

EGU22-2463

<https://doi.org/10.5194/egusphere-egu22-2463>

EGU General Assembly 2022

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



## Role of human impact on fire history and vegetation succession in one of the oldest protected forests in Europe

Niina Kuosmanen<sup>1</sup>, Tuomas Aakala<sup>2</sup>, and Heikki Seppä<sup>1</sup>

<sup>1</sup>Department of Geosciences and Geography, Faculty of Science, P.O. Box 64 (Gustaf Hällströmin katu 2), FI-00014, University of Helsinki, Helsinki, Finland

<sup>2</sup>School of Forest Sciences, University of Eastern Finland, FI-80101 Joensuu, Finland

Fire is naturally an integral part of the northern boreal forests dynamics. However, anthropogenic activity has greatly affected the fire history in Fennoscandia, especially during the last millennia and the effective fire suppression practically led to the absence of a natural fire regime in boreal forests in Finland. However, the changing climate conditions may increase the risk of severe fire events regardless of the fire management. Therefore, it is important to look into the long-term interactions between human impact, fire and vegetation succession in order to understand the possible future role of fire in boreal forests.

One of the oldest protected areas in Europe is located in Central Finland and provides a good opportunity to investigate the change from natural fire and vegetation dynamics to human controlled fire regime and the natural vegetation succession after cessation of the slash-and-burn cultivation. The site is known to have been under slash-and-burn cultivation until the beginning of the 19<sup>th</sup> century and the last known burnings were done in the 1840s after which the site has been left to natural succession. The site was partly protected in 1911 and it was included into national the old-growth forest reserve protection program in 1994.

In order to investigate the long-term natural fire history and the role of human impact in the fire and the vegetation dynamics during last 3000 years we collected peat cores covering from two small forest hollows from the Kuusmäki old-growth forests protected area. Macroscopic (> 150 µm) charcoal and *Neurospora*-fungal spores are used to reconstruct the fire history and pollen analysis is performed to reconstruct the long-term vegetation dynamics in the study area.

The preliminary results demonstrate an increase in charcoal abundance from 16<sup>th</sup> century suggesting increased fire activity and a more intensive period of slash and burn cultivation in the area until the beginning of the 19<sup>th</sup> century. The absence of charcoal during the last century suggests absence of fire after the cessation of slash and burn cultivation. These results together with the vegetation succession will be further discussed in the presentation.