

# Bogs and Wetlands

## Dartmoor Factsheet



Anybody who walks on Dartmoor will be familiar with the bogs and mires of the high moor. These wet areas are notorious and crop up in many Dartmoor stories, the most famous being the *Hound of the Baskervilles*. The legends emphasise the dismal, dangerous and evil smelling qualities of the bogs. The truth is somewhat different.

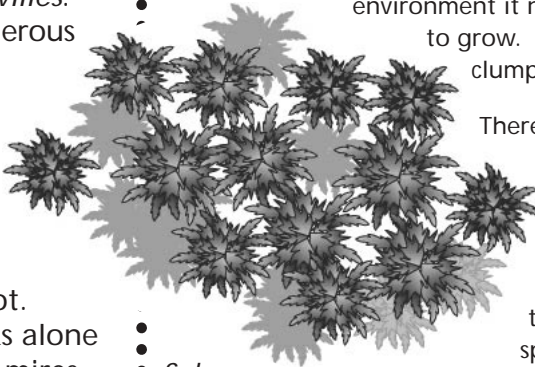
If you consider that Dartmoor consists of impervious granite and combine that with the high rainfall that an upland area attracts, it is not surprising that much of Dartmoor is wet underfoot. However, high rainfall and granite rocks alone do not explain why there are bogs and mires on the moor. To create these habitats you also need the remarkable sphagnum mosses. This is a small absorbent plant that causes water logging and stops dead plant matter from breaking down. Over many hundreds of years the accumulation of dead moss and any associated plant matter creates a layer of peat that is found over most of the higher parts of Dartmoor. Where this layer becomes thick (more than 0.5m) and extensive, the habitat produced is known as blanket bog.

### Sphagnum mosses -

- This remarkable group of mosses owe many of their special qualities to their cellular structure. Their cell walls enable the plant to absorb and hold copious amounts of water.
- This helps create the water-saturated environment it needs to grow. It grows in clumps and has no roots.



*Sphagnum moss*



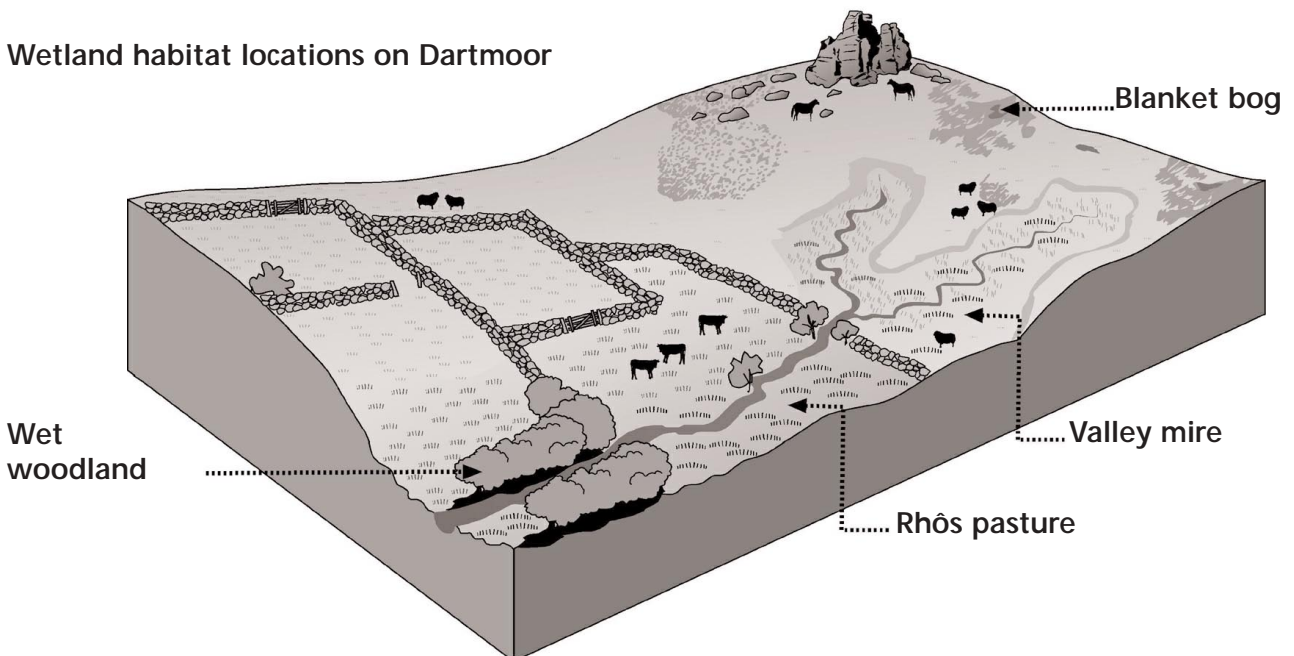
There are twelve known species on Dartmoor, each indicating slightly different conditions. They vary in colour from red to green; each species have different requirements such as levels

### *Sphagnum moss*

- of acidity and moisture. They also vary in their ability to colonise new areas. The plant has been much used for its absorbent and cleansing properties. The Vikings used it as toilet paper, the Eskimos used it for nappies and on Dartmoor they collected it as wound dressings during the First World War.

The four wetland habitats (as defined in *The Nature of Dartmoor: A Biodiversity Profile*) included in this factsheet are: **blanket bog, valley mires, rhôs pastures and wet woodland.**

### Wetland habitat locations on Dartmoor



# Blanket Bog

This is the term given to the mantle of peat which covers the central parts of the higher north moor centred on Cranmere Pool and the south moor centred on Naker's Hill. There are about 120 square kilometres of blanket bog on Dartmoor and these areas are recognised as being of international importance. Great Britain contains about 10-15% of the global resource. Even though Dartmoor contains a relatively small area of blanket bog, it is the most southerly in Britain and there is very little further south in Europe.

## Acrotelm (Top layer "the living" skin of blanket bog)

Normally no more than 30 cm deep  
Upright stems of sphagnum mosses  
- majority still alive

## Catoelm (Lower peaty layer of blanket bog)

30cm to many metres deep  
Amorphous, chocolate-covered  
mass of dead sphagnum fragments,  
nearly always waterlogged

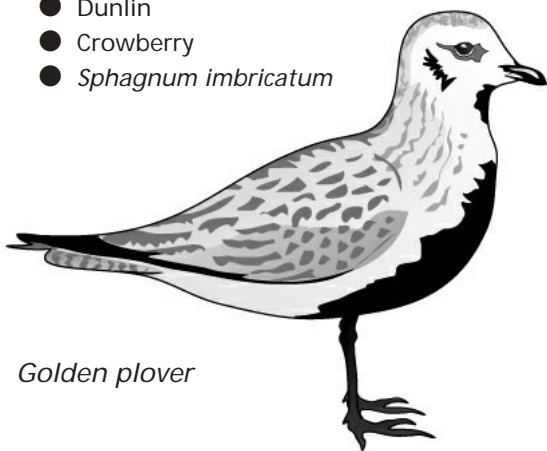
There has been a growing awareness of the importance of blanket bog as a holder of water, a vital natural resource as well as an appreciation of its role as a 'carbon sink' or carbon reservoir.

## The Characteristic wildlife of blanket bog

- Deer Grass
- Hare's-Tail Cotton Grass
- Round-leaved Sundew
- Cross-leaved Heath
- bog mosses

## Special species

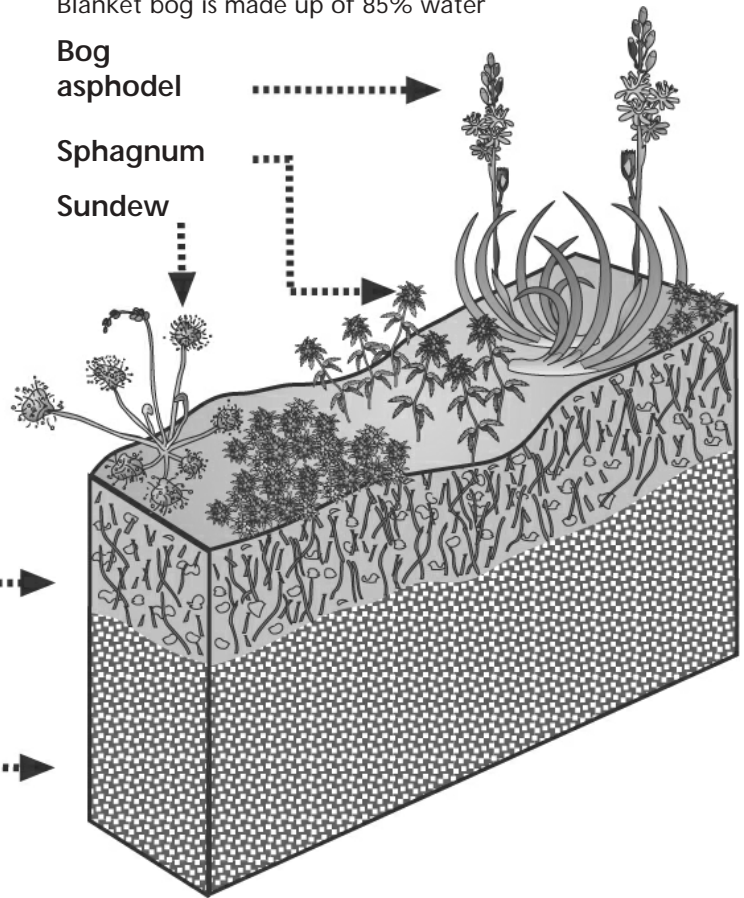
- Golden Plover
- Dunlin
- Crowberry
- *Sphagnum imbricatum*



Golden plover

## Blanket Bog structure

Blanket bog is made up of 85% water



## Factors affecting the habitat

- ◆ Much of the blanket bog has been degraded by uncontrolled burning, especially in the summer. Burning removes the top layer of moss, damaging the living skin of the bog.
- ◆ Breeding Dunlin and Golden Plover numbers are declining, possibly because of changes in the vegetation and climate, and disturbance by recreational users.
- ◆ Acidification by acid rain may be a cause for concern.

## Conservation objectives

- ▲ To reverse degradation of the blanket bog by providing the stable conditions necessary for its recovery.
- ▲ To maintain populations of breeding Golden Plover and Dunlin.

## The history of the blanket bog

About 10,000 years before present (BP) most of high Dartmoor was covered with oak and hazel woodland\* with some small patches of open heath land around the highest tors. By the Mesolithic period (8,000 BP) human activity appears to have started to change this landscape. Burning was used to clear the edges of woodland to encourage foraging animals like deer for hunting. This enabled small patches of blanket bog to expand into the heath and wet grassland. The tree line gradually moved lower down the slopes and blanket bog continued to spread. By the Bronze Age (4,000 BP to 2,300 BP) much larger areas of Dartmoor were being cleared of forest for farming. Sheep, cattle and ponies were introduced and grazed extensively, not allowing the forest to regenerate. Eventually soils were exhausted through farming with leaching causing iron pans to form. The land became increasingly waterlogged and acidic. When the climate became cooler and wetter, as it may have done at the end of the Bronze Age, these conditions provided another opportunity for the blanket bog mosses to extend over a far larger part of Dartmoor than before. Since then the layer of peat has grown metres thick in places.

Grazing and burning has continued. Burning, especially in the summer months, can damage that delicate living sphagnum moss 'skin'. Much of the peat has been cut for fuel. Many areas have been disturbed while people have been looking for and extracting tin ore. Shelling by artillery for military training only ended in 1998 leaving some areas of Blanket bog pockmarked. Other areas have been deliberately drained for agricultural improvement and forestry plantations. More recently, pressure from recreational users such as walkers, horse riders, mountain bikers has led to some erosion. All these factors, and the combined effects of climate change with more periods of drought and higher temperatures, have stopped the further growth of blanket bog. Understandably very little of Dartmoor's blanket bog now remains undamaged.

\* One of the special qualities of peat bog is that it preserves organic matter, including old plant pollen. An expert with a microscope can identify the presence of plants by identifying the different types of pollen. By taking samples from different layers in the peat, one can make a rough reconstruction of the past vegetation. This technique is called pollen analysis. From pollen analysis on Dartmoor we know that it was covered with oak and hazel.

## Valley Mire

Valley mires are areas of waterlogged, deep peat in valley bottoms, with characteristic acid wetland plant communities. Dartmoor has many of them, following the rivers and streams that drain the moor. At about 300 metres above sea level, they often occur as basin mires, often in newtakes (for more information see the Farming on Dartmoor factsheet). Mires on Dartmoor are sometimes associated with old tin streaming works, which served effectively to dam valleys, allowing peat to accumulate. This habitat grades into rhôs pasture in valley systems away from the open moor.

The valley mires of Dartmoor are unparalleled in upland Britain - only those on Bodmin Moor approach them in quality. The main plant community present is rarely found in other upland areas. The distribution and extent of this plant community in Europe is not known, but is likely to be limited. This is another wetland habitat for which Dartmoor is internationally important.

### Characteristic species of valley mire

- Cotton grass
- Cross-leaved heath
- Bog Asphodel
- Bog-bean
- sundews
- Pale Butterwort
- Marsh St.John's Wort
- Moorland Water Crowfoot
- Bog Pimpernel
- sedges and bog mosses

### Less common are

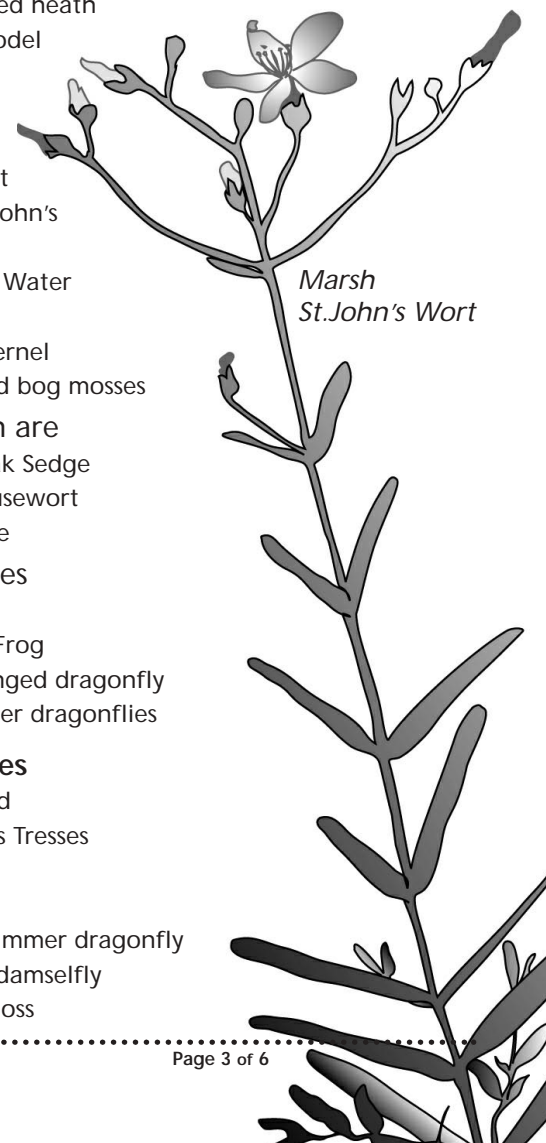
- White Beak Sedge
- Marsh Lousewort
- Bog Myrtle

### Fauna includes

- Snipe
- Common Frog
- Golden-ringed dragonfly
- Black Darter dragonflies

### Special species

- Bog Orchid
- Irish Lady's Tresses
- Curlew
- Lapwing
- Keeled Skimmer dragonfly
- Southern damselfly
- Fir Club Moss





### Factors affecting habitat

- ◆ Water extraction for human supply may have caused some mires to dry out.
- ◆ In some newtakes fertilisers and too much manure from livestock have affected and changed plant life.
- ◆ Acidification from acid rain may be damaging the valley mires.
- ◆ Disturbance by people and dogs, and predation by crows, and foxes may cause decline in Lapwing and Curlew numbers.

### Conservation objectives

- ▲ To maintain all valley mires in good condition in terms of water and species composition.
- ▲ To make sure the Bog Orchid and Irish Lady's Tresses survive and the Keeled Skimmer Dragonfly remains common.
- ▲ To stop the decline in breeding waders' population by good management practices.

## Rhôs Pasture

Rhôs pasture (species-rich purple moor grass and rush pastures) are an internationally rare habitat. On Dartmoor they are found mainly in valley bottoms within enclosed farmland. The maintenance of ecological value relies on controlled cattle or pony grazing, mainly during the summer months. The UK probably has more of this habitat than the rest of Europe (with the possible exception of the Republic of Ireland). Dartmoor contains 1,200 hectares of Rhôs pasture representing about 2% of the UK resource.

### Characteristic wildlife of rhôs pasture

- Marsh Plume Thistle
- Devil's-bit Scabious
- Heath Spotted Orchid
- Saw-wort
- Purple Moor Grass
- Sharp-flowered Rush
- Creeping Willow
- Ivy-leaved Bellflower
- Marbled White
- Small Pearl-bordered Fritillary
- Snipe
- Reed Bunting
- Grasshopper Warbler
- Woodcock
- Barn Owl
- Short-eared Owl
- Fox and Roe Deer

### Special species

- Marsh Fritillary butterfly
- Southern damselfly
- Mud snail *Lymnaea glabra*
- Narrow-bordered Bee Hawkmoth
- Double Line moth
- Cranberry
- Dormice

### Factors affecting habitat

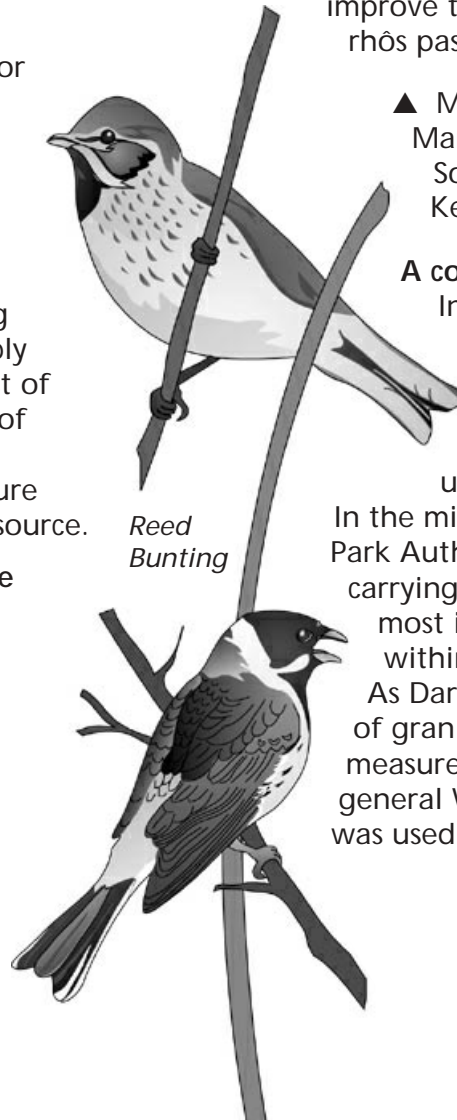
- ◆ Agricultural improvement has declined as a threat to these pastures on Dartmoor.
- ◆ Under grazing and lack of scrub control is a threat to rhôs pastures.
- ◆ The Dartmoor National Park Authority has targeted this habitat, completing a survey, identifying the best sites and valley systems and providing management agreements and Environmentally Sensitive Area top up payments for positive management.

### Conservation objectives

- ▲ Maintain and, where possible, improve the area and condition of rhôs pasture on Dartmoor.
- ▲ Maintain the populations of Marsh Fritillary Butterfly, Southern Damselfly and Keeled Skimmer Dragonfly.

### A conservation success

In the 1980s wet grassland called Culm grassland was identified as a rare and important habitat across Devon that was under considerable threat. In the mid 1980s Dartmoor National Park Authority played its part by carrying out a survey to identify the most important wet grasslands within the National Park. As Dartmoor is mostly composed of granite and not of Culm measures (a rock type), the more general Welsh term rhôs pasture was used to identify this habitat.



Reed Bunting

At this time the government was giving grants to farmers to improve the productivity of their land by draining it. Many farmers were also considering creating ponds. The changes in livestock farming and the breeds that they used meant that the traditional grazing that maintained the rhôs pastures was much reduced. As a result these neglected areas were being invaded by willow, alder and birch trees and would soon disappear under wet woodland.

Action was needed to conserve the rhôs pastures. Ecologists at DNPA convinced many of the owners of rhôs pastures of their importance and so secured management agreements both directly with the National Park Authority or through Environmentally Sensitive Area agreements (see relevant section).

By the mid 1990s another survey showed that much of this habitat's decline had been halted. However, the lack of proper grazing and the threat of 'scrubbing up' and developing into woodland remained. Owners were encouraged through their agreements to put livestock onto the pastures and volunteers were used to clear some of the invading trees. The most exciting recent initiative has been to create a herd of true Dartmoor ponies that can be taken from pasture to pasture as a grazing and conservation tool. Dartmoor ponies have adapted to local conditions and are an ideal conservation tool. In this way the Authority can help conserve the Dartmoor pony, while managing the threatened rhôs pasture at the same time. In 1997, The Dartmoor rhôs pasture Initiative won the internationally recognised Eurosite Award for its success in involving local people in the management of this wonderful habitat.

## Wet Woodland

Willow and Alder woods occur frequently where the ground is waterlogged within the National Park. The importance of these woods in a national or regional context is unclear. However, the habitat is not a common one in England as a whole, the total resource probably being less than 10,000 hectares (about 5% on Dartmoor). Within Dartmoor, wet woodlands are often found in association with oak woods or rhôs pasture in valley systems. These woodlands are usually of small size, although a few large and well developed examples occur within the National Park.

## Characteristic wildlife of wet woodland

- Grey Willow
- Goat Willow
- Alder
- Downy Birch
- Ash
- Marsh Marigold
- Opposite-leaved Golden Saxifrage
- Marsh Violet
- Great Tussock Sedge
- ferns
- bog mosses
- rich and diverse lichen communities
- Royal Fern

## Birds include

- Redpoll
- Siskin
- Willow Tit
- Woodcock

## Conservation objectives

- ▲ To identify the most important wet woods on Dartmoor and protect and manage them appropriately.

## How are Bogs and Wetlands Protected?

There are several ways a particular site can be protected:

- ▲ by being designated by English Nature as a Site of Special Scientific Interest because of special conservation interest under the *Wildlife and Countryside Act (1981)*. The owner has to be very careful and consult with English Nature before doing anything that may affect the wildlife of the site. At least four of Dartmoor's SSSIs are blanket bog or valley mires, including the two biggest - North Dartmoor 13,413 hectares, and South Dartmoor 9,668 hectares.
- ▲ Environmentally Sensitive Areas and Dartmoor National Park management agreements are annual payments to the local landowner to manage the land in ways that are beneficial to wildlife. Over 75% of the Dartmoor rhôs pasture is now covered by agreements which ensure that they are managed appropriately.

## Bogs and Mires in Folklore

Like the granite tors, Dartmoor's mires are the setting for many a Dartmoor yarn. The nasty witch Vixana of Vixen Tor lured unwary travellers into them. Even now, mischievous Pixies can confuse you and cause you to be "Pixie led" into them. Livestock are said to disappear into the worst of them.

Some time ago a man was making his way across Aunehead and was annoyed about losing his way in the boggy terrain up there. As he struggled across the bog he saw a hat lying on the bog, so to relieve his frustration he gave the hat a good kick. Much to his surprise he found the head of a well-known local farmer underneath. Apologising profusely, he asked the farmer if he was all right, to which he replied that he was fine, but he was worried about the horse he was sitting on.

It is not surprising that Conan Doyle used Foxtoer mire, thinly disguised by renaming it Grimpen Mire, as the climax for his famous Sherlock Holmes story, *The Hound of the Baskervilles*.

## Industries based on peat

Peat is an accumulation of plant matter and as such can be burnt and makes a useful fuel for domestic and industrial use. Its disadvantage is that it contains lots of water and has to be carefully dried before it can be used. 1.8 to 2 kilos of dried peat contain the equivalent energy of 1 kilo of good quality coal. Generations of moor dwellers have made use of the peat, and peat cutting scars can be traced all over the blanket bog area.

The right to take peat from the moor is referred to as "turbary". This privilege was granted by the Crown to the tanners in the 12<sup>th</sup> century. Smelting tin ore needs lots of fuel and very high temperatures and so they removed and burnt a lot of it. Dried peat was part-burnt in kilns or under earth-covered mounds and turned into a coke like charcoal that in turn would burn at very high temperatures to smelt tin. 100 kilos of dried peat produced 36 kilos of charcoal. Unlike the coal that eventually replaced it, charcoal was valued as carbon with no impurities. Trains of packhorses came from as far away as Cornwall to collect it.

### Useful web links for further information:

- Other factsheets:**
- **Wildlife and Habitats**
  - **Dartmoor Commons**
  - **Farming on Dartmoor**  
<http://www.dartmoor-npa.gov.uk/dnp/factfile/homepage.html>
- Other publications:**
- *The Nature of Dartmoor: A Biodiversity Profile*  
<http://www.dartmoor-npa.gov.uk/dnp/pubs/natureod.html>
  - *Action for Wildlife: The Dartmoor Biodiversity Action Plan*  
<http://www.dartmoor-npa.gov.uk/dnp/pubs/bap.html>
- Other information:**
- <http://www.actionforwildlife.org.uk>
  - <http://www.dartmoor-npa.gov.uk/dnp/biodiversity/homepage.html>
- Other publications (not available on-line):**
- Dartmoor Pocket Guides: Natural History set available to purchase at DNPA Information Centres and through our on-line shop:  
<http://www.dartmoor-npa.gov.uk/acatalog/>

## Commercial peat workings

The 19<sup>th</sup> century saw an extraordinary number of attempts to develop industries based on Dartmoor peat. Much ingenuity was used to devise ways to dry peat by squeezing and heating it. There were plans to extract crude oil and various kinds of gas. Naptha gas in particular was transformed into candles and moth balls as well as being used for lighting. Fibres were extracted to make paper and further attempts were made to make peat useful for agriculture and horticulture. Some of these ventures carried on for a few years but most failed miserably. Working conditions were very tough on the high moor. Some peat workers survived by poaching rabbits from nearby Huntingdon Warren. Transporting peat to where it was needed off the moor has left Dartmoor littered with tracks, tramways and railways, the Rattlebrook railway being one example. Between 1868 and 1955 there were no less than twelve attempts to make the Rattlebrook peatworks viable. Most attempts quickly petered out when the cost of transport became apparent. In 1961 the abandoned ruins were, at that time, viewed as a hazard for livestock and were blown up by the military.

## Domestic use of peat

For centuries peat cutting formed an important part of the Dartmoor farmer's year. Cutting, drying and transporting it involved much labour using specialised tools and specialised words to describe it. An average Dartmoor farmstead required 40 cartloads of dried peat to see them through the year. Many moor men made some income supplying towns and villages around the moor. It was all carried by horse, pony or donkey with heavily laden panniers on their backs. With the advance of the railway making coal easily available the peat trade disappeared. However, peat was still being cut for domestic use right up to the Second World War.

For further information, and a list of other Fact Sheets available, contact the:

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