



# **Llandyfaelog Substation Marsh Fritillary Survey Report**

On behalf of **National Grid**  
**nationalgrid**



# **Marsh Fritillary Survey Report**

Llandyfaelog

October 2025

Prepared for:  
National Grid Electricity Transmission

Prepared by:  
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Project Number:  
331201429



## Marsh Fritillary Survey Report

Revision	Description	Author	Date	Quality Check	Date	Independent Review	Date
1	First Issue	WC	17/09/25	RF HM	18/09/25	HE	06/10/25
2	Second Issue, update following client comments	HM	27/10/25	HE	27/10/25	LB	29/10/25



## Marsh Fritillary Survey Report

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## Contents

Executive Summary.....	6
1      Introduction .....	7
1.1    Overview .....	7
1.2    The Site and Survey Area.....	7
1.3    Proposed Development.....	7
1.4    Legislation.....	7
1.5    Aims and Objectives.....	8
2      Methods.....	9
2.1    Overview .....	9
2.2    Desk Study.....	9
2.3    Habitat Suitability Assessment.....	9
2.4    Larval Web Survey.....	9
2.5    Limitations.....	9
3      Results .....	10
3.1    Desk Study.....	10
3.2    Habitat Suitability Assessment.....	10
3.3    Larval Web Survey.....	10
4      Summary and Conclusion .....	11
5      References.....	12

## Figures

Figure 1 Site and Survey Area .....	13
Figure 2 Marsh Fritillary Survey Results .....	14

## Appendices

Appendix A	Figures
Appendix B	Legislation
Appendix C	Ng2: Monitoring Marsh Fritillary Larval Webs
Appendix D	Photographs



## Executive Summary

Stantec UK Ltd. were commissioned by National Grid Electricity Transmission to undertake a marsh fritillary *Euphydryas aurinia* survey for land at Llandyfaelog, Carmarthenshire (hereafter 'the Site'), in support of an Ecological Impact Assessment for a proposed substation development.

The assessment comprised a desk study and field surveys. The surveys followed UK Butterfly Monitoring Scheme (UKBMS) protocols, combining a habitat suitability assessment with a larval web survey. The habitat assessment undertaken in May/June 2025 focused on the abundance of the marsh fritillary larval foodplant, devil's-bit scabious *Succisa pratensis*, sward structure, grazing intensity, and habitat connectivity. The larval web survey was conducted on 19 August 2025 under optimal weather conditions, targeting areas identified as suitable during the habitat assessment.

No recent biological records of marsh fritillary were returned within 2 km of the Site, although a historic record from 1905 was noted approximately 3.3 km to the north. Field surveys confirmed that only one field within the Site supported devil's-bit scabious, but the extent was limited and the habitat was degraded due to silage cutting, resulting in a uniform sward structure. No larval webs were recorded during the survey, indicating the likely absence of marsh fritillary at the time of assessment.

While the Site contains small patches of suitable habitat, its current condition and management significantly limit its value for marsh fritillary. The wider landscape includes areas of purple moor grass and rush pasture within dispersal range, suggesting potential connectivity to more suitable habitats. However, based on the absence of larval webs and limited foodplant availability, the Site is considered to have negligible to low potential value for supporting a viable marsh fritillary population.



# 1 Introduction

## 1.1 Overview

- 1.1.1 Stantec UK Ltd. were instructed by National Grid Electricity Transmission to undertake a marsh fritillary *Euphydryas aurinia* survey on land at Llandyfaelog, Carmarthenshire (Ordnance Survey grid reference SN 419 132).
- 1.1.2 Preliminary, desk-based assessments of the Site and the UK Habitat Assessment Survey undertaken in May and June 2025 (Stantec 2025) identified habitat on site suitable for marsh fritillary butterflies.
- 1.1.3 The purpose of this report is to inform an Ecological Impact Assessment of proposals to construct a new substation and associated infrastructure.

## 1.2 The Site and Survey Area

- 1.2.1 The Site for the proposed Llandyfaelog substation comprises agricultural grassland fields bound by hedgerows with an area of ancient woodland to the south of the Site.
- 1.2.2 The wider Survey Area for the field survey encompassed the Site, as well as the wider area assessed to inform the Environmental Impact Assessment Screening (Stantec 2025). In addition to agricultural grassland fields, the Survey Area comprises marshy ground to the west and an area of immature plantation forestry in the south-west. The Survey Area is bordered to the north by the C2074, to the west by the A484, the Crugan Fawr Road and farm tracks to the south, and by open countryside to the east. A tributary of the Gwendraeth Fach runs through woodland along part of the eastern boundary and the headwaters of a stream (Nant Morlais) run from the centre of the Survey Area in the form of drainage ditches.
- 1.2.3 Appendix A, Figure 1 shows the boundaries of the Site, the wider Survey Area and the Larval Web Survey Area.

## 1.3 Proposed Development

- 1.3.1 The proposed development is comprised of the following principal elements:
  - Construction of a single level platform (260 metres (m) by 640 m) on which an Air Insulated Substation (AIS) is sited measuring 155 m by 602 m.
  - Bellmouth access to the A484 with an operational access road to connect the platform to the A484.
  - Modification works to the existing 400kV Overhead Line (OHL) to connect the substation to the existing OHL involving the installation of two new towers (pylons) and one replacement tower (pylon) circa 18 m and 62 m.
  - Associated drainage, and hard and soft landscaping.

## 1.4 Legislation

- 1.4.1 Marsh fritillary receives protection under the following legislation:

- Conservation of Habitats and Species Regulations 2017 (as amended);
- Wildlife and Countryside Act 1981 (as amended); and
- Environment (Wales) Act 2016.



1.4.2 Please see Appendix B for a summary of the protection marsh fritillary receives under this legislation.

### 1.5 Aims and Objectives

1.5.1 The UK Butterfly Monitoring Scheme (UKBMS) protocols (provided in Appendix C) set out standard methods for determining the presence and assessing the status of marsh fritillary populations. The guidance highlights that both adult counts during the flight period and larval web surveys in late summer provide complementary information, but that larval web counts are the most reliable indicator of population status due to natural fluctuations in adult numbers.

1.5.2 The guidance also notes that survey data should be supported by assessment of habitat quality and connectivity, since long-term population viability is strongly dependent on the condition and extent of suitable habitat.

1.5.3 Accordingly, larval web surveys were undertaken across suitable areas of the Site, supported by a habitat suitability assessment, to provide robust evidence of marsh fritillary presence and potential population status.

1.5.4 The aim of the marsh fritillary survey, as described in this report was to:

- assess the extent and quality of suitable breeding habitat;
- determine the presence or likely absence of marsh fritillary within the Site; and
- provide an indication of the value of the Site for the local marsh fritillary population, with reference to UKBMS monitoring protocols.



## 2 Methods

### 2.1 Overview

2.1.1 Surveys were undertaken in accordance with the UK Butterfly Monitoring Scheme (UKBMS) protocols (provided as Appendix C). These methods focus on larval web counts, supported by habitat assessments, to provide reliable evidence of marsh fritillary presence and population status.

### 2.2 Desk Study

2.2.1 West Wales Biodiversity Information Centre (WWBIC) was contacted in May 2025 for records of marsh fritillary within 2 km of the Site. These records were filtered then for relevant marsh fritillary records within the past 10 years.

### 2.3 Habitat Suitability Assessment

2.3.1 The habitat suitability assessment was carried out for the Survey Area alongside the UK Habitat Assessment in May/June 2025. The following habitat features with suitability for marsh fritillary were recorded:

- abundance and distribution of devil's-bit scabious *Succisa pratensis*;
- sward structure and vegetation composition;
- grazing intensity and management practices; and
- habitat connectivity to adjacent land parcels.

### 2.4 Larval Web Survey

2.4.1 Areas of habitat suitable for marsh fritillary, that supported devil's-bit scabious in the sward, as identified during the habitat suitability assessment, were surveyed for larval webs on 19 August 2025, when webs are most conspicuous. The survey was undertaken during warm, dry conditions with minimal wind.

2.4.2 The surveyor walked parallel transects across all areas of suitable habitat at regular intervals, ensuring complete coverage of scabious-rich patches. Each larval web was recorded with a handheld GPS, and the number of larvae per web was noted where visible. Habitat condition and foodplant abundance were also assessed across the Site, providing context for population viability.

### 2.5 Limitations

2.5.1 Biological records are a snapshot of available data and may be incomplete or spatially biased toward better-surveyed locations. Absence of records does not confirm absence. However, extensive habitat information was gathered during the UK Habitat Assessment in May/June 2025, and suitable habitat for marsh fritillary butterflies is considered restricted to the Larval Web Survey Area (see Appendix A, Figure 1), which was the only field parcel where devil's-bit scabious was recorded.

2.5.2 The field surveyed for larval webs had been cut recently at the time of survey, which reduced the visibility of devil's-bit scabious in the sward. However, sufficient time had passed that the basal rosette of plants had re-sprouted, and the leaves were visible in the surrounding, brown grass stubble. To avoid the survey being constrained by the reduced visibility of the larval food plants due to the cut, the surveyor increased the density of transects across the field to increase the likelihood of encounter.



## 3 Results

### 3.1 Desk Study

3.1.1 No records of marsh fritillary were returned by WWBIC for the past ten years. A historic record from 1905 was returned the location supplied was a 4-figure grid reference, and therefore the exact location of the known population is unknown, however the central point of that reference is approximately 3.3 km north from the central grid reference of the Site.

### 3.2 Habitat Suitability Assessment

3.2.1 The wider Survey Area contained several fields of purple moor grass and rush pasture (see Appendix A, Figure 2), but the majority did not support the larval foodplant, devil's-bit scabious, and were therefore considered unsuitable for marsh fritillary. Management across these areas varied, but most were grazed.

3.2.2 One field of purple moor grass and rush pasture within the Site did contain devil's-bit scabious (see Appendix D, Photograph 1 and 2), although this was limited to scattered patches across the southern and eastern parts of the field. The locations of these are illustrated on Appendix A, Figure 2. The field is managed for silage, resulting in a uniform sward structure with limited variation in vegetation height. This management practice reduces the suitability of the habitat for larval development, as optimal conditions for marsh fritillary require a mosaic of vegetation structure that provides both shelter and access to foodplants.

3.2.3 The Site is located within an area of low to moderate intensity mixed farmland, with a well-developed hedgerow network providing structural connectivity across the landscape. Areas of suitable purple moor grass and rush pasture are regularly scattered throughout the local area. The closest patch of potential habitat lies immediately across the road from the Site to the north. However, as this lies outside of the Survey Area, no access was possible to this field to check for the presence of devil's-bit scabious. The nearest patch outside the Site that was checked lies approximately 100 m to the south-east, but as noted above, was found to contain no devil's-bit scabious and is therefore unsuitable for marsh fritillary (see Appendix D, Photograph 3).

3.2.4 Overall, while small quantities of the larval foodplant are present within the Site, habitat condition and management including grazing and timing of hay/silage cuts, significantly limit suitability for marsh fritillary. However, the wider landscape retains a network of purple moor grass and rush pasture fields, some of which may provide suitable conditions for supporting the species.

### 3.3 Larval Web Survey

3.3.1 Within the field that was surveyed, no larval webs were recorded. Each individual patch of devil's-bit scabious represented multiple plants, with the largest patch covering approximately 4 square metres (see Appendix D, Photograph 1).

3.3.2 See Appendix A, Figure 2 for locations of devil's bit scabious recorded.



## 4 Summary and Conclusion

- 4.1.1 One field within the Site and wider Survey Area was considered suitable for marsh fritillary during the Habitat Suitability Assessment.
- 4.1.2 At the landscape scale, purple moor grass and rush pasture occurs frequently in the surrounding farmland, and suitable habitat is present within dispersal range. The Site may therefore form part of a wider habitat network, but in its current condition is considered to be of negligible to low potential value for marsh fritillary.
- 4.1.3 No larval webs were identified during the larval web survey indicating that marsh fritillary was not present within the Site at the time of survey. While small patches of devil's-bit scabious were recorded, the overall extent of the foodplant was very limited, and habitat structure was constrained by silage cutting. The uniform sward and scattered distribution of foodplants reduce the likelihood that the Site could support a viable breeding population.



## 5 References

UK Butterfly Monitoring Scheme (UKBMS)(undated). Ng2: Monitoring Marsh Fritillary Larval Webs Available at:  
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Wildlife and Countryside Act 1981 (as amended). Available at:  
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<https://www.legislation.gov.uk/uksi/2017/1012/contents/made> [Accessed September 2025].

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<https://www.legislation.gov.uk/anaw/2016/3/contents/enacted> [Accessed September 2025].

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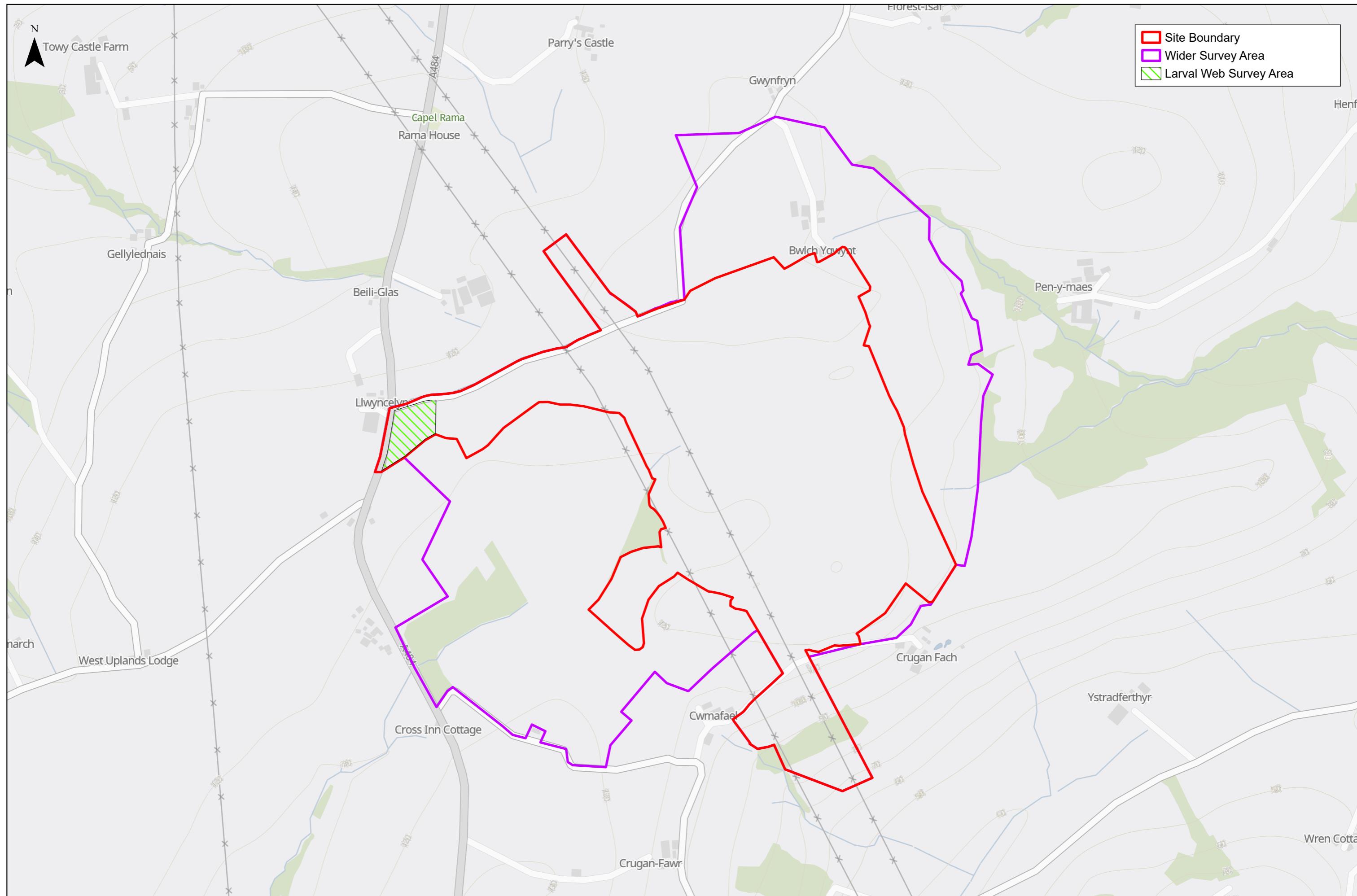


## Appendix A      Figures

Figure 1 Site and Survey Area



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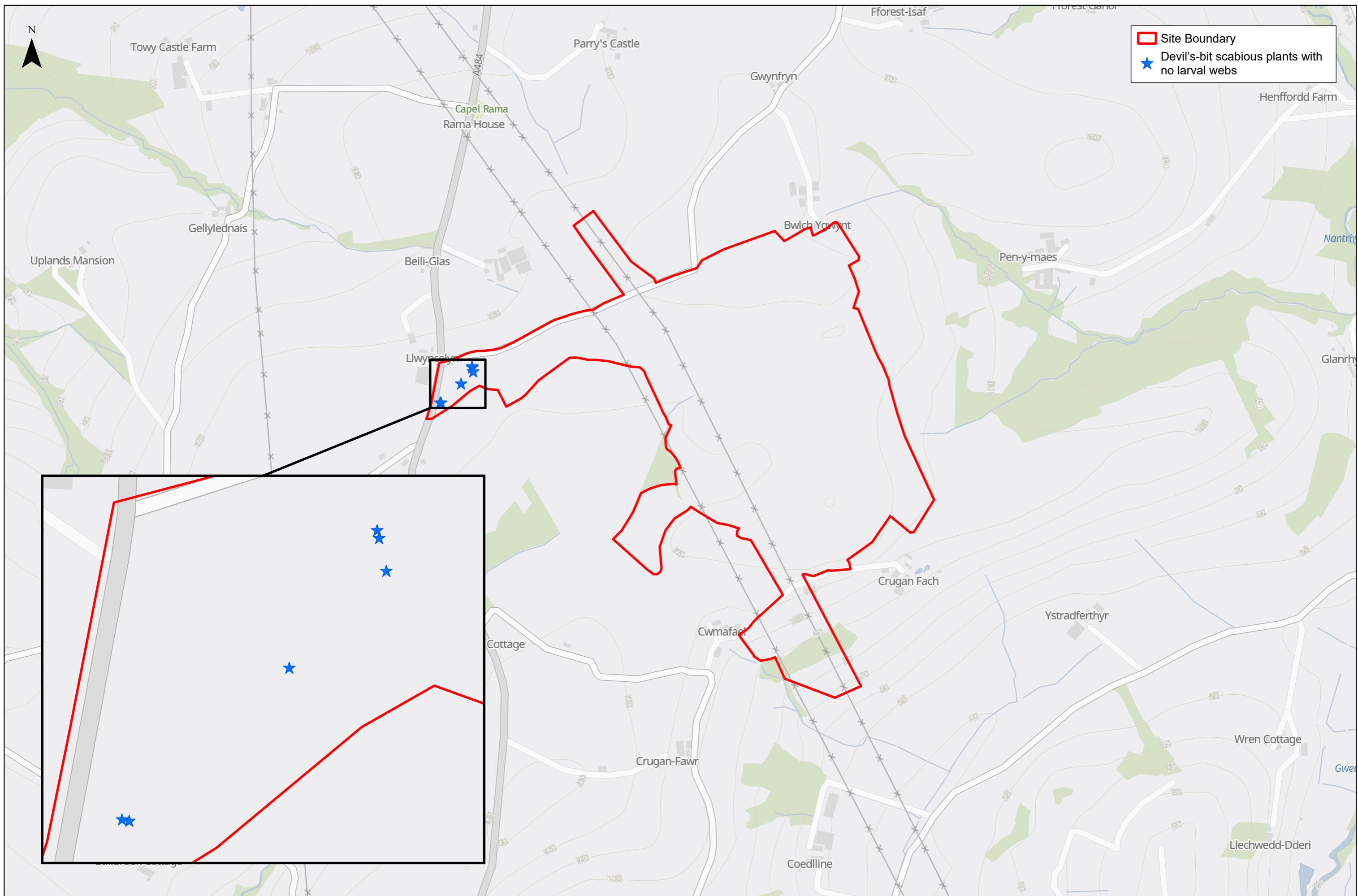


## Marsh Fritillary Survey Report

Figure 2 Marsh Fritillary Survey Results



Project Number: 331201429



## Appendix B     Legislation

B.1.1 Please note that this legal information is a summary and intended for general guidance only. The original legal documents should be consulted for definitive information. Web addresses providing access to the full text of these documents are given in Section 5 References.

B.1.2 The marsh fritillary butterfly is a fully protected species in Wales under several key pieces of legislation

### **Wildlife and Countryside Act 1981 (as amended)**

B.1.3 The marsh fritillary is listed under Schedule 5, granting it full protection, which includes prohibitions on:

- Intentional killing, injuring, or taking.
- Possession or control (live or dead).
- Damage or destruction of any place used for shelter or protection.
- Disturbance while occupying such a place.
- Obstruction of access to such places.

### **Environment (Wales) Act 2016**

B.1.4 The marsh fritillary is listed as a Species of Principal Importance (SPI) under Section 7, which requires public authorities to maintain and enhance biodiversity and promote ecosystem resilience. This listing guides planning decisions and conservation priorities.

### **Conservation of Habitats and Species Regulations 2017 (as amended)**

B.1.5 The marsh fritillary butterfly is protected under the Conservation of Habitats and Species Regulations 2017 through its listing in Annex II of the EU Habitats Directive, which is transposed into UK law via these Regulations. As it is listed on Annex II, sites supporting its populations may be designated as Special Areas of Conservation (SACs).



## **Appendix C    Ng2: Monitoring Marsh Fritillary Larval Webs**



### MARSH FRITILLARY MONITORING

Marsh Fritillary populations are best monitored during the adult flight period and when larval webs are evident in late summer. Timed counts or transects should be used to monitor the adults, however this can be difficult for many Marsh Fritillary populations due to weather conditions during the flight period in some parts of the species' range. Therefore, larval web counts are often easier, and an equally reliable method for monitoring. Furthermore, they can be carried out over a wider range of weather conditions and give additional information such as the precise location of breeding areas.

This guidance note describes how to carry out a Marsh Fritillary web count to UK Butterfly Monitoring Scheme (UKBMS) specifications. It is vital that **all** of the required information is recorded during a larval web count if it is to be used in the UKBMS to analyse trends at National, Regional and site levels.

### RECORDING BASICS

**When to record:** The best period to survey is when the webs are most conspicuous; on dry, sunny days when the larvae are active and ideally during **mid to late August or early September** but this will depend on the season, habitat and location. Counts can be done into mid/late September but often by then the larvae will have entered hibernation or heavy rain causes the webs to disintegrate. This is particularly the case for chalk grassland sites in the south of England where counts should ideally be completed before the end of August. Further north and in Wales, Scotland and Ireland they can be done throughout September (or early October in exceptionally late years). Avoid carrying out surveys in heavy rain or on days preceded by heavy rain as a number of the webs will have been damaged and would be less conspicuous.

**Preliminaries:** Prepare a large scale map of your target site (1:10 000 or enlarge 1:25 000) to take with you. The site may be a distinct ownership, habitat, management unit or combination.

Before you start to record, and particularly if this is a new site that you are surveying, briefly walk the site to identify its natural boundary and the area of suitable habitat – these may be different. Suitable habitat is identified by the presence of the larval food plant Devil's-bit Scabious (*Succisa pratensis*) growing within an appropriate sward height – ie. from 5-15cm in chalk grassland to up to 25 cm in wet grassland. This is easy to spot in late summer as the purple/blue flowers can be seen very easily but still look out for the basal leaves as on grazed sites the flower heads may have been eaten. Check whether suitable habitat is distributed across the whole site or patchy distributed or if there are very distinct patches surrounded by unsuitable habitat.

*The size of the site and the way that the habitat is distributed across the site will influence the method that you choose and most importantly, the method used to analyse the results.*

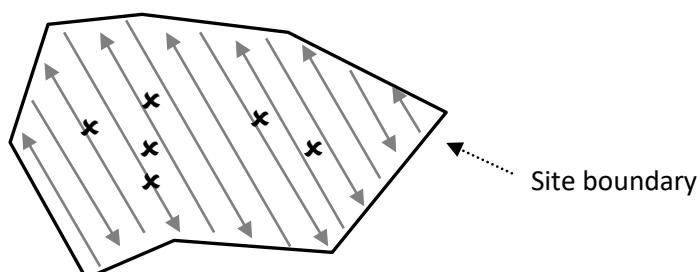
### HOW TO DO THE COUNT

#### Method One – Complete Area Search for Small Sites

This method is usually only chosen if the site is small (ca1ha or less) and it is possible to search **all** the host plants. Search the whole area of suitable habitat systematically and record the number of occupied larval webs that you see. The best way to achieve this is to walk parallel lines 2m apart, searching for larval webs in an area 1m either side of the lines, until the entire area had been searched. As a guide, an area of just 0.5ha would require a total of 2.5km to be walked for a complete area search.

Mark the location of occupied webs (individual or dense aggregations) found, with a cross on your map (x). Crosses may represent individual webs or aggregations if density is high. Make sure you record the area of search accurately on the map and estimate the size of the area covered (you can always check this using a map later). The total number of larval webs found is your final result; do not multiply this figure up as your search was a complete search of all suitable areas.

As for all methods, it is not necessary to count individual larvae or webs with no larvae present (unless vacated webs are the only record for the site). If in doubt stop and look closely at a proportion of the webs, sometimes they appear to have larvae when only shed larval skins are present which could seriously overestimate the population. Please do not disturb webs. In highly variable or dense swards, it may be necessary to narrow the transect width to 1m (0.5 m either side) to ensure that all occupied webs present are detected.



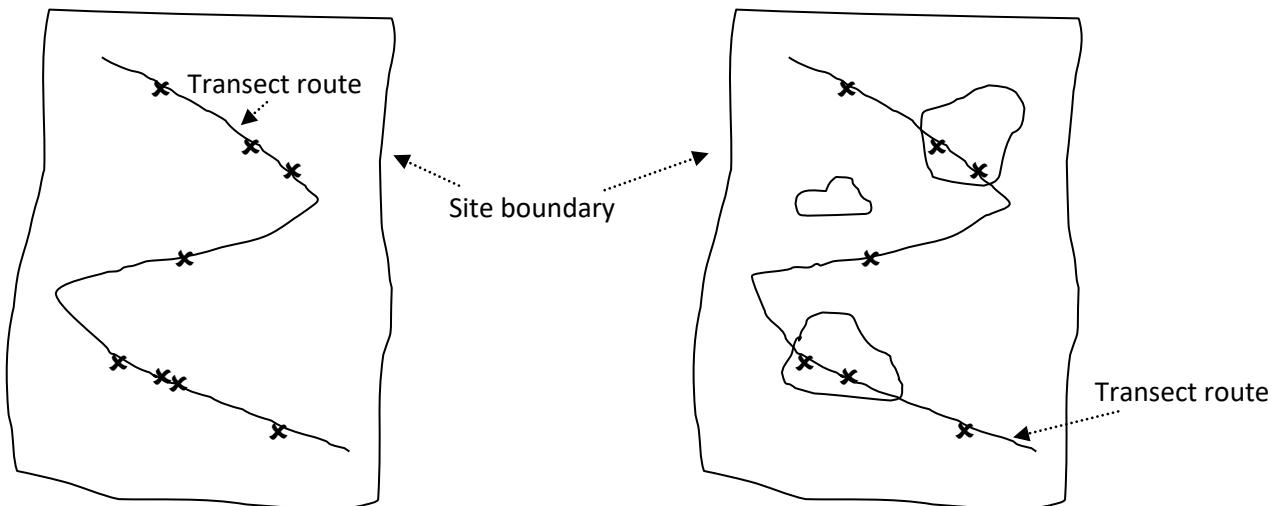
## Ng2: MONITORING MARSH FRITILLARY LARVAL WEBS

### Method Two – Sample Transect Search

This is likely to be the main method used and is suitable for larger sites (>1ha) where breeding habitat is scattered across the whole site. It may be that suitable breeding habitat is found throughout (diagram a) or, more commonly, where there are denser patches in some areas (diagram b) with Devil's-bit Scabious patchily distributed elsewhere.

Diagram a – suitable habitat is found across the whole site **x** = location of web

Diagram b – suitable habitat is patchily distributed across the whole site with some very dense clumps of host plant (shown)



This method **samples** both example sites by taking a systematic transect route across the whole site recording any occupied webs 1m either side (i.e. a 2 metre band across the site). This width has been chosen because the majority of nests will be visible, at this distance, and the count will be accurate. In dense swards, it may be necessary to narrow the transect width to 1m. Routes can be zigzag in pattern (as shown above) or areas of evenly spaced parallel lines. Mark the route you have taken on your map and record the length in metres. The route should cover at least 100m per hectare depending on the size of your site, which is just 2% of the total area. The larger the area sampled, the more precise the abundance estimate is likely to be. Quick counts of large sites are likely to be unreliable. **Do not preferentially target areas with dense Devil's-bit Scabious** but take a path which covers a representative sample of the total area of suitable habitat. This is important as the total number of larval webs found in the area of search will then be multiplied by the total area of suitable habitat to give an estimate of the number of larval webs found across the whole site.

#### Worked example:

Site area is **1.7ha** (110m by 170m) and the transect length is 200m

Area sampled is **0.04ha**  $((200\text{m} \times 2\text{m}) / 10,000 = 0.04\text{ha})$

Webs found = **8**

Population estimate = **340**  $(8 \times 1.7 / 0.04)$  (webs x total area / area sampled)

### Method Three – Transect Search Within Discrete Habitat Patches

This method is not recommended, unless it has been used previously on a site, where it can be used for the sake of continuity. The method is based on the sample transect search but, rather than sampling the whole site, only patches of good quality habitat are searched. In this case, as the population estimate will not be based on the whole site, it is very important to accurately estimate the area of the good quality patches and the transect lengths. All new recorders should use either Method 1 or 2.

### WHAT TO RECORD ON

Larval Web counts should be recorded on an Nf3: Marsh Fritillary Larval Web Monitoring Form available from Butterfly Conservation. The form allows for a large site to be broken down into several fields or sub-sites where this is more practical for monitoring. In this case, an estimated population size should be calculated for each sub-site and then added together for the whole site. A worked example of this form is shown below. The form also allows capture of basic habitat data (optional).

### ELECTRONIC SUBMISSION OF DATA

The UKBMS are currently developing a system for online data entry at [www.ukbms.org/mydata/](http://www.ukbms.org/mydata/).

### CONTACT FOR FURTHER INFORMATION

Butterfly Conservation, Manor Yard, East Lulworth, Dorset, BH20 5QP.

[transect@butterfly-conservation.org](mailto:transect@butterfly-conservation.org)

01929 400209

## Ng2: MONITORING MARSH FRITILLARY LARVAL WEBS

### Marsh Fritillary Larval web monitoring form (fictitious example)

#### Site Details

Site name:	Aurinia Moor	Transect width (circle one of these):	2m or 1m
County:	Borsetshire	Principal Habitat:	Neutral grassland/fen meadow
Vice County:	South Borsetshire	Secondary Habitat:	
Central Grid Ref: (e.g. SN215502)	AB123456		
Recorder name & contact details:	Andrew Recorder, Butterfly Conservation, Manor Yard, East Lulworth, Wareham, Dorset, BH20 5QP. 01929 400209		
Site owner/contact for access:	Butterfly Conservation, Manor Yard, East Lulworth, Wareham, Dorset, BH20 5QP. 01929 400209		

#### Survey Details

Please Indicate Method Used (1=complete search, 2=sample transect, 3=search patches only):						2
Date of visit	Field/Sub-Site ref (if applicable)	Number of occupied webs found	Length of transect (m)	Area sampled (ha)	Area of suitable habitat (ha)	Population size/estimated pop. size
2/09/10	1	4	910	0.18	3	67
2/09/10	2	11	760	0.15	3	220
2/09/10	3	1	265	0.05	1	20
2/09/10	4	5	420	0.08	2.5	156
2/09/10	5	6	560	0.11	3.5	191
TOTAL		27			13	654

Nb. To calculate the area sampled (ha), multiply the transect length by transect width (2m) then divide by 10,000. To calculate the estimated population size, multiply the number of webs found by area of suitable habitat (ha) then divide by the area sampled (ha).

#### Habitat Quality Observations (optional)

Key Habitat Feature		Observations (please tick)				
		Widespread & abundant	Frequent (in low density all across the site)	Patchy (locally abundant)	Patchy Sparse	Rare
Devil's-bit Scabious			✓			
Scrub				✓		
Rushes						✓
Other (state)						

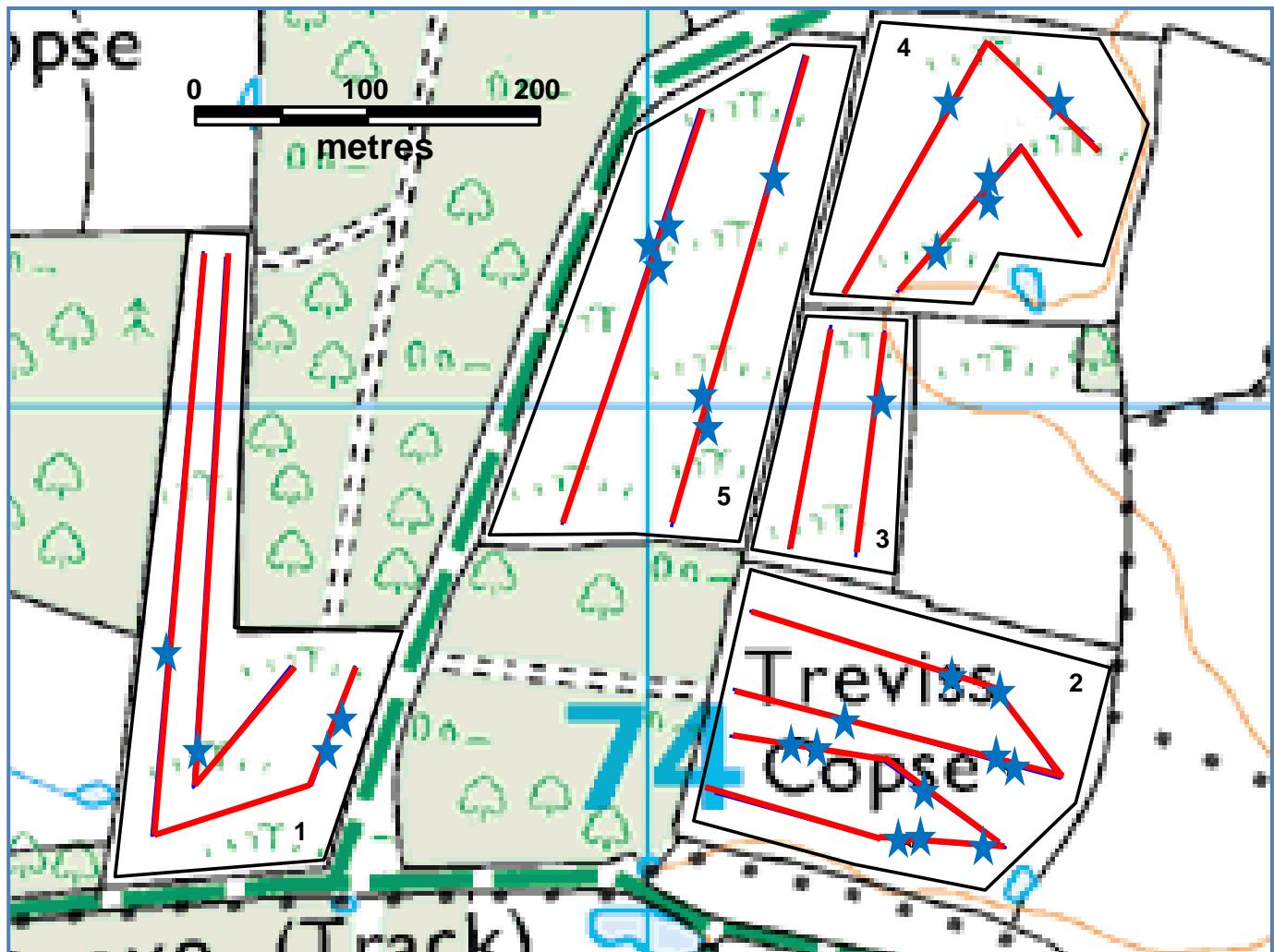
#### Habitat Management Observations (optional)

Please tick relevant site management information:							
Vegetation Height		Grazing		Burning		Cut/mown	Unmanaged
Uniform short (<8cm)		Cattle		Whole area		Most of area	
Variable (8-25cm)	✓	Ponies		Half		Half	Unknown
Tussocky (>25cm)		Sheep		Patches		Strips	✓
Other habitat/management observations:							
Some deer grazing							

## Ng2: MONITORING MARSH FRITILLARY LARVAL WEBS

### Site Map

Copy of OS map at 1:10 000 or equivalent showing scale, 1km gridlines and boundary of suitable/or occupied habitat marked. Mark the transect route and indicate the location of occupied larval webs (x).



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Are there previous records of Marsh Fritillary adults or larvae at this site?

(Please include dates, numbers of adults or larvae recorded and recorder if not previously submitted)

Yes, site monitored annually for >10yrs, records held at Manor Yard

## Appendix D     Photographs



Photograph 1: Patch of devil's-bit scabious within cut sward



Photograph 2: Suitable purple moor grass and rush pasture field during June



Photograph 3: Nearby area of purple moor grass and rush pasture that does not support devil's-bit scabious

