

The Impact of Fire Cultivation on the Development in the South-Estonian landscapes
Robert G.H. Bunce, Kalev Sepp, Pille Tomson

Europe's countryside is characterized by a rich diversity of cultural landscapes and has been shaped by traditional land-uses. These landscapes provide the support for high levels of biodiversity (Plieninger et al., 2006). Fire cultivation was used in Europe up to the 20th century and prescribed burning influenced the biodiversity for an extended period (Goldhammer, 2004). Slash-and-burn cultivation has played an important role in land use in Estonia for about 4000 years and has been practiced in all regions of Estonia. This practice survived up to the early 20th century, having a higher priority in Eastern and Southern Estonia (Jääts et al, 2010). As with all traditional cultivation systems, slash-and burn cultivation has shaped modern landscapes (Sjogren, P., Arntzen, J.E., 2013), the impacts have yet to be examined.

In historical Baltic German sources the term *buschland* has been used to identify areas regularly used for slash and burn cultivation. *Buschlands* has been described as an area covered by young trees and bushes, where small plots were selected for fire cultivation in 20-25 year cycles. This special land category *buschland* has been demarcated on 19th century cadastral maps.

By using historical maps, it is possible to identify and locate these former regularly burnt areas and examine the traces left by fire cultivation on the present natural environment and landscapes.

The aim of this study is to explain the extent of the *buschlands* in traditional rural landscapes, their changes and role in contemporary landscapes, and the future study needs for nature conservation planning.

The study area is situated in Karula National park in South-Estonia. 51 farms were analysed using digitized cadastral maps dating from the 1870s. Permanent fields, *buschlands*, hayfields and other land types of the 19th century are marked on these maps. For comparison, digitized topographical maps dating from the early and mid-20th century, and the Cadastral Base Map from 1985–1987, and the Estonian Basic Map from late 1990s were used. Comparison of the maps was undertaken using MapInfo Professional 6.5.

The outcomes of this research indicate that *buschlands*, the plots used for slash and burn cultivation occupied the largest percentage (33%) of the analysed farmlands, followed by areas used as grasslands (26%) and permanent fields (22%), the remaining land cover consisted of fens, bogs, heaths and small woodlands. The large proportion of *buschlands* can be associated with Karula's complex relief, as they were mainly situated along the hills and steep slopes. By the beginning of the 20th century, crucial changes had occurred in the land use and landscape appearance. Following the cessation of fire cultivation, the *buschlands* assumed new functions and appearance: 70% of them were transformed into arable lands, 19% forested and 9% were utilized as meadows.

Throughout the 20th century, the former *buschlands* underwent new major changes, 79% of them have become forested, forming a new specific landscape pattern with forested cuppolas and surrounding fields and grasslands. Preliminary studies show the same pattern in other areas of South-Estonia.

One third of the forest in Karula National park was formerly farmland and 46% of these were previously slash and burn areas. Whether, and how, slash and burn cultivation has affected the character and nature values on this secondary forests, and how this information must be considered in the nature conservation management, requires further study.

Goldhammer, J.G. 2004. The use of prescribed fire in the land management of Western and Baltic Europe: an overview. *International Forest Fire News (IFFN)*, 30 , 2–13). http://www.fire.uni-freiburg.de/iffn/iffn_30/01-IFFN-30-Europe.pdf.

Jääts, L., Kihno, K., Tomson, P., Konsa, M. 2010. Tracing fire cultivation in Estonia. *Forestry Studies. Metsanduslikud Uurimused* 53, 53–65.

Plieninger, T., Höchtl, F., Spek, T. 2006, Traditional land-use and nature conservation in European rural landscapes. *Environmental Science & Policy* 9, 317–321.

Sjogren, P., Arntzen, J.E. 2013. Agricultural practices in Arctic Norway during the first millennium BC. *Vegetation History and Archaeobotany*, 22 (1), 1–15.