

Eastern Interior Dall Sheep Management Plan Guidelines

April 2024

Introduction

The Dall sheep populations have been reduced to numbers far below the long-term carrying capacity of the habitat. These declines are due to multiple climate events in the past decade and in some, excessive harvest mortalities in popular sport hunting areas like Glacier Mountain in Unit 20E with highway access. Local rural residents have utilized and relied on these sheep for non-wasteful consumptive use for generations. Many local rural residents have recognized the critical declines in the sheep populations and voluntarily reduced harvest.

This Eastern Interior Council is compelled to recommend management strategies regarding the biological parameters needed to rebuild and maintain the Dall sheep populations, and the subsistence and non- subsistence uses on Federal public land.

I. Sheep Ecology

It is a recognized fact that Dall sheep are a very social animal with minimal movements within their learned habitat. Dall sheep are to be managed within the Game Management Unit (GMU) and sub-units they reside in. These sub-populations should not be expected to provide the large majority of sport harvest for the entire mountain range encompassing multiple GMUs. GMU and sub-units with snow shadows that hold higher sheep populations, should not be combined with areas with typically higher snowfalls.

Dall sheep rams and ewes are raised and learn to use areas for various times of the year, including feeding, rutting, and mineral licks. Sheep rarely move over 6-12 linear miles throughout their lives. As sheep move with older animals than themselves, they learn predator evasion strategies. Younger sheep will run to the mature sheep to lead them out of harm's way and to prime habitat.

Sheep routinely live 10-12 years under normal conditions. Many lightly hunted areas routinely sustain 10-12 year old ram harvests.

II. Sheep and Habitat

Wind scouring of winter habitat is very important to Dall sheep. Early wet snow with rain on snow seals the ridges, not allowing wind scouring. Dall sheep are not very tall (12"-20" to the belly), and have a climbing hoof not conducive to excavating a lot of snow.

Rain on snow, deep snow, and late springs that exhaust the weaker individuals of the population cause population declines. Weaker individuals that are lost first are young of the year, smaller yearlings that were late-born, and older animals over 10-12 years old. Most rams 2-10 years old survive in real hard winters. Ewes are approximately 50% smaller and have higher mortalities in deep snow than rams.

When winter-stressed ewes survive deep, wet snow and/or late springs, their physiological recovery can take all summer, and fecundity is affected for the next reproductive cycle. Lambs produced by stressed ewes will typically be late-born, smaller than average, with reduced winter survival rates, especially if another bad winter is encountered. Young ewe sheep that survive to adulthood after a hard winter's start in life, may not produce lambs until they're four.

Sheep rely on snow-off on steep south-facing slopes to access new growth in late April. They move to very low elevations to get green florescence as soon as it is available. With each additional week that melt off is delayed, overall sheep mortality increases, especially gestating ewes and yearlings. A one-month delayed melt-off in 2013 and 2014 proved to be extremely detrimental to vulnerable segments of the sheep population with a 50% decline in 2015 (see NPS 2024 update).

Sheep move up the south-facing, melted slopes with green-up. In mid-late May through the June 15th, sheep are on south-facing alpine slopes that have dryas and wildflower forbs in pre-blossom and in flower. This is a critical period when there is high protein pollen available for muscle recovery and lactation. Periodic rain events delay pollenating insect activity resulting in longer access for sheep to this high-quality feed. Sheep move onto north-facing slopes as wildflowers come into later blossom. Damp, cloudy summers are a big advantage to sheep because this extends their access to high protein feed. Recruiting lambs will have much heavier fall weights.

The opposite—hot weather, maximizes insects pollinating the forbs. When forbs pollenate quickly, the high protein feed is available for shorter periods of time, with negative effects in lactating ewes, resulting in lower fall, yearling growth rates, and the ewe's fat reserves. Very young rams leave their natal ewe group in the summer of their 2nd or 3rd year, having 1/4 to 1/2-curl horns.

Established ½ and 3/5-curl rams typically ostracize these young rams as they endeavor to join ram groups. Most rams separate from ewes in summer/fall, working out pecking orders of dominance. These young rams are inexperienced in predator detection and run to the oldest rams when predators are detected. Mature sheep lead the way to escape terrains they know intricately in their home range.

Ram health, the social presence of 7-12 year old rams is very important to the overall sheep populations' survival. Mature rams defend ewes from young rams while in rut, saving young ram's fat reserves. Mature rams are larger and have more experience evading predators, helping younger rams' survival throughout the annual cycle. Mature rams and ewes lead younger sheep throughout their home range to mineral sources, spring feeding sites, rutting areas, and in predator avoidance (see 2022 Glacier Mtn sheep survey- 12 sheep, 1 adult ram).

Dall Sheep Management Strategy – Eastern Interior

1. Maintain healthy populations of the Dall sheep resource.
 - Manage for a sufficient number of adult rams > 7 years old post hunting season
 - Different land managers working together in co-stewardship with Tribes, local state fish and game advisory committees and sheep working groups, and best science practice. Grouping funding for surveys (see NPS, ADF&G, BLM).
2. Surveys
 - Aerial and ground surveys should be conducted immediately after lambing when sheep are aggregated on south-facing slopes and ridges. Arbitrarily doing surveys in July makes sheep much harder to count on north-facing slope shadowed areas.
 - When survey data is unavailable or incomplete for a struggling population, management should default to restrictive management. A lack of data should never lead to overharvest.

3. Harvest

- Maintenance of sheep at habitat carrying capacity will lead to sustainable harvest of full-curl rams, annually.
- Management of future rebuilding sheep population need to be in a conservation mode as climate change in having negative and unpredictable declines in many sheep populations, making sheep a huge concern for food security and sustainable population (see NPS survey 2024, YUCH, Cooper Mtn, Diamond Fork, Twin Mtns, combined 93% decline).
- Only full-curl rams may be harvested.
- Eliminate the hunter counting growth rings, which leads to wanton waste and abandonment of sub-legal rams.

4. Carrying capacity

- Ram groups need to have composition documentation to calculate age, using high definition digital video with optical zoom cameras. It is imperative to know if there are adult rams entering a hunted population whether 1/2, 3/4, 7/8, 4/4 curl. Various ram population is a strong indicator of ewe age classes.

Data interpretation

Lambs are not recruited until June of the following summer, which can lead to false lamb:ewe ratios. Lambs can have high mortalities with adverse weather conditions like rain on snow and extended green-up by weeks.

The Tanana upland and Yukon-Charley Rivers National Preserve (YUCH) have seen some of the largest declines in sheep. 78% for YUCH and 28% in the Ogilvie Mountains. Dall sheep populations in Gates of the Arctic National Park and Preserve (GAAR) have lost 2/3 of the population since 2015 in the GAAR region, while in the Anaktuvuk Pass area, sheep populations have remained stable. Sheep populations in Wrangell-St. Elias National Park and Preserve (WRST) have declined from 2,500 to 1,200 in three years.

Conclusions

Sheep populations are stressed by weather events and overharvest, especially in road accessible areas. When population decline leads to non-sustainable populations represented by 50-80% decline, harvest must be curtailed until rebuilding exhibits strong population of > 7-year-old rams and stable lamb:ewe ratios.

*This is a draft. Please feel free to edit and add your ideas of sound sheep management.

Sincerely submitted,

Donald Woodruff

References

Murie – sheep of Denali

Western Interior Sheep Management Strategy – sheep ecology North

American Ungulate Conference – sheep habitat

Jack Reakoff - TEK



Dall's Sheep- 2023 Survey Summary

Gates of the Arctic National Park and Preserve

Background

The National Park Service in collaboration with Alaska Department of Fish and Game conducted an aerial survey for Dall's sheep June 29th – July 14th, 2023. Four aircraft based out of Galbraith Lake and Coldfoot surveyed two different survey areas in Gates of the Arctic Park and Preserve (GAAR): Itkillik and Southeast Gates of the Arctic Park. The Anaktuvuk survey area was not completed due to poor weather. The survey used a standardized distance sampling protocol. **Accurate Dall's sheep abundance and demographic data are critical for sustainable management of Dall's sheep populations and their harvest.**

TOTAL

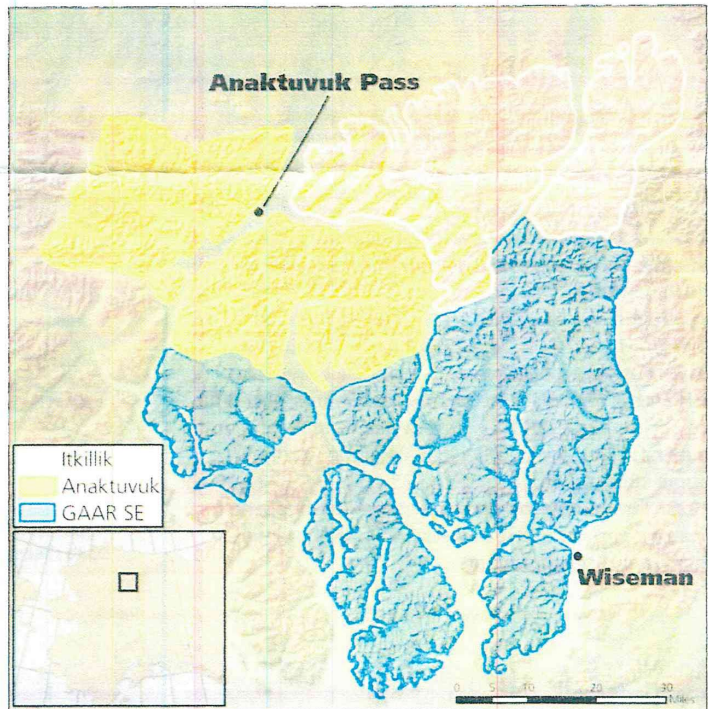


Figure 2. Map of Gates of the Arctic Park and Preserve Dall's sheep survey areas.



Figure 1. A Dall's sheep (NPS / JARED HUGHEY).

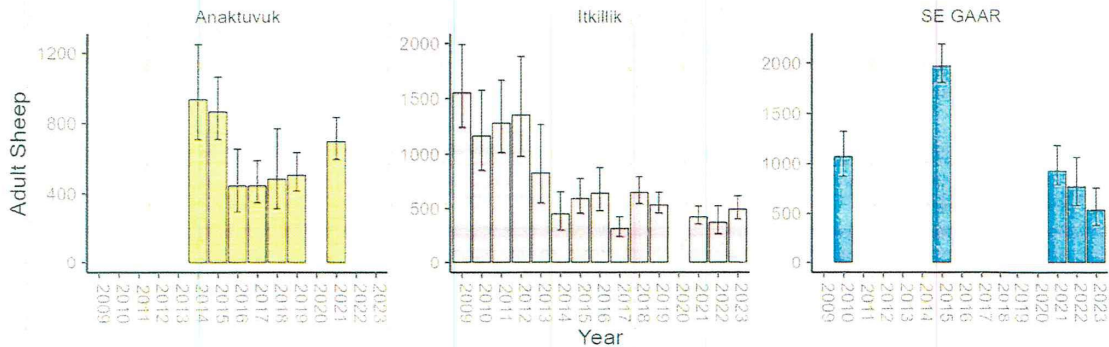


Figure 3. Estimated number of adult sheep in each survey area. Error bars indicate 95% Bayesian Credible Intervals. Colors correspond to survey areas in Figure 2.



Figure 4. A group of Dall's sheep running through rocky terrain (NPS / DYLAN SCHERTZ).

Population Estimates

The Itkillik and Anaktuvuk populations crashed after difficult winter and spring weather in 2013/2014. Since then, the Itkillik population has remained low and stable, while the Anaktuvuk population has climbed slowly. The sheep populations in Southeastern GAAR, which are surveyed less frequently, have experienced a large decline since 2015. The estimated number of adult sheep has fallen from 1,969 (95% Bayesian Credible Interval: 1805—2189) in 2015 to 533 (95% BCI 379—757) in 2023. The number of lambs per ewe-like sheep, an indicator of reproductive success, has varied greatly across survey areas and years.

Reproductive success in 2023 appeared to be normal in both the Itkillik and SE GAAR survey areas.



Figure 5. A Piper SuperCub, the survey aircraft typically used for Dall's sheep surveys (NPS / BRAD SHULTS).

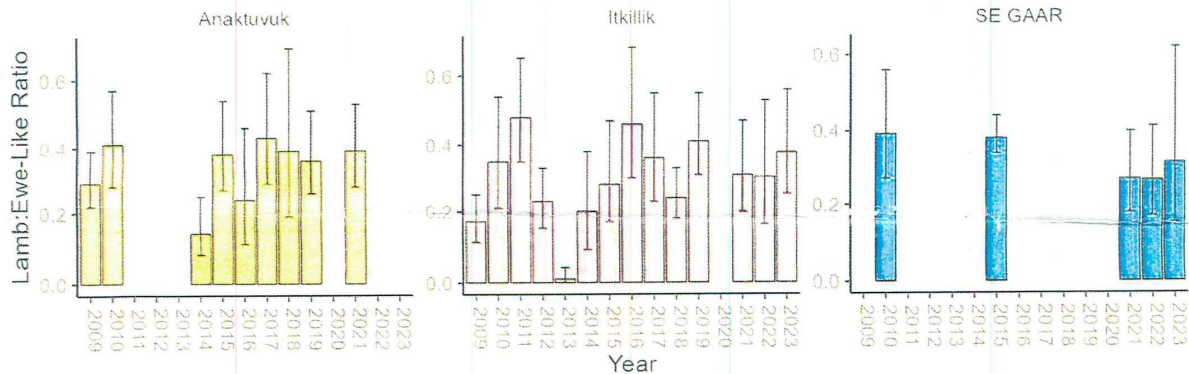


Figure 6. Estimated ratio of lambs to ewe-like sheep, an indicator of reproductive success. Error bars indicate 95% Bayesian Credible Intervals.

More Information

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<https://www.nps.gov/im/arcn/dallsheep.htm>