

Update of hunter-assisted seal tagging and traditional knowledge studies of Pacific Arctic seals, 2016 and beyond

Justin A. Crawford¹, Mark A. Nelson¹, Lori Quakenbush¹, Andrew L. Von Duyke², Merlin Henry³, Alexander Niksik⁴, Albert Simon⁵, John Goodwin⁶, Alex Whiting⁷, Kathy Frost⁸, Josh London⁹, and Peter Boveng⁹

¹Alaska Department of Fish and Game, Fairbanks, AK, Justin.Crawford@alaska.gov

²North Slope Borough, Department of Wildlife Management, Utqiagvik, AK, ³Seal hunter and resident of Koyuk, AK,

⁴Seal hunter and resident of St. Michael, AK, ⁵Seal hunter and resident of Hooper Bay, AK,

⁶Seal hunter and resident of Kotzebue, AK and Ice Seal Committee Chairman, ⁷Native Village of Kotzebue, AK

⁸School of Fish and Ocean Science, UAF, Fairbanks, AK, ⁹Polar Ecosystems Program, Alaska Fisheries Science Center, MML-NOAA, Seattle, WA



INTRODUCTION

Ringed (*Pusa hispida*), bearded (*Erignathus barbatus*), and spotted (*Phoca largha*) seals are called “ice seals” because they use sea ice for pupping, nursing, molting, and resting. In Alaska, these seals are located in the Bering, Chukchi, and Beaufort seas. They are important subsistence species used by Alaska Natives for food, oil, clothing, and handicrafts. Decreases in the extent of sea ice and lengthening of the open water season have eased industrial access to the Arctic, expediting the need to develop mitigation measures to minimize anthropogenic effects on seals, but our understanding of how changes in sea ice will affect ice seals and their habitat is not clear.

Cooperative satellite telemetry studies among hunters and biologists are increasing our understanding of important habitats, seasonal movements, use of sea ice including haul-out behavior, and seasonal site fidelity. This project expands on past studies by tagging seals at several widely-spaced locations through two studies, funded separately by the Bureau of Ocean Energy Management (BOEM) and Office of Naval Research (ONR), and further fostering collaborations among the Alaska Department of Fish and Game (ADFG), North Slope Borough Department of Wildlife Management (NSB), Marine Mammal Laboratory-NOAA (MML), Ice Seal Committee, and subsistence seal hunters. Traditional knowledge is incorporated into our findings to further explain seal movements in response to changing sea ice.

OBJECTIVES

Work with seal hunters to:

- Capture and tag ringed, bearded, and spotted seals.
- Document seal habitat use and movements:
 - **BOEM Study:** document seal movements and foraging using:
 - **SPLASH tags:** collect location and dive data (Wildlife Computers, USA).
 - **SPOT tags:** collect location and haul-out data (Wildlife Computers, USA).
 - **ONR Study:** document seal movements and ocean conditions using:
 - **CTD tags:** collect location, dive, and water conductivity, temperature, and depth data (Sea Mammal Research Unit, Scotland).
 - When possible, we tagged each seal with either a SPLASH or CTD tag epoxied to their back or head and a SPOT tag attached to their flipper.
- Gather and document local and traditional knowledge.



Figure 1. Attaching satellite-linked transmitters to captured bearded seals: a) Palsson Fitka, resident of St. Michael, on the St. Michael Canal, July 2016 and, b) Merlin Henry, resident of Koyuk, and Mark Nelson (ADFG), on the Inglutalik River, September 2016.

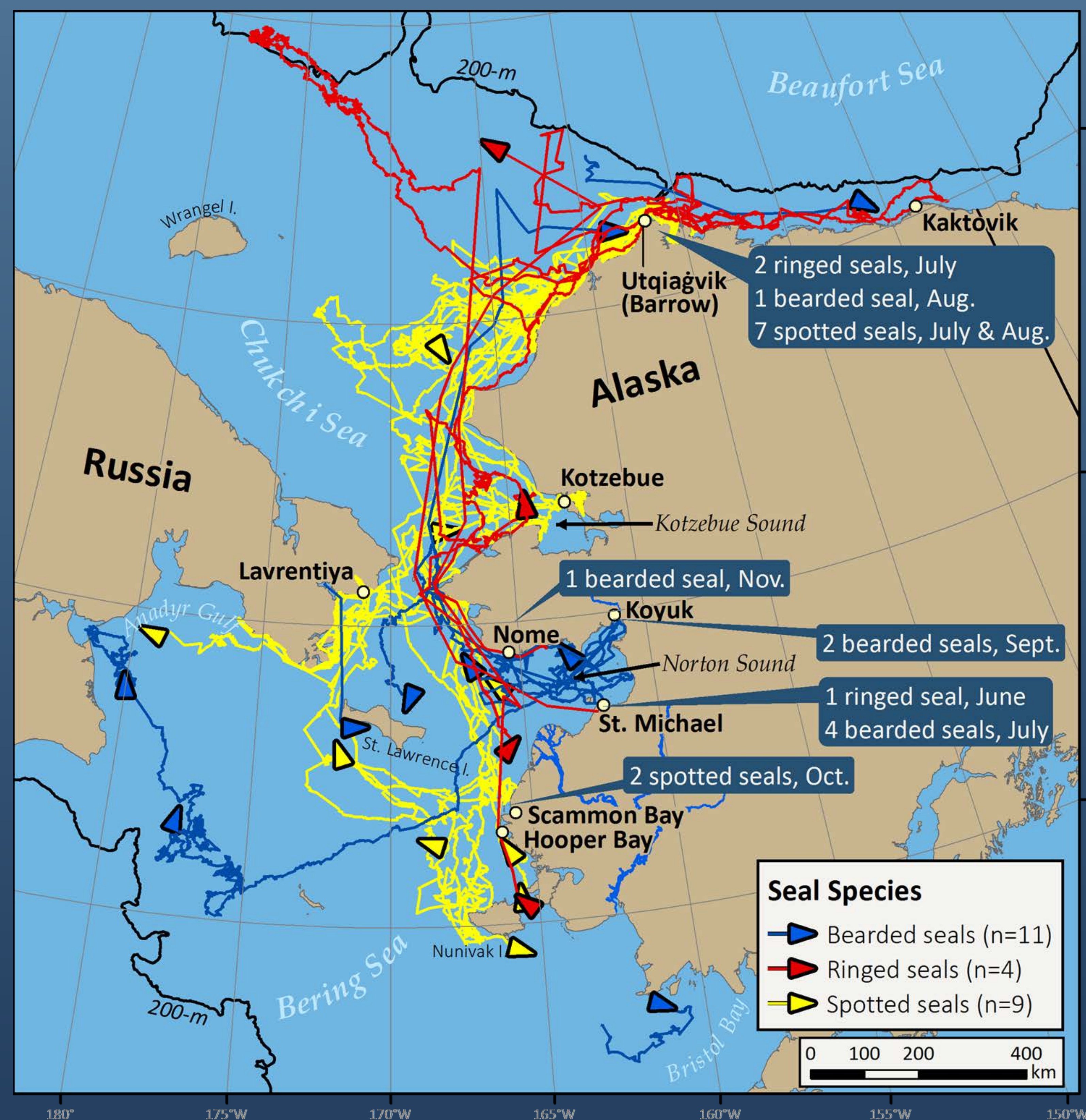


Figure 2. Movements of 4 ringed, 11 bearded, and 9 spotted seals during 2016. Seals were tagged with satellite-linked transmitters during 2014, 2015, and 2016 in Kotzebue Sound and near Hooper Bay, Scammon Bay, St. Michael, Koyuk, Nome, and Utqiagvik (Barrow). Balloons contain number of seals tagged by species and month in 2016.

Table 1. Number of ringed, bearded, and spotted seals tagged with SPLASH, CTD, and SPOT tags in 2016. As part of a collaborative effort to deploy tags, multiple agencies provided seal tags. The agency that provided the tag or the funding for the tag is listed in parenthesis and includes: BOEM, ONR, NSB, and MML.

Seal species	SPLASH (BOEM)	CTD (ONR)	SPOT (BOEM)	SPOT (NSB)	SPOT (MML)	No. tagged individuals
Ringed		2	1	2		3
Bearded	2	3	8			8
Spotted		9		2	3	9
Total	2	14	9	4	3	20

ACTIVITIES IN 2016

- We deployed satellite-linked transmitters on **20 seals (3 ringed, 8 bearded, and 9 spotted seals)** (Table 1).
- We **tracked the movements of 24 seals**, including 3 bearded seals tagged in 2015 and 1 ringed seal tagged in 2014 (Fig. 2).
 - Maps of seal movements were distributed weekly and displayed on the following webpages:

ADFG



NSB



ANIMAL TELEMETRY NETWORK



- **Traditional knowledge interviews were conducted** in Shishmaref, Kivalina, and Kotzebue in January and finalized in separate reports in June.
- Traditional knowledge collected under several BOEM projects (bowhead, walrus, and seal) was published in August (Huntington *et al.* 2016).

FUTURE WORK

- Continue to work with trained hunter-taggers and with new hunters and communities to tag seals.
- Conduct interviews to document local and traditional knowledge to better understand seal movements in response to changing sea ice.
- Continue to combine location data with traditional knowledge to better understand seal movements and habitat use in a changing environment.

ACKNOWLEDGEMENTS

Our projects are funded by BOEM and ONR, NSB support came from the Collaborative Alaskan Arctic Studies Program (formerly the Shell Baseline Studies Program). We appreciate the assistance of all the hunter-tagger crews; Albert Simon II, Palsson Fitka, Stephan Horn Jr., Tom Gray, Morgan Simon, Wybon Rivers, Denali Whiting, Edward Ahyakak, Edwin Kotangan Jr., Frank Garfield, Gordon Eakon, Henry “Boyuk” Goodwin, Allen Stone, and Pearl Goodwin. We also thank Anna Bryan, Aaron Morris, Joe Skin, and Isaac Leavitt for tagging assistance. Research on ice seals was conducted under permit #15324 issued to ADFG by the National Marine Fisheries Service and under an approved ADFG Animal Care and Use Committee Protocol #2014-03, 2015-25, and 2016-23.

LITERATURE

Huntington, H.P., L.T. Quakenbush, and M. Nelson. 2016. Effects of changing sea ice on marine mammals and subsistence hunters in northern Alaska from traditional knowledge interviews. *Biology Letters* 12:20160198. 4 pp.