

Heathland is defined by characteristics such as vegetation dominated by plants of the Ericaceae (heathers) family, dwarf shrub communities, few trees, sandy acidic soils and at altitudes below three hundred metres.

Today in most countries heathland is protected. Nevertheless, losses continue through inadequate management. Almost everywhere the traditional uses of the heathlands have ceased and, as a result of succession, the heathlands disappear under scrub and trees. To conserve them they must be actively managed and all too frequently the management has been insufficient, especially as burning and grazing are no longer practised so widely. The current estimates for British lowland heathland is ha. The national biodiversity action targets are to maintain this area and through restoration increase the area of heathland by ha Anon, European heathlands developed following forest clearances which commenced about years ago. At a few locations the clearance of forest to provide fuel for iron smelting occurred in the fifteenth and sixteenth centuries. It is now clear that the subsequent use of the land by humans was one of the factors which prevented the regeneration of the forest. Nevertheless, climate changes in the Sub-boreal period are thought to have Trans. About years ago, it is generally thought that open heathland largely lacking trees had become a well marked feature of the landscape wherever tracts of sandy acidic soils occurred Gimingham, ; Webb, There has been much speculation on the origin and persistence of the heaths and a variety of theories have been proposed reviewed by Gimingham, The early ecologists found the absence of trees difficult to explain, although it was widely recognised that a relaxation of grazing resulted in invasion by trees. It was thought that these areas had always been sandy, treeless wastes and that the heath Vegetation was a temporary stage reached during the succession from bare sand to forest. It was not until palynology and historical ecology developed that it become apparent that these areas formerly carried trees, that the trees had been removed through the activities of early humans, and that the same activities were responsible for maintaining the open heath. Many of these activities occurred in combination and the relative importance of each varied from region to region. It is important to note that these traditional activities had been responsible for the maintenance of open heathland until at least this Century and in a few areas the persistence of heathland today still relies on them. In western Norway, Faeroe Islands, Iceland, Shetland and other islands a characteristic land use was developed in combination with fishing. This land use was well established by Viking times and had persisted until the mid-part of this Century. In western Norway, the Settlements on the coastal heathland consisted of an infield area around the settlement devoted to pasture, hay meadows, and arable plots. An extensive outfield area consisting of heathlands was separated from this. The management of this system was not unlike that practised further south, particularly in the Netherlands and has been described by Kaland Cattle were kept in the byre during the winter, whereas sheep and horse grazed out of doors all the year round. To provide adequate forage on the heathland, small, irregularly shaped areas were burnt from time to time. This pattern of burning not only provided a continuous supply of nutritious forage, but created small-scale patterns of diversity in the Vegetation. Heather was cut on a years cycle to provide winter fodder for the animals in the byre. For fuel the farmers cut peat from the boggy areas on the heathland, again increasing the diversity of the Vegetation. In addition, during the autumn they dug the surface of the peat, allowed it to weather over the winter and then, when dried, they would sprinkle this material on the floor of the byre to absorb the excrement of the animals. This material together with the remains of hay and heather fodder was then periodically dug out of the byre and spread on the arable areas. These were small fields or beds, and often seaweed and fish entrails were added as well as peat and manure. This created raised soils of the "plaggen" type which were well formed by the Middle Ages. The remainder of the infield was used for hay production. Hence, there was a Trans. Here the heaths were used as a source of nutrients for the arable land; the transfer being effected by means of turf cutting and sheep grazing. Sheep were allowed to graze on the heath for about six hours during the day and were controlled by a shepherd with a dog. For the remaining eighteen hours they were confined in the barn in Order to collect their excrement. The meat and wool which they produced were considered by-products. Turf, in contrast to peat, was cut from the drier parts of the surrounding heathlands and laid on the floor of the barn

to absorb the excrement. Periodically, this material was taken from the barn and dug into the arable fields which surrounded each village. Cattle were kept in the barn all the year round and also supplied with turves. There was a flow of nutrients from the heath to the arable land through the animals and the barn. As a result of adding the turves to the arable land the soil level was raised and over the millennium from to the characteristic "plaggen" soils developed. In some places these soils were raised to a height of 1 m above the original soil level. The effect on the heathland was considerable. It maintained a low nutrient status and the presence of the grazing animals arrested succession to scrub and forest. In Jutland Denmark a similar system operated. The heaths were grazed principally by sheep, which remained out all the year round and which were frequently supervised by a shepherd. Cattle were also grazed, but often tethered and periodically taken to their stalls to collect their dung. Winter fodder for these animals was collected by cutting young heather and mixing it with lichens and hay. Turves were cut for fuel and a variety of other uses, including house insulation and, as was the case further south, this material was used to absorb the excrement of the animals either in the stable or in the farm yard. This material was then used to fertilise the arable land. To provide additional fertiliser, turves were burnt and the ash scattered on the arable land or mixed with the turves from the stables. The permanent arable areas were supplemented by small transient plots cultivated from the heath. Often an area of heath Vegetation was burnt, and the ash and humus ploughed in. Further additions of ash obtained by burning yet more turves could be added to these plots, but the plots were short-lived and when abandoned reverted to heath Højrup, ; Odgaard, Elsewhere, on the heath soils such as Eastern Jutland, land was taken from the heath and a succession of cereals grown over a period of years before the land was abandoned and allowed to revert to heath. The use of the heathland in Jutland, while similar to both that in Norway and in the areas further to the south, was not so tightly organised. This was also the case in Britain where in the lowland heaths stock were grazed, peat and turf cut, and the Vegetation cut for fodder and fuel Webb, However, we do not have clear evidence whether arable plots were fertilised using material impregnated with animal excrement, although recent evidence suggests this may have been the case. Rather than covering extensive tracts of land, the Trans. The heaths were used in combination with this land. Nevertheless the traditional management, as elsewhere, served two purposes; first, it prevented the regeneration of forest and secondly, it maintained a low nutrient status in the soils. The role of fire is problematical. It is likely that areas were burnt to provide a flush of new growth which was more nutritious to the grazing stock. The size of the area burnt may have varied from region to region. In some places, small carefully chosen patches were burnt while elsewhere large areas, as in Jutland Denmark and Hailand Sweden were burnt rotationally. In the past the occasional wildfire may have also occurred. Today, in some regions such as north-western France and southern England large fires occur, especially in hot dry summers. These fires are mostly accidental but occasionally the result of arson. They are often extensive and are very harmful to wildlife. Grazing with sheep, cattle or ponies has been important in all heathland regions. In many places an in-field and out-field system was operated. Animals were often taken off the heath, sometimes every night or at other specified times, and this had important consequences for the composition of the Vegetation and the cycling of nutrients. Frequently there were breeds of sheep adapted to feeding on the heather rather than the grass. The heathlands of western Europe are a cultural landscape which makes a significant contribution to biodiversity. This aspect of heathlands has been recognised by the large number of national and international designations which have been attached to them and which should ensure their protection from conversion to other land uses. However, these designations often do little to ensure adequate management. The role of humans in shaping this landscape is paramount and provides us with a background on which to construct our conservation and management. Today only fragments of the original heathland remain. The ownership and management of the countryside have changed in a way which makes the restoration of traditional management difficult. The principles, however, are simple. The use or management of these areas must ensure that succession to scrub and trees is checked and that the nutrient status of the soils is kept low. A variety of management options are available including burning, cutting and grazing. However, as heathland is no longer part of the agricultural system of the lowlands these measures need to be implemented for conservation management alone, for which resources need to be found. A pan-European view on heathland conservation. Proceedings of National Heathland Conference Ecosystems

of the World Volume 9A: Heathlands and related shrublands. Elsevier, Amsterdam Gimmingham, C. Heaths as natural and seminatural Vegetation. Biotic diversity in Southern Africa. Oxford University Press, Cape Town. Hedens udnyttelse, Danmarks Natur 7. The origin and management of Norwegian coastal heaths as reflected by pollen analysis. Anthropogenic indicators in pollen diagrams ed. British plant communities, Volume 2. Cambridge University Press, Cambridge.

Chapter 2 : Ecology of Heathlands - C. H. Gimingham - Google Books

Heathlands in Europe reflect a long history of human activity. This book shows us both the diversity in use all over Europe combining this with the newest insights in ecology. Central theme is how to cover the costs of maintenance of these heathlands.

Heather moorland on the North York Moors mainly consisting of *Calluna vulgaris* Heathland and moorland are the most extensive areas of semi-natural vegetation in the British Isles. The eastern British moorlands are similar to heaths but are differentiated by having a covering of peat. On western moors the peat layer may be several metres thick. Scottish "muirs" are generally heather moors, but also have extensive covering of grass, cotton-grass, mosses, bracken and under-shrubs such as crowberry, with the wetter moorland having sphagnum moss merging into bog-land. Oliver Rackham writes that pollen analysis shows that some moorland, such as in the islands and extreme north of Scotland, are clearly natural, never having had trees, [2] whereas much of the Pennine moorland area was forested in Mesolithic times. The wildlife and vegetation forms often lead to high endemism because of the severe soil and microclimate characteristics. In Europe, the associated fauna consists of bird species such as red grouse, hen harrier, merlin, golden plover, curlew, skylark, meadow pipit, whinchat, ring ouzel, and twite. Other species dominate in moorlands elsewhere. Reptiles are few due to the cooler conditions. In Europe, only the common viper is frequent, though in other regions moorlands are commonly home to dozens of reptile species. Amphibians such as frogs are well represented in moorlands. When moorland is overgrazed, woody vegetation is often lost, being replaced by coarse, unpalatable grasses and bracken, with a greatly reduced fauna. Moorland of Kilimanjaro Some hill sheep breeds, such as Scottish Blackface and the Lonk, thrive on the austere conditions of heather moors. This is recorded in Britain in the fourteenth century. Heather is burnt at about 10 or 12 years old when it will regenerate easily. Left longer, the woodier stems will burn more aggressively and will hinder regrowth. Burning of moorland vegetation needs to be very carefully controlled as the peat itself can catch fire, and this can be difficult if not impossible to extinguish. In addition, uncontrolled burning of heather can promote alternative bracken and rough grass growth which ultimately produces poorer grazing. If heather and other vegetation are left for too long, a large volume of dry and combustible material builds up. This may result in a wildfire burning out a large area, although it has been found that heather seeds germinate better if subject to the brief heat of controlled burning. To benefit multiple species, many management options are required. However, management needs to be carried out in locations that are also suitable for species in terms of physical characteristics such as topography, climate and soil. Several tors top the sparsely vegetated hills. Such a setting enhanced the plot as the drama unfolded away from the functioning world where the children could solve their own problems and face greater danger.

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