Arctic Network

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

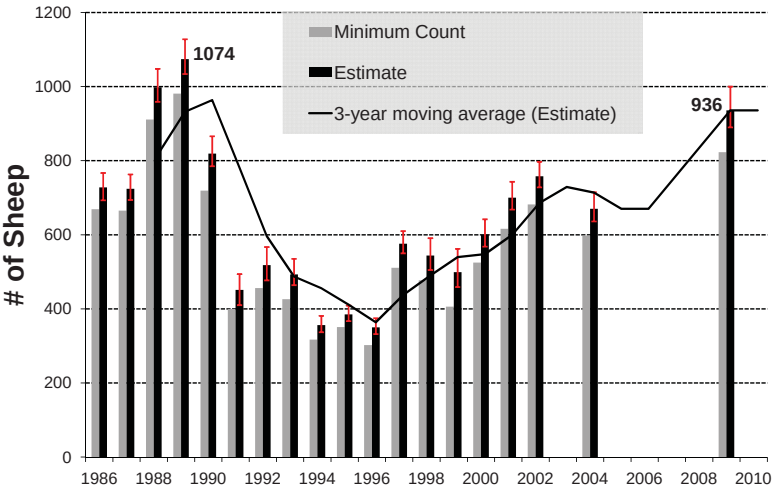
Dall's Sheep Resource Brief
September 2010, no. 20

Status & Trends

Dall's sheep (*Ovis dalli*) in the central and western Brooks Range

The Arctic (ARCN) and Central Alaska Networks are collaborating to monitor the abundance and distribution of Dall's sheep in six of Alaska's largest park units: Denali, Gates of the Arctic, Kobuk Valley, Lake Clark, Noatak and Wrangell-St. Elias. In 2009, we tested distance sampling methods in Gates of the Arctic. Four pilot-observer teams flew 308 transects across all potential sheep habitat, and we estimated 8,564 sheep (95% Confidence Interval: 6,586-11,130 sheep) in the park and preserve. Our findings suggest that distance sampling is a practical and efficient way to estimate Dall's sheep abundance over large areas, and these methods were refined for surveys in Gates of the Arctic and Wrangell-St. Elias in 2010.

Aerial surveys for Dall's sheep were also conducted in 2009 in the western Baird Mountains of Noatak and in 2008 in the Itkillik Preserve of northeastern Gates of the Arctic. Results from both surveys indicate productive populations with many lambs. The western Baird Mountains have been surveyed nearly every year since 1986, and recent data show that this population has increased since a decline in the early 1990s.



Results from aerial Dall's sheep surveys in the western Baird Mountains, Noatak National Preserve, 1986-2009. *The estimates adjust for sightability (Udevitz et al. 2006, Debevec and Udevitz 2008); error bars are 95% confidence intervals. The study area was only partially surveyed in 2003 and 2005-2007, and those data are not shown here.*

Preliminary Objectives

What do we want to know about Dall's sheep in the Arctic Network?

- Long-term trends in sheep abundance and distribution across ARCN.
- Sex and age composition in two key harvest management areas: the Itkillik Preserve in Gates of the Arctic and the western Baird Mountains in Noatak.
- Status and trends in sheep diet and forage quality in the Itkillik Preserve and western Baird Mountains.

Dall's sheep are being monitored in 4 Arctic Network parks:

Importance

Why are Dall's sheep important in the Arctic Network?

Dall's sheep are an alpine adapted species at their northernmost extent in the Brooks Range of Alaska. Gates of the Arctic, Noatak and Kobuk Valley encompass most of the available habitat in the central and western Brooks Range and likely contained 13-15% of the world's Dall's sheep in the early 1980s. Dall's sheep are a valued subsistence species for local residents, and sport hunting is permitted in the preserve areas. 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 following several severe winters. While some populations appear to be recovering, regional numbers remain lower than were seen in the early 1980s. Monitoring population trends is critical to conserving Dall's sheep and subsistence opportunities. Moreover, information about sheep abundance, distribution, demographics and health can be highly indicative of changing environmental conditions over time.

Contact: Kumi Rattenbury, Arctic Network Ecologist, Kumi_Rattenbury@nps.gov, (907) 455-0673

Management Applications

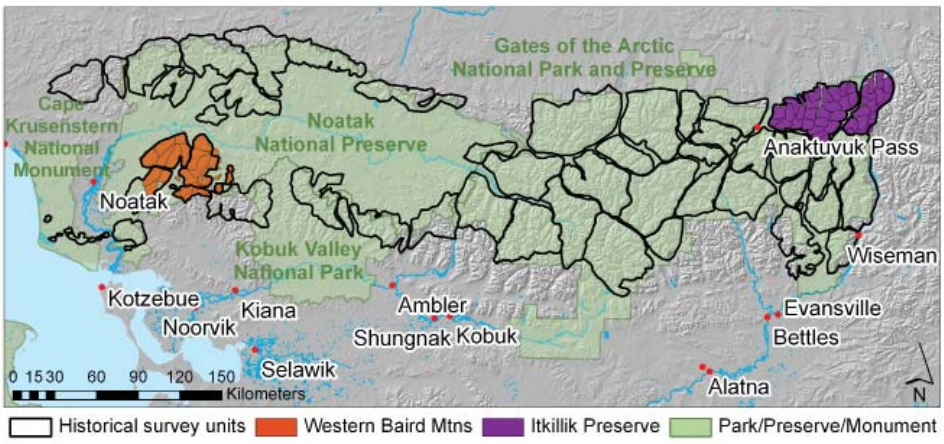
How can monitoring protect Dall's sheep in ARCN?

- Detect changes in park-wide and regional abundance of Dall's sheep as well as patterns of sheep distribution within parks.
- Provide information about sheep composition and health in areas where hunting is managed.
- Improve our understanding of alpine environmental conditions and change, and the effects of environmental change on local sheep populations

Long-term Monitoring:

How will we monitor Dall's sheep in the Arctic Network?

The Dall's sheep monitoring program is based on aerial surveys conducted at two scales: **1)** park-wide sampling to generate abundance estimates for Gates of the Arctic, Noatak and northern Kobuk Valley, and the region as a whole; and **2)** count and composition surveys in two key harvest management areas: the Itkillik Preserve in Gates of the Arctic and the western Baird Mountains in Noatak. We are currently testing distance sampling methods to obtain park-wide abundance estimates and the applicability of these methods for monitoring composition trends. These efforts are in collaboration with the Central Alaska Network which monitors Dall's sheep in Denali National Park and Preserve, Wrangell-St. Elias National Park and Preserve and Yukon-Charley Rivers National Preserve. We plan to conduct the sampling and composition surveys every three years. We will also conduct ground surveys in the Itkillik Preserve and western Baird Mountains to collect fecal pellets and vegetation for analysis of diet composition, forage quantity and quality.



Delineated Dall's sheep habitat in the central and western Brooks Range *encompasses 41,000 km^2 (15,800 mi^2), an area roughly twice the size of New Jersey.*

ARCTIC NETWORK

USING SCIENCE TO PROTECT OUR PARKS

THE ARCTIC NETWORK (ARCN) IS A MAJOR COMPONENT OF THE NATIONAL PARK SERVICE'S STRATEGY TO BETTER UNDERSTAND AND MANAGE PARK LANDS USING SCIENTIFIC INFORMATION. IT IS ONE OF FOUR INVENTORY AND MONITORING NETWORKS IN ALASKA AND 32 NATIONWIDE.

The Arctic Network provides scientific support to five parks covering more than 19 million acres. Bering Land Bridge National Preserve and Cape Krusenstern National Monument share similar coastal resources and biogeographic ties to the former land bridge between North America and Asia. Kobuk Valley National Park, Noatak National Preserve and Gates of the Arctic National Park and Preserve span extensive, mountainous terrain at the northern limit of treeline.

The Arctic Network is developing long-term monitoring protocols for 28 'vital signs', or physical, chemical and biological indicators that were selected to represent the overall health of these parklands. Many of these vital signs are expected to show change due to regional and global stressors including climate change and deposition of industrial contaminants. Many vital signs also have important human values including for subsistence.

ARCN VITAL SIGNS:

- Air Contaminants
- Brown Bears
- Caribou
- Climate
- Coastal Erosion
- Dall's Sheep
- Fire Extent & Severity
- Fish Assemblages
- Invasive/Exotic Diseases
- Invasive/Exotic Species
- Lagoon Communities & Ecosystems
- Lake Communities & Ecosystems
- Landbird Monitoring
- Moose
- Muskox
- Permafrost
- Point Source Human Effects
- Sea Ice
- Small Mammal Assemblages
- Snow & Ice
- Stream Communities & Ecosystems
- Subsistence/Harvest
- Surface Water Dynamics & Distribution
- Terrestrial Landscape Patterns & Dynamics
- Terrestrial Vegetation & Soils
- Visitor Use
- Western Yellow-billed Loons
- Wet & Dry Deposition

CONTACT US AT: (907) 457-5752, 4175 GEIST ROAD, FAIRBANKS, ALASKA 99709
OR VISIT HTTP://SCIENCE.NATURE.NPS.GOV/IM/UNITS/ARCN