142 management-related capture events carried out by Manitoba Conservation staff. Results showed that polar bears >2 years lose *ca.* 1 kg per day. Rates of mass loss for

adult males held in temporary captivity were identical to those for free-ranging bears. Data were used to make inferences about the ecological relevance of terrestrial feeding, estimate the metabolic rates for fasting bears, and model the potential ability of bears to survive prolonged fasting periods.

At 15:03, the Chair announced the conclusion of the open part of the meeting and thanked the Invited Specialists for their contributions.

Closed session

19. Revisiting ToR and resolutions

The closed session resumed at 15:22, with a discussion led by E. Regehr about the revised ToR and how best to integrate them with the version developed at the 2014 meeting. A group of volunteers agreed to lead the process.

N. Lunn pointed out that according to the current ToR media are not allowed to attend meetings of the PBSG. Given that a reporter was present for the open part of this working meeting, there was discussion as to whether this stipulation should be revised. The group agreed to revise the ToR to potentially allow media at the discretion of the (co-)chair(s) in consultation with the membership. The group also recognized that both (co-)chair(s) will have equal ability to represent the group in the media and elsewhere.

The following resolutions were discussed and adopted by consensus:

Resolution 1 – Convene a workshop to develop scientific criteria for the assessment and identification of subpopulation boundaries.

Resolution 2 – The PBSG will adopt interim use of the revised boundary for the purposes of the status table. The PBSG will also request the Government of the Northwest Territories make available the most recent telemetry data for use in developing a revised PBSG subpopulation boundary.

20. Elections

The group conducted a closed vote (paper ballot) to elect D. Vongraven and N. Lunn as co-chairs and E. Regehr as the Red List Coordinator.

21. Closing remarks and adjournment

The Chair suggested that the group aim to have products of the meeting available on the PBSG website by mid-October.

The Chair thanked all the participants for a thoughtful and productive meeting. Members thanked the National Park Service, Alaska Headquarters for hosting the meeting. The 18th Working Meeting of the IUCN/SSC Polar Bear Specialist Group, 7 -11 June 2016, was adjourned at 17:24.