

# **Marsh Fritillary Habitat Condition Survey for Llantrisant Common & Pastures SSSI (2011 – 2020)**



**MENTER AR GYFER  
CADWRAETH NATUR CYMRU**



**INITIATIVE FOR NATURE  
CONSERVATION CYMRU**

# Marsh Fritillary Habitat Condition Survey for Llantrisant Common & Pastures SSSI (2011 - 2020)

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## Acknowledgements:

This report is a culmination of the efforts and dedication of numerous volunteers and organisations committed to marsh fritillary conservation in the Upper Ely landscape of South Wales. INCC are particularly grateful to Sue Westwood (CCW) and Richard Wistow (RCT) who produced the original habitat survey in 2011 and to Butterfly Conservation (BC) and George Tordoff for digitalising and making available the data for analysis. Also to INCC volunteers Lorna Baggett and Vaughn Matthews for undertaking the 2020 habitat survey and subsequent digitalisation of data, and to Ben Williams and Richard Wistow for undertaking the habitat survey training. Lastly, it is important to acknowledge the efforts of the landowners and land managers of Llantrisant Common and Pastures SSSI, namely the Wildlife Trust of South and West Wales and the Llantrisant Town Trust – It is one thing to map a habitat, but it is another thing altogether to manage it.

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## **1. Introduction**

### **1.1. About INCC**

1.1.1. The Initiative for Nature Conservation Cymru (INCC) was founded in 2018 as a charitable incorporated organisation (charity number: 1180113). Our vision is of '*a Wales with more wildlife in more places, created by a society that intrinsically values the natural world*'.

1.1.2. INCC was formed in response to the growing need for a truly independent nature conservation organisation for Wales. An organisation that was able to speak out and challenge environmental decision makers to do more for wildlife and nature conservation in Wales. To help achieve this we undertake a wide variety of nature conservation activities, including:

- Targeted species and habitat conservation projects
- Research, surveys and monitoring
- Practical habitat management and landowner advisory
- Community engagement and education
- Advocacy and campaigns

### **1.2. Report Rationale**

1.2.1. This report compares and evaluates the changes in marsh fritillary (*Euphydryas aurinia*) habitat condition at Llantrisant Common and Pastures Site of Special Scientific Interest (SSSI). The report is intended to help inform local marsh fritillary conservation as well as meet Natural Resources Wales (NRW) license (S087356/1) conditions with regard to the Upper Ely Marsh Fritillary Population Restoration Project.

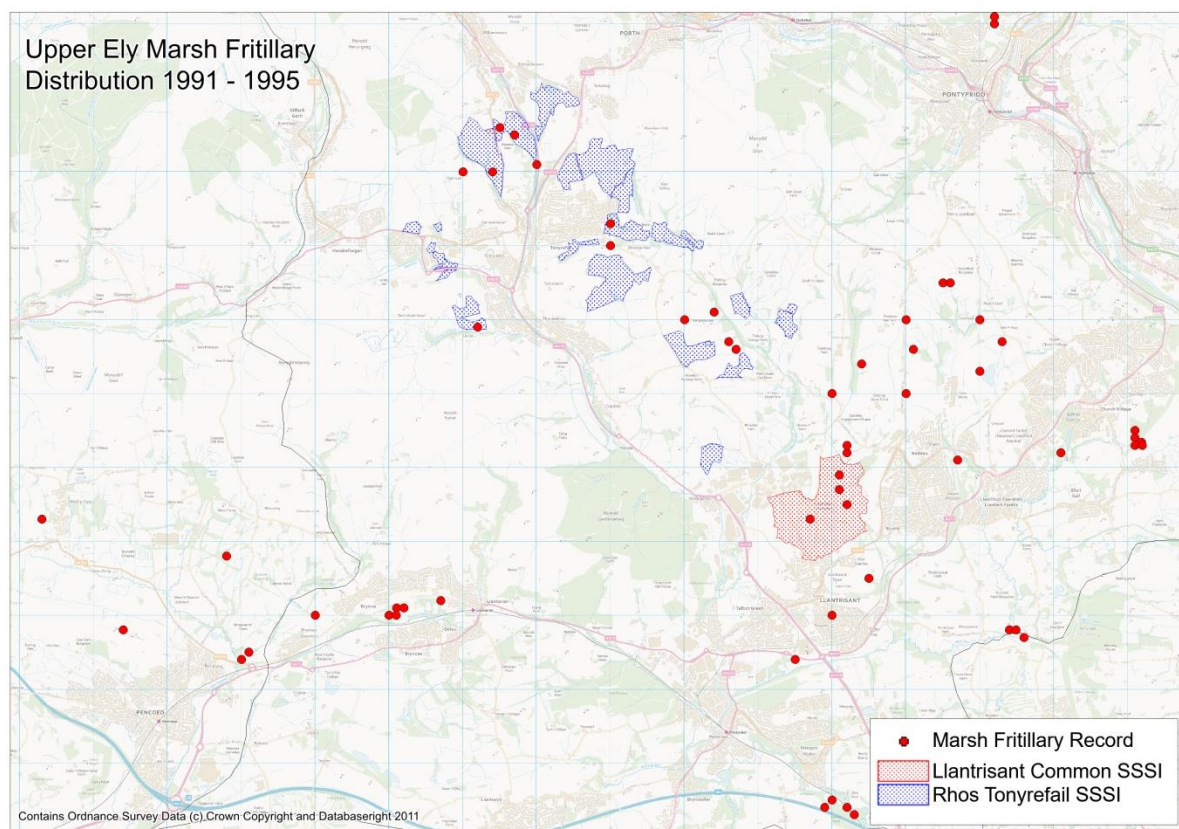
1.2.2. In July 2020, INCC obtained a license from NRW to take and possess a small number of marsh fritillary caterpillars from the wild. The caterpillars will be reared in captivity so that thousands of marsh fritillary can be returned to the Upper Ely landscape over the next four years. Donor sites for caterpillar collection are currently restricted to sites within the Upper Ely landscape, north Rhondda Cynon Taff (RCT) and Caerphilly. The receptor site for the population restoration project is Llantrisant Common and Pastures SSSI.

1.2.3. Prior to restoring a functioning population of marsh fritillary at the SSSI, it is important to understand the condition and availability of suitable habitat for the species.

## 2. Llantrisant Common and Pastures SSSI

### 2.1. Recent History and Management for Marsh Fritillary

- 2.1.1. Llantrisant Common and Pastures SSSI (**Plate 1**) was designated in 2001 and covers a total of 113ha including the whole of Llantrisant Common and a group of enclosed fields on its eastern margin. The Y Gweira nature reserve which is owned and managed by the Wildlife Trust of South and West Wales (WTSWW) makes up the most northerly enclosed pasture. The special features of the SSSI include marshy grassland, acid flush, acid grassland, species rich neutral grassland and two species, Cornish moneywort (*Sibthorpia europaea*) and bog earwort (*Scapania paludicola*).
- 2.1.2. As part of a functioning Upper Ely metapopulation, Llantrisant Common supported a marsh fritillary population up until the early to mid-1990s (**Figure 1**).



**Figure 1:** Marsh Fritillary records (SEWBrEC) from the upper Ely landscape 1991-1995.

- 2.1.3. The common has been traditionally managed with cattle for centuries, but the butterfly's extinction coincided with a period when the common was considerably more heavily grazed than it is at present (Dean *et al* 2011). Prior to SSSI designation, agricultural improvements to the common had been practiced, including the use of basic slag and the deepening of ditches and drains being examples of known works (Dean *et al* 2011).

- 2.1.4. Since its designation as a SSSI, Llantrisant Common has undergone considerable improvements in the condition of its marsh fritillary habitat. An agreed management programme has been established with the Town Trust and an abundance of good quality habitat has now developed (Wistow *pers comm* 2019).
- 2.1.5. The Upper Ely Marsh Fritillary Strategy (Dean *et al* 2011) details the history of the decline of the species during the past 25 years and more, the causes of the decline and the subsequent improvement in habitat condition. The strategy also confirms that over the last 18 years and despite an increase in habitat quality and extent for marsh fritillary the species has not been able to re-colonise (Dean *et al* 2011).



**Plate 1:** Llantrisant Common and Pastures SSSI (2009).



**Plate 2:** Llantrisant Common and Pastures SSSI (September 2020).

### 3. Methodology

#### 3.1. Habitat Assessment

- 3.1.1. The suitability of available habitat for marsh fritillary at Llantrisant Common and Pastures SSSI was surveyed on two occasions in the past 10 years, first in 2011, and again in 2020. Both surveys involved the visual assessment of the grassland so that different habitat patches could be categorised based on their suitability for marsh fritillary (Fowles 2003, Fowles and Smith 2006). As no vegetation sampling points were taken during the two surveys, an amended set of habitat condition definitions were used to categorise habitat suitability (**Table 1**). Surveyors relied on their knowledge and experience to visually assess and categorise habitat patches.

Condition Category	Code	Definition
Good Condition	GC	Grassland where c.80% of the grassland vegetation is within c.12-25cm and <i>Succisa pratensis</i> is visually abundant.
Suitable Undergrazed	SU	Grassland where <i>Succisa pratensis</i> is visually frequent or abundant and vegetation height is above c.25cm.
Suitable Overgrazed	SO	Grassland with frequent or abundant <i>Succisa pratensis</i> but is currently over-grazed such that the sward is below c.12cm.
Suitable Sparse	SS	Grassland with occasional <i>Succisa pratensis</i> and vegetation height is variable.
Potential Rank	PR	Grassland with rare <i>Succisa pratensis</i> which is currently under-grazed or neglected such that the sward is above 25 cm on average and <i>Succisa pratensis</i> occurs as scattered plants, usually in a rank, tussocky sward. Only used in the 2011 habitat survey.
Scrub	Scrub	Dense bramble or bracken – unsuitable as marsh fritillary habitat. Only used in the 2020 habitat survey.
Not Suitable	NS	Includes all other habitat types not currently suitable for marsh fritillary.

**Table 1:** Condition categories for mapping habitat quality for the marsh fritillary at Llantrisant Common and Pastures SSSI (2011 and 2020).

#### 3.2. Habitat Survey 2011

- 3.2.1. The original habitat condition mapping exercise of Llantrisant Common and Pastures SSSI was undertaken in 2011 by two experienced habitat surveyors, Richard Wistow (RCT) and Sue Westwood (CCW, now NRW). The survey formed an essential element of the Upper Ely Marsh Fritillary Strategy 2011.
- 3.2.2. Surveyors walked all the accessible areas of the SSSI with scale maps. The location, area and boundaries of different quality marsh fritillary habitat patches (**Table 1**) were annotated on the scale maps so that an overall picture regarding habitat quality

could be established. Once complete, the annotated maps were digitalised by Butterfly Conservation (BC) using a Geographical Information System (GIS).

### **3.3. Updated Habitat Survey 2020**

- 3.3.1. The marsh fritillary habitat condition survey was repeated in September 2020 by two experienced ecologists, Vaughn Matthews and Lorna Baggett. Surveyors walked all the accessible areas of the SSSI with scale maps. The location, area and boundaries of different quality marsh fritillary habitat patches (**Table 1**) were annotated on the scale maps so that an overall picture regarding habitat quality could be established. Once complete, the annotated maps were digitalised by Vaughn Matthews using a Geographical Information System (GIS).

### **3.4. Training**

- 3.4.1. An informal training day for surveyors was undertaken on 14<sup>th</sup> August 2020 to ensure a high degree of continuity existed between the two habitat surveys. The training day (**Plate 2**) involved a walkover survey of the SSSI with an experienced marsh fritillary ecologist (Ben Williams) and a member of the original (2011) survey team (Richard Wistow).

### **3.5. Larval Web Survey**

- 3.5.1. The training also provided a good opportunity for the five ecologists present to undertake a marsh fritillary larval web survey of Llantrisant Common. All surveyors involved in the survey (Lorna Baggett, Ben Williams, Richard Wistow, Vaughn Matthews and Rob Parry) are experienced in marsh fritillary ecology and survey techniques.



**Plate 2:** Marsh fritillary habitat mapping training.

## 4. Results

### 4.1. Marsh Fritillary Survey

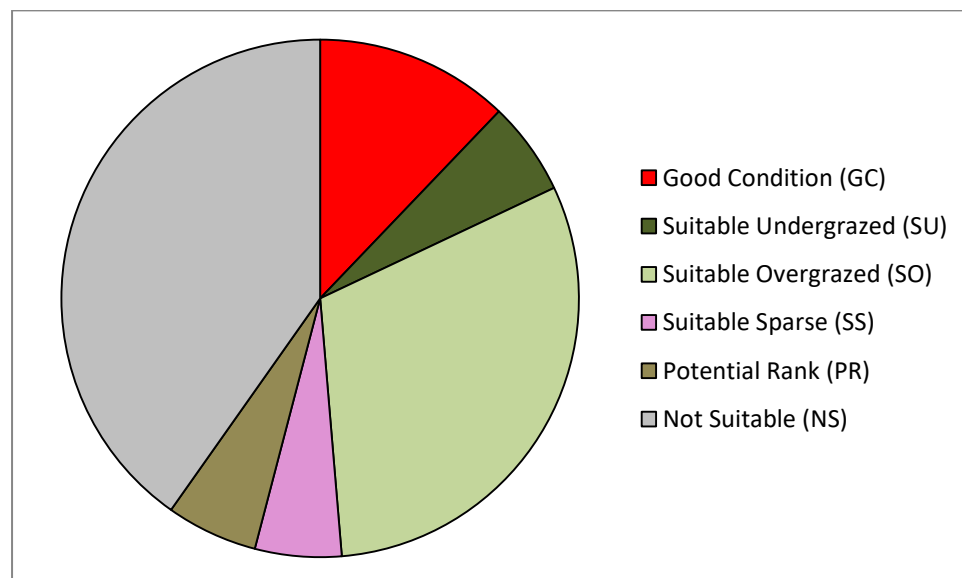
- 4.1.1. No evidence of marsh fritillary larva or larval webs were recorded at Llantrisant Common and Pastures SSSI during the habitat mapping training day (14.08.2020) or during the mapping exercise itself (September 2020).

### 4.2. Original Habitat Survey 2011

- 4.2.1. In total, 102.58ha of Llantrisant Common and Pastures SSSI were mapped during the original habitat survey in 2011. Six different habitat categories were recorded during the habitat survey (**Table 2**, **Figure 2** and **Figure 3**).

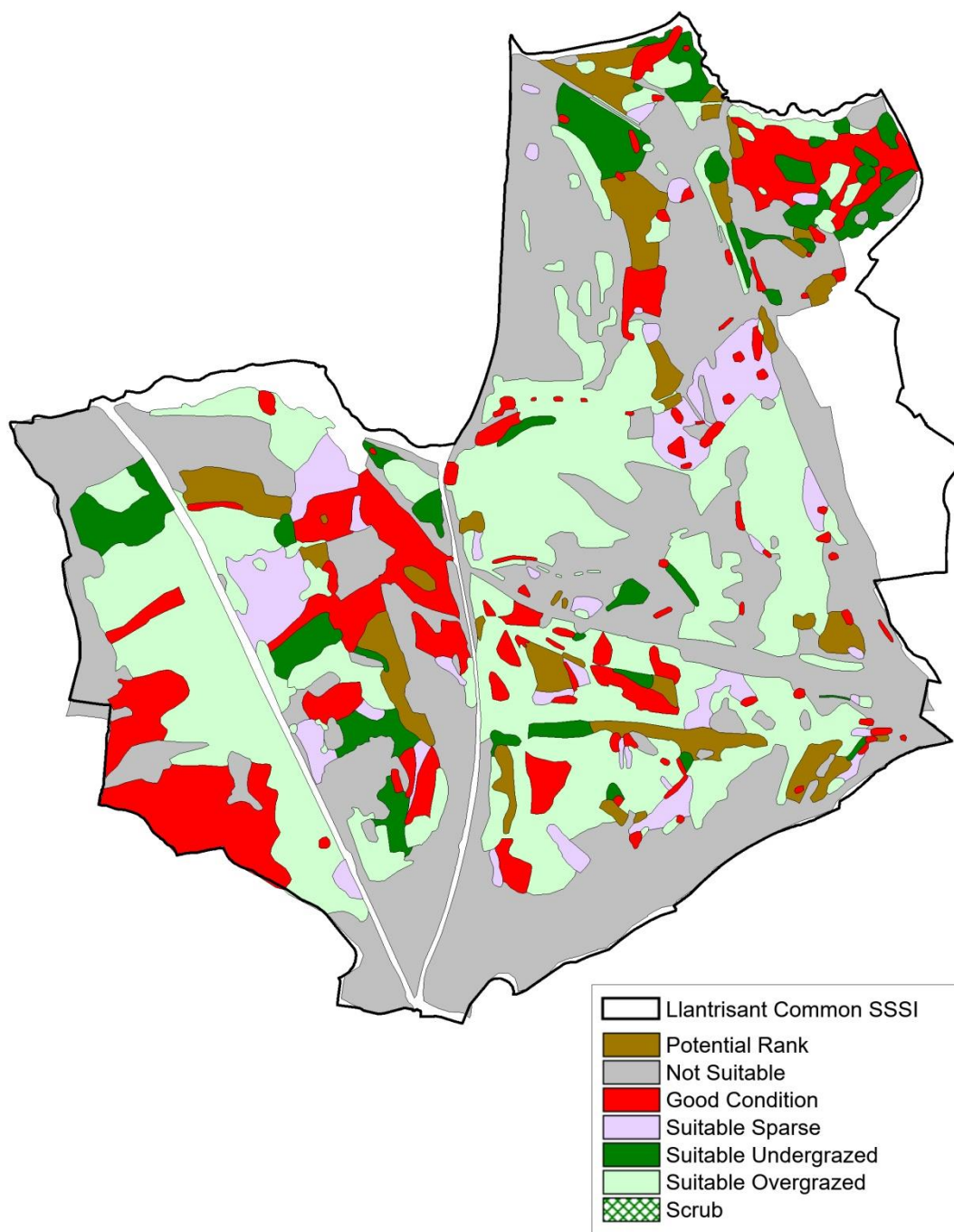
Habitat Category	Habitat Code	Area (ha)
Good Condition	GC	12.46
Suitable Undergrazed	SU	5.98
Suitable Overgrazed	SO	31.48
Suitable Sparse	SS	5.54
Potential Rank	PR	5.86
Not Suitable	NS	41.26
<b>Total Area Surveyed</b>		<b>102.58</b>

**Table 2:** Condition and area of marsh fritillary habitat at Llantrisant Common and Pastures SSSI (2011).



**Figure 2:** Proportion of different habitat categories recorded at Llantrisant Common and Pastures SSSI (2011).

**Marsh Fritillary Habitat Condition Survey  
Llantrisant Common and Pastures SSSI (2011)**



**Figure 3:** Marsh fritillary habitat condition survey of Llantrisant Common and Pastures SSSI (2011).

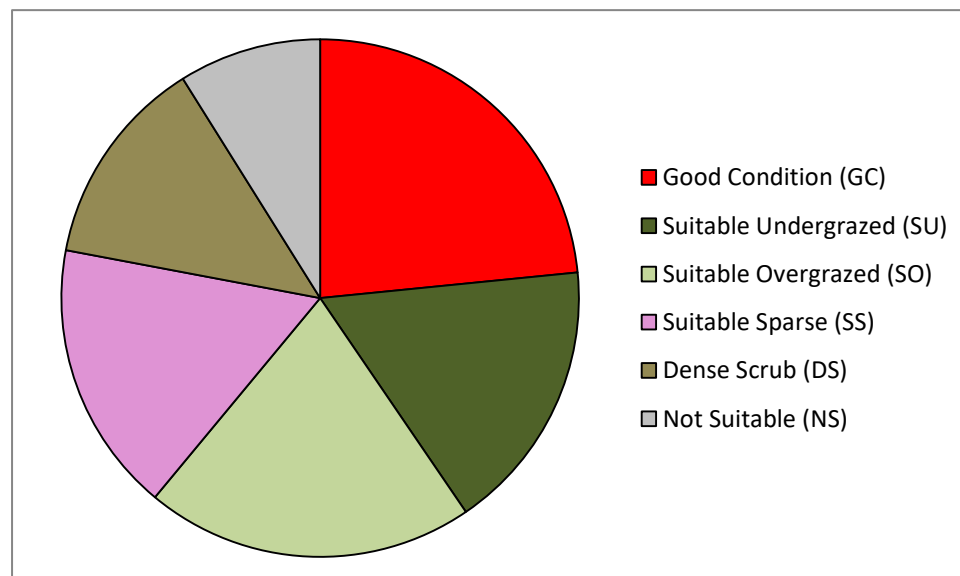
#### 4.3. Marsh Fritillary Habitat Survey 2020

4.3.1. In total, 107.52ha of Llantrisant Common and Pastures SSSI were mapped during the most recent (2020) habitat survey. Six different habitat categories were recorded during survey (**Table 3**, **Figure 4** and **Figure 5**).

4.3.2. An additional category of dense scrub was recorded and the habitat category of potential rank was omitted.

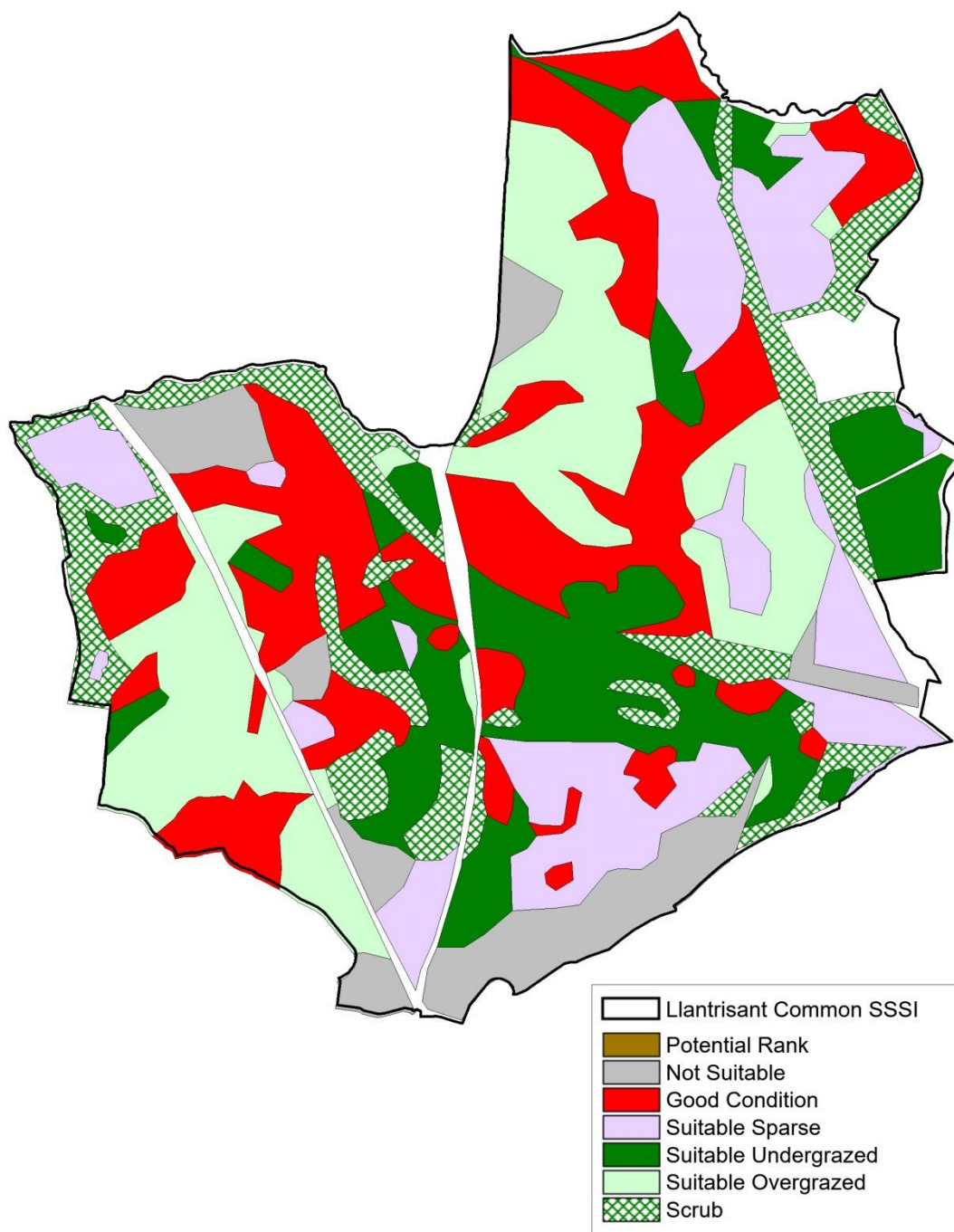
Habitat Category	Habitat Code	Area (ha)
Good Condition	GC	25.18
Suitable Undergrazed	SU	18.34
Suitable Overgrazed	SO	22.09
Suitable Sparse	SS	18.22
Dense Scrub	DS	14.12
Not Suitable	NS	9.57
<b>Total Area Surveyed</b>		<b>107.52</b>

**Table 3:** Condition and area of marsh fritillary habitat at Llantrisant Common and Pastures SSSI (2020).



**Figure 4:** Proportion of different habitat categories recorded at Llantrisant Common and Pastures SSSI (2020).

**Marsh Fritillary Habitat Condition Survey  
Llantrisant Common and Pastures SSSI (2020)**

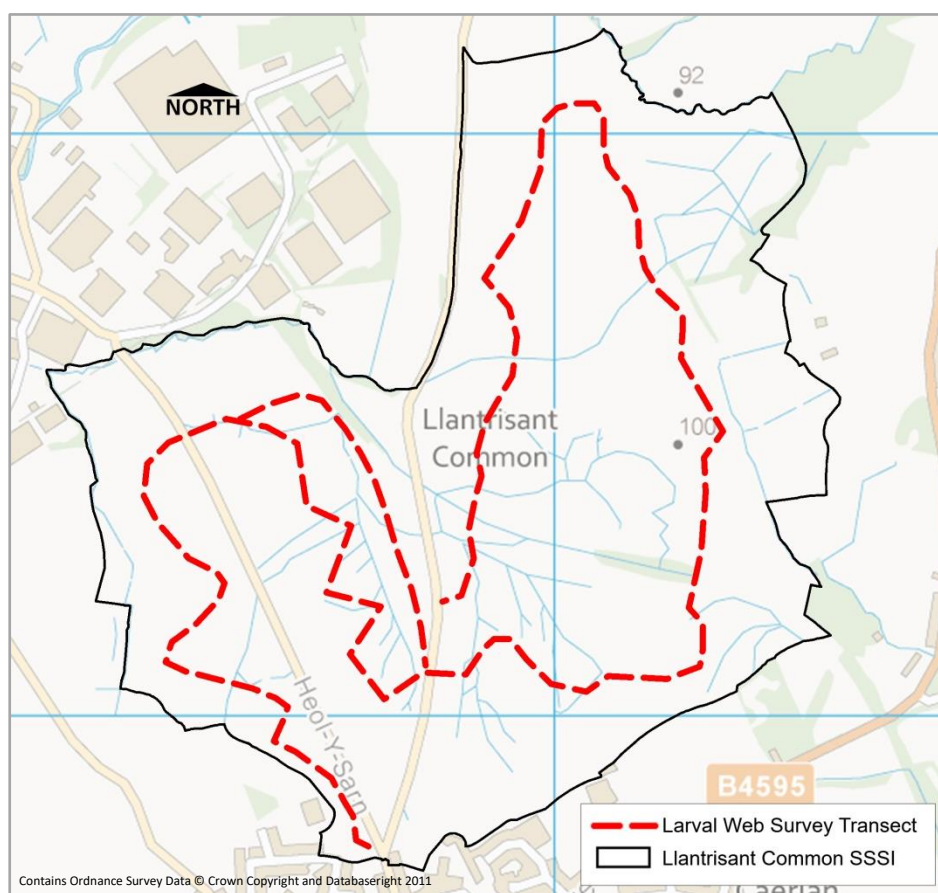


**Figure 5:** Marsh fritillary habitat condition survey of Llantrisant Common and Pastures SSSI (2020).

## 5. Considerations

### 5.1. Limitations to Survey

- 5.1.1. Whilst efforts have been made to ensure continuity of survey effort, it is possible that some interpretation of habitat condition may vary between the two survey teams, especially at the interface of different habitat types.
- 5.1.2. A smaller overall area (102.58ha) of Llantrisant Common and Pastures SSSI was surveyed during the baseline survey in 2011. The reason for this is due to some areas to the east of the SSSI (**Figure 3**) being difficult to access at the time.
- 5.1.3. The habitat category of 'potential rank' was not recorded during the most recent habitat survey of the SSSI and therefore direct comparisons cannot be made. The most recent survey did record 'dense scrub' which consisted of dense bramble (*Rubus fruticosus* agg), bracken (*Pteridium aquilinum*) and immature woodland.
- 5.1.4. The marsh fritillary larval web survey which was undertaken during the habitat mapping training day (14.08.2020) did not cover the whole of Llantrisant Common and Pastures SSSI (**Figure 6**).



**Figure 6:** Larval web survey transect of Llantrisant Common and Pastures SSSI 2020.

## 6. Interpretation of Survey

### 6.1. Habitat Change

6.1.1. **Table 3** and **Figure 7** below suggest a clear and positive change in habitat suitability for marsh fritillary at Llantrisant Common and Pastures SSSI since the original survey in 2011.

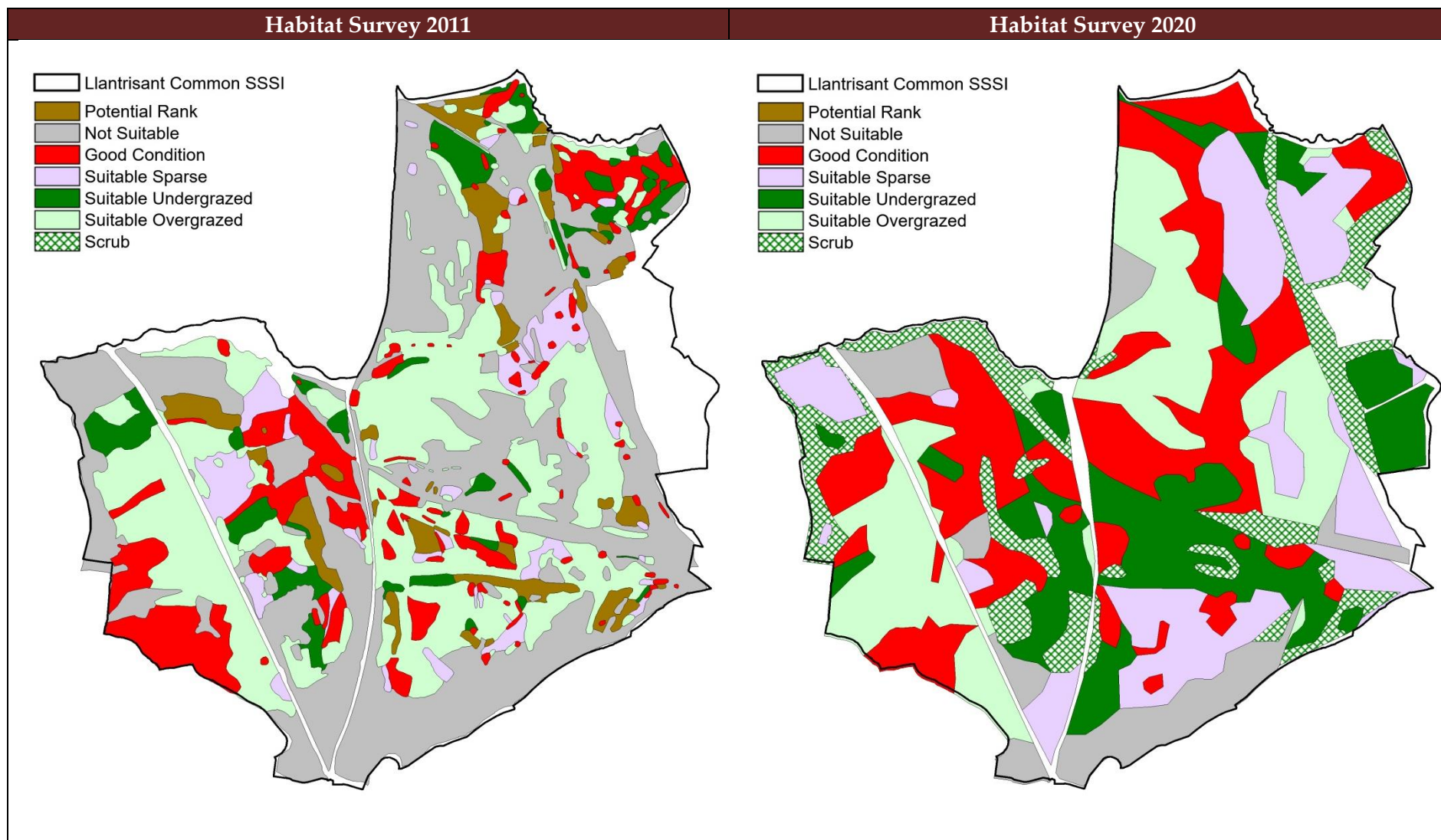
Habitat Category	Habitat Code	Habitat Area (ha) 2011	Habitat Area (ha) 2020	Difference in Habitat Area (ha) Between Surveys
Good Condition	GC	12.46	25.18	+12.72
Suitable Undergrazed	SU	5.98	18.34	+12.32
Suitable Overgrazed	SO	31.48	22.09	-9.39
Suitable Sparse	SS	5.54	18.22	+12.68
Potential Rank	PR	5.86	-	0
Dense Scrub	DS	-	14.12	0
Not Suitable	NS	41.26	9.57	-31.69
<b>Total Area Surveyed</b>		<b>102.58</b>	<b>107.52</b>	

**Table 4:** Difference in area of marsh fritillary habitat condition at Llantrisant Common and Pastures SSSI (2011 – 2020).

6.1.2. The survey shows that there has been an increase of over 12ha in good condition habitat for marsh fritillary at the SSSI in the intervening nine year period between surveys. Also noticeable is the fact that areas of good condition habitat have become larger and more contiguous throughout the SSSI. The distribution of good condition habitat is roughly similar to that of 2011, with the exception of a marked increase toward the central areas of the SSSI. Small reductions in the distribution of good condition habitat are noticeable to the southwest of the SSSI.

6.1.3. The greatest change in habitat condition category between the two surveys can be seen in ‘not suitable’ habitat. There has been a reduction of 31.69ha of ‘not suitable’ habitat and a corresponding increase in suitable habitat types, particularly in the categories good condition, suitable sparse and suitable undergrazed. The gradual change to suitable habitat types from unsuitable is encouraging and reflects the essential work of graziers and the Llantrisant Town Trust in managing the common for wildlife.

6.1.4. In 2011 a total of 31.48ha of the surveyed area was regarded as ‘suitable overgrazed’ for marsh fritillary. This figure has fallen to 22.09ha by 2020 and further suggests an overall improvement in habitat suitability and management for marsh fritillary at the SSSI.



**Figure 7:** Comparison of habitat quality distribution at Llantrisant Common and Pastures SSSI between 2011 and 2020.

## 7. References

Fowles, A.P. (2003). Guidance notes for the definition and mapping of habitat quality for marsh fritillaries. Natural Science Report 03/5/1. Countryside Council for Wales.

Fowles, A. P. and Smith, R. G. (2006). Mapping the habitat quality of patch networks for the marsh fritillary *Euphydryas aurinia* (Rottemburg, 1775) (Lepidoptera, Nymphalidae) in Wales *Journal of Insect Conservation*. 10:161–177

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