

## **The impact of ancestral heath management on soils and landscapes. A reconstruction based on paleoecological analyses of soil records in the middle and southeast Netherlands.**

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The evolution of heath lands during the Holocene has been registered in various soil records. Paleoecological analyses of these records enable to reconstruct the changing economic and cultural management of heaths and the consequences for landscape and soils.

Heaths are characteristic components of cultural landscape mosaics on sandy soils in the Netherlands. The natural habitat of heather species was moorland. At first, natural events like forest fires and storms caused small-scale forest degradation, in addition on the forest degradation accelerated due to cultural activities like forest grazing, wood cutting and shifting cultivation. Heather plants invaded on degraded forest soils and heaths developed. People learned to use the heaths for economic and cultural purposes. The impact of the heath management on landscape and soils was registered in soil records of barrows, drift sand sequences and plaggic Anthrosols. Based on pollen diagrams of such records we could reconstruct that heaths were developed and used for cattle grazing before the Bronze Age. During the Late Neolithic, the Bronze Age and Iron Age, people created the barrow landscape on the ancestral heaths. After the Iron Age people probably continued with cattle grazing on the heaths and plaggic agriculture until the Early Middle Ages. After 1000 AD two events affected the heaths. At first deforestation for the sale of wood resulted in the first regional extension of sand drifting and heath degradation. After that the introduction of the deep stable economy and heath sods digging resulted in acceleration of the rise of plaggic horizons, severe heath degradation and the second extension of sand drifting. At the end of the 19th century the heath lost its economic value due to the introduction of chemical fertilizers. The heaths were transformed into 'new' arable fields and forests and due to deep ploughing most soil archives were destroyed. Since 1980 AD, the remaining relicts of the ancestral heaths are preserved and restored in the frame of the programs to improve the regional and national geo-biodiversity.