

MWP

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Appendix 6E – Marsh Fritillary Report

Ballynisky Wind Farm

Ballynisky Green Energy Ltd.

December 2025

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RSK Biocensus Technical Note

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00	15/09/2025		JP59	EP15	SH76

1 Introduction

1.1 Purpose of this report

- 1.1.1 RSK Biocensus was commissioned by Greensource Ltd. to undertake monitoring surveys for the Marsh Fritillary (*Euphydryas aurinia*) butterfly, in relation to the proposed Ballynisky Wind Farm Project (hereafter referred to as 'the Project').
- 1.1.2 The Project is in the townland of Ballynisky, Co. Limerick, approximately 9 kilometres (km) north of Newcastle West and 6 km northwest of Rathkeale. The surroundings are rural, predominantly comprising largely of agricultural grassland bordered by hedgerows and lines of trees with some ditches, mixed broadleaved woodland and fen, as well as nearby watercourses (namely the Ahacronane River and Riddlestown Stream). It is in a lowland location with elevation ranging from approximately 46-56 metres (m) Above Ordnance Datum (AOD).
- 1.1.3 The survey area comprises six adjoining fields of wet grassland, of which one is partially within the Project boundary (Figure 1).
- 1.1.4 This report outlines the methods used and gives the findings of surveys completed in August 2025, which provide an update to marsh fritillary surveys carried out in September 2023 (RSK Biocensus, 2024). Previous surveys recorded a mix of suitable but under grazed and unsuitable habitat within the site while identifying a total of 14 occupied larval webs.
- 1.1.5 The aim of the assessment was to provide an updated survey for providing an estimation of the area and assessment of the quality of suitable habitat for Marsh Fritillary butterflies. In addition, also providing a larval web search for calculating an estimate of the likely population present within the site. Suitable habitat is indicated by the presence of the larval food plant Devil's-bit Scabious (*Succisa pratensis*), together with general habitat conditions such as sward height, and vegetation type and structure. Optimal sward heights range from 5-15 cm in chalk grassland, up to 25 cm in wet grassland.

1.2 Key documents

- 1.2.1 The survey method was devised using standard methods in the following publications:
- 'Monitoring Marsh Fritillary Larval Webs' by the UK Butterfly Monitoring Scheme (UKBMS) and;
 - 'Habitat Condition Monitoring for Marsh Fritillary' by the National Biodiversity Data Centre (NBDC).

1.3 Background information

- 1.3.1 The Marsh Fritillary requires large areas of suitable habitat, ideally with degree of light grazing, preferably by cattle, to maintain flower-rich areas and good populations of Devil's-bit Scabious (the larval foodplant) in an open sward. Adults feed on nectar of a variety of flowering plants. Caterpillars are gregarious and form distinctive larval webs in August and September over their foodplant.
- 1.3.2 Information on legal protection is provided in Appendix A. The species is:

- Listed on Annex II of the EU Habitats Directive
- Butterfly Conservation priority category: High
- Red List of Irish Butterflies (2010): Vulnerable
- GB Red List (2022): Vulnerable
- European status: Vulnerable

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2 Methods

2.1 Habitat Condition Assessment

Field survey

- 2.1.1 The field survey was undertaken on 19th and 20th August 2025 by two suitably qualified ecologists (RSK Biocensus staff codes TW18 and JP59).
- 2.1.2 The survey area was divided into six sub-sites (Fields 1 to 6) and 'zigzag' transect routes covering at least 100m per hectare were mapped to ensure representative coverage of habitats within each field, and in the survey area as a whole (shown in Figure 2).
- 2.1.3 Along each transect, survey 'stopping points' were pre-determined and evenly distributed. Fields 1, 2, 3, 4 and 6 were categorised as 'medium-sized' sites (i.e., 1 to 5 ha), therefore requiring at least 40 stopping points, whereas Field 5 was categorised as a 'small-sized site' (<1 ha), requiring at least 20 stopping points.
- 2.1.4 At each stopping point, habitat condition was recorded using criteria set out in NBDC guidance as summarised in

Table 1. Condition attributes recorded at each stopping point.

- 2.1.5 Upon completion of the transect route, an estimate of the percentage cover of tall scrub

Attribute	Description
Vegetation height	A = <12 cm; B = 12-25 cm; C = 25-50 cm; D = >50 cm
Devil's-bit Scabious abundance (plants per m ²)	A = 1-2 plants/m ² ; B = 3-9 plants/m ² ; C = 10+ plants/m ² ; D = None
Structured vegetation	Presence of any steps in vegetation or ground that provide localised protection from elements at ground level.
Low invading scrub	Low invading scrub <25 cm tall and >10% cover present
Evidence of stock grazing	Localised evidence present (e.g., poaching, dung, etc)

(i.e., >0.5 m) for the whole field was recorded.

Data analysis

- 2.1.6 To determine the overall condition of the habitat present within the site, the following were calculated from habitat condition data collected during the survey for each field. Percentages were calculated for the following variables from the total number of stopping points for each field. Variables included:

- Mean vegetation height (cm);
- % Frequency of scabious;
- % Frequency of scabious category A;
- % Frequency of scabious category B;
- % Frequency of scabious category C;
- % Frequency of 12-25 cm swards;
- % Frequency of category B/C Scabious in 12-25 cm swards;
- % Frequency of category B/C Scabious in >12 cm swards;
- % Frequency of category B/C Scabious in >25 cm swards;
- % Frequency of structured vegetation;
- % Frequency of low invading scrub;

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- % Frequency of stock grazing signs; and
- % Cover of tall scrub (>0.5m).

2.1.7 Each field was then placed into one of the following categories defined in Table 2.

Table 2. Categorisation of the suitability of habitats for marsh fritillary.

Habitat condition	Criteria
Good Condition Habitat (GC)	>20% frequency of Devil's-bit Scabious of category B/C abundance growing in 12-25 cm tall swards and <10% cover of tall scrub (>0.5 m tall)
Suitable Under-grazed Habitat (SU)	>20% frequency of Devil's-bit Scabious of category B/C abundance growing in >25 cm tall swards and <20% cover of Devil'-bit Scabious of category B/C abundance growing in 12-25 cm tall swards.
Suitable Over-grazed Habitat (SO)	>20% frequency of Devil's-bit Scabious of category B/C abundance growing in <12cm tall swards and <20% frequency of Devil's-bit Scabious of category B/C abundance growing in 12-25 cm tall swards.
Unsuitable Habitat (US)	<5% frequency of Devil's-bit Scabious of category B/C abundance growing in >25 cm tall swards.

2.2 Larval Web Search

2.2.1 A transect search method was used, which is the recommended approach under UKBMS guidance for larger sites (1>ha) where breeding habitat is scattered across the whole site.

2.2.2 The surveyors searched the vegetation for the distinctive larval webs along the same transects used for the habitat condition assessment (Figure 2). Surveyors walked slowly along the route, recording any evidence of larval webs 1 m either side (i.e. a 2 m band across the site).

2.2.3 If the habitat was considered to be suitable from the habitat assessment (i.e. GC, SU or SO) and therefore has the potential to support a regular population of marsh fritillary, the number of larval webs per hectare was calculated utilising the total area surveyed. The larval web density per hectare was then multiplied by the total area of suitable habitat within the site to give an estimated total number of larval webs present within the field.

2.3 Limitations

2.3.1 The weather leading up to the survey was wet, with heavy rainfall over the night of the 18th August. Marsh Fritillary larval webs are fragile, and vulnerable to damage by rain. Therefore, it is possible that evidence of marsh fritillary larvae could have been destroyed by the adverse weather conditions prior to the larval web search. However, larval webs were found during the survey in good condition and so it is unlikely that the survey results were significantly affected by the weather.

2.3.2 The habitat conditions estimate habitat suitability based on the samples taken along the specified transect routes, which did not cover all parts of each field. The method is an assessment tool, and it is therefore possible that categories of habitat condition could be higher or lower had a different route been taken. Furthermore, the transect method aims to determine the suitability of each field as a unit meaning that, while a field may be deemed "unsuitable", there may still be small patches of higher suitability within that field, occurring at a low frequency or not encountered on the transect route.

- 2.3.3 Vegetation at the site was very dense, making it difficult to see and count Devil's-bit Scabious plants and larval webs in longer swards and in encroaching scrub. However, every effort was made to thoroughly hand-search the vegetation at stopping points (for Devil's-bit Scabious plants) and along the transect route (for larval webs). Surveyors were confident that habitat suitability was estimated fairly and that few larval webs were missed.

3 Results and Discussion

3.1 Habitat Condition Assessment

- 3.1.1 Fields 1, 2 and 5 were assessed as “Suitable Under-grazed” habitat (SU) for Marsh Fritillary. Fields 3, 4, and 6 were assessed as “Unsuitable” (US).
- 3.1.2 The data analysis carried out for each field is summarised in Appendix B. Photographs of habitats in each field are provided in Appendix C.

3.2 Larval Web Search

- 3.2.1 Of the 6 fields that were surveyed, only Fields 1, 2 and 6 had evidence of larval webs.
- 3.2.2 The larval web in Field 1 appeared damaged, possibly by the rainfall that occurred the previous evening, with only one caterpillar visible. The web in Field 2 was empty, meaning that species could not be confirmed. The larval web in Field 6 was active and in good condition, with numerous caterpillars present.
- 3.2.3 Descriptions of each larval web found and estimated population sizes are available in Appendix B. Photographs are provided in Appendix C. Approximate locations of larval webs are shown in Figure 3.

3.3 Evaluation

- 3.3.1 Fields 1, 2, and 5 were “Suitable but Under-Grazed” habitat for Marsh Fritillary. The limiting factor in condition for these fields was the sward height, which was typically higher than 50cm. Across the fields that had been previously surveyed (with the exception of Field 3), occurrences of low invading scrub and tall scrub were higher in 2025 than in 2023, with less structured vegetation. This, along with a lack of evidence of stock grazing in Fields 1, 2, and 3 suggests that a lack of management may have reduced the suitability for Marsh Fritillary. Whilst evidence of stock grazing was identified in Fields 4, 5, and 6, the intensity may still be insufficient to reduce scrub growth and sward height, and to promote structural variety within the sward itself.

Field 1 – inside development boundary

- 3.3.2 Field 1 was at the lower limit of suitability in regard to Devil’s-bit Scabious abundance, with 20% frequency of category B/C abundance growing in swards taller than 25 cm. This had decreased from 55% in 2023. This field had an estimated population of 48 webs, with one larval web identified on the transect, which was consistent with the results of the 2023 survey. This larval web found in Field 1 was within the footprint of development (Figure 3).
- 3.3.3 There is suitable habitat for Marsh Fritillary in sections of grassland interspersed throughout 60% of the field that is not dominated by tall scrub. The areas of suitable habitat alongside the Marsh Fritillary population present may be adversely affected by any vegetation clearance or disturbance arising from the proposed development. This could harm individuals and lead to reductions in local populations. Additionally, permanent loss of habitat could result in effects on the wider population indirectly through the loss of suitable breeding habitat, which is a limited resource in the wider landscape.

Mitigation measures should be implemented during construction activities to limit these impacts.

Field 2 – outside development boundary

- 3.3.4 The abundance of larval webs identified in Field 2 was lower in the 2025 survey than in 2023, with a single unconfirmed empty web, as opposed to the 10 larval webs in 2023. The frequency of Devil's-bit Scabious was highest in this field, with 55% of habitat condition assessment points recording the plant's presence, though this had decreased from 85% in 2023.

Field 6 – outside development boundary

- 3.3.5 Field 6 was not accessible for the survey in 2023, meaning that this was the first time data were collected in this location. This field was being grazed by cattle, but not intensively so, with sward height remaining higher than 50cm on average across the field. Frequency of Devil's-bit Scabious in abundance categories B/C was 5% across the transect length, resulting in a habitat condition assessment of "Unsuitable". However, there were localised patches of suitable habitat with abundant Devil's-bit Scabious and structured vegetation, particularly towards the northern and eastern extents of the field. There was an active larval web recorded in one of these patches, and this was the only active and healthy web encountered in all 6 fields, despite the habitat assessment of "Unsuitable" and expected population size of 0 webs.
- 3.3.6 Fields 2 and 6 do not overlap the development boundary and are therefore considered unlikely to be impacted negatively by the proposed development. However, if managed correctly in the future, these fields could perhaps provide valuable alternative habitat to compensate for the areas lost to the development. This particularly includes Fields 3, 4, and 6, which may be enhanced from "Unsuitable" to more suitable condition categories.

3.4 Recommendations

- 3.4.1 Any vegetation clearance, even in grassland considered to be "Unsuitable", should be preceded by a check for Marsh Fritillary larval webs by a suitably qualified and experienced ecologist, within 24 hours of clearance. Should any larval webs be found, the supporting plant and larval web will be hand dug and translocated to an area of suitable retained habitat, under watching brief by an ecologist.
- 3.4.2 Management of retained habitat would be undertaken to enhance it for Marsh Fritillary, to compensate for any loss of vegetation containing Devil's-bit Scabious that may be required to facilitate the Project. This should be undertaken by grazing, with the aim to prevent scrub encroachment within areas of wet grassland, and to maintain the overall sward height of the vegetation at 12-25 cm tall, such that the habitat improves to be of 'good condition' for Marsh Fritillary. Care should be taken not to permit overgrazing of the fields, as livestock may damage larval webs and their supporting vegetation.

4 References

RSK Biocensus, 2024. 2485475 *Ballynisky Wind Farm Marsh Fritillary Report Rev01*.

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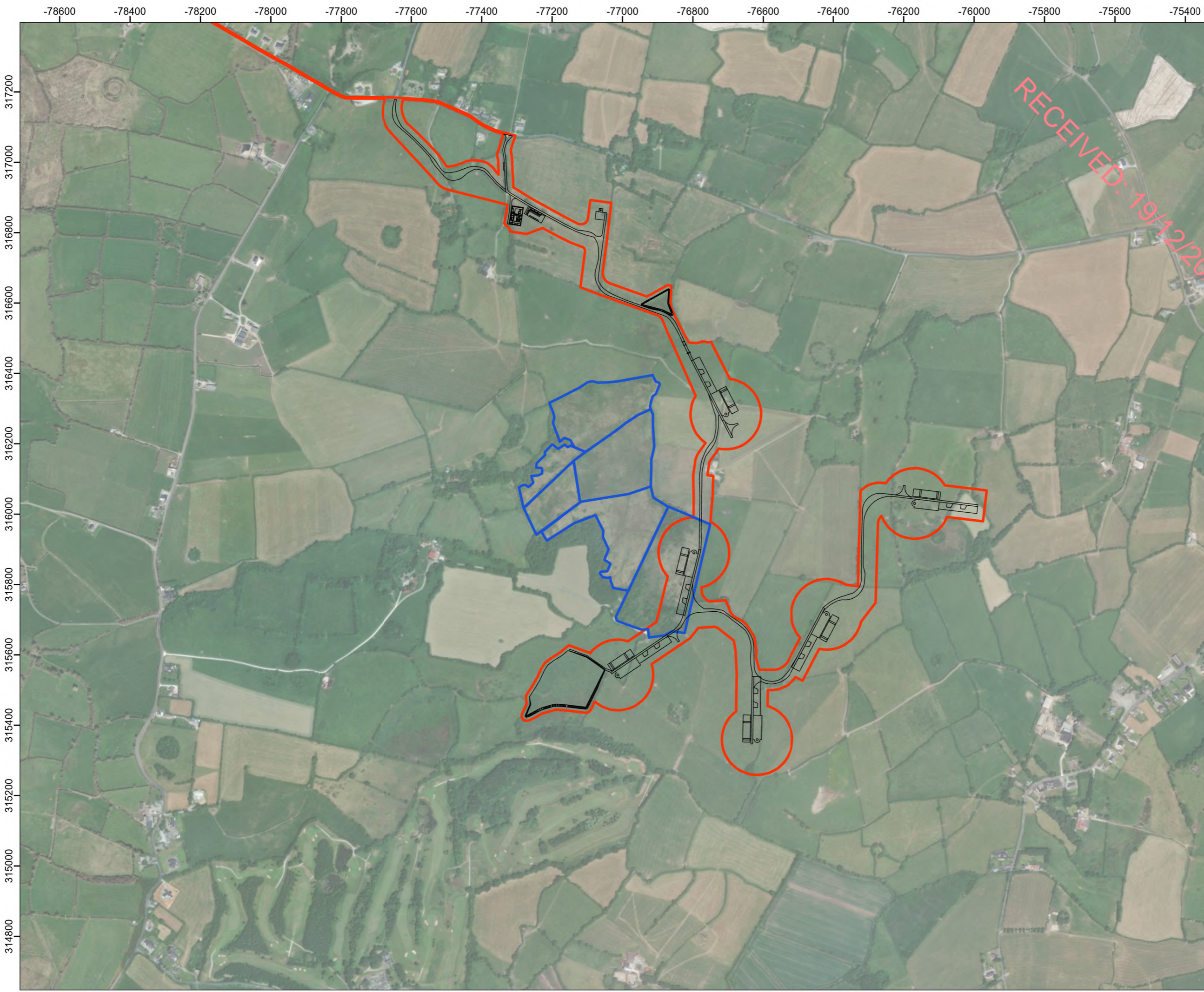
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Figures

Figure 1: Site Location Plan

Figure 2: Transect Routes

Figure 3: Larval Web Locations



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- Legend:**
- Ballynisky Planning Boundary
 - Marsh Fritillary Survey Area
 - Site Layout



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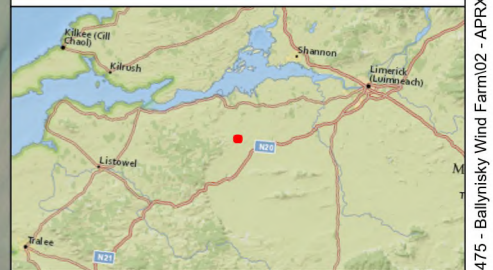
TITLE: Figure 1:
Site Boundary and Survey Area

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- Legend:**
- Ballynisky Planning Boundary
 - Marsh Fritillary Survey Area
 - Marsh Fritillary Transect Line



Rev	Date	Description	Drn	Chk	App
01	19/09/2025	2485475	TG	RPH	EP

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TITLE: Figure 2:
Transect Routes

Metres
SCALE: 1:2,800 @ A3

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Contains Ordnance Survey data © Crown copyright and database right 2025
Ballynisky Planning Boundary:
NatGeo_World_Map: National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.
World Imagery: Maxar, Microsoft
Marsh Fritillary Transect Line:



- Legend:**
- Ballynisky Planning Boundary
 - Marsh Fritillary Survey Area
 - - - Marsh Fritillary Transect Line
 - Larval web point

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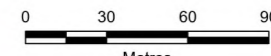
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Rev	Date	Description	Drn	Chk	App

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TITLE: Figure 3:
Location of Larval Webs



Metres

SCALE: 1:2,800 @ A3



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Ballynisky Planning Boundary:
NatGeo_World_Map: National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.
World Imagery: Maxar, Microsoft
Larval web point:
Marsh Fritillary Transect Line:

Appendix A – Guidance and Legislation

Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (Habitats Directive) 1992

The Habitats Directive 1992 requires EU Member States (MSs) to maintain or restore, at favourable conservation status, natural habitats and species of wild fauna and flora of community interest, which are listed under Annex I, II, IV and/or V.

Marsh fritillary is a species listed as an Annex II species. Under the Habitats Directive, EU Member States are required to contribute to the Natura 2000 network through the designation of Special Areas of Conservation (SACs) for natural habitat types listed in Annex 1 and habitats of species listed in Annex II. SACs are managed in accordance with the ecological needs of the species.

The Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) 1979

The principal aims of the Bern Convention 1979 are to ensure the conservation and protection of wild plant and animal species and their natural habitats (listed in Appendices I and II of the Convention), to increase cooperation between contracting parties, and to regulate the exploitation of those species (including migratory species) listed in Appendix III. To this end, the Bern Convention imposes legal obligations on contracting parties, protecting over 500 wild plant species and more than 1,000 wild animal species.

Appendix B – Habitat Condition Assessment Results

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Table 3. Habitat Condition Assessment Results.

Analysis categories	Field number					
	1	2	3	4	5	6
Mean vegetation height (cm)	>50 cm	>50 cm	>50cm	>50cm	>50	>50
% Frequency of Scabious	32.5	55	5	7.5	35	12.5
% Frequency of Scabious category A	12.5	20	5	0	10	7.5
% Frequency of Scabious category B	17.5	25	0	7.5	15	2.5
% Frequency of Scabious category C	2.5	10	0	0	10	2.5
% Frequency of 12-25 cm swards	0	0	0	2.5	0	0
% Frequency of category B/C Scabious in 12-25 cm swards	0	0	0	0	0	0
% Frequency of category B/C Scabious in <12 cm swards	0	0	0	0	0	0
% Frequency of category B/C Scabious in >25 cm swards	20	35	0	7.5	25	5
% Frequency of structured vegetation	27.5	52.5	7.5	25	55	40
% Frequency of low invading scrub	25	7.5	0	2.5	15	2.5
% Frequency of stock grazing signs	0	0	0	67.5	20	100
% Cover of tall scrub (>0.5 m)	40	10	5	30	2	10
Overall Habitat Condition	SU	SU	US	US	SU	US

Table 4. Larval Web Search Results.

Field number	Map reference (Figure 3)	Description
1	1	Damaged larval web, single caterpillar present.
2	2	Possible larval web, no caterpillars present.
6	3	Active larval web, numerous caterpillars present.

Table 5. Estimated Population Sizes.

Field number	Number of occupied webs found	Length of transect (m)	Area sampled (ha)	Area of suitable habitat (ha)	Estimated population within suitable habitat
1	1	620	0.12	5.72	48
2	1	730	0.15	4.27	28
3	0	700	0.14	<i>Unsuitable</i>	0
4	0	340	0.07	<i>Unsuitable</i>	0
5	0	340	0.07	1.14	0
6	1	600	0.12	<i>Unsuitable</i>	0
TOTAL	14	2,730	0.56	11.1	361

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Appendix A – Photographs

Habitats



Photograph 1. Field 1.



Photograph 2. Field 2.



Photograph 3. Field 3.



Photograph 4. Field 4.



Photograph 5. Field 5.



Photograph 6. Field 6.

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Larval webs



Photograph 7. Damaged larval web, Field 1.



Photograph 8. Possible abandoned larval web, Field 2.



Photograph 9. Active larval web, Field 6.

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