

The status and distribution of Broom-tip *Chesias rufata* at Morfa Harlech and Harlech Forest in 2023

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Crynodeb gweithredol

Mewn arolwg ar gyfer Rhesen Gam *Chesias rufata* ym Morfa Harlech a Choedwig Harlech, sef lleoliad allweddol ar gyfer y gwyfyn yng ngogledd Cymru, rhwng Gorffennaf a dechrau Medi 2023, cofnodwyd 11 o larfau ar blanhigyn bwyd, y fanhadlen *Cytisus scoparia*.

Cafwyd hyd i'r holl larfau ar lwyni aeddfed mewn amodau cysgodol ar y brif rodfa sy'n rhedeg o'r gogledd i'r de drwy'r goedwig, a darganfuwyd pob un heblaw un i'r gogledd o'r gyffordd â'r rhodfa sy'n rhedeg o'r dwyrain i'r gorllewin. Mae rhan ogleddol y rhodfa yn cynnal y dwysedd mwyaf o fanadl yn y dirwedd, er eu bod i'w cael ar hyd y brif rodfa a hefyd ar hyd y rhodfa orllewinol. Mae'r planhigyn bwyd hefyd wedi'i wasgaru dros y twyni agored cyfagos a glaswelltir y twyni, lle mae toreth o lasbrennau banadl yn dynodi ei fod yn ehangu ei gynefin mewn mannau.

Dylid cadw banadl ar hyd y rhodfa sy'n rhedeg o'r gogledd i'r de yng Nghoedwig Harlech i gynnal y boblogaeth o resi cam a dylid cynnal natur gysgodol yr ardal.

Mae angen gwneud rhagor o waith arolygu i weld a yw clystyrau ychwanegol o'r planhigyn bwyd yn cynnal y gwyfyn.

Executive summary

A survey for Broom-tip *Chesias rufata* at Morfa Harlech and Harlech Forest, the key locality for the moth in north Wales, from July to early September 2023 recorded eleven larvae on the foodplant, Broom *Cytisus scoparia*. All larvae were found on mature bushes in sheltered conditions on the main north-south ride that runs through the forest, and all but one were found north of the junction with the east-west ride. The northern part of the ride supports the greatest density of Broom within the landscape although it occurs along the entire length of the main ride and also along the western ride. The foodplant is also scattered over the adjoining open dunes and dune grassland where an abundance of Broom saplings indicate that it is expanding its range in places.

Broom along the north-south ride within Harlech Forest should be retained to support the population of Broom-tip and the sheltered nature of area should be maintained.

Further survey work is required to determine if additional stands of the foodplant support the moth.

1. Introduction

The Broom-tip moth *Chesias rufata* (Fabricius, 1775) is widespread in Europe (Karsholt & Razowski, 1996), with recent records from Wicklow and Wexford in Ireland (Randle *et al.*, 2019). In the UK, it has experienced significant recent declines with a 90% reduction in abundance between 1970 and 2016 and a 91% reduction in distribution between 2000 and 2016 (Randle *et al.*, 2019). It is now largely confined to south-east England, East Anglia, the Welsh borders, south-west Scotland and the Scottish Highlands, with post-2000 records from 137 hectads. Randle *et al.* (2019) classes the moth as Near Threatened.

In Wales, Broom-tip has been recorded from seven vice counties (VC35, 41, 42, 46, 47, 48 & 50) (Butterfly Conservation, 2022). It was regarded as fairly common in Monmouthshire with important populations in Wentwood Forest and within the Lower Wye Valley & Wye Gorge including Llandogo, Tintern and Redding's Inclosure (Horton, 1994). It remains relatively widespread here with post-2000 records from 14 sites (Monmouthshire Moth and Butterfly Group website) although it is unclear how many support breeding populations. The moth is a rare and localised resident in Glamorgan with just eight records from five hectads from 1857 to 2009 (Gilmore *et al.*, 2014), and there are recent records from Kenfig Burrows (2019) and Senghenydd (2012) (Glamorgan Moth Recording Group website). There is also a recent record (2019) from Fedw Wood in Breconshire. In north Wales, it is regarded as scarce, threatened and of "conservation concern" (North Wales Lepidoptera website). Most recent records are from Morfa Harlech and Harlech Forest (Table 1), although small numbers of adults have been attracted to light at Llanfyllin and nearby Rhos-y-brithdir in Montgomeryshire from 2006 to 2019. Other records in Montgomeryshire, Denbighshire and elsewhere in Merionethshire probably represent dispersing individuals.

There are two subspecies of Broom-tip in the UK; subspecies *scotica* in Scotland and subspecies *rufata* in England and Wales. The moth is associated with heathland, moorland and open woodland where adults are on the wing from April to August, with peaks in May and July (Randle *et al.*, 2019), and are attracted to light. Larvae feed on the leaves of Broom *Cytisus scoparia* from July to September, subsequently pupating underground throughout the winter (Henwood *et al.*, 2020).

Broom-tip was first recorded at Morfa Harlech/Harlech Forest in 2002 and it has subsequently been recorded regularly at light from four tetrads, always in small numbers (Table 1). The flight season here is from late April to mid-July, with a distinct peak in May but without a July peak (North Wales Lepidoptera website).

The aims of the current survey were to map the distribution of the larval foodplant on Morfa Harlech and Harlech Forest and to assess the distribution of Broom-tip by searching for larvae. This would provide a truer reflection of the exact distribution of the moth rather than recording the more mobile adult stage. Surveys were undertaken from July to September to avoid confusion with larvae of the Streak moth *Chesias legatella* which have a similar appearance and also feed on Broom in May and June. The Streak is much more widespread in the UK and Wales and is known from Harlech Forest (North Wales Lepidoptera website).

Table 1. Records of Broom-tip from Morfa Harlech and Harlech Forest. From: North Wales Lepidoptera website.

Site	Grid Reference	Date	Abundance
Harlech Forest	SH571328	23/04/2002	1 adult
Harlech Forest	SH568327	16/05/2002	2 adults
Harlech Forest	SH571328	16/05/2002	2 adults
Harlech Forest	SH571327	28/05/2003	1 adult
Harlech Forest	SH571327	21/06/2003	1 adult
Harlech Forest	SH5732	11/08/2012	1 larva
Harlech Forest	SH580337	08/08/2018	2 larvae
Morfa Harlech	SH574301	29/06/2005	1 adult
Morfa Harlech	SH574301	07/05/2006	1 adult
Morfa Harlech	SH574301	05/07/2006	1 adult
Morfa Harlech	SH574301	10/07/2006	1 adult
Morfa Harlech	SH574301	15/05/2007	1 adult
Morfa Harlech	SH574301	19/06/2008	1 adult
Morfa Harlech	SH574301	31/05/2009	1 adult
Morfa Harlech	SH574301	20/06/2013	2 adults
Morfa Harlech	SH574301	19/06/2014	1 adult
Morfa Harlech	SH574301	22/05/2015	2 adults
Morfa Harlech	SH574301	16/07/2015	1 adult
Morfa Harlech	SH574301	20/07/2015	1 adult
Morfa Harlech	SH574301	22/07/2015	1 adult
Morfa Harlech	SH574301	09/05/2016	2 adults
Morfa Harlech	SH574301	31/05/2016	1 adult
Morfa Harlech	SH574301	23/04/2017	1 adult
Morfa Harlech	SH574301	25/05/2017	1 adult
Morfa Harlech	SH574301	27/06/2018	1 adult
Morfa Harlech	SH574301	01/06/2019	1 adult
Morfa Harlech	SH574301	16/05/2022	1 adult

2. Methods

The site was visited on seven occasions between 8th July and 4th September 2023 to encompass the period when larvae would be expected to be found. The aim was to beat as many of the Broom bushes as possible on the reserve and this was made easier by the fact that most of them were situated along the edges of the forest rides. The northern ride was revisited on the last two dates as the other areas seemed unproductive, in the hope of recording late larvae. The visits were as follows:

8th July 2023. Most of the northern part of the main ride covered.

20th July 2023. The rest of the main north-south ride covered.

3rd August 2023. Western ride and clear-felled area checked for Broom. Southern SAC area.

10th August 2023. Northern part of the ride penetrating further into the forest.

23rd August 2023. SAC/dune grassland area.

30th August 2023. Northern part of main ride. West side.

4th September 2023. Northern part of main ride. East side.

Each Broom bush was tapped sharply with a stout stick onto a beating tray (purchased from Watkins & Doncaster) held underneath. Large bushes were beaten in more than one place. Insects, especially bugs, would readily fall onto the beating tray and these were then tapped off with the stick. Any larvae, of Broom-tip or other species, would remain attached to the tray and also remain still for a time while they could be examined or photographed (see Figure 5). Larvae would be carefully placed back onto Broom bushes after identification.

3. Results

3.1 The distribution of Broom at Morfa Harlech and Harlech Forest

The distribution of Broom at Morfa Harlech and Harlech Forest is shown in Figure 1. The continuous red line indicates a high density of Broom bushes while a broken red line indicates a lower density. A scattering of bushes is indicated within the circled areas. As can be seen, the greatest density of Broom occurs over the northern part of the main forest ride although it occurs along the entire length of the main ride and also along the western ride. Broom is also scattered over the SAC/dune grassland area. Over the northern part of this latter area, there is an abundance of broom saplings indicating that the plant is expanding its range in places.

3.2 The distribution of Broom-tip at Morfa Harlech and Harlech Forest

The results of the survey for Broom-tip are given in Table 2. All eleven larvae were found on the main north-south ride that runs through the forest (Figures 2 & 3) and all of these except one were found north of the junction with the east-west ride (SH578332). The northern part of the ride also has the greatest density of Broom bushes. Ten larvae were beaten from bushes whilst one was spotted while at rest on Broom in camouflage pose (Figure 4). Larvae were found on well-established bushes with none on small, wispy bushes. They were found at the edge of the ride and also on bushes in small clearings slightly further into the forest. It seems odd that larvae were only found in this northern area as seemingly suitable habitat exists elsewhere, both within and outside the forest.



Figure 1. Distribution of Broom at Morfa Harlech and Harlech Forest.

Table 2. Broom-tip larval records at Morfa Harlech and Harlech Forest in 2023.

Date	Area	No. Larvae	Grid References
8 th July	N Ride	4	SH58033378, SH58033375, SH57993366, SH57993364
20 th July	N & S Ride	2	SH57903346, SH57803323
3 rd August	W Ride, SAC	0	-
10 th August	N Ride	2	SH57983366, 57813355
23 rd August	SAC	0	-
30 th August	N Ride (West side)	2	SH58063384, SH57883343
4 th September	N Ride (East side)	1	SH58053381

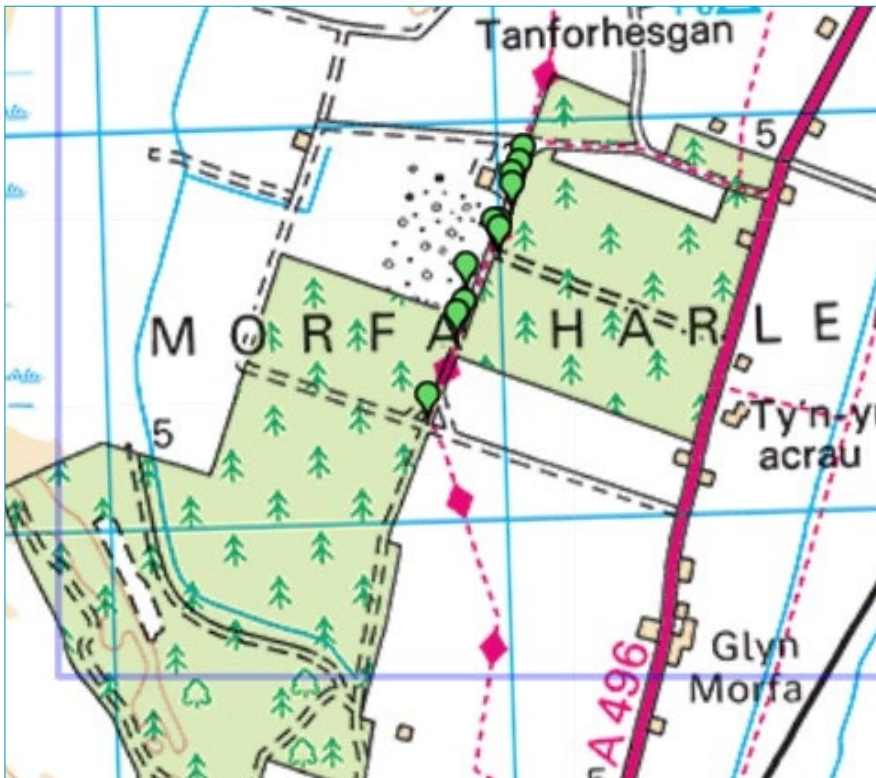


Figure 2. Distribution of Broom-tip larvae at Morfa Harlech and Harlech Forest in 2023.



Figure 3. Distribution of Broom-tip larvae at Morfa Harlech and Harlech Forest in 2023.



Figure 4. Broom-tip larva at rest on foodplant, 30th August 2023. Enlarged image.



Figure 5. Broom-tip larva on beating tray, 4th September 2023. Enlarged image.

4. Discussion

From the current survey, it appears that Broom-tip is established primarily over the northern part of the ride in Harlech Forest which supports the greatest density of Broom. Most larvae were found on mature bushes growing in sheltered situations along the forest ride. Whilst Broom-tip was not recorded elsewhere, it is very likely that it breeds in other locations on Morfa Harlech and within Harlech Forest but was not picked up due to lower numbers of larvae. In order to maintain a population of Broom-tip within the Morfa Harlech – Harlech Forest landscape, it is vital to retain Broom along the occupied northern ride and maintain its sheltered nature either by the retention of current conifer trees or promoting stands of native tree species. Ideally, the moth population would be encouraged to expand into other areas of the forest and surrounding dune habitats.

Further survey work is required to determine if additional stands of the foodplant support the moth.

5. Acknowledgements

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6. References

Butterfly Conservation. 2022. Wales Provisional Moth List 2021.

Gilmore, D., Slade, D. & Stewart, B. 2014. *The Moths of Glamorgan*. Atropos, Helston. Glamorgan Moth Recording Group website - [GMRG - Glamorgan Moth Group :: Moths :: 70.196 \(Chesias rufata\) \(glamorganmoths.org.uk\)](http://GMRG-GlamorganMothGroup::Moths::70.196(Chesiasrufata)(glamorganmoths.org.uk))

Henwood, B., Sterling, P. & Lewington, R. 2020. *Field Guide to the Caterpillars of Great Britain and Ireland*. Bloomsbury Nature Guides, London.

Horton, G.A.N. 1994. *Monmouthshire Lepidoptera. The Butterflies and Moths of Gwent*. Comma International Biological Systems.

Karsholt, O. & Razowski, J. 1996. *The Lepidoptera of Europe. A Distributional Checklist*. Apollo Books, Stenstrup.

Monmouthshire Moth and Butterfly Group website - [MMBG - Monmouthshire Moth and Butterfly Group :: Moths :: 70.196 \(Chesias rufata\) \(gwentleps.org.uk\)](http://www.mmbg.org.uk)

North Wales Lepidoptera website - trawsgoed.com/NWLeps.aspx

Randle, Z., Evans-Hill, L.J., Parsons, M.S., Tyner, A., Bourn, N.A.D., Davis, T., Dennis, E.B. O'Donnell, M., Prescott, T., Tordoff, G.M. & Fox, R. 2019. *Atlas of Britain & Ireland's Larger Moths*. Pisces Publications, Newbury.

Waring, P., Townsend, M. & Lewington, R. 2003. *Field guide to the moths of Great Britain and Ireland*. British Wildlife, Hook.

Data Archive Appendix

The data archive contains:

[A] The final report in Microsoft Word and Adobe PDF formats.

~~[B] A full set of maps produced in JPEG format.~~

~~[C] A series of GIS layers on which the maps in the report are based with a series of word documents detailing the data processing and structure of the GIS layers.~~

~~[D] A set of raster files in ESRI and ASCII grid formats.~~

~~[E] A database named [name] in Microsoft Access 2000 format with metadata described in a Microsoft Word document [name.doc].~~

~~[F] A full set of images produced in [jpg/tiff] format.~~

[G] Species records held in Welsh Invertebrate Database (WID).

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