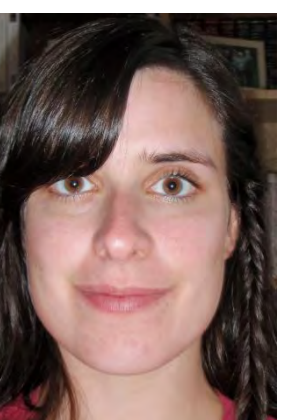


The quality of neighboring plants at multiple spatial scales modulates winter browsing on fir by white-tailed deer

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1. Neighboring plants can decrease or increase the degree of herbivory suffered by a plant

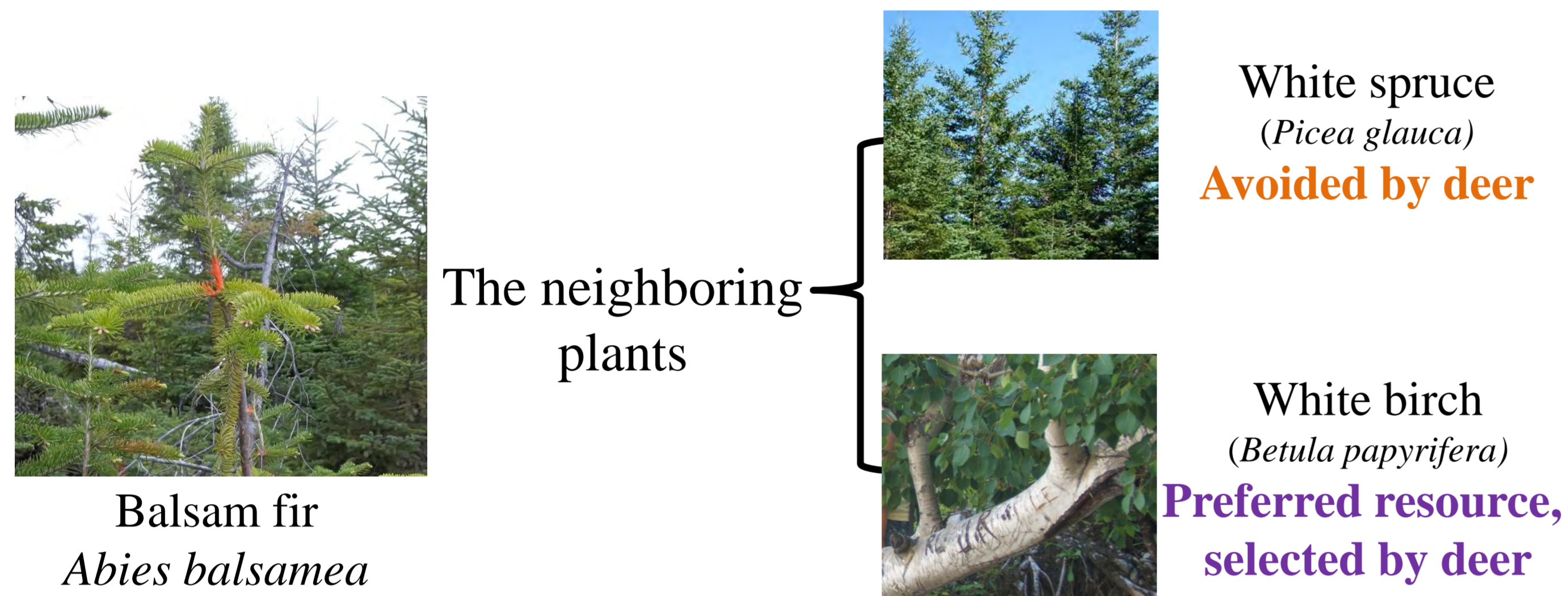
Associational effects result from the hierarchical resource selection process of herbivores, from a home range to a bite [1].

Larger scales of selection are usually influenced by the most limiting factors, such as predation, while selection at finer scales is mostly determined by resource selection [2].

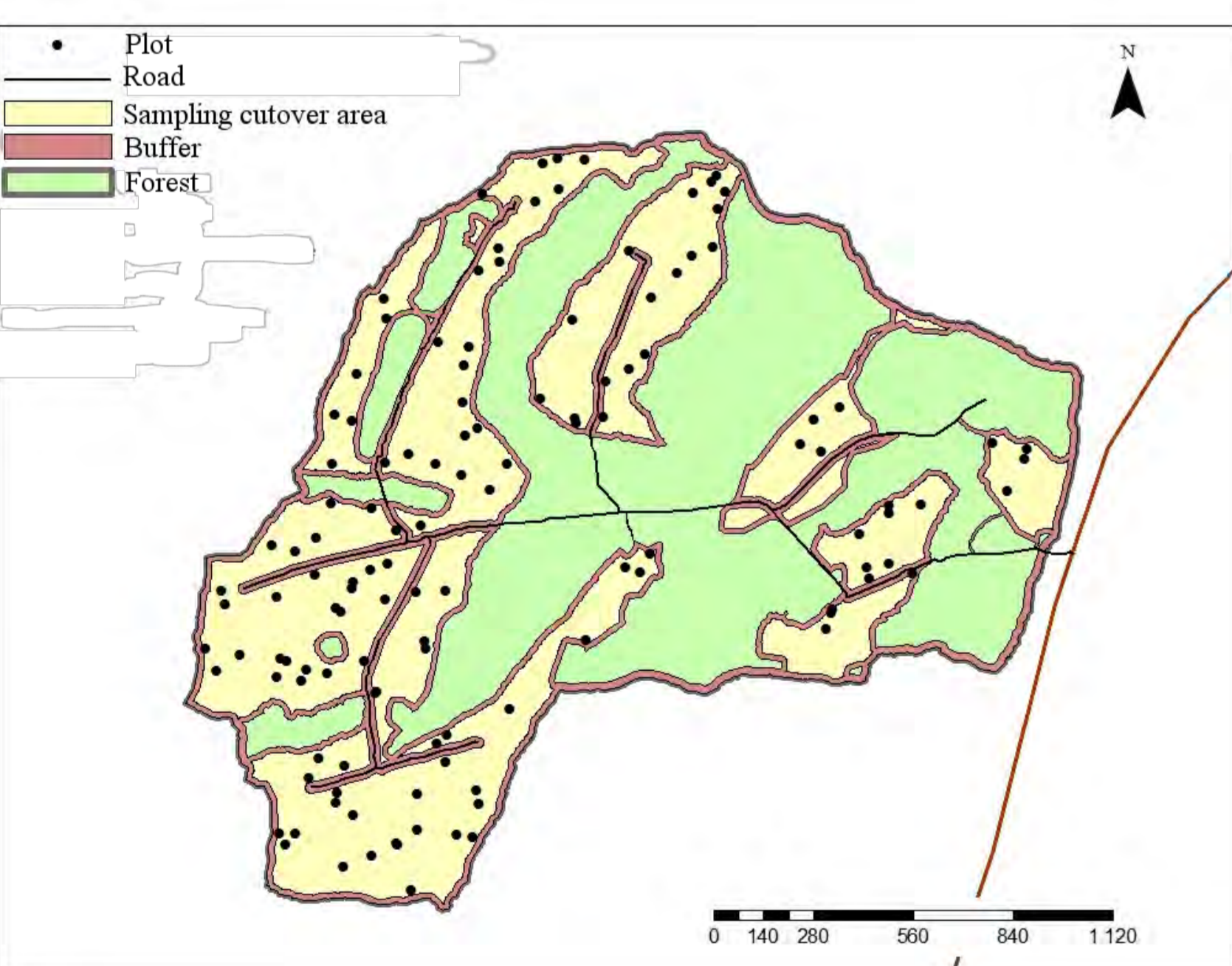
But what is a fine scale for herbivores? **At which distance do neighboring plants no longer influence the decision of whether or not herbivores eat a plant?**

2. Objective:

Determining the spatial extent of neighbor effects on the degree of white-tailed deer herbivory on balsam fir



3. On Anticosti Island, we measured deer browse on fir with neighbors varying in abundance and nutritional quality



- 12 year-old cutover, with dense regeneration of fir, spruce and birch
- 125 plots of 40 m²
- Data available:
 - Deer browse on fir
 - Number of firs, spruces and birches
 - Chemical composition for all spp.
 - % Fibre
 - % Nitrogen content

4. We tested the correlation between browse on fir and neighbor attributes at various scales

Variables tested using cross-correlations :

- Not correlated with consumption: number of spruces, number of firs, number of birches, nitrogen content of all species, fibre content of birches
- **Correlated with consumption: fibre content of spruces and of firs**



E.C. received additional funding :



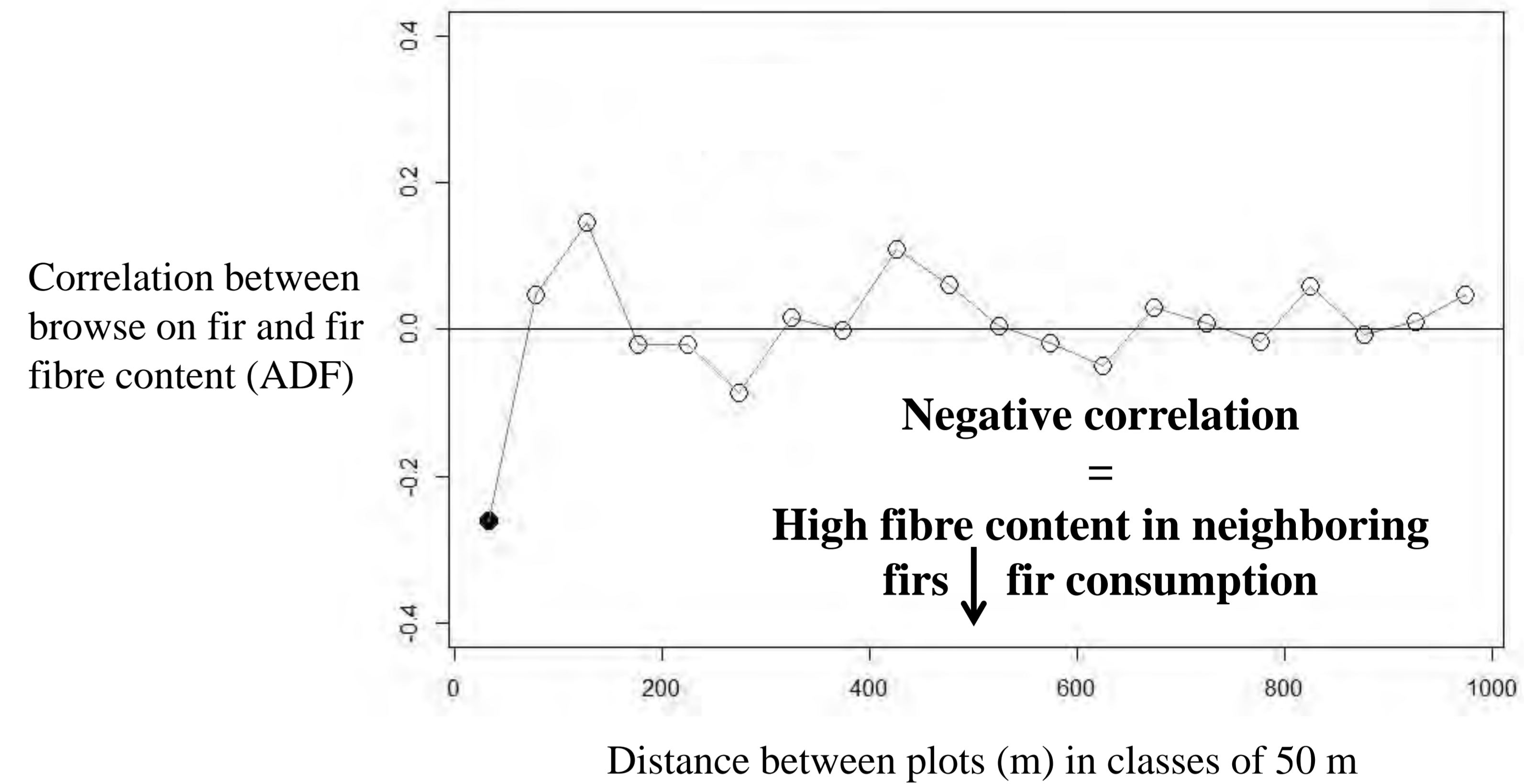
[1] Johnson, D.H. 1980. Ecology 61: 65-71

[2] Rettie, W. J. and F. Messier. 2000. Ecography 23: 466-478

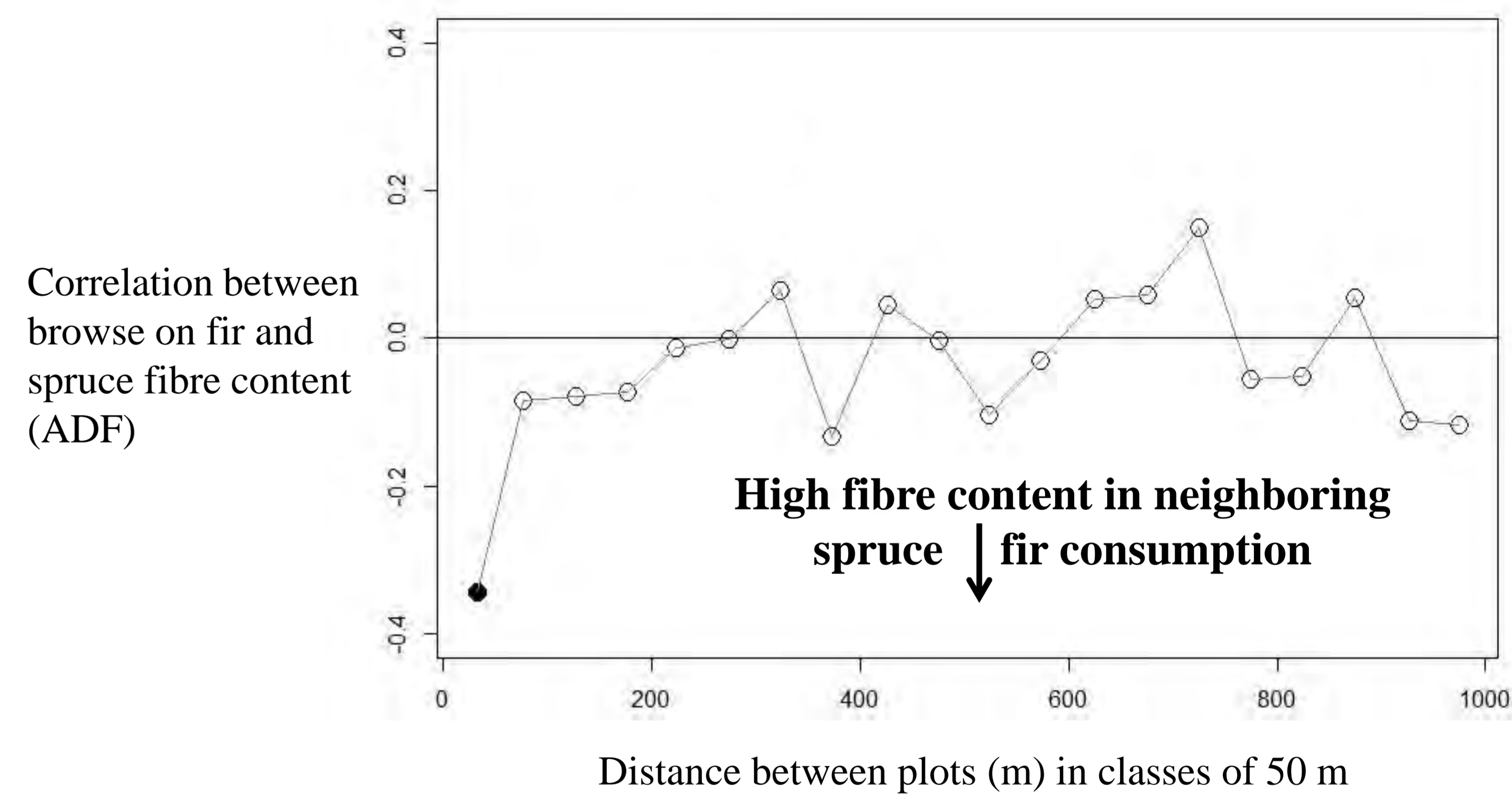
[3] Sauvé, D. G. and S. D. Côté. 2007. Journal of Wildlife Management 71: 911-914

[4] Bergvall U. A. et al. 2008. Ecoscience 15: 343-348

5. Browse on fir was negatively correlated with the fibre content of neighboring firs between 0 and 50 m



6. Spruce fibre content was also negatively correlated to herbivory on fir at the same spatial scale (0-50 m)



7. Low nutritional quality neighbors could decrease the amount of herbivory on balsam fir at fine spatial scales

- The spatial variation in **fir and spruce quality is correlated with the degree of herbivory on fir** at a fine scale. White-tailed deer avoid fibre-rich food [3], as **fibres can reduce digestibility**.
- The level of herbivory could be increased by increases in fir quality. Deer can select forage according to intraspecific variation in nutritional quality [4]
- **How could the quality of an avoided resource (white spruce) influence browsing on fir?** Two hypotheses:
 - Areas with spruce rich in fibre are avoided by deer
 - High fibre content in spruce correlates with an unmeasured constituent (e.g. terpenoids) reducing fir digestibility