Arctic Network

National Park Service
U.S. Department of the Interior

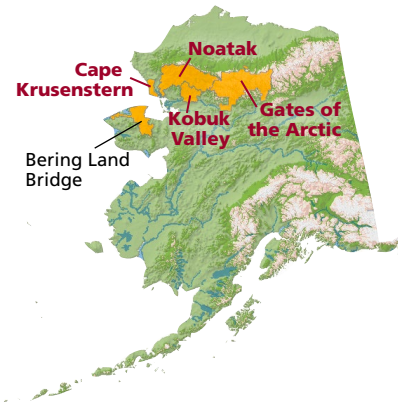
Alaska Region
Inventory & Monitoring Program

Bering Land Bridge N Pres. • Cape Krusenstern NM
Gates of the Arctic NP & Pres. • Kobuk Valley NP • Noatak N Pres.

October 2015

Dall's Sheep Resource Brief

The Status of Dall's Sheep in The Arctic Network: Declining Populations



Map: (above) Arctic Network parklands. Dall's sheep are being monitored in 4 Arctic Network parks (noted in **red**): Cape Krusenstern NM, Noatak N Pres., Kobuk Valley NP, and Gates of the Arctic NP & Pres.

There were an estimated 10,072 sheep (95% Credible Interval [CrI] 8,081-12,520 sheep) in 2010 in Gates of the Arctic National Park and Preserve (GAAR) and 2,809 sheep (95% CrI 2,361-3,379 sheep) in 2011 in the Western Arctic National Parklands (WEAR), which includes habitat in Noatak National Preserve (NOAT), Kobuk Valley National Park and Cape Krusenstern National Monument. These numbers were similar in GAAR and higher in WEAR than in the early 1980s.

Annual surveys indicated a stable population in the Itkillik subarea of GAAR from 2009 to 2012 (~1,750 sheep). However, sheep declined more than 60% in the Itkillik in 2013 and 2014 and more than 70% across WEAR from 2011 to 2014. Very low numbers of lambs were observed in 2013 (1-14 lambs per 100 ewe-like sheep, which includes ewes, yearlings and young rams) in multiple areas in Alaska and Canada and this trend was repeated in the Brooks Range in 2014. The decline impacted lambs and ewe-like sheep more than rams in the Itkillik but affected all age classes in WEAR.

In 2015, surveys were conducted in the western Baird Mountains in WEAR and across GAAR. Preliminary estimates indicated continued decline and poor lamb recruitment in the western Baird Mountains, but stable or slightly increasing numbers of adult sheep and higher than average lamb numbers (~40 lambs per 100 ewe-like sheep) in northeastern GAAR. Total and adult sheep are about 25% lower across GAAR than in 2010. The exact cause of the recent decline is not known but may in part be due to the record cold spring in 2013. Environmental conditions, particularly harsh winter weather, are limiting factors for Dall's sheep populations, especially in WEAR, which has more isolated populations at the northwestern edge of the species range. All hunts were closed by emergency order in WEAR in 2014 and 2015 due to the decline. Surveys will be conducted annually in the Itkillik and Anaktuvuk subareas and the western Baird Mountains to assess further population changes.

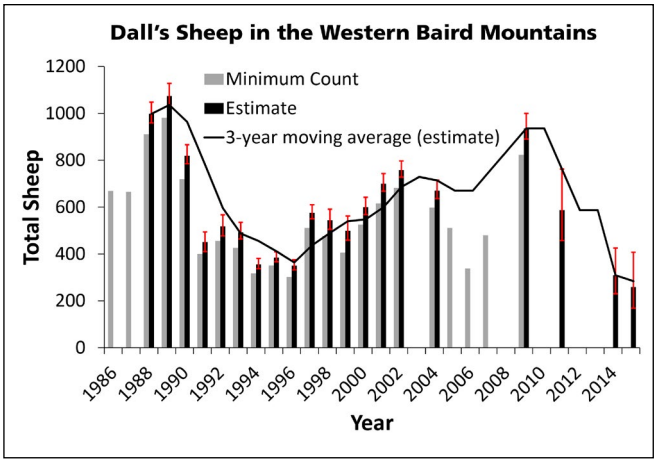
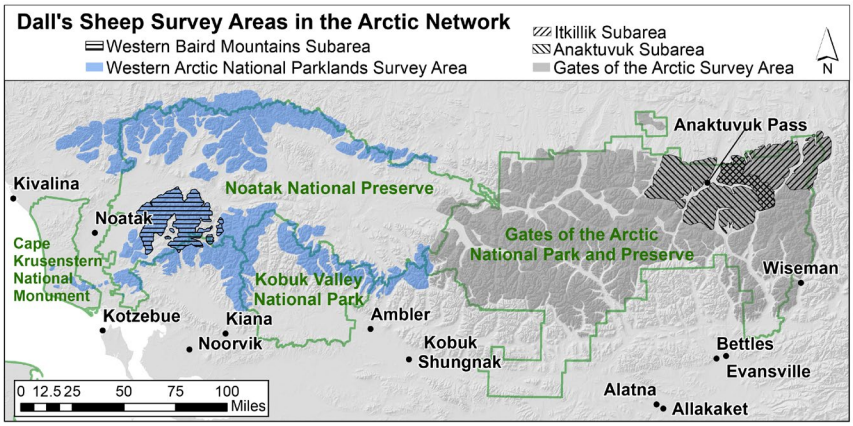


Photo (near right): Group of Dall's sheep ewes and lambs; Map (far right): Survey areas in ARCN; Graph (top right): Dall's Sheep in the Western Baird Mountains. Results from aerial Dall's sheep surveys in the western Baird Mountains, WEAR, 1986-2015. Estimates are from sightability model analysis of minimum count data from 1988 to 2009 (with 95% confidence intervals; Udevitz et al. 2006) and distance sampling in 2011, 2014 and 2015 (with 95% credible intervals; Schmidt and Rattenbury 2013). The area was partially surveyed in 1986, 1987 and 2005-2007.



Why This Vital Sign Is Important

Dall's sheep are an alpine adapted species at their northernmost extent in the Brooks Range of Alaska. GAAR and NOAT encompass most of the available habitat in the central and western Brooks Range and were estimated in the 1980's to contain 13-15% of the world's Dall's sheep. Dall's sheep are an important subsistence species for local residents and highly valued where sport hunting is permitted in preserves. Dall's sheep are also one of the most visible large mammals for wildlife viewing in northern Alaska.

Widespread and dramatic declines in sheep numbers were observed in the early 1990s and again in 2013-2015, resulting in emergency closures for subsistence and sport hunting in WEAR. Monitoring population trends is critical to conserving Dall's sheep and maintaining hunting opportunities. Moreover, information about sheep abundance, distribution, demographics and health can be highly indicative of changing environmental conditions over time.

What We Want To Know About This Vital Sign

- Long-term trends in sheep abundance and distribution.
- Long-term trends in sex and age composition of sheep populations.
- Sheep diet composition and quality in northeastern GAAR.

How We Monitor This Vital Sign

The Dall's sheep monitoring program in ARCN is based on aerial, distance sampling conducted at two scales: 1) park-wide sampling across GAAR and WEAR; and 2) more frequent sampling in key harvest management areas: the Itkillik and Anaktuvuk subareas in GAAR and the western Baird Mountains in WEAR. Estimates of total abundance and counts for different sex and age classes are produced using Bayesian modeling. These efforts are in collaboration with the Central Alaska Network, which monitors Dall's sheep populations in Denali National Park and Preserve, Wrangell-St. Elias National Park and Preserve, and Yukon-Charley Rivers National Preserve. The park-wide aerial surveys are conducted every four years and every one or two years in the sub areas. We are also collecting fecal pellets in GAAR to monitor late winter diet composition and quality. For more information please see: https://www.youtube.com/watch?v=y1dfoiyQxwE, http://onlinelibrary.wiley.com/doi/10.1002/jwmg.216/abstract and http://onlinelibrary.wiley.com/doi/10.1002/jwmg.557/abstract

How Monitoring This Vital Sign Can Help Park Managers

- Detect changes in regional and local abundance of Dall's sheep
- Provide information about sheep demographics and health in areas where hunting is managed
- Improve our understanding of alpine environmental conditions and the effects of environmental change on local sheep populations

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