

Ice Seal Baseline Studies, 2019-20
North Slope Borough Dept. of Wildlife Management

Report to the Ice Seal Committee

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Dimond Center Hotel, Anchorage, AK



Geoff Carroll (ADF&G *retired*) with a bearded seal that was captured and tagged on 11-Sep-2020 in the Mayoeak River near Utqiagvik, AK.

Photo: NSB-DWM

Report prepared by:

Andrew Von Duyke
Department of Wildlife Management
North Slope Borough, P.O. Box 69, Utqiagvik, AK 99723

andrew.vonduyke@north-slope.org 907-852-0350

Introduction

The primary mission of the North Slope Borough Department of Wildlife Management (NSB-DWM) is to conduct wildlife research related to species that are important as subsistence resources to North Slope communities. This research provides decision-makers with the information they need to effectively manage wildlife and its habitat and to ensure that healthy and abundant populations are available for subsistence. This document provides an update on ice seal research activities carried out by the NSB-DWM in 2019-20.

Ice associated seals are important for subsistence and have therefore been the focus of a long-term study at the NSB-DWM beginning in 2011. The objectives of the NSB-DWM Ice Seal Project are to gather data in order to: (1) improve the baseline understanding of ice seal seasonal movements, diving behavior, and haul-out behavior; (2) characterize habitat-use; (3) monitor health; and (4) develop productive collaborations that maximize the value of the data collected.

To accomplish these objectives, the NSB-DWM captures ice seals and fits them with satellite transmitters to collect data on their movements, diving, and haul-out behavior. We also necropsy both hunter harvested and stranded ice seals. This work augments other datasets and broadens the information available for comprehensively monitoring a sentinel species of the Arctic. Note that we are currently collaborating with a number of partners to leverage the data collected in order to answer larger scale questions about the basic ecology and conservation of ice seals. Perhaps our most important collaborators are the Native seal hunters who have taught us a great deal and without whom this work would not be possible.

Methods

Seals are captured during the open water season using drift nets. Nets are monitored constantly during deployment, and entangled seals are quickly removed from the water to be processed. During all handling the seals are physically restrained (i.e., no drugs). A glue-on satellite tag is attached with epoxy to the seal's head or back, and will remain attached for about 10 months when it is shed during the seal's annual molt. Screw-on satellite tags are permanently attached with screws through two holes punched in the webbing of a rear flipper and into a backing plate.

2019-20 activities and highlights

This year's work by the NSB-DWM Ice Seal Project consisted primarily of collaborative efforts with the Alaska Department of Fish & Game, Arctic Marine Mammal Program (ADFG-AMMP). As such, though the NSB-DWM was involved in tagging a total of 15 ice seals in 2019, only two were fitted with NSB-DWM satellite transmitters (Table 1).

Information about those seals that received ADFG-AMMP satellite tags ($n = 13$) can be accessed at: www.adfg.alaska.gov/index.cfm?adfg=marinemammalprogram.arcticprogram, or from their report to the Ice Seal Committee.

In 2019, NSB-DWM focused on capturing ringed seals in the spring in close proximity to the gravel pit in Utqiagvik, AK (Fig. 1) and along the shoreline near Pigniq. Numerous spotted seal haulouts were observed in Dease/Oarlock/Pittalukruak (Fig. 1), and 2019 was also noteworthy in that many bearded seals were observed in the creek systems that feed into Elson Lagoon, Dease Inlet, and Pittalukruak Lake. All captured seals appeared healthy.

Table 1 - List of seals tagged by NSB-DWM in 2019. Note that the light blue entries indicate seals with satellite tags operated by ADFG-AMMP. These seals were captured through a collaborative project between NSB and ADFG funded by ONR.

* Data from these seals is summarized at: www.adfg.alaska.gov/index.cfm?adfg=marinemammalprogram.icesealresearch.

† Tag ceased transmitting on 23-Sep-2019.

‡ Tag is still transmitting as of 17-Jan-2020.

Seal ID	Species	Date Tagged	Sex	Age	Capture Location	Tag(s)	Tag Duration	Agency
EB2019BW01	Bearded	7-9-18	Male	Adult	Utqiagvik	SPLASH / SPOT	13 days†	NSB-DWM
EB2019BW02	Bearded	7-9-18	Female	Juv	Dease Inlet	SPLASH	120 days‡	NSB-DWM
BS19-01-M	Bearded	*	Male	*	Pittalukruak Lake	CTD/SPOT	*	ADFG-AMMP
RS19-01-M	Ringed	*	Male	*	Utqiagvik	CTD/SPOT	*	ADFG-AMMP
RS19-02-M	Ringed	*	Male	*	Utqiagvik	CTD/SPOT	*	ADFG-AMMP
RS19-03-M	Ringed	*	Male	*	Utqiagvik	SPLASH/SPOT	*	ADFG-AMMP
RS19-04-M	Ringed	*	Male	*	Utqiagvik	CTD/SPOT	*	ADFG-AMMP
RS19-05-M	Ringed	*	Male	*	Utqiagvik	SPLASH/SPOT	*	ADFG-AMMP
SS19-01-M	Spotted	*	Male	*	Dease/Pittalukruak	CTD/SPOT	*	ADFG-AMMP
SS19-02-M	Spotted	*	Male	*	Dease/Pittalukruak	CTD/SPOT	*	ADFG-AMMP
SS19-03-M	Spotted	*	Male	*	Dease/Pittalukruak	CTD/SPOT	*	ADFG-AMMP
SS19-04-M	Spotted	*	Male	*	Dease/Pittalukruak	CTD/SPOT	*	ADFG-AMMP
SS19-05-M	Spotted	*	Male	*	Dease/Pittalukruak	SPLASH/SPOT	*	ADFG-AMMP
SS19-06-M	Spotted	*	Male	*	Dease/Pittalukruak	SPLASH/SPOT	*	ADFG-AMMP
SS19-07-M	Spotted	*	Male	*	Dease/Pittalukruak	SPLASH/SPOT	*	ADFG-AMMP

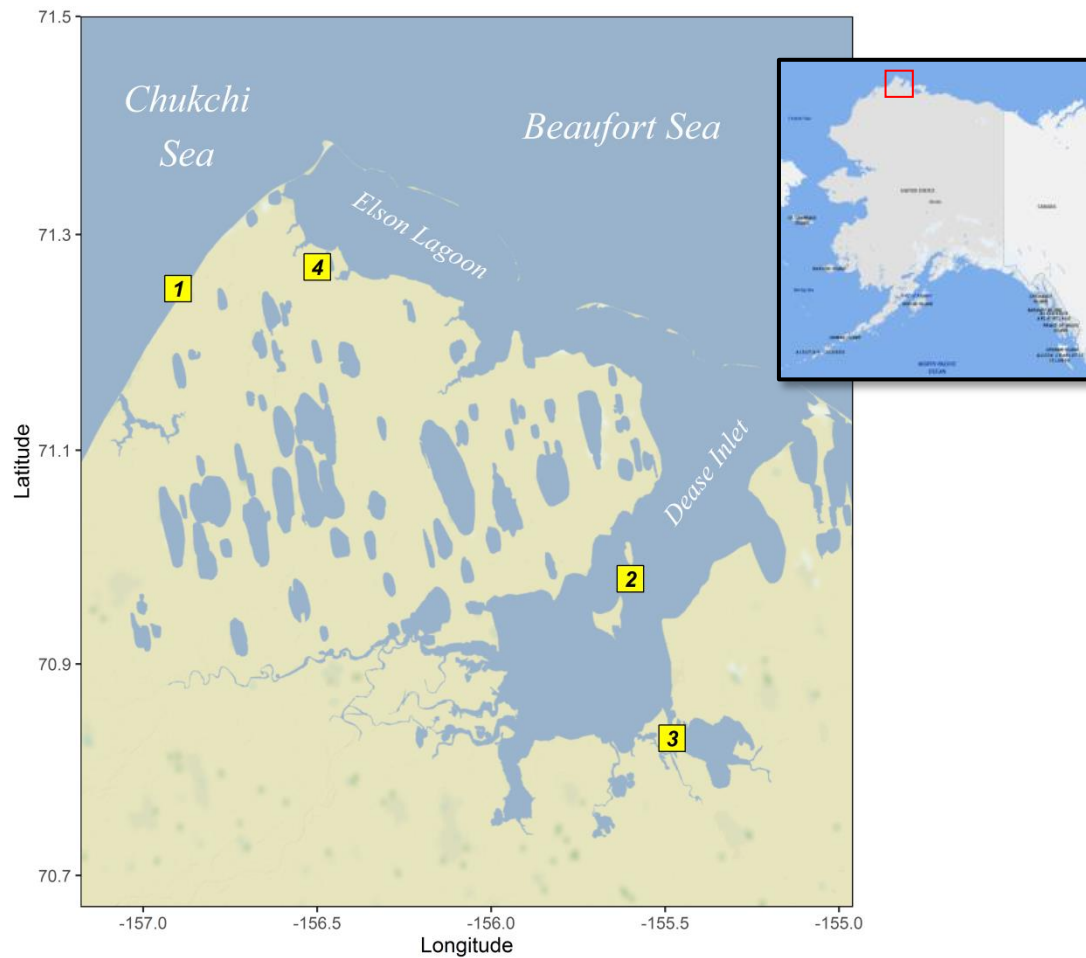


Figure 1 - Ice seal tagging locations in 2019. (1) In mid-June ringed seals were captured near Utqiagvik. (2 & 3) Spotted seals were caught in Dease Inlet near Oarlock Island and in Pittalukruak Lake in the mid-late summer. (3 & 4) Bearded seals were captured near the entrance to Pittalukruak Lake and in the creeks that drain into Elson Lagoon during the late-summer / early fall.

Ringed Seals

Ringed seal capture and tagging efforts commenced earlier in 2019 than ever in our program's history, starting (and ending) in the third week of June. Virtually all shore fast ice was gone by the end of June, a period when ringed seal tagging efforts ordinarily began. Our crew was fortunate to find some of the last shore fast ice in the vicinity of Utqiagvik (Fig. 2), which was near the gravel pit and Pigniq. The ice was occupied by dozens of ringed seals that were hauled out to molt. At the time of their capture, the 2019 ringed seals were in the final stages of their molt, but were far enough along to attach glue-mounted satellite tags. Given the early and rapid onset of the ice retreat, our crew had a very narrow operational window and nearly missed it altogether. If the season continues to shift any earlier, glue-mounted tags will not be useable because the molt will still be occurring at the time of capture.



Figure 2. (above) Ryan Adam and Justin Crawford (ADFG-AMMP) set a net near the beach by the gravel pit in Utqiagvik, AK. Note that the dark patches on the ice in the background are Long-tailed Ducks. This ice was quickly retreating and breaking up, even as our crew was working. (Left) A typical ringed seal captured in 2019, all of which were males, and tended to be small for adults, but in good body-condition. Note the SPLASH attached to this seal's back. (Photos: Kevin Fisher)

Bearded Seals

Beginning in mid to late July local hunters began to regularly observe and harvest bearded seals. It was noted by both hunters and our crew that there appeared to be an abundance of bearded seals, particularly in the southern portion of Dease Inlet, where several river systems drain. A large bearded seal was observed by Geoff Carroll, hauled out on edge of the Mayoak River. Geoff informed our crew, and we hiked across the tundra to attempt capturing it (Fig. 3). This seal was content to remain in its same location until we arrived, stretched the net across the river, and caught it. This was the 2nd largest seal we captured in 2019 at over 6 feet in length (188 cm) and estimated to weigh > 400 lbs (181 kg).



Figure 3 – Capturing a bearded seal on a creek near Utqiagvik, AK. (Upper left) A large bearded seal was observed hauled out on the Mayoek River by local resident and retired ADFG biologist Geoff Carroll. (Lower left) The NSB-DWM seal crew hiked across the tundra to access the seal, capturing it by stretching a net across the river (upper right). Photos: NSB-DWM.

The largest bearded seal of 2019 was captured in the Alaqtaq River, which drains into Pittalukruak Lake. This individual was tagged by ADFG-AMMP and was estimated to weigh at least 450 pounds (204 kg). A third bearded seal was caught in the open water of the southern portion of Dease Inlet. It should be noted that it was possible to capture these last two seals only due to the expert boat handling skills and seal expertise of Joe Skin and Isaac Leavitt respectively. The satellite tracks of the two seals tagged by NSB-DWM are shown in Fig. 4.

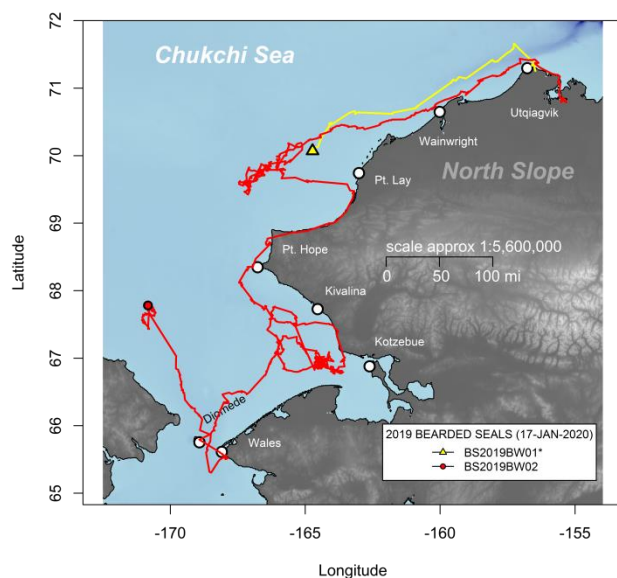


Figure 4 – Satellite tracks of the two bearded seals tagged by NSB-DWM in 2019. Note that EB2019BW01 only transmitted for 13 days. Cause of tag failure is unknown, though battery voltage was normal immediately prior to end of satellite transmissions.

Current and anticipated ice seal research and collaborations by the NSB-DWM:

1. The NSB-DWM continues to monitor the health of subsistence harvested ice seals. Dr. Raphaela Stimmelmayer (raphaela.stimmelmayer@north-slope.org) is the PI for these activities and will present in more detail at ISC 2020.
2. Collaborations:
 - a. ***Integration of Local or Traditional Knowledge and western science using a Bayesian approach for fully formed models.***

Collaborators include: NSB-DWM Ice Seal Program, Dr. Henry Huntington (Huntington Consulting), Dr. Marie Auger-Méthé and Rowenna Gryba (University of British Columbia), and Francis Weise & Phillip Malloy (Stantec LLC). Work continues in developing models of ice seal movements, behavior, and habitat use that include both Indigenous Knowledge (IK) and western science. So far, 25 hunters from Utqiagvik, Pt. Hope, and Kotzebue have been interviewed to document IK. It is anticipated that merging IK with satellite data will yield a better understanding of ice seals that can be applied to their management and conservation.
 - b. ***Evaluating novel assessment approaches for coastal ice seal haulout areas and behavior in the Alaskan Beaufort Sea.***

This project is a collaboration between the NSB-DWM Ice Seal Program and Dr. Donna Hauser (University of Alaska – Fairbanks). Funding is provided by the Coastal Marine Initiative and the Alaska Arctic Observatory and Knowledge Hub (AAOKH). Dr. Hauser introduced this project to the ISC in 2019, but because the funding decision was delayed by the federal government, the first anticipated field season will now commence in 2020, and continue again in summer 2021. Part of this project includes “drone” training and pilot certification of the researchers, hunters, and AAOKH collaborators.
 - c. ***Correction factors to improve the accuracy of the MML instrument based aerial surveys for ice seal abundance.***

The NSB-DWM joined other partners in sharing ice seal haul-out and spatial data to assist the Marine Mammal Laboratory (NOAA Fisheries) with their ice seal abundance estimates. Dr. Peter Boveng (peter.boveng@noaa.gov) can provide further details about this work.
3. Satellite tagging:
 - a. Ice seals in the National Petroleum Reserve of Alaska (NPR-A) will be satellite tagged this summer in order to monitor species in areas with potential to be affected by future oil development in the NPR-A. Watch for updates in 2020-21.

- b. The NSB-DWM Ice Seal Program has unused satellite tags that will be deployed during the summer and early fall of 2020 near Utqiagvik.

4. Manuscripts:

- a. Davidson et al. *IN PREP*. New ecological insights from the Arctic Animal Movement Archive (AAMA).
- b. Hamilton et al. *IN PREP*. Marine Mammal Hot Spots in the Arctic. (Fig. 5)
- c. Von Duyke et al. *IN REVISION*. Ringed seal (*Pusa hispida*) seasonal movements, dive, and haul-out behavior in the Beaufort, Chukchi, and Bering seas (2011–2017).

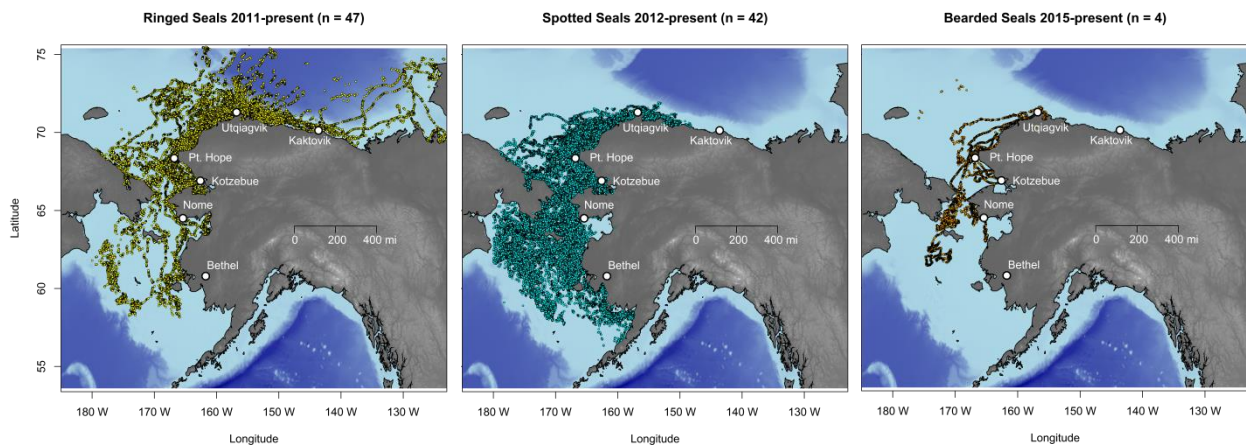


Figure 5. Pooled ice seal satellite data collected by the NSB-DWM since 2011.

Conclusion:

To address the need for information on the movements, behavior, and habitat use of ice-seals, the NSB-DWM Ice Seal Program continues to monitor their health and spatial ecology, and to develop research collaborations that can maximize the benefits of the data collected. Findings from this research will not only fill in knowledge gaps about species that are notoriously difficult to study, but also will support activities mandated in response to the listing under the Endangered Species Act (ESA) of ringed and bearded seals (both *threatened*). Such activities include the development of recovery plans and the process of designating critical habitat. Dive- and surface-durations, along with movement data are also useful for deriving correction factors that increase the accuracy of visual and instrument based aerial surveys for pinniped abundance estimation. Meanwhile, polar bear conservation would also benefit from an improved understanding of the relationships between polar bears and their primary prey. Finally, mitigation planning for human/wildlife conflicts is a growing need in a more ice-free and accessible Arctic, and this information will further inform these actions.

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