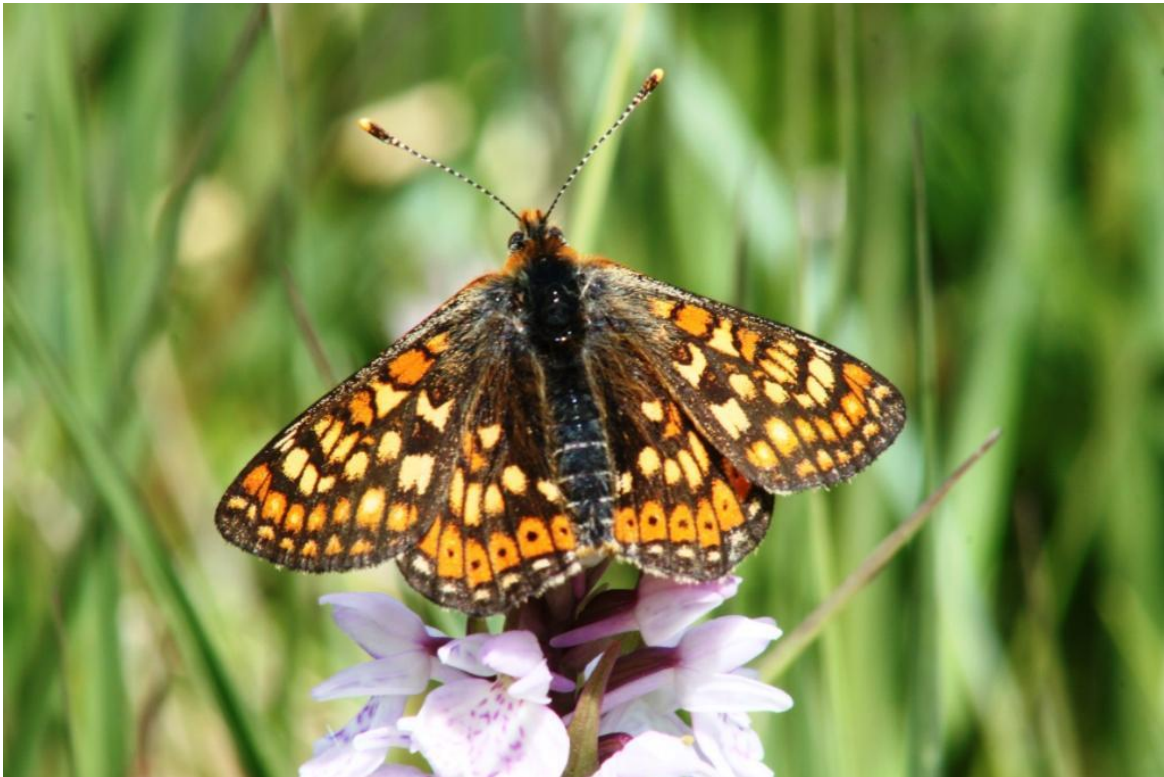


Dartmoor Delivery Plan for Marsh Fritillary and Narrow-Bordered Bee Hawkmoth

Description and Importance of the Species

The marsh fritillary is one of six fritillary species found on Dartmoor and has the typical colouration and patterns of this group of butterflies. It flies from mid-May to the end of June and lays eggs in batches, usually on the food plant of the caterpillar, the devil's-bit scabious. On hatching, the caterpillar's form a protective web in which they proceed to feed on the leaves of the scabious, periodically moving to a new leaf as the food runs out. They over-winter when half-grown, emerging in March to bask in the sun and continue feeding. When full grown, the caterpillars are about 3.5 cm in length, almost black in colour with spikes and small white spots along the body.



Marsh fritillary, copyright DNPA

The narrow-bordered bee hawkmoth is an attractive day-flying moth that can easily be mistaken for a bumblebee when flying rapidly. The name derives from the dark edging band on the forewings that is narrower than that of the very similar broad-bordered bee hawkmoth (not recorded on Dartmoor). Its flight period overlaps with the fritillary, although it tends to emerge slightly earlier in early May and may be seen into early July. The caterpillar also feeds on devil's-bit scabious and pupates in late summer before spending the winter in a cocoon just below the soil surface. It is nationally scarce and restricted to sites on rhos pasture and chalk downland with extensive populations of the foodplant.

The marsh fritillary is declining throughout its limited distribution in Europe and is protected under the EU Habitats Directive. In the UK it has declined by 46% since the 1970's. Within the Biodiversity 2020 national strategy, it is listed as requiring urgent action 'to secure habitat management at all sites through agri-environment schemes where possible'. The hawkmoth has also declined substantially in the UK and although it is still found across much of Europe and Asia, it is declining in some countries and is now extinct in the Netherlands and Belgium. It is earmarked as a medium priority for action in England 'to ensure abundant food plant and nectar sources' through agri-environment schemes.



Newly emerged narrow-bordered bee hawkmoth, copyright DNPA

Current Status on Dartmoor

Marsh fritillaries are found in colonies on the fringes of the moorland within valleys containing extensive flower-rich wet grasslands called rhos pastures, where the foodplant is often abundant. Their long-term survival in these valleys is dependent upon a well-connected series of such sites, with the butterfly occupying a variable number of these fields in any single year. Annual monitoring is carried out of this butterfly and the webs formed by its caterpillars, with an average of 35 sites being recorded in the 5 years from 2010 to 2014. The population of marsh fritillary on Dartmoor has increased in recent years after a decline throughout the late nineties and early 2000's.



Full-grown marsh fritillary caterpillar



Young caterpillars with web, both copyright DNPA



Newly hatched hawkmoth caterpillar on same devil's-bit scabious plant as a batch of marsh fritillary eggs, copyright DNPA

Full grown hawkmoth caterpillar, DNPA

All of the 18 sites where the hawkmoth has been recorded over the past 20 years are contained within known marsh fritillary sites. The monitoring of the hawkmoth has been far less intensive, making it difficult to establish any population trend, but it is recorded annually at some sites.

Both species are largely confined to the four Rhos Pasture Key Wildlife Areas (see separate Delivery Plan and map), but also occur in scattered locations elsewhere in the National Park where there is sufficient suitable habitat.

Issues affecting the Species on Dartmoor

- A lack of suitable grazing animals on the large number of small fields that make up the valley rhos pastures where these species survive. In recent years, Dartmoor ponies have largely taken over from the traditional beef cattle as the main grazers of these sites, as farmers have moved to larger herds of continental cross cattle that are less suited to these wet grasslands



Marsh Fritillary site on Dartmoor, copyright DNPA

- Loss of abundant food plant on the rhos pastures. This can result from insufficient scrub control leading eventually to wet woodland, too little grazing producing dense purple moor grass swards, or too much grazing causing poaching and stunted scabious plants unsuitable for the caterpillars to feed on
- Lack of continuity of management throughout whole valleys which is likely to eventually lead to the loss of these species as sites become more isolated and prone to local extinctions
- Little is known about the ecology or specific requirements of the hawkmoth. However, its presence at many of the fritillary sites indicates management needs are similar, if not identical, to those of the butterfly
- Drainage, tree planting and pond creation are relatively minor factors, but may be important detrimental features at individual sites



Typical Dartmoor rhos pastures in valley bottom (showing as small, buff-coloured fields surrounded by willow and birch scrub, copyright DNPA)

Current Initiatives on Dartmoor

- The Two Moors Threatened Butterfly Project has been running since 2005, employing a Project Officer to visit sites regularly to discuss management with the farmers. In particular, this has involved helping to get these sites into appropriate agri-environment agreements eg Higher Level Stewardship (HLS) that encourage better grazing and scrub control. The Officer also co-ordinates volunteer groups to carry out scrub control at key sites and oversees annual monitoring in conjunction with the Devon Branch of Butterfly Conservation. Sites for high brown and pearl-bordered fritillaries are also covered by this project
- All The Moor Butterflies is a new HLF-funded project covering butterflies and moths on Dartmoor, Exmoor and Bodmin Moor. Stage 1 is due to start in April 2015 and if successful, Stage 2 will carry forward the full 3 year project from April 2016
- The Natural Connections Project in 'Moor Than Meets the Eye' starts in Jan 2015 and will produce whole valley plans for two of the Rhos pasture KWAs that hold both species. It will also seek to raise the profile of the habitat and key species within the local community
- The new Countryside Stewardship agri-environment scheme will be launched in 2015 which will provide opportunities for landowners to enter new land management agreements involving rhos pastures with marsh fritillaries over the next 10 years
- County Wildlife Sites have been notified for whole rhos pasture valleys as their overall management is critical to the long-term survival of these insects

- Most of the former DNPA management agreements that held marsh fritillaries are now in HLS, but there are still 3 remaining. Annual monitoring and habitat management takes place at these sites



Dartmoor pony and heifer grazing sites that support both insect species, copyrights DNPA

Targets

- Maintain at least the current marsh fritillary population of 35 sites on Dartmoor recorded on a rolling 5 year average, with at least 4 sites in each of the 4 main rhes pasture valley systems
- Maintain colonies of narrow-bordered bee hawkmoth in all of the 4 main rhes pasture valley systems

Delivery and Monitoring

Continue to provide annual advice and support for farmers with sites holding marsh fritillary through specific partnership projects such as the Two Moors Threatened Butterfly Project (TMTB) and the HLF funded All the Moor Butterflies Project (ATMB).

Continue annual monitoring of recently occupied marsh fritillary sites, co-ordinated by Butterfly Conservation.

Through the TMTB/ATMB Projects, continue to bring new sites into agri-environment agreements and maintain suitable management on existing agreements holding these species.

Continue monitoring and habitat management of sites with marsh fritillary and the hawkmoth under DNPA ownership or agreements.



Marsh fritillaries on marsh plume thistle, copyright DNPA

The Natural Connections Project will produce Integrated Land Management Plans the two main rhos pasture valleys holding these insects.

Continue to monitor rhos pasture County Wildlife Sites on a rolling programme, implementing any management recommendations that arise from them.

Continue periodic training sessions on the hawkmoth for volunteers and officers who visit marsh fritillary sites so that they will be recorded through the monitoring programme for the butterfly.

Delivery and Monitoring	Lead	2015	2016	2017	2018	2019
Favourable habitat management through agri-environment schemes or individual agreements under the TMTB/ATMB Projects	TMTB/ATMB Projects + NE	x	x	x	x	x
Annual monitoring of known marsh fritillary sites, simultaneously checking for NBBH	Devon Branch BC	x	x	x	x	x
Produce Integrated Plans for 2 key rhos pasture valleys	MTME Project		x			
Training days on NBBH for volunteers and officers	TMTB/ATMB Projects		x			x
Favourable habitat management on DNPA owned or managed sites	DNPA	x	x	x	x	x
Monitor rhos pasture County Wildlife Sites on a rolling programme	DNPA	x	x	x	x	x



Narrow-bordered bee hawkmoth nectaring on patch of ragged robin, copyright DNPA