Northern Ireland Priority Species -Habitat Guide: Marsh Fritillary butterfly

The Marsh Fritillary butterfly is the smallest Fritillary in Ireland, yet a dark checked wing pattern and bright tones of orange and yellow make this beautiful butterfly stand out. Unfortunately it is threatened throughout Europe therefore targeted conservation efforts are vital.

Legislative background

The Marsh Fritillary (*Euphydras aurinia)* butterfly and many of its associated habitats are protected under legislation. Northern Ireland holds a significant proportion of the UK and European resource of both the Marsh Fritillary and associated habitat.

The Marsh Fritillary is a European protected species and is listed in Annex II of the Habitats Directive. As the butterfly is a threatened European species it is also protected under Appendix 2 of the Berne Convention. It is listed as a protected species under the Wildlife (NI) Order 1985 (as amended) and is both a UK and Northern Ireland priority species. The species can be a Special Area of Conservation (SAC) and an Area of Special Scientific Interest (ASSI) selection feature, in addition to associated habitat features.

Table 1: Linking Habitat types with N2K features, ASSI features and NI Priority Habitats and Species

Northern Ireland Priority Species type: Marsh Fritillary **Associated Northern Ireland priority habitat types:** Purple Moor- Grass and Rush Pastures, Coastal Sand Dunes, Lowland Raised Bog, Lowland Heathland, Lowland Fen and Upland Flushes, Fens and Swamps.		
Habitat Directive Annex 2 species	**ASSI features**	**NI priority species associated with Marsh fritillary habitat**
Marsh Fritillary **Habitat Directive Annex 1 habitats:** H6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils H2130 Fixed dunes with herbaceous vegetation ("grey dunes"). H2150 Atlantic decalcified fixed dunes (*Calluno-ulicetea*) H2170 Dunes with *Salix repens* ssp. *argentea* (*Salicion arenariae*). H7120 Degraded raised bogs still capable of natural regeneration H4010 Northern Atlantic wet heaths with *Erica tetralix* H7140 Transition mires and quaking bogs H7230 Alkaline fens.	Marsh Fritillary **Associated habitats:** Purple Moor-grass and Rush Pasture. Coastal Sand Dunes. Lowland Raised Bog. Wet Heathland. Lowland Fen (tall herb / short medium). Upland flushes, Fens and swamps	Narrow-bordered Bee Hawk-moth, Cryptic Wood White Butterfly, the beetles *Carabus clatratus* and *Lebia cruxminor*.

Life cycle of the Marsh Fritillary

The adult butterfly flies from late May to early July, feeding on nectar from a range of wildflowers. The female butterfly lays batches of eggs on the leaves of the Devil's-bit Scabious plant (*Succisa pratensis*), which is the only food plant for Marsh Fritillary caterpillars. Through June and July, females lay their eggs in batches of up to 300 on the underside of the leaves. The eggs hatch within 2 to 3 weeks. From August until late September the brown, spiny caterpillars feed together on Devil's-bit Scabious leaves inside a thick silken web.

During the winter they hibernate together in a small web, hidden in grass tussocks. The caterpillars appear in February or early March, having turned black, and feed in conspicuous groups on Devil's-bit Scabious leaves nearby. By late April the caterpillars disperse and pupate. They exist in pupa / chrysalis form for 2 to 4 weeks, depending on temperature. Adult butterflies emerge from their chrysalis by late May.

Habitat requirements: Landscape scale

Marsh Fritillary is a highly mobile species who is not site faithful from year to year. Instead, they move throughout the landscape opportunistically using suitable areas. Therefore, in addition to single sites, they require an extensive network of well connected patches of suitable habitat to persist and thrive. A viable population may be spread across the land parcels of several farms. The butterfly prefers a patchwork of short and tall vegetation with a good supply of nectar sources in sunny situations, which also favours the caterpillars. The butterfly will move through this landscape, regularly utilising 'core' breeding sites, but also opportunistically colonising suitable 'satellite' habitat patches between these sites. These satellite sites may only be occupied one or two years in ten, but provide vital stepping stones through the landscape, ensuring better connectivity and genetic resilience within Marsh Fritillary populations. Satellite sites could include new sites where Marsh Fritillary was not recorded previously, which are in favourable condition or can become favourable through management. Without this habitat connectivity at a landscape scale the Marsh Fritillary may eventually become locally extinct, as appears to be happening to more isolated colonies in County Down.

Given the Marsh Fritillary's preference for operating at a landscape-scale, conservation efforts should also target suitable lands adjacent to each other.

Habitat requirements: Site specific scale

As Devil's-bit Scabious is the only food plant for their caterpillars, Marsh Fritillary is reliant on Devil's-bit Scabious-rich habitats. These can include purple moorgrass and rush pasture, coastal dune grasslands, cutover lowland raised bog, fens and wetlands.

High quality Marsh Fritillary habitat with many flowering Devil's-bit Scabious plant

Site specific factors:

- Typically found in two distinct habitat groups: dry calcicolous grasslands, and damp neutral or acidophilous grassland and mires.
- Areas of locally frequent Devil's-bit Scabious are vital.
- South facing slopes and sunny aspects are particularly important as they provide ideal conditions for caterpillar development and during the adult flight period.
- Shelter is a key factor and features that provide this such as hedgerows, scrub patches, ditches and earth banks etc should be noted and maintained especially if they provide cover from westerly winds.
- A sward of varied vegetation height towards the end of summer/early autumn.

Where are they found in Northern Ireland?

In Northern Ireland there are two distinct primary areas for the butterfly:

- An isolated network of fen and sand dune sites to the east in County Down.
- A much more connected landscape of species-rich grassland in the west throughout Counties Fermanagh and Tyrone.

Marsh Fritillary sites which exist outside the two main landscapes are found in the Sperrins, Clare Bog and Montiaghs Moss.

DAERA hold priority habitat and species data on the NIEA Natural Environment Map Viewer. See https://appsd.daera-ni.gov.uk/nedmapviewer/ (and link to video tutorial). Note that the Map Viewer indicates areas which hold NIEA records of habitat / species data, but does not infer the complete coverage of these environmental assets in Northern Ireland.

Pressures & Threats

Threats to this species in Northern Ireland are generally poorly understood, but the following factors are thought to have a negative effect on Marsh Fritillary populations:

- Habitat deterioration - loss and reduced quality of breeding habitat as a result of agricultural improvement.
- Habitat fragmentation - fragmentation of habitat, leading to small/isolated colonies vulnerable to extinction through chance events, natural population fluctuations, and genetic decline.
- Grazing - lack of grazing and/or overgrazing can result in the deterioration/loss of Marsh Fritillary habitat.
- Abandonment: in the absence of management by cutting or grazing, Purple Moor-grass and rush pasture undergoes vegetation change leading to rankness and the development of scrub and woodland.
- Parasitism- Marsh Fritillary has two known hymenopteran (wasp, bee etc) larval parasites, *Cotesia bignelli* and *Cotesia melitaearum. Cotesia bignelli* is present in Ireland and the presence of the parasite indicates that the butterfly is well established in the area but heavy parasitic loading can apparently lead to local extinctions and cause colonies to move around the landscape. The parasites can control the size of Marsh Fritillary colonies, but in doing so may also perform a useful function by preventing the butterfly from diminishing the supply of the food plant, Devil's-bit Scabious.
- Climatic change- Short term weather change with a succession of wet or cool summers may reduce the potential for dispersal and affect breeding success. Also, spring weather has an effect on the rates of parasitism and is probably more important than wet summers. Windy and cold conditions during their peak flying time in late May and June frequently restricts flight activity and lead to poor population growth. Sheltered south facing sites are preferable, as these can be core areas where the species can retreat to in adverse weather.

How can Marsh Fritillary habitat be conserved?

The best way to conserve Marsh Fritillary is to look after its habitat. Purple moor-grass and rush pasture is the predominant underlying habitat type, and it should be managed accordingly with extensive grazing.

Cattle-grazing is preferential with an aim to create a sward with a varied vegetation height. On known or potential Marsh Fritillary sites, sheep grazing should be avoided. In addition scrub removal and hedge management should be carefully planned to prevent removing shelter to areas of frequent Devils-bit Scabious (especially on the West, South-west and North-west sides).

Further information on Marsh Fritillary conservation is available at https://www.daera-ni.gov.uk/publications/efs-species-specific-advice which has been developed for the Environmental Farming Scheme in Northern Ireland.

How do we determine the "health" or condition assessment for Marsh Fritillary?

The conservation status can be determined by the condition of the habitat. Favourable condition is defined by setting targets or target ranges for a series of different attributes. These are components or characteristics of the vegetation that are relatively easy to measure, but which are reliable indicators of the "health" of the habitat.

NIEA has developed Rapid Condition Assessments for several broad habitat types (grassland, moorland, woodland, coastal and wetlands). These will be made available online in the future. In the interim copies can be requested by contacting NIEA by E-mail: NIEA.EFSHigher@daera-ni.gov.uk.

Please also refer to the EFS Species-specific advice for Marsh Fritillary, which includes details of the rapid habitat condition assessment developed for the all-Ireland Marsh Fritillary monitoring programme.

Pollinator advice.

The variety and abundance of flowering plants within semi-natural habitats provide good sources of pollen and nectar for many of our pollinating insects such as bumblebees, hoverflies, butterflies and moths. For further information on habitat management for pollinators, refer to the All-Ireland Pollinator Plan resources: www.pollinators.ie.