The migratory caribou of Northern Québec/Labrador: variations in body condition in two herds of different sizes

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Why studying migratory caribou?

Key element of the northern ecosystem and intimately linked to the culture and the economy of the North

- Past and present changes in population dynamics, body condition, distribution and habitat use
- Unknown possible effects of global climate change
- Concerns about potential impacts of industrial development
Population dynamics and body condition

Changes in resource availability ↔ changes in the demography of populations

Caribou population dynamics

Resource availability

Climate

Energy balance

Survival

Reproduction

Demography

Monitoring changes in body condition
**Population dynamics and body condition**

*Adult females*: body condition affects survival and reproduction which determine population demography.

*Young of the year*: rapid and strong response to factors affecting body condition at birth and at weaning.

**Relationships between body condition and population abundance**
Study species and area

- Migratory caribou (*Rangifer tarandus*) of Northern Québec/Labrador
- Two herds: **George River herd** & **Leaf River herd**
**Historical variations**

Large variations in abundance

summer competition for forage on calving grounds and summer range

Relationships between changes in body condition and population abundance

![Graph showing population size over years for George River and Leaf River.](image)
Body condition monitoring

- 1975-2002: random adult females and calves
- 2007-June and October-November: female-calf pairs (n=20 for each herd)

**Measurements:**
- body mass (kg)
- body size: body length, chest girth and hind foot length (cm)
Females body condition

• Body mass of adult females responded to an increase of population abundance

• Similar trends for body size measurements
**Females body condition**

- **June 2007 - Calving**
  
  **Leaf**: 7 kg lighter than **George**

  No difference in skeletal size

- **Oct-Nov 2007 - Weaning**

  **Leaf**: 10 kg lighter than **George**

  6% less kidney fat

  No difference in skeletal size
Calves body condition

- **In both herds**: rapid decline of calves’ body mass in response to an increase in population abundance.
Calves body condition

- **June 2007 - Calving**
  - George calves: +1kg body mass
  - +12% kidney fat
  - +1.3cm foot length

- **Oct-Nov 2007 - Weaning**
  - George calves: +10kg body mass
  - +7% kidney fat
  - +3 cm foot length
Conclusion

• Close relationships between the body condition of females and calves and population abundance
• Rapid response of calves body mass to population abundance
• Great differences between herds

Development of indirect indicators (e.g. body condition) for ecological monitoring of the abundance of caribou herds
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