

# Dynamics of a Recolonizing Dall's Sheep Population in Southwest Yukon

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**ABSTRACT** Dall's sheep (*Ovis dalli* spp.) are distributed throughout Yukon. In the Coast Mountains south of Whitehorse, Dall's sheep (*O. d. dalli*) occur at relatively high density, with regional numbers estimated at roughly 2,500 individuals. Sheep are distributed in a number of discrete populations within this broader regional context. One such population is found on Caribou/Nares Mountains (Caribou/Nares), adjacent to the community of Carcross and roughly 20 km north of the Yukon-British Columbia border (Figure 1). This area is located along the route used by people travelling north during the Klondike gold rush in the late 1800s. The influx of people into this area is believed to have had a significant effect on wildlife populations from both commercial hunting and increased access. Up until the 1960s, small numbers of sheep were observed on Caribou/Nares, but disappeared in the early 1970s for unknown reasons. During the mid-1970s and 1980s, small numbers (~10) of transient groups were occasionally present. In 1990, a larger group of 23 animals recolonized the area from either the Gray Ridge population to the west or the Montana Mountain population to the south (Figure 1). Sheep have remained on Caribou/Nares to the present time. This recolonization event provided a unique opportunity to examine the dynamics of an establishing Dall's sheep population over a 25-year timeframe. From 1990 to 2015, Yukon Department of Environment conducted seven aerial surveys (helicopter-based) in mid-June to mid-July. Information collected included minimum population counts, productivity in the form of lamb:nursery sheep (i.e., ewe-like) ratios, sex ratios, and ram age structure. I fitted non-lamb counts to a logistic population model to estimate both carrying capacity ( $K$ ) and intrinsic growth rate ( $r_{max}$ ).  $K$  and  $r_{max}$  were estimated as 64.5 (SE = 1.3) and 0.44 (SE = 0.02), respectively (Figure 2). During this time there was no detectable trend in lamb productivity in the population from a linear regression of productivity over time ( $\beta_{Trend} = -0.11$ , SE = 0.63). A survey in the summer of 2016, subsequent to this analysis, observed a non-lamb count of 59 animals on Caribou/Nares. Further investigation into the demographic mechanisms governing this population's apparent regulation around  $K$  will provide greater insight regarding Dall's sheep carrying capacity.

*Biennial Symposium of the Northern Wild Sheep and Goat Council 20:1-3.*

**KEYWORDS** Dall's sheep, intrinsic growth rate, productivity, *Ovis dalli*, recolonization, Yukon

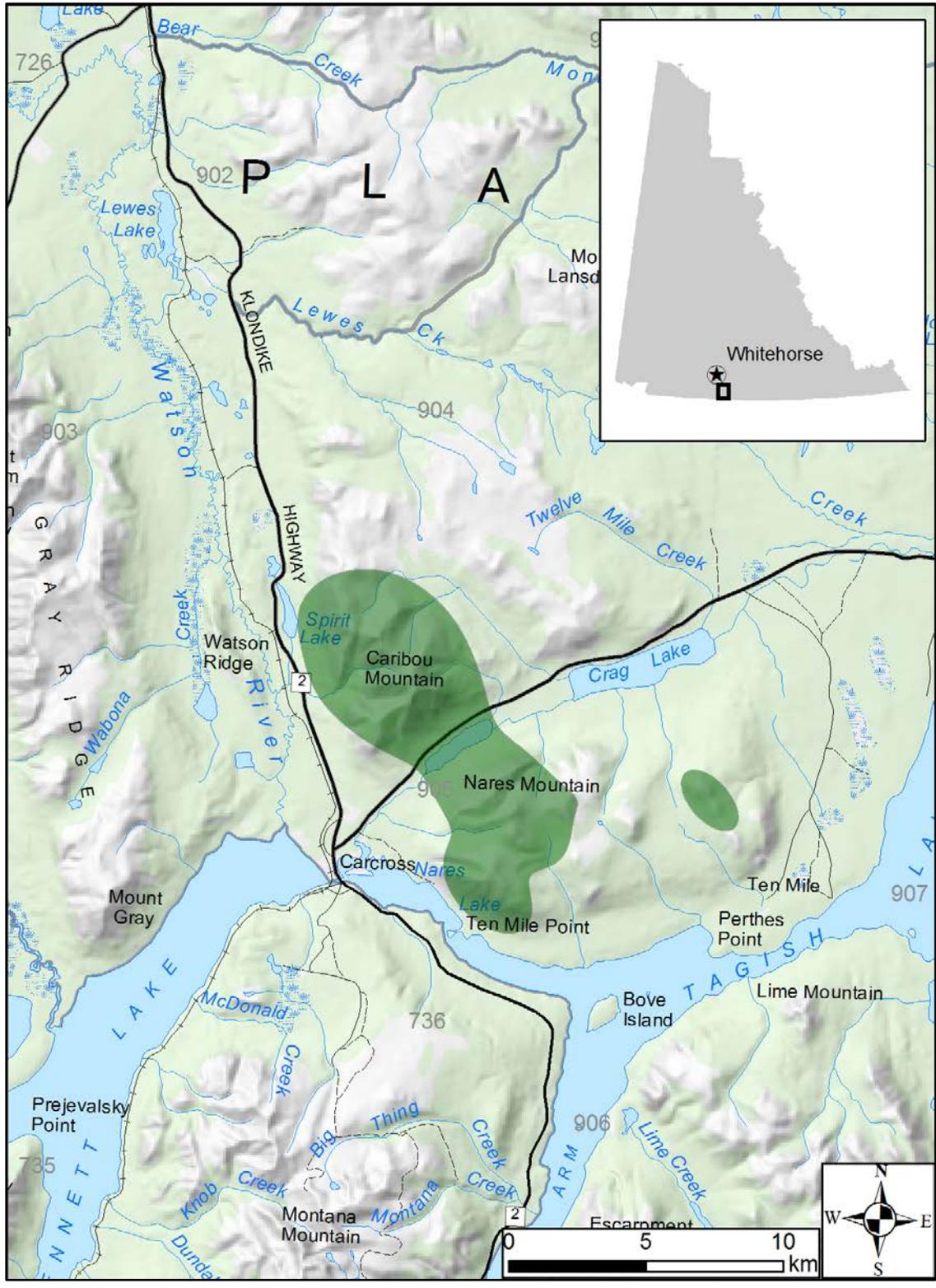


Figure 1. Distribution of Dall's sheep on Caribou and Nares Mountains in southwest Yukon.

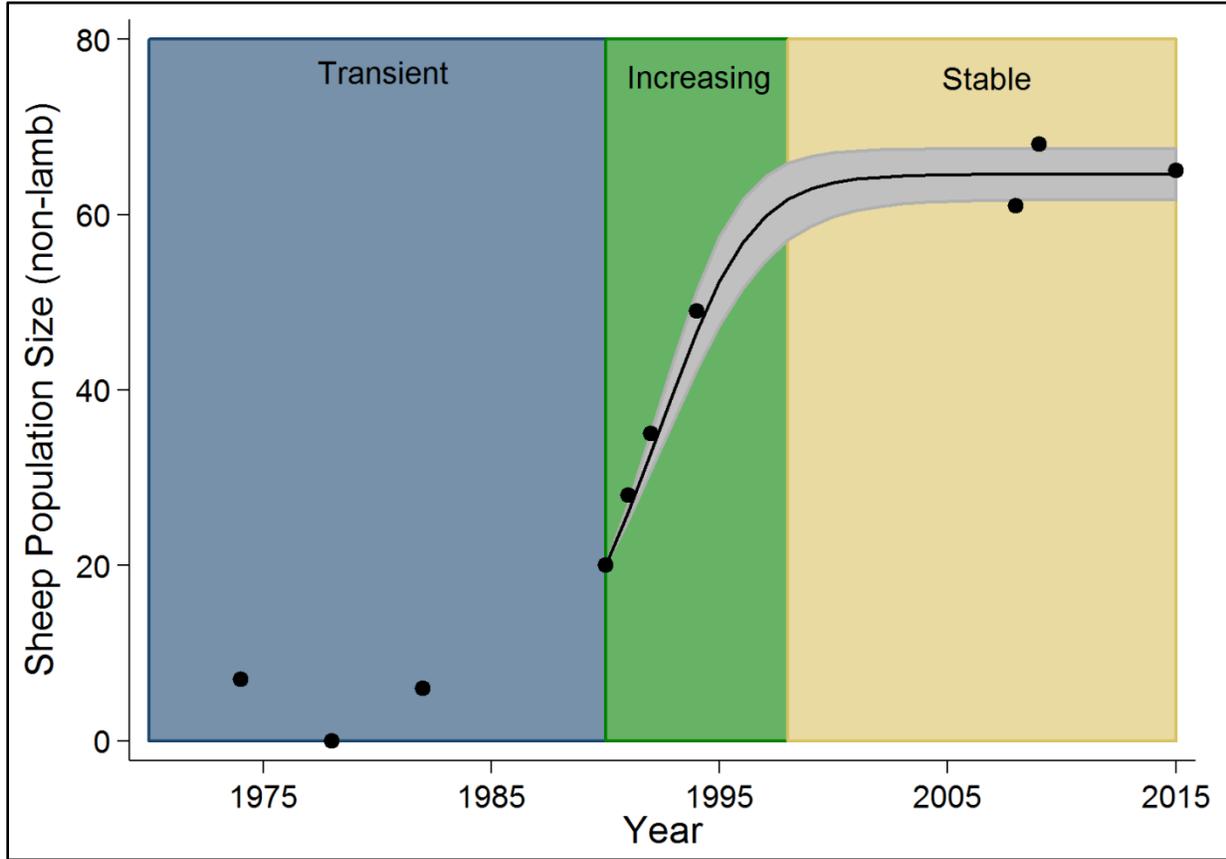


Figure 2. Dall's sheep counts (black circles) and logistic growth model predictions (solid line) on Caribou and Nares Mountains (1974-2015). The time series is roughly categorized by the population's transient, increasing, and stable states. The gray area represents the 95% confidence interval of the predictions.