

## VALKENBURG

### A CONCEPTUAL MODEL OF POPULATION CHANGES IN ALASKAN CARIBOU HERDS

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Abstract: The sizes of Alaskan caribou herds have fluctuated throughout recorded history. I believe these fluctuations are primarily driven by the interaction of density-dependent food limitation, predation, insect harassment, and local climatic conditions. Predation, insect harassment, and climatic conditions act primarily to limit the areas which caribou find suitable to live in over the long haul (i.e. suitable caribou habitat). Food acts primarily to regulate herd size within suitable caribou habitat. A small (relative to food supply) caribou herd within suitable habitat can be expected to be highly productive with most 24-month-old females producing calves.

Population growth continues at up to 20% per year until food shortages within suitable habitat cause the caribou to search for food in more marginal habitat (e.g., where survivorship is reduced by predation, insect harassment, or snow conditions). At that point, body condition deteriorates, and productivity and survival decrease, causing the herd to stabilize or decline. The amplitude and period of caribou population fluctuations are not predictable for more than a few years.

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