# Engaging the Zoo & Aquarium Population of Polar Bears in Scientific Studies

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## Background

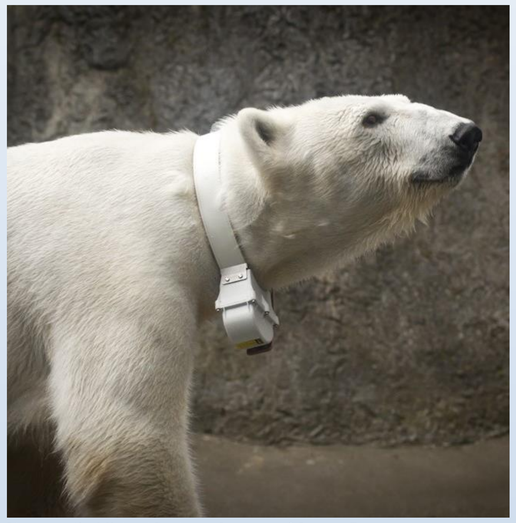

*Photo credit: Michael Durham, Courtesy of Oregon Zoo*

- Due to inherent challenges associated with studying wild bears, zoo bears provide valuable opportunities for scientific research.
- To facilitate research and identify priorities, the Polar Bear Research Council (PBRC) was formed in 2018.
- Members are experts in polar bear conservation science and represent zoological facilities, governmental agencies, and non-governmental organizations. They include veterinarians, scientists, field researchers, and zoo professionals.

## Mission

To support and facilitate polar bear research in zoos which produces solutions to conservation and management challenges facing wild bears.

Goals:

- Keep current with emerging scientific questions
- Guide research priorities
- Facilitate priority research in zoos
- Compile and share contributions of zoos to wild bear conservation and research

Map indicating N. American institutions participating in polar bear research

## Priority Areas of Research

*Photo credit: Michael Durham, Courtesy of Oregon Zoo*

- The PBRC has identified four priority areas of research:
  - Field techniques
  - Health and welfare
  - Physiological and behavioral ecology
  - Reproductive physiology
- The PBRC has endorsed 13 research projects since 2018.
- The PBRC Research Masterplan outlines current and emerging issues for which zoo bears can participate in research that fills knowledge gaps in our understanding of their wild counterparts.

⟸ Scan QR code to download current Polar Bear Research Masterplan!

## Research Highlights

Over 70 scientific publications have included polar bears in zoos as part of their methodologies. Zoo bears provide insight into the unique physiology and behavior of this species or have helped optimize and validate field techniques.

Many zoos are able to acquire voluntary blood samples, allowing temporal changes in biomarkers related to metabolism, reproduction, and nutrition to be evaluated.

*Photo credit: Como Park Zoo and Conservatory*

Activity sensors have been validated with zoo bears enabling the autonomous collection of behavioral data in free ranging bears (Ware et al., 2015 & Pagano et al., 2017, 2018, 2019).

*Photo credit: San Diego Zoo Wildlife Alliance*

Behavioral bioassays and histological examination of foot pads demonstrated that chemical communication facilitates social and reproductive behavior (Owen et al., 2015).

*Photo credit:* © Emily Ringer / Polar Bears International

*Photo credit: D. Sabo*

Through dietary studies with zoo bears, scientists estimated macronutrient compositions of wild polar bear diets. Results also contributed to improved dietary recommendations for zoo bears (Rode et al., 2021; Robbins et al., 2022).

Infrared thermography has been validated to assess energy expenditure during play bouts (Bissonette et al., 2020) and as a method to determine heart-rate (Rzucidlo et al., 2023), providing new approaches to non-invasive monitoring of wild bears.

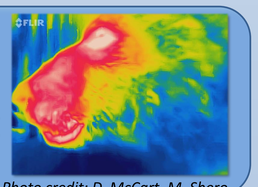


*Photo credit: D. McCart, M. Shero*

## Conclusions

- Through multi-institutional collaborations, zoos are in a unique position to contribute to the conservation and monitoring of wild populations.
- The PBRC encourages all zoos with polar bears to participate in endorsed projects.

## References

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