Executive Summary

54th Meeting of the Federal-Provincial-Territorial Polar Bear Technical Committee

January 31-February 2, 2023

Host: Government of Québec

Location: Québec City, Québec

The 54th meeting of the Canadian Federal-Provincial-Territorial Polar Bear Technical Committee (PBTC) was held in Québec City, Québec between January 31 and February 2, 2023. This was the first in-person meeting since the beginning of the COVID-19 pandemic. The meeting was attended in-person by 16 Committee Members, with representatives from the Torngat Wildlife & Plants Co-Management Board, Government of Newfoundland and Labrador and the Wildlife Management Advisory Council (North Slope) attending virtually. In addition, the meeting was attended in person by 2 permanent participants and virtually by 2 additional permanent participants. There were 16 invited specialists in attendance (1 virtually) and 11 support staff (2 attending virtually).

The PBTC meeting consists of an open session where members, their support staff, permanent participants and invited specialists participate and exchange information. This year, the open session lasted 2 days. This is followed by a closed session, where only members, their support staff, and permanent participants are allowed to attend and PBTC specific business is discussed, and the status table is populated. The closed session lasted 1 day in 2023. No executive summary is provided for the closed session.

Day one

The meeting began with a welcome by the co-chairs and a round of introductions by those present. This was followed by a note from co-chair Mark Basterfield of the Nunavik Marine Region Wildlife Board (NMRWB) that he would not be accepting a nomination to continue as co-chair, thus indicating the need to elect a new co-chair. Following this, the agenda was approved with 3 changes, including the addition of an update from Caroline Ladanowski on the Polar Bear Range States meeting during the closed session, the removal of the Nunavut Davis Strait Inuit Qaujimajatuqangit (IQ) report presentation from the subpopulation reports portion as it would be presented earlier, and the removal of the Viscount Melville population assessment report from the open and closed sessions.

Next was an update and discussion of matters arising from the Polar Bear Administrative Committee (PBAC) meeting. Specifically, the PBAC shared a guidance document with the PBTC describing a framework for the development of management objectives for each subpopulation to be included in PBTC's status table. There was substantial discussion about the history of the management objectives, their appropriateness, and the inclusion of co-management partners in their development.

There was further discussion of the specifics of the guidance document. It was agreed that many of these questions were best directed to PBAC, as the objectives are a PBAC item, though will be provided within the PBTC status table to provide context. A later action item was developed to seek input from PBAC on whether they wanted feedback on the draft guidance document.

The PBTC then approved the meeting minutes from the January 2022 virtual PBTC meeting and the November 2022 teleconference. This was followed by a review of completed and outstanding action items arising from each meeting. These items were all to be addressed during specific points in the meeting and discussion was thus deferred.

There was a discussion about the Executive Summary and a general desire to make this a revolving responsibility so that it did not rest on one member. It was agreed upon that the Executive Summary for a given year would automatically become the responsibility of the previous host member.

The next topic on the agenda was updates on ongoing or completed research and management activities in Canada. Nick Lunn provided the first presentation outlining activities undertaken by Environment and Climate Change Canada (ECCC). This presentation included a wide variety of activities undertaken by ECCC. Although their primary focus has been Western Hudson Bay, they have also been engaged in research activities throughout many of the Canadian subpopulations.

Next, Steve Baryluk and Faye d'Eon-Eggerston (Government of Northwest Territories) provided research and management updates for the Inuvialuit Settlement Region (ISR). Steve presented on progress towards developing a biopsy-darting based population estimate for the Northern and Southern Beaufort Sea (NB and SB, respectively) subpopulations. He reported that this past year they had seen a high proportion of adult bears and low numbers of dependent young. There was a question raised about why this might be and it was unclear. Steve indicated that they would be doing an additional year of study, which would help assess if this was a one-year event or something more consistent. It was noted that it was quite cold last year, and ice patterns seemed different than usual. Steve then discussed progress on sending non-invasive samples to the BearWatch program for genetic analysis using single nucleotide polymorphisms (SNPs). He reported good success with fecal DNA, but uncertain success from tracks, though this still provides a potentially transformative approach if success can be increased.

Kaitlin Wilson (WMAC North Slope) next provided a brief update on work from contractor Stephen Braund to develop workshops to work with communities to combine Indigenous Knowledge (IK) in integrated population models. They have planned 3-4 workshops with ISR communities for this work.

Next, were updates from co-management partners and invited specialists from Nunavut. Ezra Greene (Nunavut Tunngavik Incorporated; NTI) provided a verbal update indicating they had been working with ECCC in preparation for the Range States meeting in Iqaluit. They also have active work with the Whale Cove HTO and World Wildlife Fund to help mitigate human-bear conflicts. This was followed by updates from the Regional Wildlife Organizations (RWOs). Ezra stated that the Qikiqtaaluk Wildlife

Board would not provide a formal update due to their displeasure with the denial of their membership application to the PBTC. The Kivalliq Wildlife Board did not provide an update. Paul Ikuallaq provided a verbal update from the Kitikmeot Regional Wildlife Board. He shared concerns about the way Western scientific researchers engage with Inuit communities and how they use Inuit knowledge only when it suits them. He indicated that they will be developing a management framework based on Inuit priorities and knowledge and Inuit Qaujimajatuqangit and will seek out the scientific information that they need to meet these priorities. This was followed by Pamela Wong, also from the Kitikmeot Regional Wildlife Board. She highlighted that there needs to be consideration paid to ethics when working with and about topics that impact communities.

These were followed by updates from the Government of Nunavut, provided by Alyssa Bohart and Amélie Roberto-Charron. Amélie provided the research update, highlighting that they had supported and/or conducted recent subpopulation assessments in the Davis Strait (DS), Southern Hudson Bay (SH) and Western Hudson Bay (WH) subpopulations, with the DS report finalized and the SH and WH reports to be finalized following community consultations which were yet to be scheduled. She indicated that planning was underway for a winter/spring 2023 Lancaster Sound (LS) subpopulation survey. The survey was being planned as a combined aerial survey and biopsy darting survey. Nunavut will also be conducting an IQ study as part of this work. Amélie also discussed plans for an August 2024 Foxe Basin (FB) subpopulation survey. She concluded by overviewing collaborations with universities and other jurisdictions. Alyssa then provided the management update for the Government of Nunavut. She reported that progress was underway on a WH harvest risk assessment but that there were challenges due to contrasting views of IK and science. She also provided an update on Nunavut's harvest management system, with the name changing to the Harvest Administration and Credit Calculation System (HACCS). There were several changes to the system, with the primary ones being the removal of some mathematical calculations of credits and that there would no longer be partial credits for bears, only whole credits. This was followed by some questions and clarification of the credit system and how many credits a community can request at once, along with details on how credits are zeroed (after a new TAH decision, even if the TAH stays the same).

Joe Northrup from the Ontario Ministry of Natural Resources and Forestry provided the Ontario research update. This update consisted of various projects in collaboration with other jurisdictions involved in SH. He highlighted biopsy darting work to assess movements and survival, conflict mitigation work with Cree communities in Ontario and deployment of tracking devices. He discussed the collaborative development and deployment of "burr-on-fur" tags that were created by Polar Bears International and 3M. These tags can attach to the fur, thus removing issues around collaring and allowing the tracking of non-female bears. He indicated that these have shown variable success and more refinement is needed.

Vicki Trim next provided a verbal update from Manitoba. Manitoba largely supports other research and monitoring programs taking place in WH. She reported on activities from the Polar Bear Alert Program which handled 8 bears in the last year, fielded 114 occurrence reports, and kept 5 bears in their holding facility. She indicated that there

have been less bears handled in the last couple of years. She also reported on two bears being found > 100km inland from the coast in communities.

Next were reports from co-management partners in Québec. Guillaume Szor provided the update for the Government of Québec. Québec has had no formal research projects during the last year. He indicated that harvest reporting has been steadily declining since the time between 2010-2013 and near half of the reporting has been of defense of life and property kills (DLPK). They estimated only 5% reporting rate in 2022, but he also indicated that once the harvest management plan is accepted this will require 100% reporting. The presentation was followed by questions and discussion about various topics related to harvest.

Mark Basterfield from the NMRWB provided the next update for the Nunavik Marine Region (NMR), which focused on a discussion of the decision-making process on the total allowable take (TAT) in SH. This is a complicated process because of the numerous jurisdictions involved in SH.

Felix Boulanger from the Eeyou Marine Region Wildlife Board (EMRWB) provided the next update for the Eeyou Marine Region (EMR). He described the evolution of the management plan in Québec and how their concerns had been addressed.

Bob Rogers from the Government of Newfoundland and Labrador provided the next update. There was no ongoing research being conducted, but 12 bears were harvested in the last year with 1 DLPK. They are currently undergoing consultation on their management plan. This was followed by an update from the Nunatsiavut Government provided by Jason Dicker, who discussed the filling of their quota of 12 bears and describing some of the samples collected from harvested bears.

Next, Dominique Henri from ECCC presented on a recently completed IQ study on the Davis Strait subpopulation. Dominique was an invited specialist and presented out of order in the agenda due to a scheduling conflict. The study was motivated by the need to gather information on polar bears form Inuit, who have lived with the species for millennia. Their goal was to gather and document IQ on polar bear health around the communities of Kimmirut, Pangnirtung and Iqaluit to help support Davis Strait harvest management. The study was hampered significantly by covid, but they were able to conduct many interviews and some validation sessions. She described the methods, including a method called ‘proportional piling’ that has not been applied to polar bears previously and seeks to have participants quantify specific metrics, in this case about polar bear condition and distribution. The study revealed that Inuit have seen overall healthy polar bears with perhaps slight declines in condition over time. They indicated habitat changes and shifts in the composition of the seal populations. Across participants, there was noted concerns about public safety related to polar bears and that there was a need to balance public safety with the desire for bears to be around for future generations.

The next section of the meeting focused on updates from the United States and Greenland, which have jurisdictional management authority over certain subpopulations shared with Canada. First up, Erik Anderson from the United Stated Fish and Wildlife Service provided an update on their work in the SB and Chukchi Sea (CS) subpopulations. Harvest in SB has been stable and below the quota since 2013-14.

They have been assessing denning phenology of bears, and he reported on work examining timing between den emergence and departure from the den. This showed an average of around 9 days between den emergence and departure and found that cubs had higher survival when they spent more time at the den prior to departure. He also reported on conflict between people and bears. In this area they have conflict in communities but also with industry. He reported on a specific area of industrial development where there are manmade islands used by the bears. This requires extensive monitoring.

Next, Todd Atwood from the United States Geological Survey provided an update. Most of their work had been focused on the SB subpopulation estimation work. He explained significant logistical challenges with field work over the last few years. They encountered over 90 bears this year in the US portion of the study area. He also discussed work looking at denning distribution with a potential shift of more dens into areas with more industrial development. However, this work was ongoing and nothing is definitive yet.

Andrew Von Duyke from the North Slope Borough provided the next update. He reported on their work trying to obtain DNA from tracks of bears. He indicated around 50% success at identifying individual and sex from DNA collected from tracks. He also reported on some research examining waste ingestion by bears, which is primarily plastics. He reported on an aggressive bear that was euthanized in recent years whose gastrointestinal tract was full of plastic bags.

The first day completed with a brief update from Fernando Ugarte from the Greenland Institute of Natural Resources. He reported that for all the subpopulations shared with Canada, removals are below the quota.

Day two

The second day began with presentations from invited specialists. First up, Robert Letcher (ECCC) focused on using harvest-based samples to monitor contaminant levels across the Arctic. He described the Arctic contaminants monitoring program and the background on this program. He reported on results form polar bear samples, where they identified 210 persistent organic pollutants. He discussed some findings on the detection of flame retardant chemicals whereby there seemed to be patterns of chemicals declining in polar bears after policy interventions to limit their use. He provided further results showing high but variable levels of contaminants in polar bears across the arctic.

Nick Lunn (ECCC) provided a presentation on behalf of Evan Richardson (ECCC) who was unable to attend. The presentation focused on polar bear genomics and foraging ecology. He discussed various genomics work currently underway with polar bears. This included work to examine heritability of home range size and conflict behavior, finding moderate heritability of conflict behavior. He next discussed work to use epigenetic clocks to estimate polar bear age from DNA methylation patterns. Preliminary results indicated good concordance between bear age and estimates from methylation

patterns. He then discussed research on foraging ecology of bears. The goal of this research, which takes place near Pond Inlet, is to document inter and intraspecific species interactions at kill sites and to look at preferential tissue consumption by bears. They used harvested seals with a camera arrays around them to document these processes. Preliminary results indicate that polar bears preferentially consumed blubber prior to feeding on muscle. There is another field season planned for 2023.

Alex Langweider, a PhD student at McGill University next spoke about her research project on polar bear in James Bay (part of SH) in collaboration with communities in the Eeyou Marine Region. The work was in direct collaboration with the communities and aimed to develop a monitoring program for polar bears that was noninvasive. They used barbed-wire and scents to attract bears, which would rub against the barbed-wire, leaving a hair sample that could be used to extract DNA and obtain a genotype. She discussed lessons learned in the first year and the modifications to their barbed-wire corrals for the second year of sampling. They deployed 37 stations in the EMR in 2021 and 40 stations in 2022. They collected 118 hair samples in the first year and identified 35 unique individuals. Bears tended to be on islands, with no bears found on the mainland. There was 1 bear captured at 2 sites in 2021. Still awaiting results for 2022. Alex discussed the costs and provided a road map for others that might want to use this approach. She then discussed future work, which would focus on Cree knowledge interviews, diet analysis through stable isotope analysis from the hair and a 3rd field season.

Eric Regehr from the University of Washington gave the final presentation from invited specialists. His presentation was a summary of a paper entitled *Polar bear harvest management: defining biological sustainability, the components of a quantitative subpopulation assessment, and the components of a sustainable harvest management regime*. This was a paper that was developed at the request of the Polar Bear Range States. The objectives of the paper were to 1) define biologically sustainable harvest, 2) define the components needed for a quantitative subpopulation assessment and 3) define the components needed for a sustainable harvest management regime. He walked through the specifics of each objective, highlighting uncertainties and considerations. He defined a biologically sustainable harvest as one that keeps the population above what he referred to as the maximum net productivity level, or the maximum number of bears that can be harvested on an annual basis without causing population decline. Above this number, the risk of adverse demographic effects is low. He described the components of a quantitative subpopulation assessment as 1) an evaluation of habitat and whether it is changing and 2) field study to estimate demographic parameters. Lastly, he outlined the components of a sustainable harvest regime as 1) implementing a harvest that will meet whatever the management objective is, 2) including a system for monitoring and adjusting harvest levels, and 3) using adaptive management.

Next, the meeting moved to the discussion of technical issues. Nick Lunn presented on the functioning of the new CR5A collar release mechanisms. A consistent concern that has been raised by communities and research is that collar release mechanisms often failed, leaving collars on long term. A new mechanism (the CR5A) has recently been developed to attempt to address this issue. These new mechanisms have been

performing much better, with no confirmed instances of a collar failing to release as of the PBTC meeting. There are some uncertainties, however, because collars will often stop transmitting on the sea ice, so it is unknown if the collar failed or was pulled off by the bear. This was followed by significant discussion of the concerns communities have around collaring.

Next, were reports on completed aerial surveys for WH and SH. Joe Northrup first provided the overview and results of the SH survey. The survey took place in 2021 at the same time as the WH survey. The survey followed the same design as the previous two aerial surveys in 2011 and 2016. In 2021, there were more bears estimated to be in SH than in either previous survey. Some new estimation methods were used and so two estimates were produced: one that is most comparable to the 2016 survey, and one that produces a more robust estimate. The first method showed a 29% increase from 2016 and the second method produced an estimate of 1119 bears with 95% confidence intervals of 860-1454. Joe indicated that this increase had two likely sources. First, there was some concurrent biopsy darting work taking place in both WH and SH and this is suggestive of some potential minor distribution shifts of bears at the border between WH and SH, leading to more bears in SH in 2021. Second, harvest between 2016-2021 was much lower than between 2011-2016, and ice conditions were much better, with 3 consecutive years of relatively short ice-free seasons. These conditions likely resulted in higher reproduction, recruitment or survival. The relative contribution of each is uncertain though, and 1/3rd of the population was dependent young, so care needs to be taken when interpreting the survey results for harvest management purposes.

Alyssa Bohart then provided the report for the WH survey. She overviewed the survey design, which occurred at the same time as the SH survey and mirrored the two previous surveys (2011 and 2016). This survey found a decline in bear numbers to 618 bears, with 95% confidence intervals of 425-899. As with SH, there was contrasting evidence regarding whether this decline was due to movement or demography. There is evidence that the number of cubs, yearlings and subadults is low in WH and this is supported by physical capture data from ECCC. However, there also was the evidence from biopsy darting data that bears shifted some to SH in 2021. Ultimately, it is likely a mix of the two, with reduced vital rates along with some movement. However, more study is needed, as in SH to resolve this. The presentation was followed by various questions and discussion about both SH and WH surveys. There was substantial displeasure voiced about the perceived premature release of the WH report.

The PBTC then discussed the various datasets that they maintain annually. This included the human removals by jurisdiction and a research table. Data has been shared and entered into these tables. In addition, the secretariat discussed a new table that would be used to record human-polar bear conflict by jurisdiction.

Felix Boulanger provided an updated from the human-polar bear coexistence working group. This was initiated because several jurisdictions had been seeing increased conflict in recent years and there was the recognition that PBTC would be a good forum for sharing ideas on causes and solutions. There was discussion to collect standardized data, coordinate with the Range States conflict working group and to make conflict a

standing agenda item at PBTC. Further, the working group has been envisioned as a group that will continue to meet annually.

Frankie Jean-Gagnon from the NMRWB provided an update on the Indigenous Knowledge working group activities. The working group has recently finalized their background paper that provides a review and background on the use of Indigenous Knowledge in general and in polar bear management specifically. They have decided to have a general public version posted on the PBAC website and a more comprehensive version with recommendations to the PBTC that will be for PBTC only. She also discussed work on revising the status table sections relating to Indigenous Knowledge.

This completed the open session of the PBTC meeting.