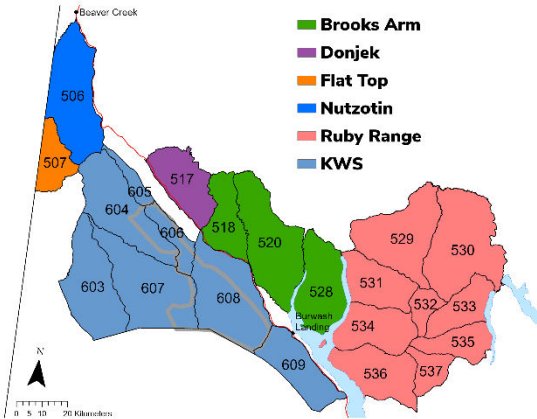




## Kluane Region Sheep Population Surveys – 2023



A survey of the Brooks Arm and Ruby Range Sheep Management Units (SMUs) in 2022 indicated concerning declines in sheep numbers. In 2023 we expanded the survey area to include neighboring areas to provide updated population estimates for the entire region. A minimum count survey was conducted in June/July 2023 of the Brooks Arm, Ruby Range, Donjek, Nutzotin and Flat Top Sheep Management Units (SMUs). We also flew the subzones in the Kluane Wildlife Sanctuary (KWS), associated with the Kluane Sheep Permit. The purpose of the survey was to estimate abundance, distribution, lamb recruitment rates and adult sex ratios. These measures, when monitored over time, are indicators of population trends.

Figure 1. 2023 Kluane region survey area

### Summary of 2023 Survey Results

**Population Trend:** The sheep populations in the Donjek, Flat Top and Nutzotin SMUs, and the KWS Permit Area have declined by 49-63% from previous surveys (2011-2016). The two SMUs surveyed in 2022, Ruby Range and Brooks Arm, showed small population increases from last year, but overall have declined by 16% and 24%, respectively, since the 2015/2016 survey. Though the Donjek has historically been a small population, its decline is especially concerning, with an apparent population of only 30 adult sheep.

**Date:** June 26 – July 7, 2023

**Hours Flown:** 65

**Population estimate (non lamb):**

Brooks Arm: 157  
 Ruby Range: 675  
 Donjek: 30

Nutzotin: 121  
 Flat Top: 192  
 KWS: 246

**Lamb:Nursery**

Brooks Arm: 10:100  
 Ruby Range: 33:100  
 Donjek: 50:100  
 Nutzotin: 28:100  
 Flat Top: 15:100  
 KWS: 28:100

**Ram:Nursery**

Brooks Arm: 50:100  
 Ruby Range: 57:100  
 Donjek: 67:100  
 Nutzotin: 81:100  
 Flat Top: 47:100  
 KWS: 80:100

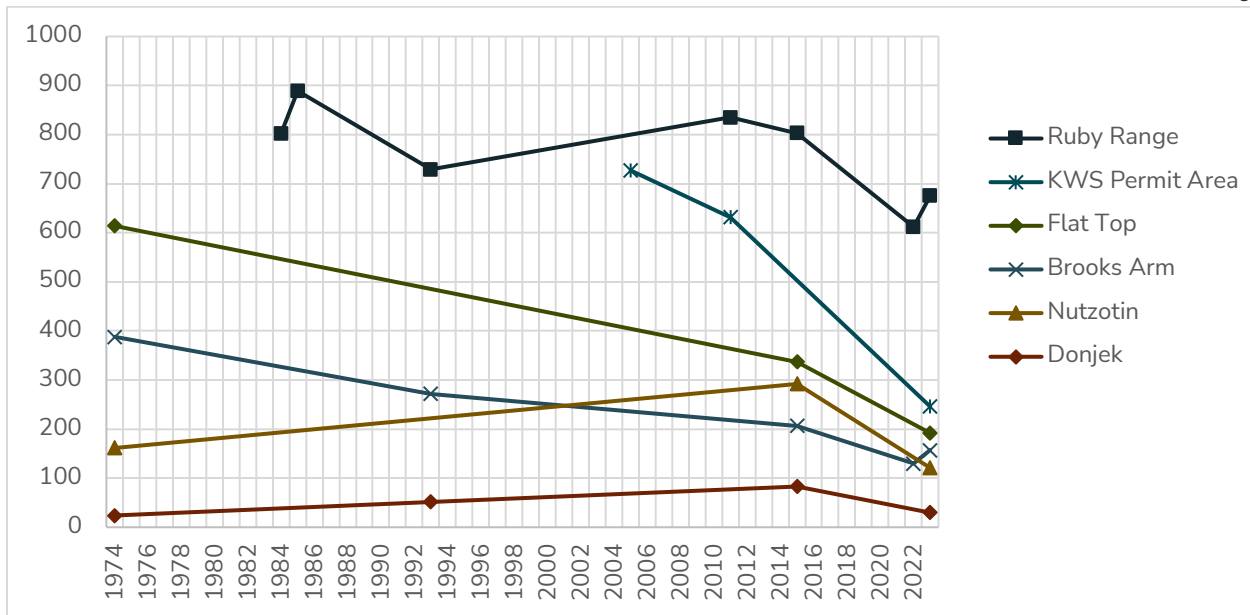
An average lamb recruitment of 25 lambs per 100 nursery sheep is considered necessary for a stable population; ratios below that suggest populations may be in decline. The recruitment rates for the Ruby Range, Donjek, Nutzotin and KWS populations were all above this threshold. However, the Brooks Arm and Flat Top SMUs were below. The low ratio in the Brooks Arm SMU is concerning, as this is the second consecutive year with low recruitment.

In accordance with our science-based guidelines, the desired adult sex ratio indicating a lightly harvested population is 50 rams per 100 nursery sheep. The Flat Top SMU was slightly below this threshold. However, the ratio was significantly exceeded in the Nutzotin, Donjek and KWS, indicating that fewer nursery sheep were observed than expected. This suggests nursery sheep are declining more quickly than rams, possibly due to increased vulnerability to environmental factors.

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**Harvest:** In surveyed populations a full curl ram harvest rate of no more than 4% of the non-lamb population size is recommended (Environment Yukon 2020). Using the 2015 population estimates, the 5-year average harvest rate for licensed hunters in all the surveyed areas has been below that level. The 2023 population estimates change that calculation, suggesting that Brooks Arm, Donjek and Ruby Range are approaching the sustainable limit. Harvest rates in the Nutzotin SMU are high and currently exceed sustainable limits.

Table 1. Sheep harvest summary 2015–2022 for Brooks Arm, Donjek, Flat Top, Nutzotin, Ruby Range and KWs Permit Area showing the number of rams harvested per year in each SMU, the 5-year average harvest, and estimated harvest rates.

SMU	2015	2016	2017	2018	2019	2020	2021	2022	5yr Average Harvest (2018-22)	2023 Pop. Estimate	Harvest Rate Estimate (2015pop)	Harvest Rate Estimate (2023 pop)
Brooks Arm	13	8	6	7	7	7	2	4	5.4	157	2.6%	3.4%
Donjek	5	0	0	2	0	2	0	0	1.0	30	1.2%	3.3%
Flat Top	0	1	5	2	2	0	6	4	2.8	192	0.8%	1.5%
KWS Permit Area	1	2	1	1	1	1	1	2	1.2	246	0.2%	0.5%
Nutzotin	4	6	3	8	6	12	6	8	8.0	121	2.7%	6.6%
Ruby Range	19	14	20	28	25	15	23	23	22.8	675	2.8%	3.4%

Figure 2. Population trends for the Brooks Arm, Donjek, Flat Top, Nutzotin, Ruby Range SMUs and GMS in the KWS permit area

**Management and Regional Context:** These SMUs were last surveyed in 2015 and 2016, with the exception of the KWS, which was last surveyed in 2011. Using these past surveys as a benchmark, all populations have declined. Regionally, surveys of neighbouring sheep populations (Thechàl Dhâl' and Vulcan Mountain in Kluane National Park) found similar trends over the same time period (2015–2023).

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Furthermore, between 2017-2022, a regional trend in below-average recruitment rates was also observed in other nearby wildlife populations, including the neighbouring Kluane caribou herd, and the Alsek and Kluane/Paint Mountain moose populations (Blakeburn, et al. 2020). Because this decline can be found in several species, it suggests that environmental factors such as snow depth, snow duration and/or freeze/thaw events may be contributing to the low recruitments. Further studies would be needed to better understand the impact of these environmental factors.

The above-stated 2023 recruitment rates improved in the majority of the survey units, with recruitment rates falling at, or exceeding, 25 lambs:100 nursery sheep. Similarly, high recruitment results were reported from surveys in Kluane National Park, with recruitment rates of 30 lambs:100 nursery sheep.

The declining sheep populations in the western Kluane Region are concerning. Sheep populations are cyclical and so population fluctuations of highs and lows are to be expected. However, the large population declines seen in Donjek, Nutzotin, Flat Top and the KWS suggest closer monitoring of the area may be warranted. The low recruitment and significant population declines of the Brooks Arm and Flat Top populations indicate this could be a longer-term trend, and that management action may be required to help stabilize these populations.

### **What does it mean**

- Sheep populations in the Kluane Area are declining and at low levels, possibly due to environmental factors.

### **What's next**

- The Government of Yukon and First Nation governments will continue to work together to monitor sheep in the area.
- We anticipate there will be additional discussions with First Nations, Renewable Resource Councils and the public on sheep management in the Kluane Region.

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