Influence of population density on white-tailed deer movements and activity budgets

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Study area
Anticosti is a 7,943 km² island located in the Gulf of St. Lawrence, Québec. White-tailed deer were introduced on Anticosti in 1896 and, in the absence of predators, they increased rapidly and had dramatic negative impacts on the vegetation.

Methods
We fitted VHF collars to deer introduced in enclosures. Collars were equipped with motion sensors that allowed us to remotely quantify deer activity budgets continuously with an automated receiver-datalogger.

Results and Discussion

Activity budgets
- Mean proportion of daily active time did not significantly differ by month or by density.
- The length of active and inactive bouts and the number of activity cycles were not affected by density. However, the number and length of activity bouts varied by month.
- Deer could have increased the number of daily activity bouts because forage in July is less abundant but more easily digested than at the end of summer.
- Deer at 25 deer/km² had inactive bouts 15 min longer in September than in June and July 2003 and inactive bouts for densities of 7.5 deer/km² and 15 deer/km² were 15 minutes longer in 2002 than in 2003.
- Deer activity varied significantly by time of day and by month (see figure 1).

Conclusions
Our hypothesis 1 and 2 on the effects of deer density on activity budgets were not verified. Time budgets appear to be more affected by changes in plant phenology and classical diel activity patterns.

Experimental design
We manipulated density in 3 sets of enclosures (or blocks). Enclosures were built around clearcuts where 30% of the residual forest was left.

Figure 1. Daily activity patterns by month for white-tailed deer on Anticosti Island, Qc. Daily activity patterns varied by hour and month, with peaks at dusk and dawn. Data for June and July 2002 and 2003 is reported.

Figure 2. Mean distance moved per hour per female deer on Anticosti Island according to density. Error bars show 95% confidence intervals.

Figure 3. A schematic map of a block where we manipulated density.