

An ICE-based monitoring for roe deer in sympatry with red deer in Belgium

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Introduction

In Belgium, roe deer is the most common wild ungulate. The species is widely spread and shares around 55 % of the forests with red deer in South Belgium. Since the indicators of ecological change (ICE) are validated for roe deer living without any interaction with other ungulates, we investigated the same ICE in forests where both species are sympatric to assess their relevance and sensitivity.

The Hertogenwald forest (6000ha) is one of the Belgian study areas. The bag statistics show that it is mainly dominated by red deer : the ratio culled red:roe deer = 4:1. Since 2004, several ICE are measured on roe deer.

ICE used

Indicators of animal performance measured on culled animals during the hunting season (from October till December) are based on :

- Condition : body mass (BM)
- Constitution : jaw lengths : total jaw length (TL) and minimal diastema height (MDH)
- Fertility : number of corpora lutea (CL) of ovaries

Also, each deer is sexed and aged, considering different age classes determined by using dental eruption and tooth wear.

Indicators of population abundance (measured between February and April) :

- Kilometric index (KI) : number of roe deer per kilometre of transect sampled on foot at dawn and dusk
- Night kilometric index (NKI) : number of roe deer per kilometre of road sampled by night counts

As the red deer population declined continuously from 2004 till 2012, we used the NKI red deer to analyze the possible impact of red deer on roe ICE.

First results

Indicator of condition

- The BM is statistically different between age but not between sex : 8,3 ($\pm 1,7$) kg for calves and 14,1 (± 2) kg for adults
- For calves and adults, linear regressions are significant between BM and KI (or NKI roe deer but not with NKI red deer)

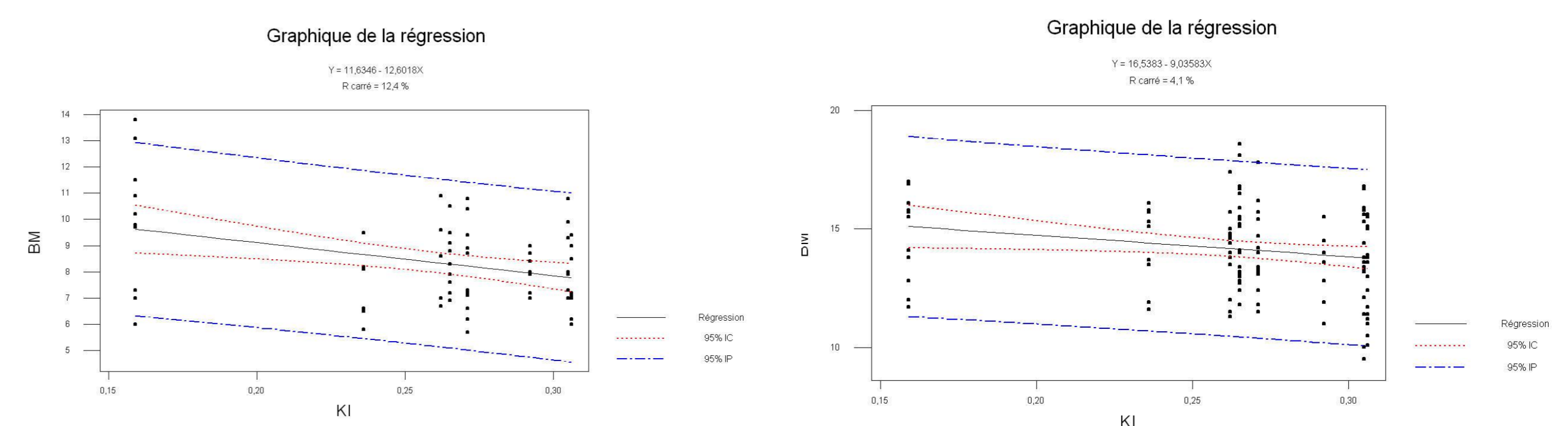


Fig. : Linear regressions between body mass (BM ; kg) and kilometric index (KI) for calves (left) and adults (right)

Indicators of constitution

- TL and MHD are statistically different between age but not between sex : TL : 120,00 ($\pm 5,38$) mm for calves and 143,09 ($\pm 5,61$) mm for adults ; MHD : 9,11 ($\pm 0,72$) mm for calves and 10,04 ($\pm 0,67$) mm for adults
- Linear regression between TL and KI is significant for calves
- Linear regression between MHD and KI is not significant for calves (nor adults)

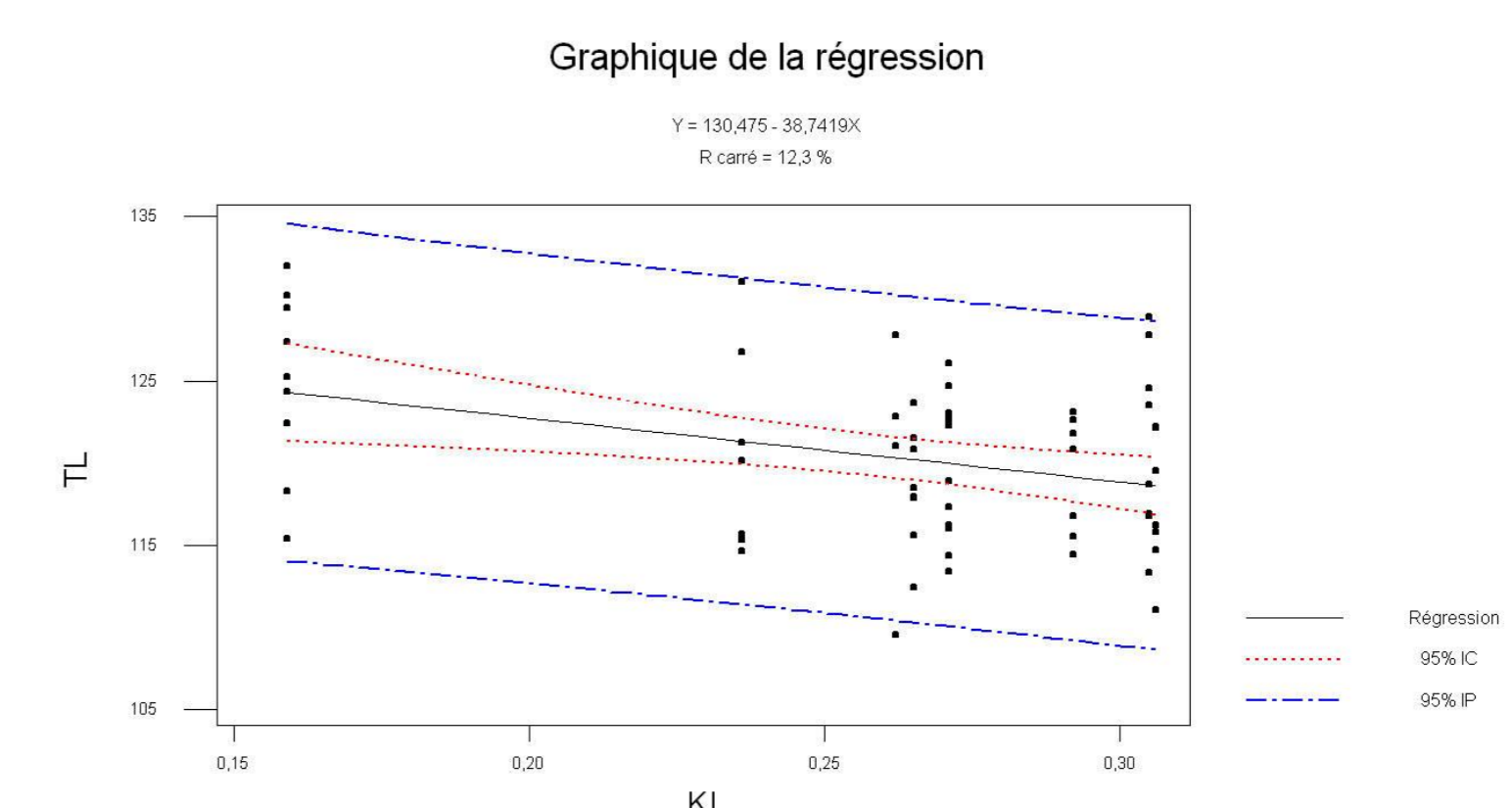


Fig. : Linear regression between total length (TL; mm) and kilometric index (KI) for calves

Indicator of fertility

- Differences between yearlings and adults are almost significant : mean number of CL = 1,4 ($\pm 0,6$) for yearlings and 1,8 ($\pm 0,5$) for adults
- 80% of adults have 2 or 3 CL (2% are no pregnant, 18% with 1 CL, 78% with 2 CL, 2% with 3 CL)
- The regressions with the different indicators of population abundance are not significant
- The regression between BM and the number of CL is significant. The mean body mass of adults with 0 / 1 / 2 / 3 CL is respectively 9,1 / 13,8 / 14,5 / 16,1 kg

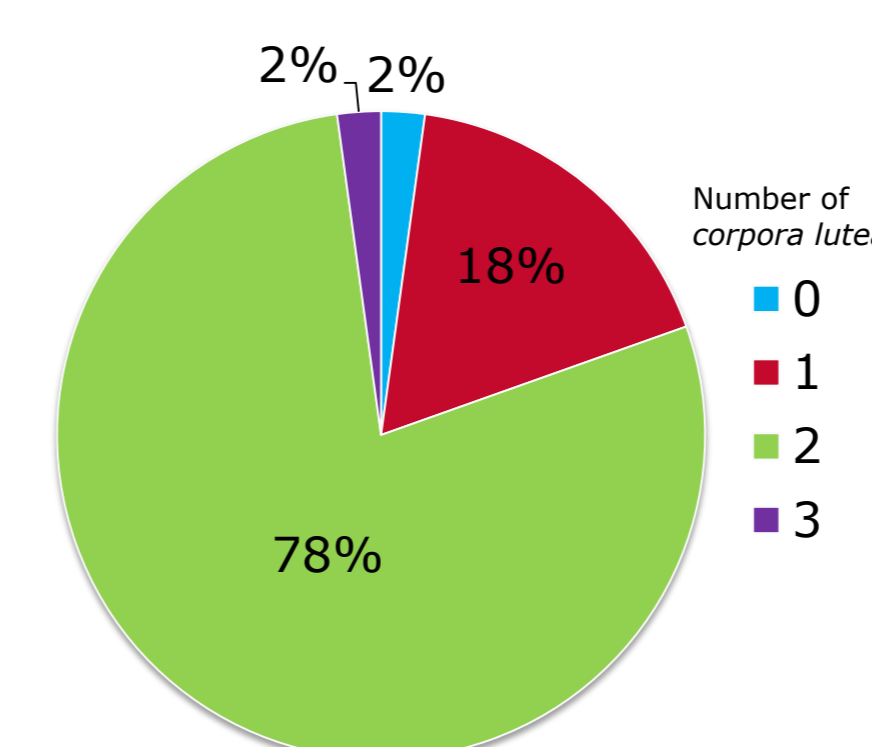


Fig. : % adults with 0, 1, 2 or 3 of corpora lutea of ovaries

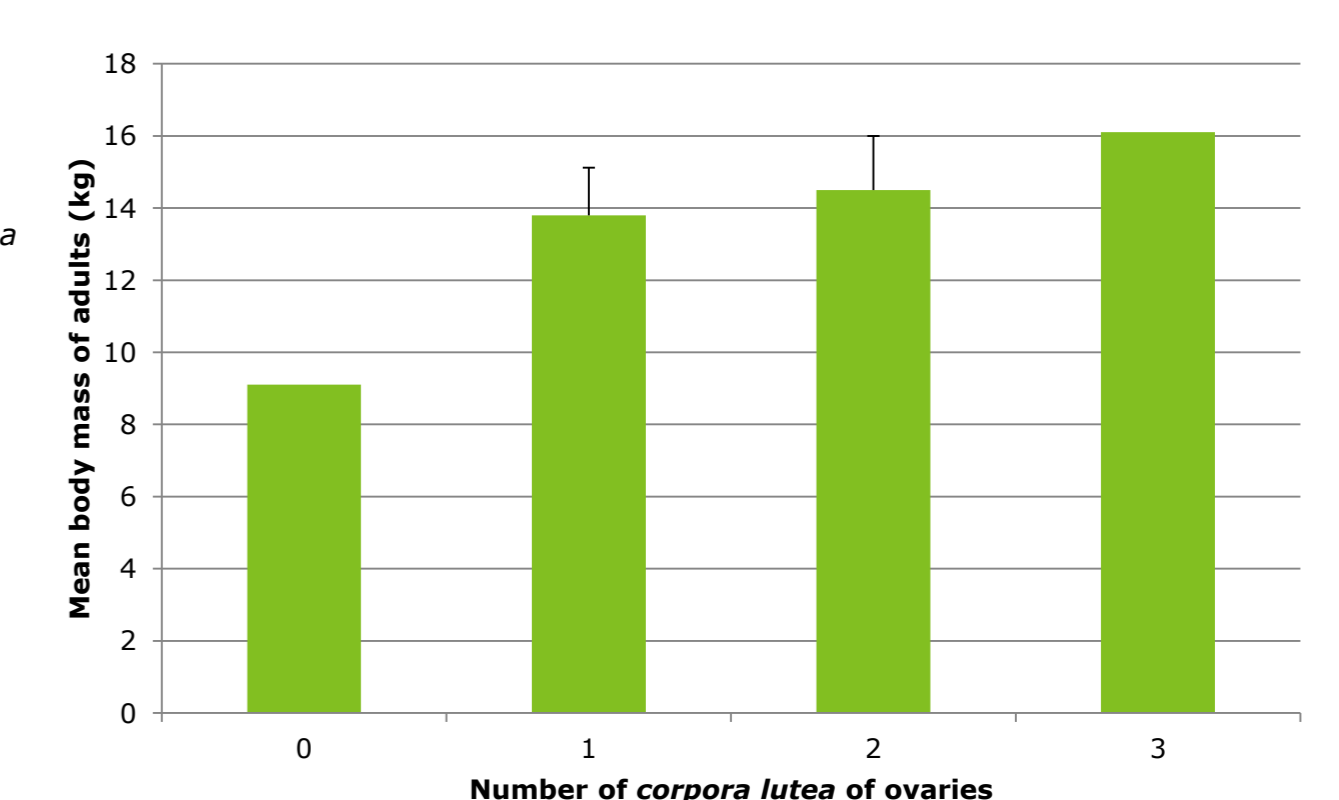


Fig. : Mean body mass of adults (kg, \pm SD) with 0, 1, 2 or 3 of corpora lutea of ovaries

Conclusion

The ICE monitoring showed coherent results for roe deer. No indicator seems to be affected by red deer variation in density even if mean values of the indicators are lower than these observed in forests free of red deer.

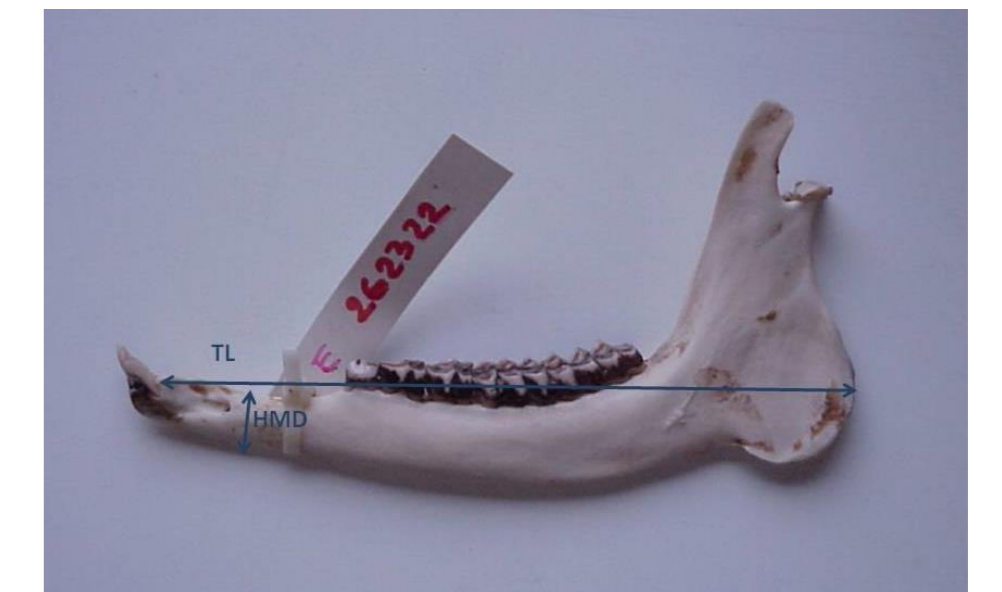


Fig. : Jaw lengths : total jaw length (TL) and minimal diastema height (MDH)

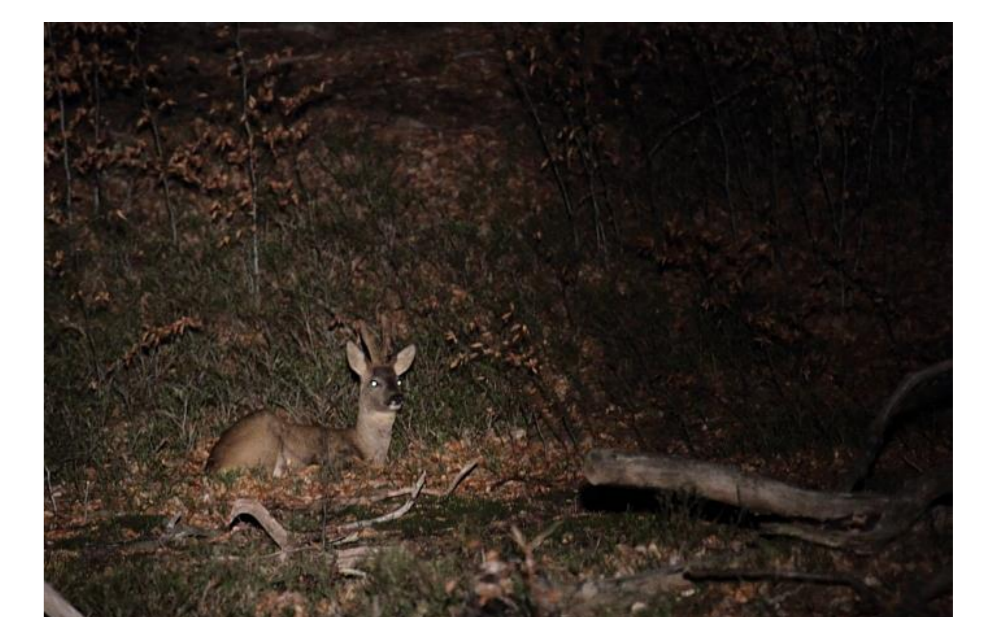


Fig. : Roe deer during night counts ©Nicolas Van Hove