



Effects of Body Condition and Population Size on Gestation Rate in a Migratory Caribou Herd

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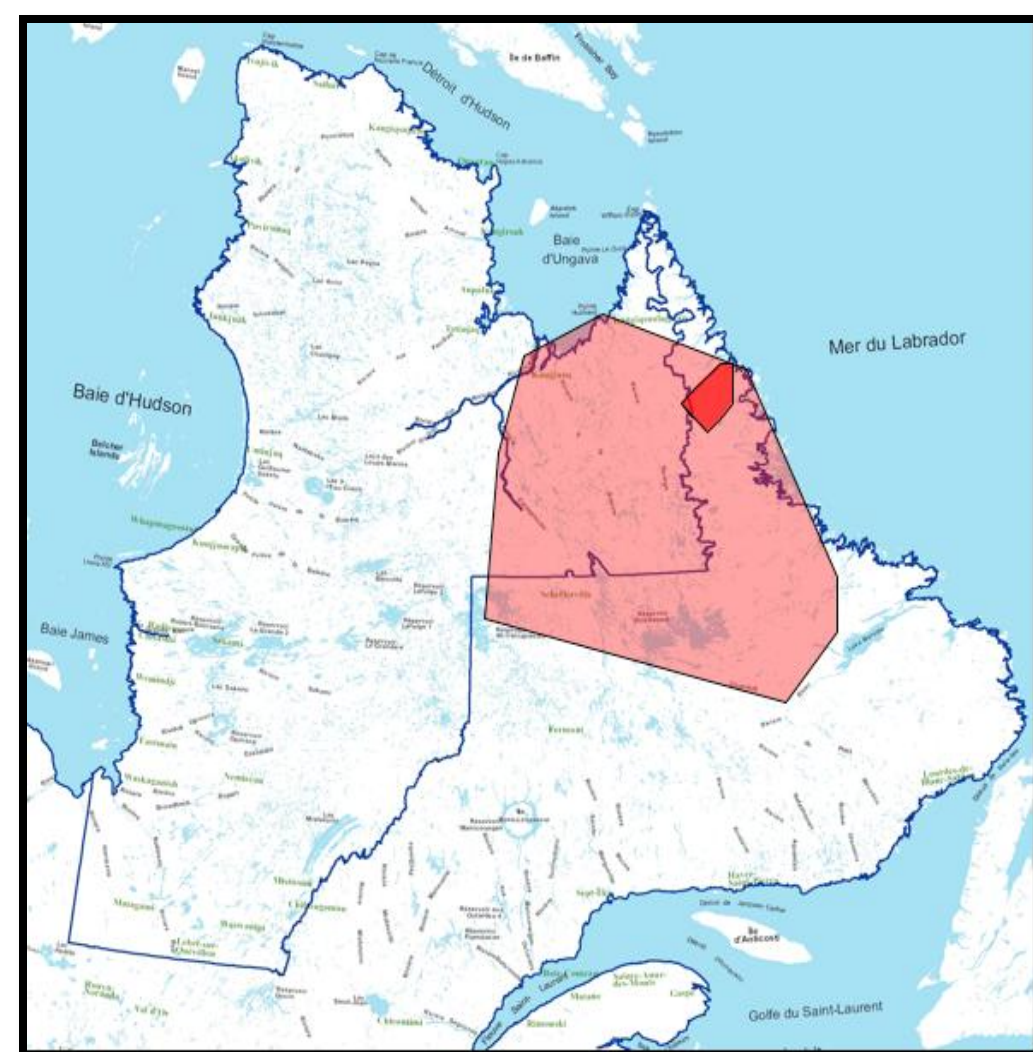


Introduction

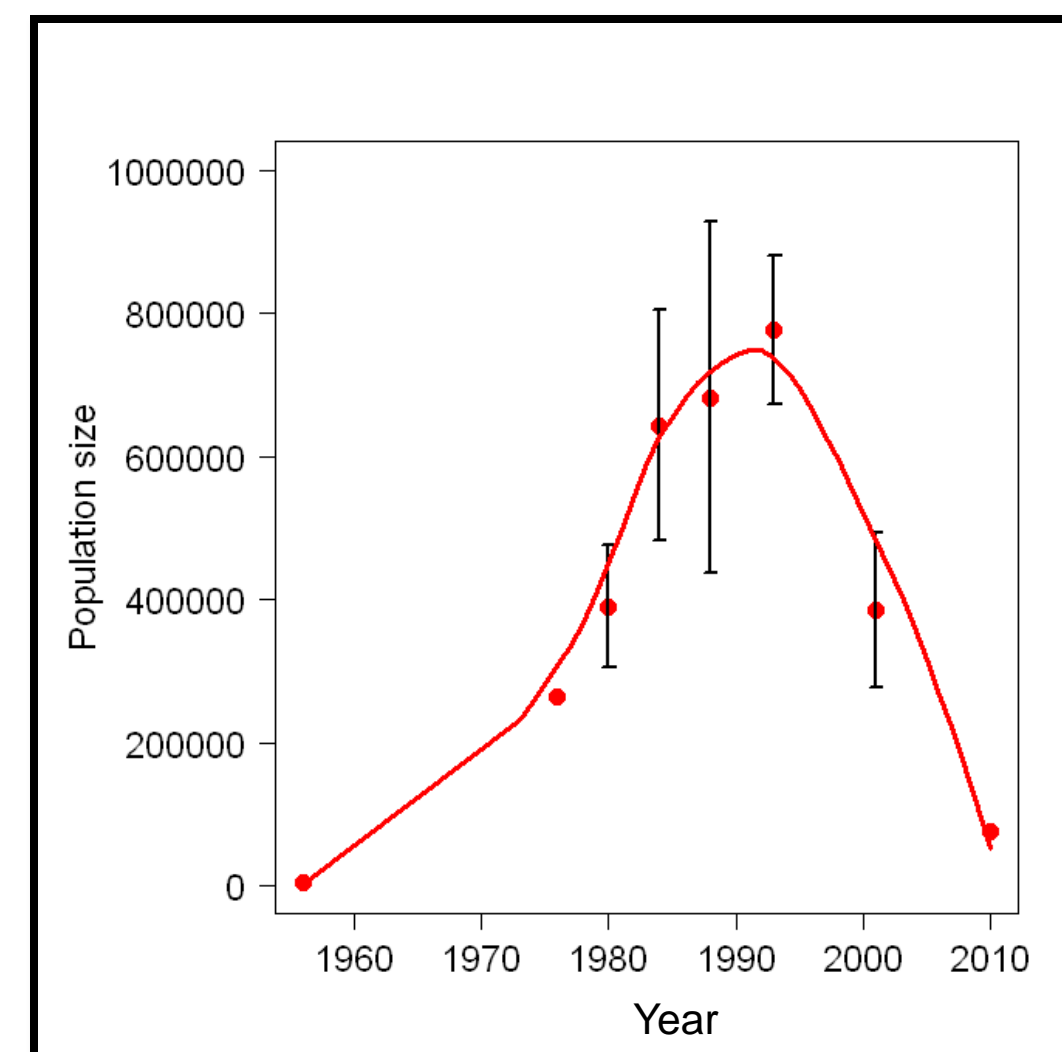
Female **fecundity** drives **population dynamics** as it affects population productivity. In many ungulates, including **caribou (*Rangifer tarandus*)** females in better condition (heavier and fatter) are more likely to reproduce compared to females in poorer condition. Multiparous long lived species, like caribou, often adopt a conservative **reproductive strategy** at high population **density** in order to maximize maternal survival.

Our objectives were to determine if
 (1) the relationship between body condition and fecundity was conserved in a migratory caribou herd
 (2) females of similar body condition were less fecund at high population densities, thereby adopting a conservative reproductive strategy

The Rivière George Herd (RGH)



The RGH range for 2009, in Northern Québec and Labrador, an area of ~213 390 km² (red polygon) with its calving ground (dark red polygon).



Demographic trend of the RGH including confidence intervals and estimated population size from loess smoothing (red line).

Methods

- Five years of body condition data (1980, 1984, 1986, 1987 and 2002)
- 156 known aged females, 3 years and older
- Presence or absence of a foetus in Spring (March- April)
- Body condition indices: mass, percentage of body fat, hind foot length, parasite load (number of warbles)
- Population size as a continuous variable, grouped according to trend, and grouped based on population size (trend2)
- Corrected for fat loss over the collection period for pregnant females to March 23.

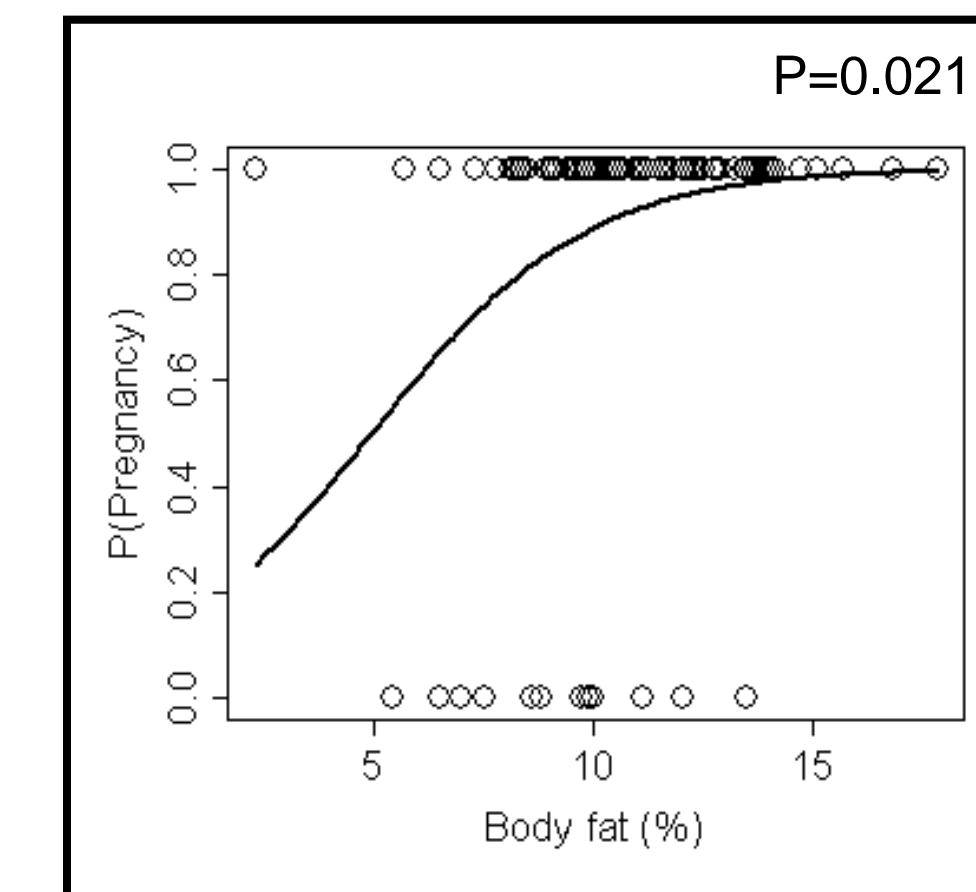
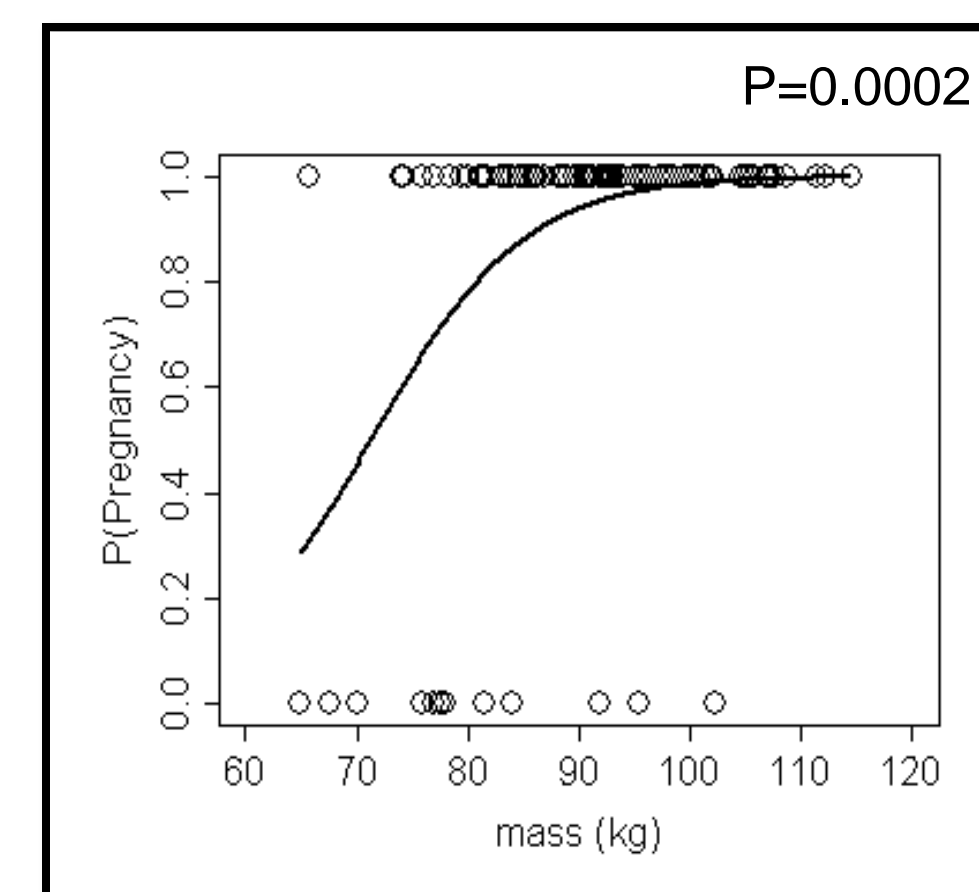


We used **simple and multivariate logistic regressions** to model the probability of pregnancy based on body condition indices and population size and trends. **Statistical analyses** were performed using R software version 2.9.2. (R Development Core Team 2009).

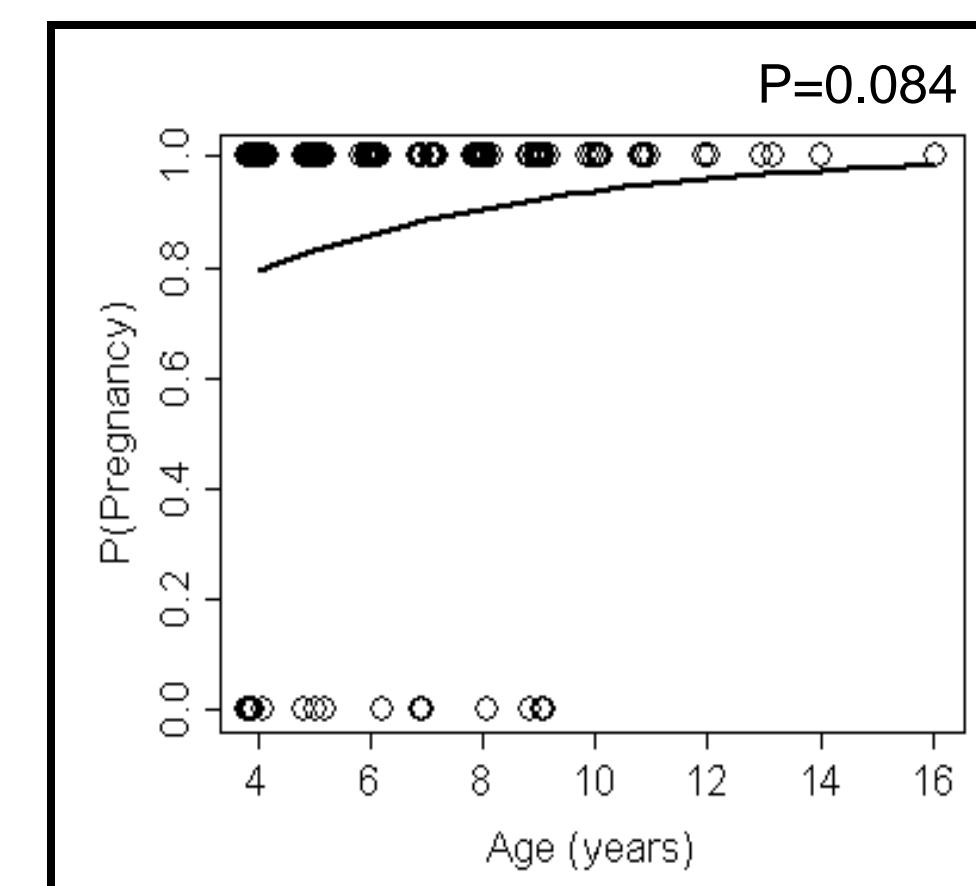
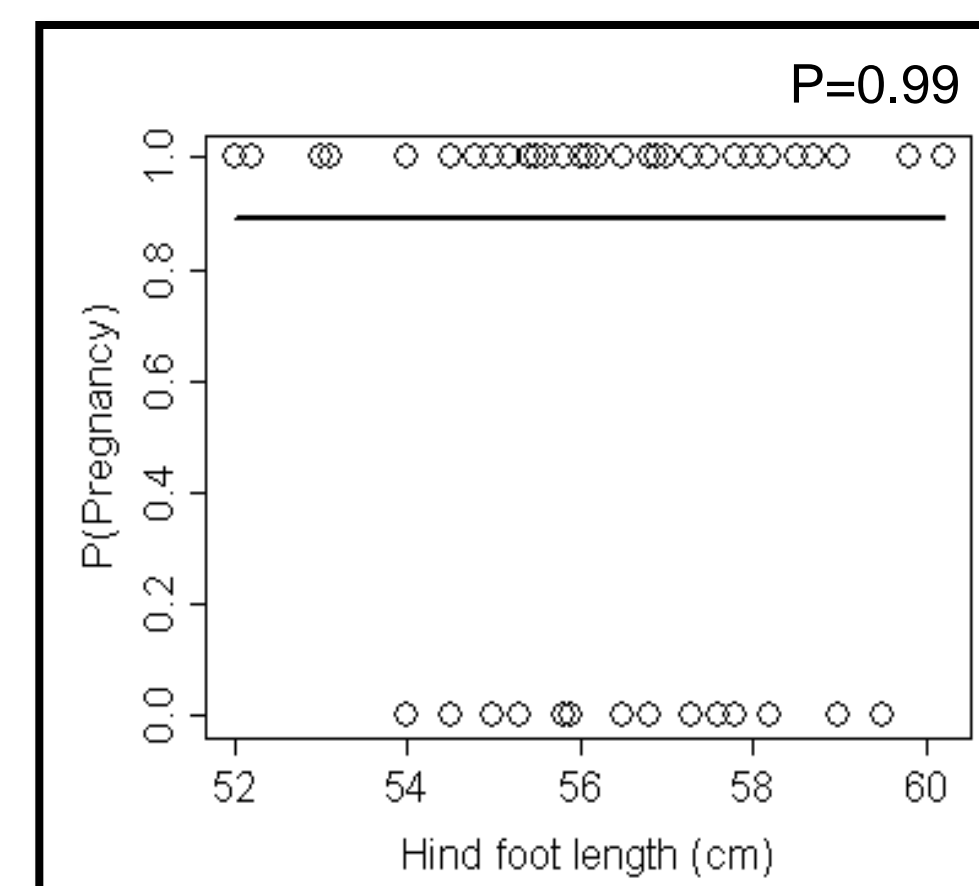
Results [1]

Individual Predictors of Pregnancy

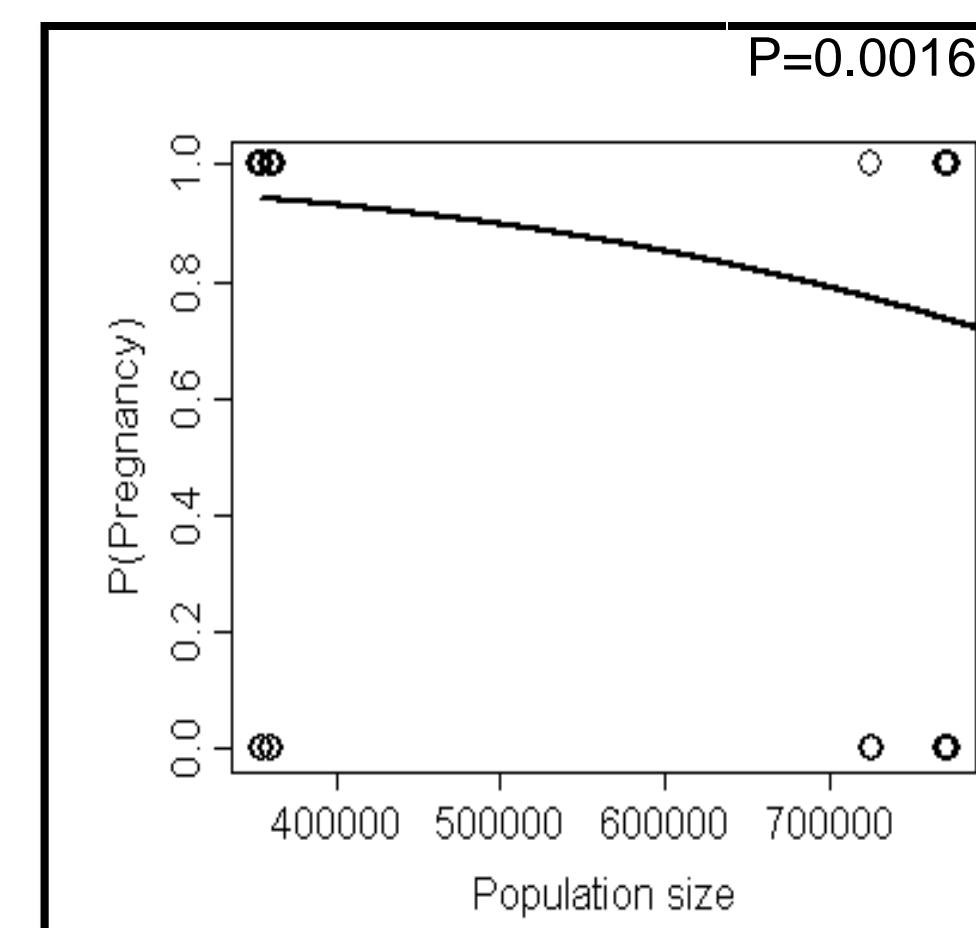
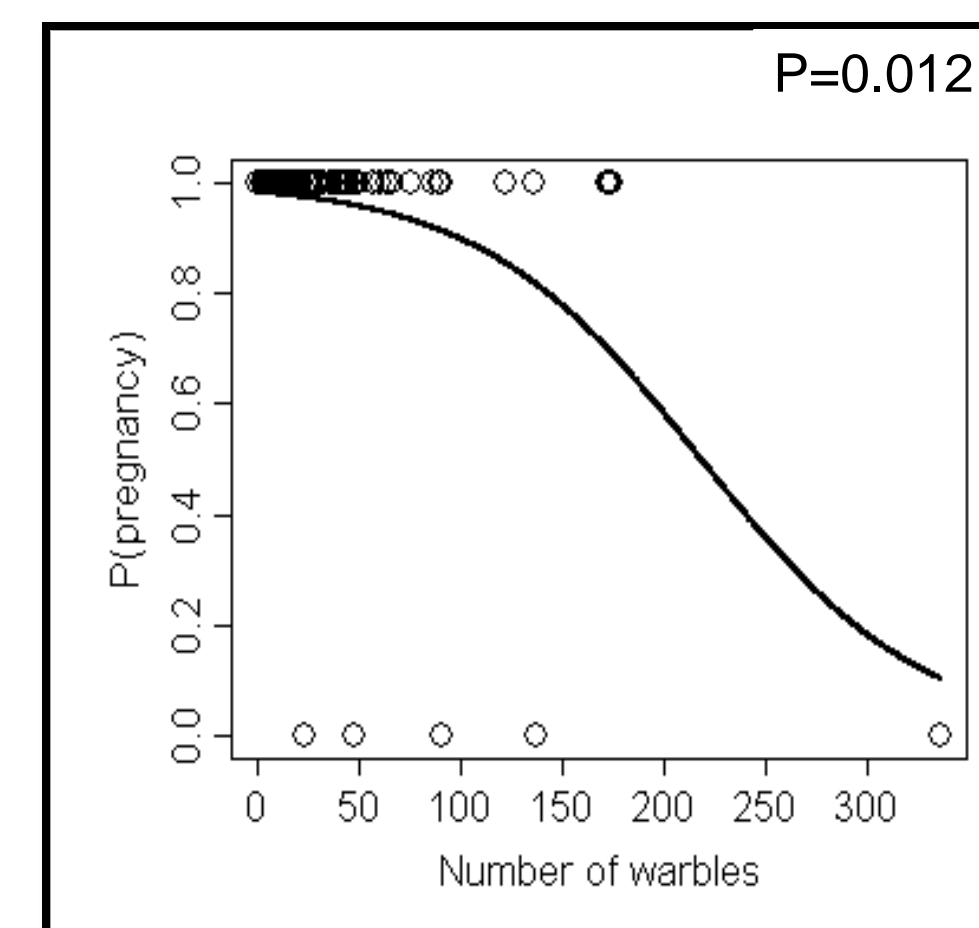
Body mass and **percentage of body fat** were **positively** correlated with **probability of pregnancy**.



Hindfoot length and **age** were **not significantly** related to the **probability of pregnancy**.



Number of warbles and **population size** were **negatively** related to the **probability of pregnancy**.

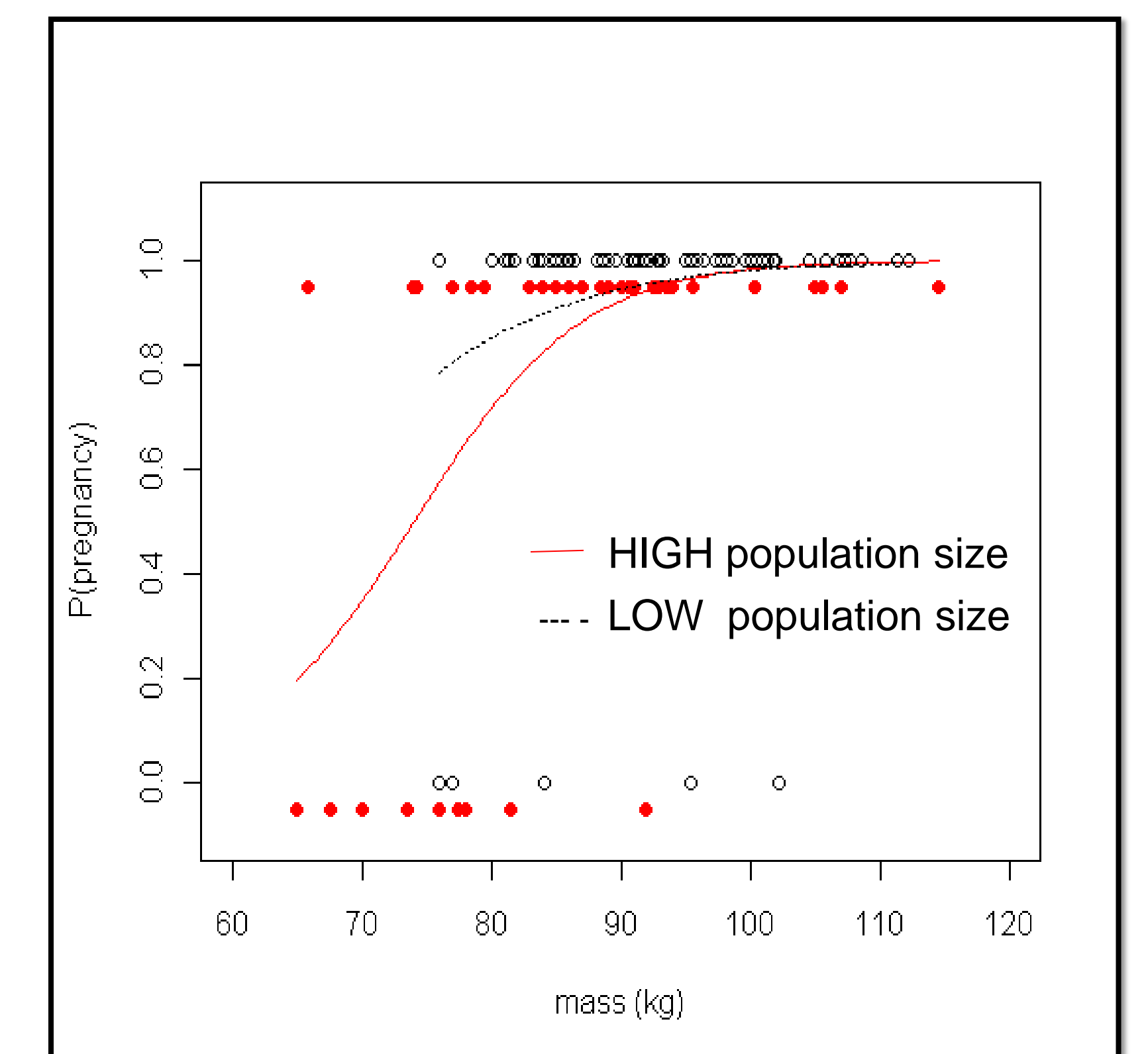


Results [2]

Population Size as a Predictor of Pregnancy

Mass ($p=2.02 \times 10^{-5}$) was the only significant variable in multivariate logistic models. **Hindfoot length** ($p=0.07$) and **age** (0.09) were almost significant.

The relationship between **mass** and **gestation** **did not vary** according to **population size**. Population size ($p=0.25$), trends ($p=0.33$) and interactions were not significant.



No significant difference between the logistic regressions comparing **high** and **low** population sizes ($p=0.39$).

Conclusions

The relationship between mass and percent body fat with gestation was conserved in the RGH but did not vary with population size. Based on gestation, caribou from the RGH do not adopt a conservative reproductive strategy.

However, more conservative strategies may be observed in date of birth, maternal investment and maternal care post calving.

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