

## Reply to referee 2 – second revision

We thank the referee for checking the manuscript and for these additional comments. Please see the corrections in the revised manuscript.

l.297-299 I think it is less important to mention here that *Betula* is an invader. The main point is to link periods of cool conditions, predominantly herbs and dwarf shrub vegetation with and less fire (by providing a lesser amount of fuel to burn) and periods of increased tree proportion, warmer climate, and more fuel to burn.

Newline 292-299: We modified the paragraph evaluating the association between fire regime and vegetation density and composition.

l.313 The sentence “Some woodland regenerations are seen throughout the late Holocene, the most apparent one at 1.6 kyr BP. Stable fire fluxes may thus reflect cooler climate conditions with more sparse vegetation is the HNAR”. I am confused by these statements, which seem to contradict. I see an increase in levoglucosan in your record during DA. You mention an increase in woodland cover around 1.6. Can this rise in levoglucosan be linked to expansion in tree cover and thus more fuel?

Newline 314-316: We rephrased the sentences. Low fire fluxes from 4.5 kyr are concomitant with sparse vegetation in the HNAR, with a recovery at 1.6 kyr BP.

l.328, Please be aware that above you said that the Vikings cut down not burnt the forests, which makes sense as they did not have much wood anyway, then talked about the loss of vegetation cover, whereas on this line you attribute the reduction in levoglucosan to the reduction in forest fires. To avoid confusion of fire origin please revised these sentences.

Newline 323-327: We modified the text. Our hypothesis is that land clearance led to decreased fuel availability and thus decreased fire proxies.