

## Central Alaska Network

Denali NP & Pres. • Wrangell-St. Elias NP & Pres. • Yukon-Charley Rivers N Pres.

## Dall's Sheep Resource Brief

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### Status & Trends

#### Monitoring Dall's sheep in the Central Alaska Network

The Central Alaska (CAKN) and Arctic Networks are collaborating to monitor the abundance, composition, and distribution of Dall's sheep in six of Alaska's largest park units, including Denali and Wrangell-St. Elias.

In 2010-2011, surveys were completed for most sheep habitat across the Network for the first time in 30 years. Estimates from those surveys show

numbers similar to the abundance estimates from the 1980s. In Denali, the population is approximately 2,252 sheep (1,871 – 2,765, CV = 10%), and is composed of approximately 16% lambs, 50% ewe-like (including ewes and immature rams), 26% less than full-curl rams, and 8% full-curl rams. In Wrangell-St. Elias, the population is approximately 12,428 sheep (10,780

– 14,470, CV = 8%) and is composed of approximately 18% lambs, 55% ewe-like, 21% less than full-curl rams, and 6% full-curl rams.

### Objectives

#### What do we want to know about Dall's sheep in CAKN?

- Trends in abundance, distribution, and sex and age composition of Dall's sheep
- Trends in the number and composition of harvested sheep from park lands
- Dall's sheep productivity (lamb survival and recruitment)
- Integrate and collocate sheep monitoring with other monitoring efforts where practical including monitoring efforts directed at flora, fauna and physical resources



*Clockwise L to R: Two less than full-curl rams sit on a ridge; one of the planes used to conduct aerial surveys; a group of sheep as seen from the air; an ewe-like sheep with two lambs*



Dall's sheep are being monitored in all 3 network parks



### Importance

#### Why are Dall's sheep important in the Central Alaska Network?

Dall's sheep are a sedentary (relatively non-migratory) resident of alpine areas, a potential indicator of environmental change, and are one of the six keystone large mammal species (moose, caribou, sheep, black bear, brown bear, wolf) of interior Alaska. Dall's sheep can be legally hunted by subsistence users on park and preserve lands in the Central Alaska Network and can be hunted on preserve lands by sport hunters. Evidence also

suggests that environmental conditions such as severe winter weather can dramatically affect Dall's sheep numbers.

Given that approximately 20% of the world's Dall's sheep population occurs in the Central Alaska Network, it is important to monitor the species in this network.



### Management Applications

#### How can monitoring protect Dall's sheep in CAKN?

- Detect changes in park-wide and regional abundance of Dall's sheep as well as patterns of sheep distribution within parklands
- 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 are we monitoring Dall's sheep in CAKN?

The Dall's sheep monitoring program is based on aerial distance sampling surveys coupled with Bayesian statistical analysis and was recently developed by NPS scientists and published in *The Journal of Wildlife Management*. Transects (15 or 20 km) are flown 90 m above the ground. The pilot and observer count sheep uphill of the transect line. In addition to counting sheep, the survey crew also classifies them into one of five composition categories: lamb, ewe-like, less than full-curl ram, full-curl ram, and unclassified. In 2010 and 2011, crews completed 84 transects in Denali and 303 in Wrangell-St. Elias.

The new monitoring methods are now providing better results on population status and trends of Dall's sheep on national parklands. Traditionally, minimum count surveys, which don't include estimates of precisions or corrections for imperfect detection, have been used to estimate population size. Now, the analysis involves Bayesian

modeling using information from prior surveys to more precisely estimate population size and composition.

Not only do the new methods for estimating sheep population abundance and composition provide more accurate results from which to make management decisions and track the status of this iconic species, the new methods cost about 80% less due to reduced flight time.



*A biologist-observer looks for and records sheep on the uphill side of the plane while conducting an aerial distance survey*



CENTRAL ALASKA NETWORK

## USING SCIENCE TO PROTECT OUR PARKS

THE CENTRAL ALASKA NETWORK (CAKN) IS ONE OF 32 NATIONAL PARK SERVICE INVENTORY AND MONITORING NETWORKS. EACH NETWORK EXISTS AS PART OF A NATIONAL EFFORT TO BETTER UNDERSTAND AND MANAGE PARK LANDS USING SCIENCE-BASED INFORMATION.

In order to focus this effort, 270 national park units with significant natural resources were grouped into 32 regional networks.

The Central Alaska Network is made up of 3 parks: Denali National Park and Preserve, Wrangell-St. Elias National Park and Preserve, and Yukon-Charley Rivers National

Preserve. Together, these 3 parks contain over 21.7 million acres and makeup 25% of all the land in the National Park Service. They represent a great diversity of climate and landform, from temperate coastal rainforests to glaciated mountain ranges. What they share in common are their largely wild and unaltered landscapes.

In order to track the condition of our parks, Central Alaska Network scientists have chosen 34 key indicators, or "vital signs," to represent the overall health of the network. Each vital sign falls into one of 4 categories: animal life, physical environment, human use, or plant life. Underlying these 4 vital sign categories is a focus on habitat change.

### CAKN VITAL SIGNS:

#### Animal Life

Arctic Ground Squirrel  
Bald Eagles  
Brown Bear  
Caribou  
Dall's Sheep  
Freshwater Fish  
Golden Eagles  
Moose  
Passerines  
Peregrine Falcons  
Ptarmigan  
Small Mammals  
Snowshoe Hare  
Wolves

#### Physical Environment

Air Quality  
Climate  
Fire  
Glaciers  
Land Cover  
Permafrost  
Shallow Lakes  
Snow Pack  
Soundscape  
Streams & Rivers  
Volcanoes & Tectonics

#### Human Use

Human Populations  
Human Presence/Use  
Natural Resource Consumption  
Trails

#### Plant Life

Exotic Species  
Insect Damage  
Plant Phenology  
Subarctic Steppe  
Vegetation Structure/Composition

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