

Lichen Survey  
Holyhead Anglesey  
Kingsland  
Cae Glas  
Penrhos Country Park  
4-5 March 2013



Mike Gosling



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## **1. INTRODUCTION**

Mike Gosling was commissioned by TEP to carry out a lichen survey at three sites near Holyhead on Anglesey; Kingsland, Cae Glas and Penrhos Country Park. The sites are located on the periphery of Holyhead.

The aim of the survey was to record the lichens at these sites and to broadly assess their diversity and comment on the lichen habitats within the wider context.

A number of survey locations were identified for each of the three sites in order that a targeted survey might be undertaken. Survey locations were chosen so as to ensure that a variety of potential lichen habitats could be surveyed in each of the three sites. Some locations were specifically chosen because they would be directly affected by development proposals while other survey locations were chosen because general lichen interest was identified in ecology surveys completed in 2010 and 2011.

- Kingsland: sites 1 and 2 – Drawing G2977.062
- Cae Glas: sites 1 to 10 – Drawing G2977.063.
- Penrhos Country Park: site 1 – Drawing G2977.064.

A total of 13 locations were visited at the 3 sites.

## **2. METHODOLOGY**

The land is all owned by Anglesey Aluminium Metal Limited. There was full access to all parts of all the sites, though some localised areas were difficult to access due to dense vegetation and brambles.

Where practical, lichens were identified in the field using a lens and standard chemicals. Many small and difficult taxa cannot be done in the field. Specimens of taxa requiring microscopic identification of spores were collected for later analysis. Due to time constraints not every taxon could be recorded or collected but the descriptions that follow give a sound overview of the lichens and the lichen alliances with comments on any significant or unusual taxa. Further identification and microscopic identification was done using Smith et al. (2009). Names of lichens follow Smith et al. (2009) with minor later alterations.

The survey was completed by experienced lichen ecologist Dr Mike Gosling on 4<sup>th</sup> and 5<sup>th</sup> March 2013. The weather was fine throughout the survey.

### **3. RESULTS**

Species lists can be found in section 8. Nomenclature follows Smith et al.(2009)

A total of 95 lichen taxa were recorded from all sites.

#### **3.1 Kingsland**

There are 2 sites, the Western one (Drawing G2977.062) is a linear strip consisting of hedgerow trees and a dry stone wall made of acidic local rock. The Eastern site is a linear strip following Kingsland Road and consists of hedgerow trees and an acidic dry stone wall (Drawing G2977.062).

Kingsland Site 1



Photograph 1 Orange *Xanthoria* on trees with typical mosses and lichens on wall top.

This is described as a species poor intact hedge on the Phase one survey map. The site consists of three sections. The northern part is bramble, elder and hawthorn hedge with dry stone wall below. The trees are orange with *Xanthoria parietina*, *Xanthoria polycarpa* and the grey *Physcia adscendens*. These are members of the *Xanthorian* alliance. They are nitrophyte species typical of nutrient enriched sites, subject to airbourne NH<sub>3</sub>, NO and NO<sub>2</sub>. In this case from vehicles and agricultural sources. Other species on the trees were *Diploicia canescens*, *Opegrapha atra*, *Ramalina farinacea* and *Ramalina fastigiata*. This last species is now recolonizing trees in many areas of the country. The wall has a number of common crustose species, *Ochrolechia parella*, *Tephromela atra*, *Lecanora campestris*, *Buellia aethalea* and, *Lecanora rupicola*. The most interesting lichen here is *Miriquidica pycnocarpa*. This is an upland species of acid rocks and not recorded from Anglesey. It has several sites in North Wales. (Species to be confirmed).

The middle section of the site has little lichen interest with vegetation overgrowing large parts of the wall.

The southernmost section exposes the wall where there is a monoculture of *Ramalina spp*, *Ramalina siliquosa* and *Ramalina subfarinacea*.

Overall the wall supported common lichens typical of acid walls. Most are in good condition and appear to be flourishing and can be found in many similar habitats on Anglesey.



Photograph 2 South end of wall with white lichen crusts on wall top and luxuriant *Ramalina* spp. on vertical face.

### Kingsland Site 2

The northern end is an intact dry stone wall with brambles. The wall flora consists of common lichens with nitrophyte species well represented as one would expect adjacent to a main road. The walls have similar species to the other Kingsland site but are not as well developed and several minor species seen at Site 1 were not found here. In places mortar carries very common lichens such as *Caloplaca citrina*, *Lecanora albescens* and *Protoblastenia rupestris*. The trees again bear the lichens of the *Xanthorion* alliance indicating nutrient enrichment. The dominant lichens on trees are *Xanthoria parietina* and *Lecidellia elaeochroma*. Generally the wall has less lichen interest at the southern end with the wall obscured by vegetation and lichens confined to the wall top.

## 3.2 Cae Glas

### Location 1

This is a rocky headland backed by coniferous plantation. The rocks are hard acidic phyllites and quartzites of the New Harbour Formation and have a pristine maritime lichen flora showing classic zonation from the black littoral zone through the grey supralittoral zone to the terrestrial habitats furthest from the sea. The littoral zone above the seaweed is black due to *Verrucaria maura* with minor amounts of *Verrucaria striatula*. Orange *Caloplaca marina* and black shrubby *Lichina confinis* complete the assemblage. The supralittoral zone is species rich, with *Anaptycia runcinata*, *Ramalina siliquosa*, *Ramalina cuspidata*, *Lecanora atra*, *Lecanora gangaleoides*, *Lecanora helicopsis*, *Lecanora actophila*, *Lecanora rupicola* and *Xanthoparmelia loxodes* and *Xanthoparmelia pulla*. In the terrestrial zone are found species less tolerant of sea spray, *Flavoparmelia caperata*, *Parmotrema perlatum*, *Melanelixia fuliginosa*, *Lecanora polytropa*, *Lecanora sulphurea*. Within grassy hollows on the horizontal surface above the rocks are swards of *Cladonia portentosa*, *Cladonia furcata* and *Peltigera didactyla*. The lichens here are an excellent example of those growing on acid maritime rocky shores around the coasts of Britain. They show all the features described by

Fletcher in his papers on the ecology of maritime supralittoral and littoral lichens of rocky shores around Anglesey. (Fletcher 1973) Overall a superb lichen habitat with no doubt many other species growing in the wide diversity of microhabitats.

#### Location 2



Photograph 3 Littoral and supra-littoral zonation on rocks by shore.

A dry stone wall described as a species poor, defunct hedge on the Phase 1 map.

This is an intact dry stone wall covered in places by gorse and bramble. It carries the typical lichen flora of hard acid rocks, white *Ochrolechia parella* and *Lecanora rupicola*, yellow green *Lecanora sulphurea* and shrubby *Ramalina spp.* Very small amounts of *Buellia ocellata* and *Polysporina simplex* were found but not seen again; neither are particularly rare species but are easily overlooked. Overall the wall was of average interest with lichens typical of this habitat in many parts of Anglesey.

#### Location 3

This is a small area of woodland with scrub and ruined buildings. Only the trees marked as broad leaved plantation on the Phase 1 map were examined in detail. The dominant species on trees is the large white crustose *Pertusaria pertusa*. Of greater interest were *Enterographa crassa* and *Pyrenula chlorospila*, both species are 'old forest indicators' and used to calculate the RIEC (Revised Index of Ecological Continuity).(Rose 1976) (Rose & Coppins 2002) This is used to identify and grade woodlands with a maximum score of 100%.This wood scores 20%. Their presence suggests that whilst the trees are not particularly old there may be some ecological continuity at the site. The *Pyrenula* is not uncommon in shaded woodland on smooth bark but was not seen elsewhere during the survey. The extreme tops of the trees here are orange with members of the *Xanthorian* community together with other foliose and fruticose lichens. Clearly the tops of the tall trees catch some airborne pollution from nearby locations.



Photograph 4 (Location 4) Woodland with *Enterographa crassa* & *Pyrenula chlorospila*

#### Location 4

This was a small number of rocky boulders probably from field clearance. These carry only a few lichens, *Acarospora fuscata* is common together with *Hypotrachyna britannica*. A very small specimen of *Acarospora smaragdula* was seen on these rocks. This is a rather scarce lichen though often probably overlooked.

#### Location 5

This was a pile of field clearance boulders with a poor lichen flora. It is used as a bird perch and carries typical species of this habitat, *Xanthoria parietina*, *Candelariella vitellina* and *Acarospora fuscata*.

#### Location 6

This is marked as an acid/neutral rock exposure on the Phase 1 map but was not located despite a search due to impenetrable vegetation. It is likely to have a similar lichen flora as other acid rock outcrops at Cae Glas.

#### Location 7

This is a rocky outcrop mostly covered by gorse and the lichens here are typical of the habitat with abundant *Hypotrachyna britannica*. *Caloplaca crenularia* was noted, it does occur at other sites but is in small quantities at all of them. *Lecidea fuscoatra*, a common lichen of acid rocks was only found at this location.

#### Location 8

This is a rocky grass and gorse covered outcrop with a generally poor lichen flora. Typical acid species were again found. Common species here were *Ochrolechia parella*, *Hypotrachyna britannica*, *Melanelixia fuliginosa*, *Tephromela atra*, *Ramalina* spp. *Pertusaria pseudocorallina*, *Parmelia omphalodes*, *Xanthoparmelia loxodes*.

## Location 9

This is a low rocky outcrop with scattered boulders. The lichens found included the same ones found in similar sites at Cae Glas with white patches of *Lecanora rupicola*, *Pertusaria pseudocorallina* and *Ochrolechia parella* together with grey *Tephromela atra*. The closely related species *Xanthoparmelia loxodes*, *Melanelixia fuliginosa* *Parmelia saxatilis* and *Hypotrachyna britannica* were seen growing together forming extensive patches on well-lit horizontal rock surfaces. Again, *Ramalina spp.* were frequent on vertical rock faces and this was the only place where the very common urban lichen *Lecanora muralis* was found. Overall a good representative selection of lichens on acid rock in good condition.



Photograph 5 (Location 11) Typical extensive lichen cover on rock outcrop.



## Location 10

This was an extra site at SH2693580068 where two trees growing on the old dump carried nitrophyte species of the *Xanthorian* alliance. This was the only place where *Ramalina canariensis* was seen, a large shrubby lichen now invading suburbs and towns as atmospheric conditions improve.



Photograph 6 (Location 12) Nitrophyte lichens and shrubby *Ramalina canariensis* on tree.

## Location 11

This roadside hedge at SH259805 was an additional site which had prolific shrubby lichen growth consisting of *Ramalina farinacea*, *Ramalina fastigiata*, and *Usnea subfloridana*. These are N sensitive species and this luxuriant growth was not seen elsewhere at any of the three main sites.

### 3.3 Penrhos Country Park

A single location was visited on the northern edge of the wooded area of the park and listed as plantation broadleaved woodland on the Phase 1 survey map. The north facing damp shaded stone and mortared boundary wall was briefly examined. *Diploicia canescens*, a species of nutrient enrichment, covered the bottom metre of the wall. The mortar had a sorediate lichen crust which is tentatively identified as *Dirina massiliensis* f. *sorediata* which was not seen at any other location. The woodland was rather species poor with many trees with no lichen interest. The old woodland indicator *Enterographa crassa* was again seen but only on one tree together with two common crustose species *Arthonia spadicea* and *Phlyctis argena*. These last two species though common in Britain were not seen elsewhere. Two trees adjacent to the northern boundary wall stood out from the other trees in the wood with extensive leafy lichens including *Flavoparmelia caperata*, *Melanelixia glabratula*, *Parmotrema perlata*, *Parmelia saxatilis*. These are common lichens throughout Britain but this was the only place they were seen in such relative abundance. This is likely to be due to the lack of shading and open aspect of these two trees.

The ruined buildings within the woodland have lichens on them and may have more small crustose species associated with shaded habitats. Two species were collected, one is a *Bacidia* sp. and the other is *Verrucaria* sp. Overall a poor wood for lichens growing on the trees with perhaps some potential species establishing themselves on the edges.

## **4. DISCUSSION**

### **4.1 Trees**

Most lichens found on trees are common in much of the country in similar habitats. Where trees are near roads and farmland nitrophyte species were found and are likely to flourish. The woods at Penrhos Country Park and Cae Glas location 4 were the most extensive areas of trees examined with a poor lichen flora. At Cae Glas *Enterographa crassa* on several trees and *Pyrenula chlorospila* are of some interest since they indicate a degree of ecological continuity.

### **4.2 Dry Stone Walls**

These were sometimes covered in vegetation with no lichen colonisation possible but when exposed carried a good cover of species typical of acid rocks in Anglesey and other coastal sites. White crusts of *Ochrolechia parella* and *Lecanora rupicola*, yellow-green *Lecanora polytropa* and *L. sulphurea* often colonised the tops of walls with *Ramalina spp.* often forming extensive swards on the vertical parts of the walls.

### **4.3 Rock Outcrops**

Inland outcrops at Cae Glas had a predictable flora similar to the walls but with *Parmelia spp.* *Xanthoparmelia* and *Melanelixia* often present. In a number of places, grass and gorse has covered this habitat and lichen growth is therefore impossible.

At Cae Glas Location 2 was the only extensive maritime outcrop recorded. The lichens here were in superb condition, luxuriant and with diverse species zoned from sea level inland from the black littoral zone through the supralittoral zone up to the terrestrial zone. This zonation was often over 3-5 metres. Such a substrate has many micro-habitats and it is very likely that other species would be found with further analysis.

## **5. OVERALL COMMENTS**

Overall no nationally or internationally important lichen species were found. No lichens on the BAP list were found, only 2 species in the RIEC were found, these were *Enterographa crassa* seen at two sites and *Pyrenula chlorospila* seen at one site. Most lichens seen were representative of these habitats in West Wales and other relatively unpolluted parts of the western UK.

When the distribution of some species was checked using the maps of the NBN Biodiversity Network several species appear not to have been recorded on Holy Island or have only a handful of records on the island of Anglesey. This reflects the lack of records sent to NBN rather than the scarcity of the species on Anglesey.

## **6. RECOMMENDATIONS**

### **6.1 Dry Stone Walls**

These have a very representative lichen flora for this area and to maintain this any vegetation that encroaches on them needs to be cleared away to allow lichens to recolonize and to flourish. Any rebuilding of walls should try to replace lichen covered boulders in an appropriate way.

## 6.2 Trees

Where these bear orange *Xanthoria spp.* and are subject to nutrient enrichment from roads and fields these will flourish and maintain their nitrophyte flora as long as the airborne NH<sub>3</sub>, NO and NO<sub>2</sub> continues to be present.

At Cae Glas Location 4, this woodland has some potential for further lichen colonisation provided trees can be kept free of ivy.

At Penrhos Country Park, the wooded area surveyed is rather dark and only on the edges does colonisation appear to be occurring where light and moisture have allowed some interesting but common lichens do grow on the two trees by the northern boundary wall. Again, ivy should be prevented from growing up tree trunks.

The proposed woodland felling works proposed at Penrhos Country Park will create much more woodland edge than is currently present. This will expose more of the tree to daylight allowing lichens to colonise the woodland resulting in the woodland becoming a better lichen habitat.

## 6.3 Rock Outcrops

At Cae Glas Location 2, the finest lichen flora was encountered. It is species rich and luxuriant. If left alone it should flourish with little intervention. It would suffer if trampled on as several species are loosely adhered to the substrate.

## 7. REFERENCES

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## **8. SPECIES LIST**

*Acarospora fuscata*

*Acarospora smaragdula*

*Anaptychia runcinata*

*Anisomeridium polypori*

*Arthonia radiata*

*Arthonia spadicea*

*Bacidia* sp. Penrhos Slate Wall flesh coloured, domed fruits

*Buellia aethalea*

*Buellia ocellata*

*Caloplaca ceracea*

*Caloplaca citrina*

*Caloplaca crenularia*

*Caloplaca flavescens*

*Caloplaca marina*

*Caloplaca microthallina*

*Candelariella vitellina*

*Catillaria chalybeia*

*Cladonia cervicornis*

*Cladonia fimbriata*

*Cladonia furcata*

*Cladonia portentosa*

*Cladonia pyxidata*

*Cliostomum griffithii*

*Diploicia canescens*

*Dirina massiliensis* f. *sorediata*

*Enterographa crassa*

*Evernia prunastri*  
*Fuscidea cyathoides*  
*Hypotrachyna britannica*  
*Lecania naegelii*  
*Lecanora actophila*  
*Lecanora albescens*  
*Lecanora dispersa*  
*Lecanora expallans*  
*Lecanora gangalioides*  
*Lecanora helicopis*  
*Lecanora muralis*  
*Lecanora polytropa*  
*Lecanora rupicola*  
*Lecanora sulphurea*  
*Lecanora symmitca*  
*Lecidella elaeochroma*  
*Lecidella subincongrua*  
*Lepraria incana*  
*Lichina confinis*  
*Melanelixia fuliginosa*  
*Melanelixia glabratula*  
*Micarea denigrata*  
*Miriquidica pycnocarpa*  
*Ochrolechia parella*  
*Opegrapha calcarea*  
*Opegrapha niveoatra*  
*Opegrapha varia*  
*Opegrapha vulgata*

*Parmelia omphalodes*  
*Parmelia saxatilis*  
*Parmotrema perlatum*  
*Peltigera didactyla*  
*Pertusaria hymenea*  
*Pertusaria pertusa*  
*Pertusaria pseudocorallina*  
*Phlyctis argena*  
*Phyiscia adscendens*  
*Phyiscia tenella*  
*Polysporina simplex*  
*Porina chlorotica*  
*Protoblastenia rupestris*  
*Protoparmelia badia*  
*Pyrenula chlorospila*  
*Pyrrhospora quernea*  
*Ramalina canariensis*  
*Ramalina cuspidata*  
*Ramalina farinacea*  
*Ramalina fastigiata*  
*Ramalina siliquosa*  
*Ramalina subfarinacea*  
*Rhizocarpon geographicum*  
*Rhizocarpon reductum*  
*Rhizocarpon richardii*  
*Rinodina gennarii*  
*Sarcogyne regularis*  
*Tephromela atra*

*Toninia aromatica*

*Usnea subfloridana*

*Verrucaria maura*

*Verrucaria striatula*

*Verrucaria sp. Penrhos on wall*

*Xanthoparmelia loxodes*

*Xanthoparmelia pulla*

*Xanthoparmelia verruculifera*

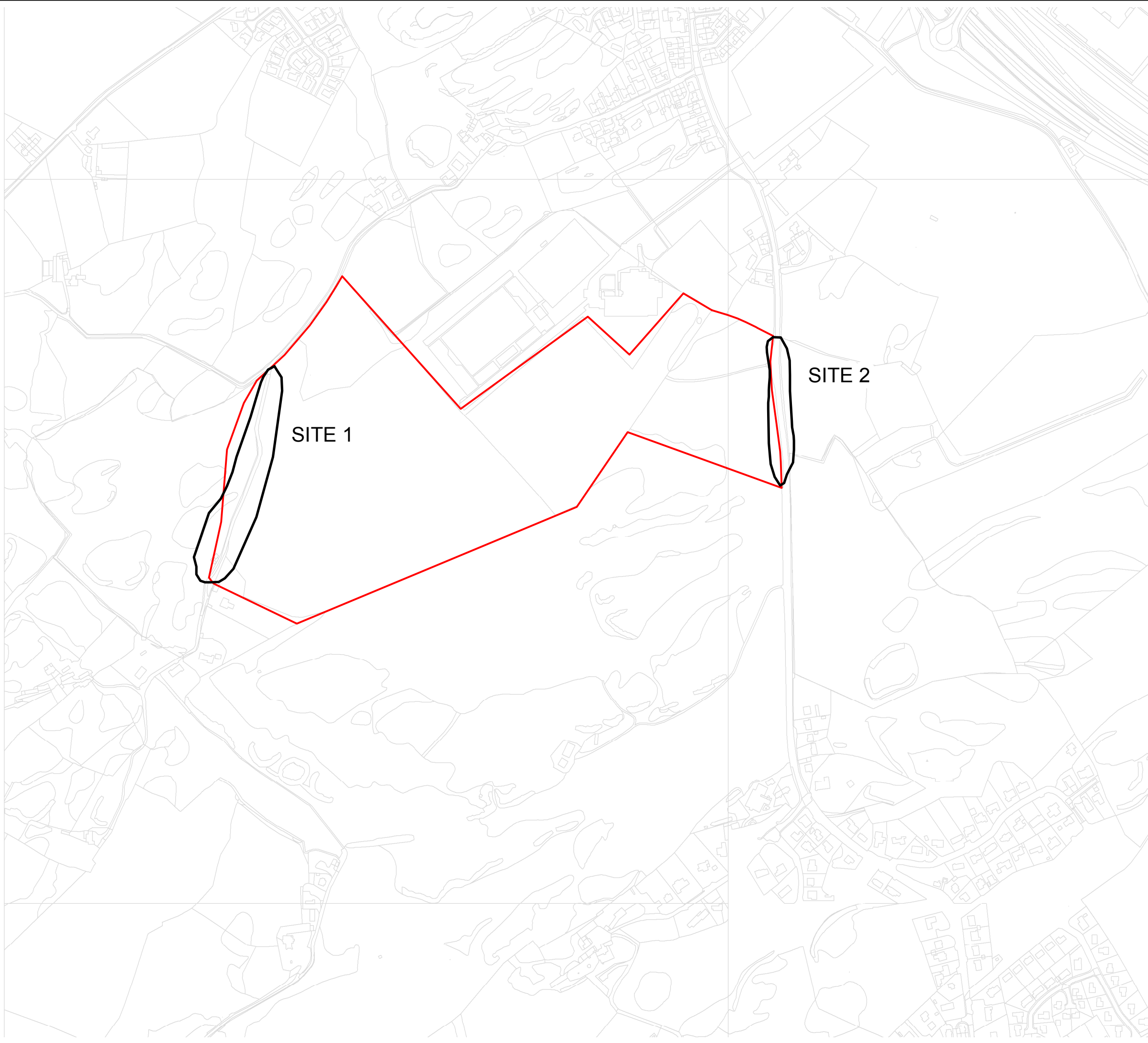
*Xanthoria calcicola*

*Xanthoria candelaria*

*Xanthoria ectaneoides*

*Xanthoria parietina*

*Xanthoria polycarpa*




**Key**  
 Site boundary

SITE 1

SITE 2


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Rev	Description	Dwn	Appvd	Date
 Genesis Centre Birchwood Science Park Warrington WA3 7BH Tel 01925 844004 Fax 01925 844002 email tep@tep.uk.com				
<b>Project:</b> Penrhos Leisure Village				
<b>Title:</b> Lichen Survey March 2013 Kingsland				
<b>Map No.</b>		G2977.062		
<b>Scale:</b>		1:5,000 @ A3		<b>Date:</b> 11/04/13
<b>Drawn:</b> MW		<b>Checked:</b> TR		<b>Approved:</b> TR



**Key**

 Approximate site boundary



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Project:  
**Penrhos Leisure Village**


Title:  
**Lichen Survey March 2013  
Cae Glas**

Map No. **G2977.063**

Scale: **1:6,500 @ A3** Date: **11/04/13**

Drawn: **MW** Checked: **TR** Approved: **TR**


**Key**

 Approximate site boundary



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Rev	Description	Dwn	Appvd	Date
	 Genesis Centre Birchwood Science Park Warrington WA3 7BH Tel 01925 844004 Fax 01925 844002 email tep@tep.uk.com			
Project: Penrhos Leisure Village				
Title: Lichen Survey March 2013 Penrhos Country Park				
Map No.		G2977.064		
Scale:		1:6,500 @ A3		Date: 11/04/13
Drawn:	MW	Checked:	TR	Approved: TR