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# Survey for the Blue Ground Beetle *Carabus intricatus* in Coed Maesmelin, Glamorgan

D. C. Boyce & J.M. Walters

Evidence Report No. 45

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## 1. Crynodeb Gweithredol

Ar ôl darganfod nifer o chwilog y llawr *Carabus intricatus* mewn gardd ar gyrion Castell-nedd yn 2012 a 2013, comisiynodd Cyfoeth Naturiol Cymru arolwg o warchodfa gyfagos Coed Cadw, sef Coed Maesmelin. Mae'r chwilen *Carabus intricatus* yn rhywogaeth goetirol Genedlaethol Brin, a dim ond mewn parciau a choedwigoedd hynafol yn Nyfnaint a Chernyw y mae wedi'i darganfod o'r blaen. Caiff ei chynnwys yng Nghynllun Gweithredu'r DU ar Fioamrywiaeth fel Rhywogaeth â Blaenoriaeth. Go brin fod y chwilen wedi bridio mewn gardd, felly rhagdybir bod y cofnodion ar gyfer 2012 a 2013 yn ymwneud â chwilog a oedd wedi'u golchi i lawr o goetir cyfagos yn ystod fflachlif a ddigwyddodd adeg eu darganfod. Ar ôl chwilio Coed Maesmelin yn ystod y nos yn 2013, ni ddaethpwyd o hyd i'r chwilen.

Ar 28ain Mai 2014 ymwelwyd â Choed Maesmelin unwaith eto yn ystod y nos, a threuliwyd sawl awr yn chwilio am chwilog llawndwf mewn boncyffion coed. Dyma'r dull mwyaf effeithiol o ddod o hyd i'r rhywogaeth ar safleoedd yn ne-orllewin Lloegr, ac yn aml gellir dod o hyd i chwilog llawndwf yn bwydo ar wllthod ac yn cymharu mewn amgylchiadau o'r fath. Fodd bynnag, ni ddaethpwyd o hyd i rai yn ystod ein hymweliad ym mis Mai, er chwilio'r holl gynefinoedd addas yn ofalus. Yn dilyn hyn, ymwelwyd â'r safle eto ar 22ain Ionawr 2015 i weld a ellid dod o hyd i *C. intricatus* a oedd yn gaeafgysgu yno. Yn ystod misoedd y gaeaf gellir dod o hyd i chwilog llawndwf mewn pren marw sydd wedi deillio o nifer o goed collddail gwahanol, fel arfer dan fwsogl a rhisgl neu mewn rhuddin pwdr llaith. Yng Nghoed Maesmelin, daethpwyd o hyd i ddwy chwilen fenywaidd ac un chwilen wrywaidd mewn sefyllfaedd nodweddiadol, mewn canghennau a boncyffion marw, mwsoglyd a oedd yn perthyn i goed derw a choed bedw.

Mae darganfod *Carabus intricatus* yng Nghymru yn cynrychioli estyniad pwysig iawn yn nosbarthiad y rhywogaeth ym Mhrydain. Mae pob un o'i phoblogaethau cryfach yn Lloegr i'w cael mewn coedwigoedd sydd ag ychydig o lystyfiant yn unig yn haen y llwyni a haen y caeau, gydag amgylchiadau o'r fath yn cael eu cynnal gan bori, fel arfer. Arferai anifeiliaid bori yng nghoetir Coed Maesmelin, ond nid yw wedi'i bori ers sawl blwyddyn bellach, ac o'r herwydd ceir mieri trwchus mewn manau. Byddai ailgyflwyno pori a thorri'r mieri a'r prysglwyni eraill yn hynod ddymunol, er mwyn gwella ansawdd y cynefin ar gyfer y chwilen. Mae'n debyg y bydd mwy o gytreff'n cael eu darganfod mewn parciau a choedwigoedd hynafol yn ardal Castell-nedd, a byddai'n werthfawr cynnal mwy o arolygon, yn enwedig yn y coedwigoedd sydd gerllaw Coed Maesmelin.

## 2. Executive Summary

Following the discovery of several adult blue ground beetles *Carabus intricatus* in a garden on the edge of Neath in 2012 and 2013, Natural Resources Wales commissioned a survey of the nearby Woodland Trust reserve at Coed Maesmelin. The blue ground beetle is a Nationally Rare woodland species, which has only ever been found in ancient woods and parks in Devon and Cornwall. It is included in the UK Biodiversity Action Plan as a Priority species. It seemed very unlikely to be breeding in a garden environment and it was postulated that the 2012 and 2013 records were of individuals that had been washed down out of nearby woodland during flash-flood events that occurred at the time of these discoveries. A night search of Coed Maesmelin in 2013 failed to produce any sightings of the beetle.

On the 28<sup>th</sup> May 2014 Coed Maesmelin was visited again at night and a number of hours were spent searching tree trunks for the adult beetles. This is the most effective method of locating the species in its south-west English sites, with adults often being found feeding on slugs and mating in such situations. However, none were found during the May visit despite careful searching of all areas of suitable habitat. Following this, a second visit was made on the 22<sup>nd</sup> January 2015 to see if hibernating *C. intricatus* could be located. Adults are found in the winter months in dead wood of a range of broadleaves, usually occurring under moss and bark or in moist heart-rot. At Coed Maesmelin, two females and one male were found in typical situations in association with dead, mossy oak and birch stumps and branches.

The discovery of *Carabus intricatus* in Wales represents a very significant extension of its British range. All of its stronger English populations are found in woods where there is little vegetation in the shrub and field layers, with such conditions usually being maintained by grazing. The woodland at Coed Maesmelin was formerly open to stock, but has been ungrazed for a number of years and has consequently developed a dense field layer of bramble in many places. Re-introduction of grazing and cutting back of bramble and other scrub is highly desirable in order to improve the quality of the habitat for the beetle. It seems likely that more colonies will be found in ancient woods and parks in the Neath area and further surveys, especially in those woods lying adjacent or close to Coed Maesmelin, would be valuable.

### 3. Introduction and Methods

This report details the findings of a survey of the Woodland Trust reserve at Coed Maesmelin by DC Boyce (DCB) and JM Walters (JMW). The survey aimed to ascertain the status of the blue ground beetle *Carabus intricatus* at the site. Coed Maesmelin is an ancient semi-natural woodland dominated by sessile oak *Quercus petraea*, which lies just to the north of the Neath conurbation in Glamorganshire (Watsonian vice county 41). A central grid reference for the site approximates to SS724981. This work has been carried out under contract to Natural Resources Wales (NRW). The location and boundary of the site can be seen in Figure 4.1.

Though it is superficially similar to the common violet ground beetles, *C. problematicus* and *C. violaceus*, the blue ground beetle can be distinguished by its more elongate 'spidery' form and the generally brighter blue colouration of the whole body. The general appearance of the beetle can be seen in Figure 3.2 below. *Carabus intricatus* is a very rare insect which has its main British stronghold in river valleys where there are extensive stands of ancient upland oak woodland on the southern edge of Dartmoor, Devon. There are a few further colonies in wooded sites on the fringes of Bodmin Moor, Cornwall (Boyce & Walters, 2001). In the forthcoming Status Review of ground beetles, it is classified as Near Threatened and Nationally Rare (Telfer, *in prep.*). These status categories reflect its very limited British range (eight post-1980 hectads), the loss of a number of historical sites, and the apparent stability of the remaining colonies. The great rarity and perceived threat to the British populations of the blue ground beetle led to its inclusion as a Priority Species in the UK Biodiversity Action Plan (BAP).

*Carabus intricatus* was first discovered in south Wales on 28 April 2012 by Neath resident Lee Beynon, who found one amongst a wood pile in his garage and sent photographs to Andrew Whitehouse at Buglife. Mr. Beynon found two more individuals in his garden during May and August that year. JMW visited the site with Andrew Whitehouse and Duncan Allen on 21 May 2012. The suburban garden looked totally unsuitable as habitat for the beetle, so day and night searches were conducted in the nearby woodland at Coed Maesmelin. This is situated a few hundred metres from the source of these records. During 2013 Mr. Beynon found a further 3 individuals in his garden (Walters, 2013). It seemed most likely that the beetles found had been washed out of the wood along a small stream which had flooded several times during 2012 and 2013. Despite extensive searching for several hours in 2012, no *Carabus intricatus* were found in the woodland. The beetle is usually easy to locate by torchlight at night during May by searching tree trunks and at this point it was thought possible that the beetles may have originated in other woodland areas.

In its Dartmoor and Bodmin localities, the blue ground beetle is an inhabitant of ancient oak and beech *Fagus sylvatica* woodland and wood-pasture, usually in river valleys, where the beetle generally favours sites with well-insolated southerly aspects (Boyce & Walters, 2001). Some examples of typical habitat in south-west England are shown in Figure 3.1.



Figure 3.1. *Carabus intricatus* habitat on Dartmoor and Bodmin Moor.

The adult beetles are mainly active from late-March to early-July and are long-lived, perhaps surviving for two to three years or longer. At night they climb tree trunks in search of food and potential mates. Slime trails are followed in search of their favourite prey, the tree slug *Lehmanna marginata*. The beetle grips on to the slug with its pincer-like jaws and then injects digestive juices into its victim. This quickly kills and dissolves the slug's body into a 'soup' which can be sucked up by the beetle. In the course of half an hour an adult can devour a slug larger than itself. Caterpillars are also consumed in a similar manner. Like many other ground beetles, *C. intricatus* is a spring breeder, with eggs laid during the spring and larvae, which also feed on slugs, developing rapidly over the summer months. The new adult generation emerges in August and September and overwinter in cells that are usually sited beneath bark and moss on dead trunks, stumps and branches of a range of deciduous trees (Boyce & Walters, *ibid.*).

Studies have shown that the beetle is most easily located by searching on tree trunks at night between April and July, with the beetles being particularly active on mild, damp nights. The other productive survey technique is to search for the adults in their over-wintering sites.





Figure 3.2. Blue Ground Beetle *Carabus intricatus* Coed Maesmelin 22 January 2015

## 4. Results

On 26 May 2014 DCB and JMW visited Coed Maesmelin Wood with Steve Bolchover. A reconnaissance survey of the wood was undertaken during daylight hours in order to identify those parts of the site that appeared to have the greatest potential for blue ground beetle. This was followed up after dark (21.30 to 23.30hrs) by searching tree trunks for the adults. Weather conditions during the night search were dry and relatively mild, these being very conducive to adult activity. Much of the area of the wood was searched, with the majority of time being spent in those areas that appeared likely to be most suitable for the beetle (primarily in the western section, which is more open and has a southerly aspect). Despite the favourable weather conditions, no *Carabus intricatus* were discovered in the six man-hours night searching.

A second visit was made by DCB and JMW on 22 January 2015. Searches were conducted throughout the Woodland Trust reserve. Three (1 male and 2 female) *Carabus intricatus* were discovered under dead, moss-covered oak and birch. One of these specimens was in an area which had been specifically targeted during both previous spring night searches. The absence of any records during two intensive nocturnal searches in 2012 and 2014 is very surprising in light of the subsequent discovery of the beetle, as night searches in the spring are usually the most productive survey technique for this species. The three specimens were found at: SS 72229808, SS 72309813 and SS 72609813. These three grid references were taken using a hand-held Garmin GPS unit, with the readings being accurate to within seven or eight metres. All were found in typical overwintering sites; in rotten oak and birch logs and stumps. The location of these sites within the wood is shown in Figure 4.1 and a typical over-wintering site in a red-rotted birch stump can be seen in Figure 4.3.

During the two visits to the site other adjacent areas of woodland were also assessed for their potential to support blue ground beetle colonies. To the west of Coed Maesmelin there is another south-facing stand of ancient woodland at Brithdir Wood. Unfortunately, this has been planted with conifers for the most part and appears unsuitable for *C. intricatus*. Running away to the north of Coed Maesmelin, there are a series of contiguous ancient woodland sites. The first of these, lying adjacent to Coed Maesmelin, is the privately owned Darran Wood, which still has semi-natural sessile oak woodland. This wood looks to have potentially suitable habitat for blue ground beetle, but it was not possible to assess it as it is in private ownership with no public access. To the north of here is the large Dyffryn Woods complex, which is also in the ownership of the Woodland Trust. Unfortunately, much of this large area has been planted with conifers and appears unsuitable for blue ground beetle. However, there are some stands of beech plantation and other broadleaves, which do look to have some patches of habitat that may still have *C. intricatus*. However, all of the woods to the north of Coed Maesmelin lie on generally easterly aspects, which are less favoured by the blue ground beetle in its south-western English sites. The location of these other woods, and the areas of potentially suitable habitat within them, is mapped in Figure 4.2.

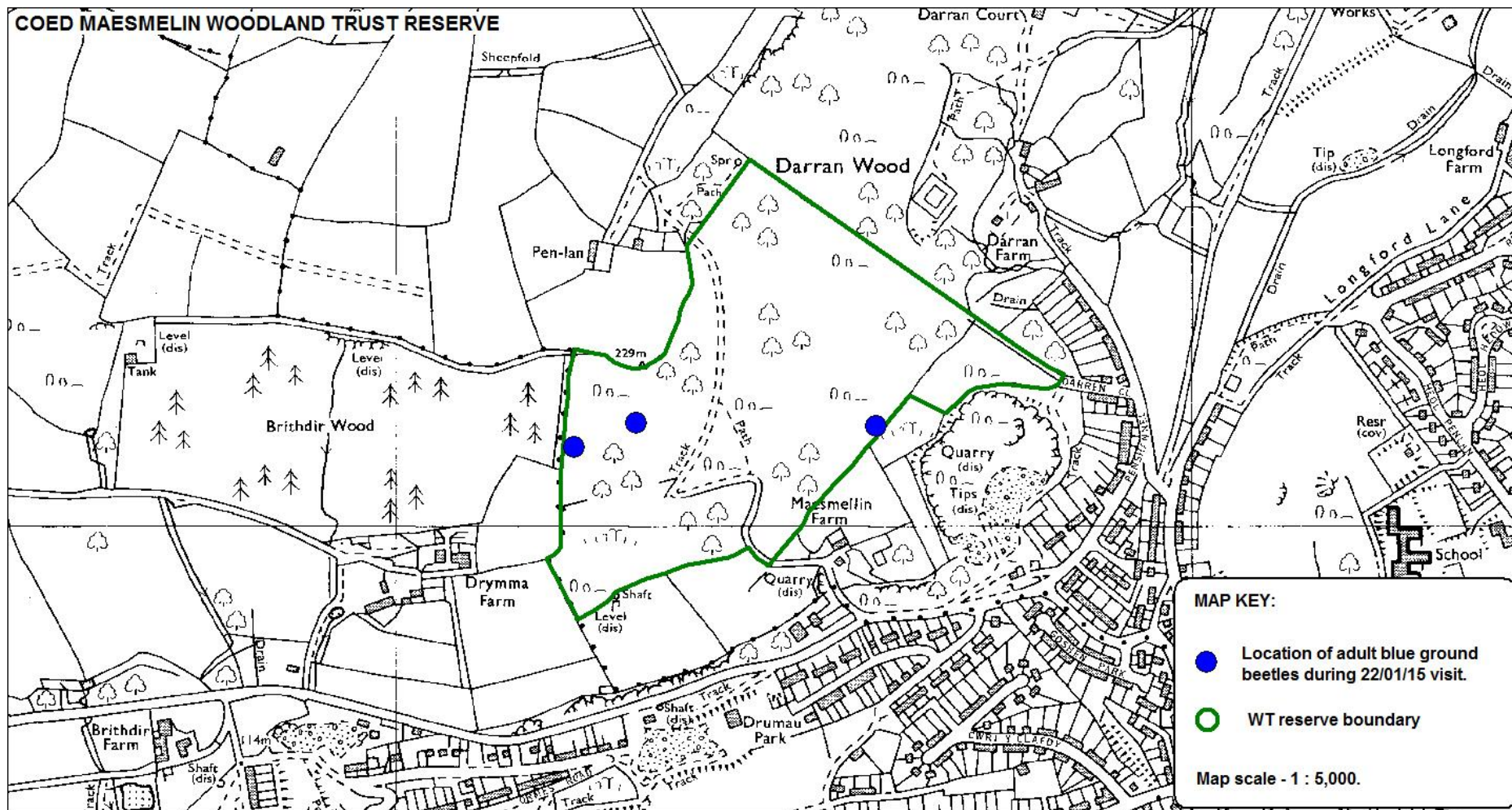


Figure 4.1: Boundary of Coed Maesmelin WT reserve, Neath, with locations of January 2015 *Carabus intricatus* records

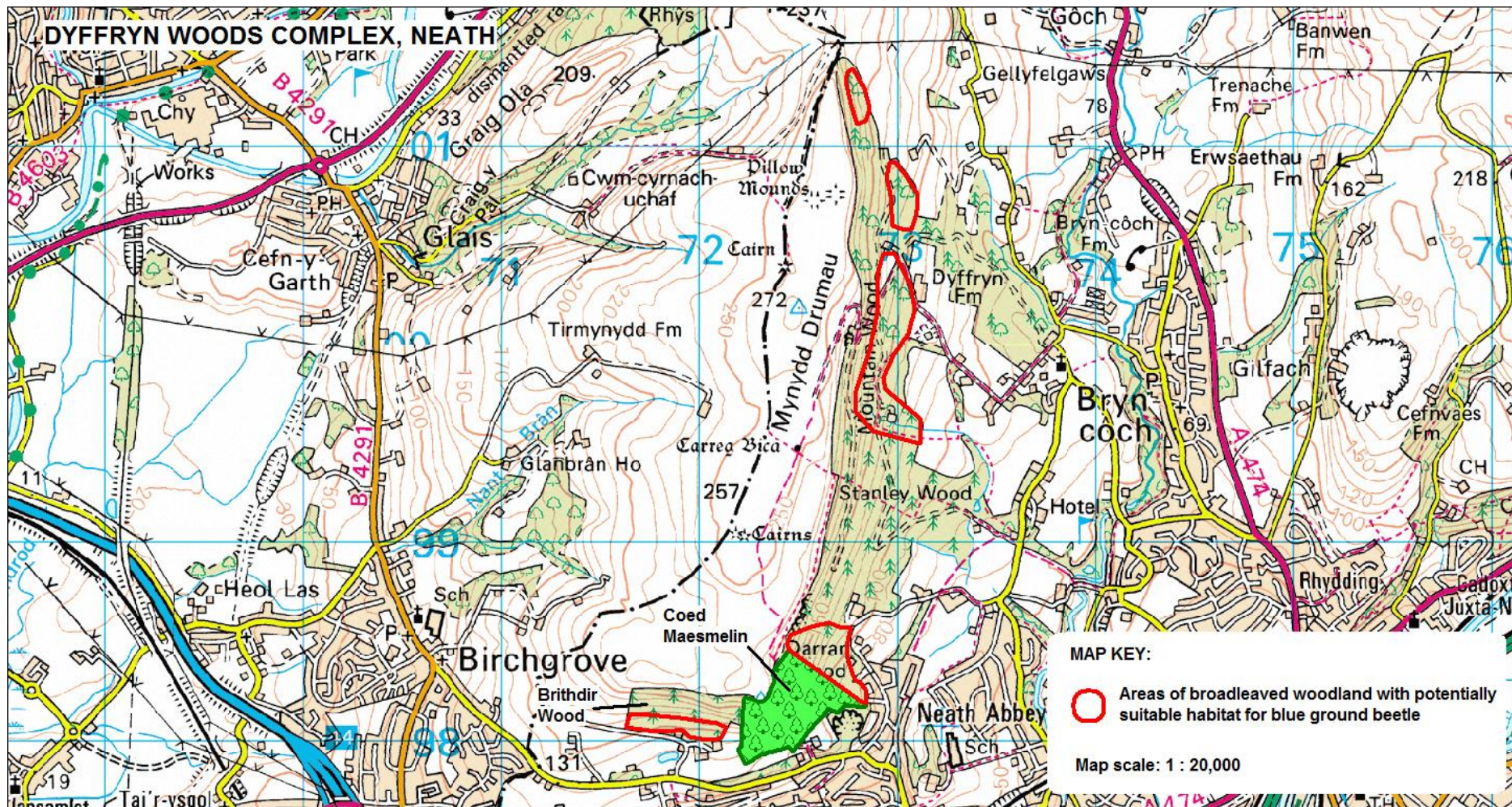


Figure 4.2: Dyffryn Woods complex, Neath, showing approximate location of other potentially suitable *Carabus intricatus* habitat



Figure 4.3: Blue Ground Beetle *Carabus intricatus* over-wintering site in old birch stump at the eastern end of the reserve.

## 5. Discussion

Coed Maesmelin was acquired by the Woodland Trust (WT) in the late 1990s, at which time the woodland ceased to be grazed, with a fence being erected around the WT-owned area. Studies in south-western England have shown that the blue ground beetle is usually found in woodland sites with a very sparse shrub and field layer. Such conditions are usually maintained where the woodland is open to grazing and this was the case at Coed Maesmelin before the acquisition of the site by WT. Since the fencing of the woodland, dense bramble *Rubus fruticosus* has grown up in the field layer across much of the site (see Figure 5.2).

It seems likely that the site is now in sub-optimal condition for the beetle and the clearance of the bramble, by cutting and follow-up grazing, is considered desirable in order to ensure the protection of this very important population. It is worth noting that the three 2015 records of blue ground beetle all came from parts of the site where the field layer is still relatively sparse (see Figure 5.1). In the case of the most westerly of these records, bramble growth was being suppressed by the heavy shade cast by the adjacent conifer plantation.



Figure 5.1. Blue Ground Beetle *Carabus intricatus* habitat at the western edge of the reserve. Here there are still areas of ground relatively free of bramble encroachment.



Figure 5.2. Coed Maesmelin Wood showing bramble encroachment.

## 6. Recommendations for future monitoring

A high priority should be given to the exploration of the other potentially suitable patches of woodland that lie within this same woodland block. The location of these is shown in Figure 4.2. It is very unlikely that the Coed Maesmelin population is the only one existing in south Wales. Examination of the OS map for the area shows a number of other blocks of woodland in the Neath area that may also have the potential to support colonies of the beetle. Further surveys of those ancient sites where there is broadleaved woodland, in which oak and beech are the main canopy species, is also highly desirable. This will help develop our understanding of the species in Wales and to assess the importance of the Welsh populations in a UK context.

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## 8. Acknowledgements

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## 9. Data Archive Appendix

No data outputs were produced as part of this project.



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