

Progress Report, Action #7
2018-2020 Bilateral and Multilateral Actions,
Circumpolar Action Plan:
Conservation Strategy for the Polar Bear



Action	Develop strategies for responding to the potential for large numbers of bears stranded on shore near communities and human developments and consider the consequences including those for human safety and transmission of disease between bears
Point(s) of contact or Lead Country	Conflict Working Group Martyn Obbard & Sybille Klenzendorf martynobbard@gmail.com ; Sybille.Klenzendorf@wwf.de ;
Partner Countries	
Timeline Description as per 2018-2020 implementation table	Carried over from 2015-2017; initial task expected to be completed in 2018-2020 2-yr cycle, yet should be maintained since new information becomes available on a regular basis
Baseline status	Information exists but has not been analyzed as part of international report
Planned Outputs	Each Range State will share documents they have developed (Best Management Practices [BMPs] and sponsored research) that directly pertain to action #7, including how to handle orphaned cubs. These will be posted on the Range States website.
Modifications made to date	<p>The title and description of this action were modified to better match the exact language from the Circumpolar Action Plan (CAP) document “2 YearImplementationTable_FINAL.pdf”. Further, based on discussions within the Conflict Working Group (CWG), the phrase “nutritionally-stressed” was dropped from the title and description to better reflect the need to manage large concentrations of bears on shore, regardless of their nutritional status.</p> <p>The original timeline for this action was 2015-2017; however, the CWG was not able to fully complete the task in that timeframe. Therefore, this action will be completed during the 2017-2019 timeframe. The CWG and the CAP Implementation Team (CAP IT) both agreed that this action is best handled at the individual Range State level, with BMPs being shared on what each Range State has found works best for them. As a result, the CWG will not write a strategy that would apply to all the Range States as this action is not really a collective Range States action, but rather is better</p>

	handled at the individual Range State level, though individual Range States will benefit by sharing BMPs amongst jurisdictions.
Progress Report Date	September 30, 2019

Progress Report on Activity

In 2017, the CWG and CAP IT agreed that this action is best addressed at the individual RS level and that progress should be reported by country. Each Range State should share documents they have developed (Best Management Practices [BMPs] and sponsored research) that directly pertain to action #7: Develop strategies for responding to the potential for large numbers of bears stranded on shore near communities and human developments and consider the consequences including those for human safety and transmission of disease between bears, including how to handle orphaned cubs. Links to these documents will be posted on the Range States website.

To date, several range states have posted documentation to an internal Google Docs drive. The CWG chose to create an internal Google drive because many publications are not cleared for publication as PDFs and are only available as abstracts (peer – reviewed journals). CWG is currently assembling information to be posted to the range states website. The goal is to publish them on the website in the next 6 months and add new publications as they become available.

An overview of the google drive is below:

The screenshot shows the Google Drive interface. At the top left is the Drive logo. A search bar at the top right contains the text 'Search Drive'. Below the logo is a 'New' button with a plus icon. A sidebar on the left lists navigation options: Priority, My Drive (selected), Shared with me, Recent, Starred, and Trash. Below the sidebar, a 'Storage' section shows a progress bar for '8.6 GB of 30 GB used' and a link to 'UPGRADE STORAGE'. The main content area shows the breadcrumb 'My Drive > CWG Files' with a share icon. Below this is a list of folders under the heading 'Name ↑':

- Action 7: BMPs Stranded Bears on Land
- Action 19,20: Tourism
- Action 22: PBHIMS
- Action 58: Bear Safety Messages
- Admin
- CAP documents
- Community Conflict Management Plans
- Emergency Response
- Meeting Notes and Action Items
- Presentations
- Reference Papers
- Reports
- Tools to reduce HBC
- Training Materials
- Viewing/Photo/Filming Guidelines

A sample of resources obtained by jurisdiction include:

Canada:

Research publications:

1. 2016. N. W. Pilfold, D. Hedman, I. Stirling, A. E. Derocher, N. J. Lunn, and E. Richardson. Mass loss rates of fasting polar bears. *Physiol Biochem Zool.* 2016 Sep-Oct;89(5):377-88.
2. 2013. Derocher, A. E., J. Aars, S. C. Amstrup, A. Cutting, N. J. Lunn, P. K. Molnár, M. E. Obbard, I. Stirling, G. W. Thiemann, and D. Vongraven. Rapid ecosystem change and polar bear conservation. *Conservation Letters* 6:368-375.
3. 2010. Towns, L., A. E. Derocher, I. Stirling, N. J. Lunn, and D. Hedman. Spatial and temporal patterns of problem bears in Churchill, Manitoba. *Polar Biology* 32:1529-1537.

Non-peer-reviewed documentation:

1. *Nunavut Polar Bear Guard Training*
2. *Manitoba Alert Program*
3. *Churchill Safety Brochure*
4. *Parks Canada Polar Bear Safety Brochure*
5. *Parks Canada Bear Safety Plan Template*
6. *Ontario Orphan Cub Protocol*
7. *NWT safety brochure*
8. *Nunavut Polar Bear Safety Brochure*

Greenland:

Non-peer Reviewed Literature

1. *Greenland Guidelines for Polar Bear Encounter*

Norway:

Peer-reviewed papers:

1. Lone, K., B. Merkel, C. Lydersen, K. M. Kovacs, and J. Aars. 2018. Sea ice resource selection models for polar bears in the Barents Sea subpopulation. *Ecography* 41:567-578.

2. Lone, K., K. M. Kovacs, C. Lydersen, M. Fedak, M. Andersen, P. Lovell, and J. Aars. 2018. Aquatic behaviour of polar bears (*Ursus maritimus*) in an increasingly ice-free Arctic. *Scientific Reports* 8:9677.
3. Tartu, S., S. Bourgeon, J. Aars, M. Andersen, A. Polder, G. W. Thiemann, J. M. Welker, and H. Routti. 2017. Sea Ice-Associated Decline in Body Condition Leads to Increased Concentrations of Lipophilic Pollutants in Polar Bears (*Ursus maritimus*) from Svalbard, Norway. *Science of the Total Environment* 576:409-419.
4. Stempniewicz, L. 2017. Polar Bears Observed Climbing Steep Slopes to Graze on Scurvy Grass in Svalbard. *Polar Research* 36:1326453.
5. Hamilton, C. D., K. M. Kovacs, R. A. Ims, J. Aars, and C. Lydersen. 2017. An Arctic Predator–Prey System in Flux: Climate Change Impacts on Coastal Space Use by Polar Bears and Ringed Seals. *Journal of Animal Ecology* 86:1054-1064.
6. Aars, J., T. Marques, K. Lone, M. Andersen, Ø. Wiig, I. M. B. Fløystad, S. B. Hagen, and S. T. Buckland. 2017. The Number and Distribution of Polar Bears in the Western Barents Sea Area. *Polar Research* 36:1374125.
7. van Beest, F. M., J. Aars, H. Routti, E. Lie, M. Andersen, V. Pavlova, C. Sonne, J. Nabe-Nielsen, and R. Dietz. 2016. Spatiotemporal Variation in Home Range Size of Female Polar Bears and Correlations with Individual Contaminant Load. *Polar Biology* 39:1479-1489.
8. Lone, K., J. Aars, and R. A. Ims. 2013. Site Fidelity of Svalbard Polar Bears Revealed by Mark-Recapture Positions. *Polar Biology* 36:27-39.
9. Vongraven, D., J. Aars, S. C. Amstrup, S. N. Atkinson, S. E. Belikov, E. W. Born, T. D. Debruyn, A. E. Derocher, G. M. Durner, M. Gill, N. Lunn, M. E. Obbard, J. Omelak, N. Ovsyanikov, E. Peacock, E. Richardson, V. Sahanatien, I. Stirling, and Ø. Wiig. 2012. A Circumpolar Monitoring Framework for Polar Bears. *Ursus Monographs* 5:1-66.

Non – peer reviewed papers:

1. Norwegian Polar Institute – Guidelines for travel and wildlife in Svalbard. 2011. PDF/pamphlet. (Only Norwegian). <https://www.sysselmannen.no/globalassets/ferdsel-pa-svalbard/ferdsel-og-dyreliv-pa-svalbard.pdf>
2. Norwegian Polar Institute – Polar Bears in Svalbard. 2005. PDF/pamphlet. http://kho.unis.no/doc/Polar_bears_Svalbard.pdf
3. Sysselmannen – Safety in Svalbard. 2019. PDF/pamphlet (Norwegian/English/Russian): https://www.sysselmannen.no/contentassets/5f359e34e35d43a7a29f36064eaebc1c/foleder_sysselmannen_svalbard_a5_engelsk.pdf
4. Visit Svalbard – Polar Bears – "how to avoid confrontations with polar bears" <https://en.visitsvalbard.com/visitor-information/polar-bears>

5. Visit Svalbard – Svalbard guidelines <https://en.visitsvalbard.com/visitor-information/rules-of-svalbard-and-safety>
6. Hamilton, C. D. 2016. *Challenges for Ice-Associated Top Trophic Arctic Animals in a Changing Climate*. Ph.D.-thesis, University of Tromsø, Tromsø.
7. Andersen, M. 2013. *Polar Bears (Ursus maritimus) in the Barents Sea Area: Population Biology and Linkages to Sea Ice Change, Human Disturbance and Pollution*. Ph.D.-thesis, University of Tromsø.

Russia: no report.

United States:

Peer-reviewed papers:

1. 2018. Wilson, R. R., C. Perham, D. P. French-McCay, and R. Balouskus. Potential impacts of offshore oil spills on polar bears in the Chukchi Sea. *Environmental Pollution* 235: 652-659.
2. 2017. Wilson, R., E. Regehr, M. St. Martin, T. Atwood, E. Peacock, S. Miller, and G. Divoky. Relative Influences of Climate Change and Human Activity on the Onshore Distribution of Polar Bears. *Biological Conservation* 214: 288-294.
3. 2016. Atwood, T. C., E. Peacock, M. A. McKinney, K. Lillie, R. Wilson, D. C. Douglas, S. Miller, and P. Terletzky. Rapid environmental change drives increased land use by an Arctic marine predator. *PLoS ONE* 11:e0155932
4. 2015. Miller, S., J. Wilder, and R. R. Wilson. Polar bear–grizzly bear interactions during the autumn open-water period in Alaska. *Journal of Mammalogy* 96:1317-1325.
5. 2015. Rode, K. D., R. R. Wilson, E. V. Regehr, M. St. Martin, D. C. Douglas, and J. Olson. Increased Land Use by Chukchi Sea Polar Bears in Relation to Changing Sea Ice Conditions. *Plos One* 10:e0142213.
6. 2017. Atwood, T.C., C. Duncan, K. Patyk, P. Nol, J. Rhyan, M. McCollum, M. McKinney, A. Ramey, O.H. Kwok, S. Hennager, and J.P. Dubey. Environmental and behavioral changes influence exposure of an Arctic apex predator to pathogens and contaminants. *Scientific Reports* 7, doi:10.1038/s41598-017-13496-9.
7. 2017. Neuman-Lee, L., P.A. Terletzky, T.C. Atwood, E.M. Gese, G.D. Smith, S. Greenfield, J. Pettit, and S.S. French. Demographic and temporal variations in immunity and

- condition of polar bears (*Ursus maritimus*) from the southern Beaufort Sea. *Journal of Experimental Zoology Part A: Ecological Genetics and Physiology* 327:333-346.
8. 2019. Watson, S.E., H.C. Hauffe, M.J. Bull, T.C. Atwood, M.A. McKinney, M. Pindo, and S.E. Perkins. Global change-mediated behavioural shift in polar bears alters faecal microbiota. *ISME*, doi:10.1038/s41396-019-0480-2.
 9. 2019. Fry, T.L., K.R. Friedrichs, T.C. Atwood, C. Duncan, K. Simac, and T. Goldberg. Reference intervals for blood-based biochemical analytes of southern Beaufort Sea polar bears. *Conservation Physiology*, 7:10.1093/conphys/coz040.
 10. 2018. Lillie, K., E. Gese, T.C. Atwood, and S.A. Sonsthagen. Development of on-shore behavior among polar bears in the southern Beaufort Sea: inherited or learned? *Ecology and Evolution*, doi:0.1002/ece3.4233.
 11. 2017. McKinney, M.A., T.C. Atwood, S. Pedro, and E. Peacock. Ecological factors drive declines in hair mercury concentrations of southern Beaufort Sea polar bears, 2004-2011. *Environmental Science and Technology*, doi:10.1021/acs.est.7b00812.
 12. 2017. McKinney, M., T.C. Atwood, S.J. Iverson, and L. Peacock. Onshore food subsidies add complexity to the response of Alaska polar bears to climate change. *Ecosphere* 8(1):e0.633.10.1002/ecs2.1633.
 13. Van Hemert, C., T.J. Spivey, B.D. Uher-Koch, T.C. Atwood, D.R. B.W. Meixell, J.W. Hupp, K. Jiang, L.G. Adams, D.G. Gustine, A.M. Ramey, X-F. Wan. 2018. Serosurvey of influenza A antibodies in wildlife from Arctic Alaska: limited evidence for exposure among mammals. *Journal of Wildlife Diseases*, doi: 10.7589/2018-05-128.
 14. The following are in press or in prep:
 - a. Lillie, K., E.M. Gese, T.C. Atwood, and M.M. Conner. Use of subsistence-harvested whale carcasses by polar bears (*Ursus maritimus*) in the southern Beaufort Sea. *Arctic*, in press.
 - b. Bourque, J., T.C. Atwood, G.J. Divoky, C. Stewart, and M.A. McKinney. Individual and combined fatty acid and stable isotope-based diet estimates suggest onshore foraging on seabirds and whale carcasses by southern Beaufort Sea polar bears. *Ecology and Evolution*, in revision.
 - c. Pagano, A.M., T.C. Atwood, G.M. Durner, and T.M. Williams. The seasonal energetic landscape of an apex marine carnivore exhibiting distinct land-sea movement strategies. *Ecology*, in revision.
 - d. Van der Walt, M., L. Nueman-Lee, P.A. Terletzky, T.C. Atwood, E.M. Gese, and S.S. French. Measuring stress and reproduction in polar bears (*Ursus maritimus*) using hair hormone concentrations.
 - e. Rode, K.D., R.R. Wilson, M. St. Martin, and E.V. Regehr. Cumulative effects of disease, contaminants and diet on polar bear body condition in the Chukchi Sea.
 - f. Wilder et al. Efficacy of Bear Spray Versus Polar Bears

Non – peer reviewed papers:

1. 2018. Miller, S. *Detection, deterrence, and attractant management: a list of tools for reducing human-bear conflicts. Unpublished literature, prepared for Range States Human-Polar Bear Conflict Working Group, U.S. Fish and Wildlife Service, Anchorage, Alaska. 8pp.*
2. 2017. USFWS. *Coping with Increasing Numbers of Polar Bears along the Coast of Alaska: Some Examples of Planning, Actions Taken, and Outreach Tools. Unpublished literature, Marine Mammals Management, Anchorage, Alaska. 2pp.*
3. 2016. USFWS. *Emergency response for polar bears: a decision matrix. Unpublished literature, Marine Mammals Management, Anchorage, Alaska. 7pp.*
4. 2015. USFWS. *Oil spill response plan for polar bears in Alaska. Unpublished literature, Marine Mammals Management, Anchorage, Alaska. 65 pp.*
5. 2012. USFWS. *Polar bear diversionary feeding workshop report. Unpublished report, Marine Mammals Management, Anchorage, Alaska. 58pp.*

Not country specific:

Peer-reviewed:

- a. Vongraven, D., A. E. Derocher, and A. M. Bohart. 2018. *Polar bear research: has science helped management and conservation? Environmental Reviews 26:358-368.*
- b. Rode, K. D., J. K. Fortin-Noreus, D. Garshelis, M. Dyck, V. Sahanatien, T. Atwood, S. Belikov, K. L. Laidre, S. Miller, M. E. Obbard, D. Vongraven, J. Ware, and J. Wilder. 2018. *Survey-based assessment of the frequency and potential impacts of recreation on polar bears. Biological Conservation 227:121-132.*
- c. Tartu, S., S. Bourgeon, J. Aars, M. Andersen, D. Ehrich, G. W. Thiemann, J. M. Welker, and H. Routti. 2016. *Geographical Area and Life History Traits Influence Diet in an Arctic Marine Predator. Plos One 11:e0155980.*
- d. Wilder, J. M., D. Vongraven, T. Atwood, B. Hansen, A. Jessen, A. Kochnev, G. York, R. Vallender, D. Hedman, and M. Gibbons. 2017. *Polar bear attacks on humans: Implications of a changing climate. Wildl. Soc. Bull.. doi:10.1002/wsb.783*
- e. Atwood, T. C., K. Simac, S. W. Breck, G. York, and J. Wilder. 2017. *Human-Polar Bear Interactions in a Changing Arctic: Existing and Emerging Concerns. Pages 397-418 in Marine Mammal Welfare: Human Induced Change in the Marine Environment and its Impacts on Marine Mammal Welfare, A. Butterworth (ed.). Springer, Cham, Switzerland.*
- f. Atwood, T.C., C. Duncan, K. Patyk, and S. Sonthsagen. 2017. *Monitoring the welfare of polar bear populations in a rapidly changing Arctic. Pages 503-529 in Marine Mammal*

Welfare: Human Induced Change in the Marine Environment and its Impacts on Marine Mammal Welfare, A. Butterworth (ed.). Springer, Cham, Switzerland.

- g. *Vongraven, D., J. Aars, S. C. Amstrup, S. N. Atkinson, S. E. Belikov, E. W. Born, T. D. Debruyne, A. E. Derocher, G. M. Durner, M. Gill, N. Lunn, M. E. Obbard, J. Omelak, N. Ovsyanikov, E. Peacock, E. Richardson, V. Sahanatien, I. Stirling, and Ø. Wiig. 2012. A Circumpolar Monitoring Framework for Polar Bears. Ursus Monographs 5:1-66.*

Non-peer-reviewed

- a. *2018. Range States Human-Polar Bear Conflict Working Group. Detection, Deterrence, and Attractant Management: A List of Tools for Reducing Human-Bear Conflicts. Draft overview of tools.*
- b. *2016. Review of human-polar bear conflict reduction measures. Thesis report by Marianne Doelman.*
- c. *Camping In Bear Country. Should You Consider Using Electric Fencing? Tom S. Smith, Ph.D. Bear Research Ecologist USGS – Alaska Science Center*
- d. *2010. TASER ELECTRONIC CONTROL DEVICE USE/SAFETY. STATE OF ALASKA DEPARTMENT OF FISH AND GAME STANDARD OPERATING PROCEDURE NO III-735*
- e. *USE OF PROJECTILES TO DETER BEARS. Dick Shideler, ADFG, Oilfield Grizzly Project, Craig Perham, USFWS, Marine Mammals Management*
- f. *EVALUATION OF BEAR REPELLENTS. Dick Shideler, Alaska Department of Fish & Game, Wildlife Conservation Division.*

Next Steps:

The CWG will continue to compile information and BMPs relevant to this action and will post them in a designated section of the Range States website for public access by those charged with managing polar bears stranded on shore.

Considerations Going Forward:

Considering your experience implementing this CAP Action to date, would you recommend that it be retained as a priority action moving forward (i.e. will it provide a positive conservation benefit for polar bears, and will multilateral collaboration on the action benefit the RS). If not, please provide a short explanation of why. If yes, then please also provide any suggested modifications going forward to make the action more meaningful in terms of goals/objectives/desired outputs. Please ensure that any modifications result in a clear

expected outcome(s) (e.g. a report) and a method for sharing that report (conference, Range State website etc).

The CWG recommends maintaining this Action Item since new information and experience on BMPs related to Action 7 become available continuously.