LLANDDULAS LIMESTONE
&
GWRYCH CASTLE WOOD
SITE OF SPECIAL SCIENTIFIC INTEREST

YOUR SPECIAL SITE AND ITS FUTURE

‘Your Special Site and its Future’ is part of our commitment to improve the way we work with Site of Special Scientific Interest (SSSI) owners and occupiers. In it, we explain what is special about the wildlife on your site, and what care is needed to look after its wildlife into the future.

All SSSIs are considered to be of national importance and we recognise the crucial role that owners and occupiers play in their management and protection. We need you to share your views and knowledge of this site with us, to help safeguard it.

We hope that you will find ‘Your Special Site and its Future’ interesting and helpful. Please contact us if there is anything about the site and its management that you would like to discuss.

What is 'special' about the wildlife at Llanddulas Limestone & Gwrych Castle Wood SSSI?

Llanddulas Limestone & Gwrych Castle Wood has eight special features.

- Feature 1 **Limestone grassland** This is herb rich grassland on steep shallow free-draining and drought prone soils associated with limestone bedrock and rock outcrops. The sward typically contains grasses such as sheep's fescue, oat-grasses and quaking grass. Amongst these are colourful herbs including rock-roses, common bird's-foot-trefoil, lady's bedstraw, wild thyme and salad burnet.

- Feature 2 **Dry heath** Dwarf shrubs, principally heather, bell heather and western gorse, dominate the dry heath producing in late summer a glorious display of pink, purple and gold flowers that brighten the steep slopes. Growing amongst these dwarf shrubs that prefer acid soils can also be found the herbs of the calcareous grassland**.**

- Feature 3 **Semi-natural broadleaved woodland** Broadleaved woodland now amounts to less than 10% of the land cover of Wales, whereas during prehistoric times it would have clothed most of the land. It is considered to be 'semi-natural' because over the millennia human activities have to a degree interrupted the natural cyclical process of life, death and decay. A rich mixture of broadleaved trees and shrubs, including sessile oak, ash, wild cherry, wych elm, rowan and hazel dominate the woodland communities here.

- Feature 4 **Lesser horseshoe bat** (winter roosts - hibernacula) Bats use the caves and disused mine systems as hibernation sites during the winter. When active the bats also use the surrounding wooded hillsides for feeding and as corridors to reach their breeding sites, usually in a nearby building.

- Feature 5 **Silver studded-blue butterfly** This small butterfly is on the wing on warm sunny days in June.

- Feature 6 **Rare butterflies, moths and a fly (invertebrate assemblage)**
  These include fritillary, hairstreak and brown argus butterflies and the moths, horehound plume, cistus forester and chalk carpet.

- Feature 7 **Rare lower plants - mosses (bryophyte assemblage) and a lichen**
  The mosses include species of *Bryum* and *Grimmia*, small, dense cushions or tufts amongst rocks, *Pleurochaete squarrosa* that grows in turf. Small colonies of the jelly lichen *Collema fragile* are present on the rocks of Craig y Forwyn.

- Feature 8 **Rare plants (vascular plant assemblage)** Wild cabbage, dwarf mouse-ear, hoary rock-rose, stinking hellebore, white horehound, ivy broomrape, spring cinquefoil and a whitebeam are the rare plants here. Wild cabbage clings to the steepest cliffs nearest the sea with hoary rock-rose and spring cinquefoil growing amongst nearby outcrops of limestone and where soils are disturbed white horehound flourishes. Further inland the whitebeam maintains a grip on the cliff tops. Elsewhere, on the thinnest stony soils dwarf mouse-ear flowers early in the year.

As well as the features listed above, Llanddulas Limestone & Gwrych Castle Wood has other habitats that contribute to the special wildlife interest. These include beech woodland, mixed semi-natural woodland, limestone cliffs and screes, gorse scrub and dense bracken and neutral grassland. This mixture of habitats is important for much of the wildlife including butterflies, other insects, birds and badgers.

What do we want Llanddulas Limestone & Gwrych Castle Wood to look like?

The following is a description of how we would like to see the features at Llanddulas Limestone & Gwrych Castle Wood.

Limestone grassland

It is our aim to maintain the existing 25.1ha of limestone grassland as follows:

- With a sward of lime-loving native grasses and herbs

Steep slopes and rocky plateaux should be covered by sustainable limestone grassland. Usually this will be grazed extensively by livestock but in some locations where livestock are absent or where soils are very thin, drought-prone or exposed grasslands can be self-sustaining if invasive scrub is checked by other herbivores, e.g. rabbits. This grassland should also be present where there is open ground at the edges of the woodland, in woodland glades and amongst limestone cliffs, crags and rock outcrops. The sward will comprise locally native species, typical of unimproved limestone environments. These grasslands will have sward heights ranging from short tightly grazed turf to ranker tall dense grass-dominated swards where grazing is all but absent. Invasive non-native species, especially cotoneaster, should be scarce or absent particularly from the rockiest grasslands where the threat is greatest. Native scrub species such as hawthorn, blackthorn and gorse and bracken will be found in nearby stands where their continued presence will provide food and shelter for essential species while not compromising the integrity of the grassland. They should not be allowed to pose a threat to the grassland by, for example, individual scattered bushes being permitted to coalesce to form tall, dense stands that cast cool, damp shade on the adjacent grassland.

Limestone grassland *© CCW / John Osley*

Dry heath *© CCW / John Osley*

Dry heath

It is our aim to maintain the existing 14.6ha of dry heath as follows:

- Dominated by heather, with some bell heather and western gorse
- With an associated range of locally native grasses and herbs
- With a diverse age structure

The dry heath is dispersed within the site as small stands associated with the limestone grassland. The vegetation will comprise locally native dwarf shrubs, grass and herb species, typical of lightly grazed heathland environments. Some of the grasses and herbs will be lime-loving. Currently much of the heath is ungrazed but some is grazed by sheep, so some burning or cutting may be necessary to revitalise dense, over-mature stands. Encroachment by pioneer woodland species such as silver birch (and in some locations pine trees, gorse and bracken) will not be tolerated, nor will encroachment by invasive non-native species, especially cotoneaster; the presence of these species will eventually lead to the loss of dry heath to species-poor woodland and scrub, a threat to the survival of the silver studded-blue butterfly population. Expansion of the dry heath would be at the expense of these trees, shrubs and bracken as loss of limestone grassland to heath would not be acceptable.

Semi-natural broadleaved woodland

It is our aim to maintain the existing 25.5ha of semi-natural broadleaved woodland as follows:

- With a canopy dominated by ash and oak
- With local dominance by birch, hazel and beech
- A naturally diverse under-storey and age structure
- Sufficient amounts of natural regeneration to perpetuate the woodland

At least 20% of the site should be covered by a sustainable semi-natural broadleaved woodland. A further 15% of the site is currently modified semi-natural broadleaved woodland or plantation woodland with the potential to be returned to this type of habitat. The trees should be locally native species, with a dominance of ash and oak, except in a few areas where beech will continue to be tolerated. Birch and hazel will be locally dominant at the woodland fringes. In the long term, the canopy should include trees of all ages, and particular attention will be paid to maintaining old veteran trees, regardless of species, both for the lower plants that thrive on their bark and as roosting sites for bats. The under-storey, field and ground layers will contain canopy species as seedlings and saplings as well as locally native woodland shrubs and herbs typical of a site where the bedrock is Carboniferous limestone. Dead wood, standing and fallen, will provide habitat and niches for invertebrates, fungi and bryophytes. The canopy should not be completely closed. There will be a shifting pattern of gaps, typically occupying 20% of the potential woodland area.
Invasive non-native species, especially cotoneaster, should be scarce or absent in the field and ground layers.

Lesser horseshoe bat

The cave and mine systems will continue to support at least 50 lesser horseshoe bats, as identified by underground surveys during the winter. All caves and mines will be managed to ensure the availability of sites for mating and hibernation. All roosting sites will be free from disturbance and the entrance points clear of obstructions. The temperature and humidity of the eleven hibernation sites should be constant throughout the winter.

Woodland, scrub and open habitat communities will be maintained to provide conditions suitable for foraging throughout the year. Hedgerows and other linear habitats that function as flight lines will be maintained and protected for dispersal purposes.

Silver studded blue butterfly *© CCW / Neil Smith*

Lesser horseshoe bats *© CCW*

Silver studded-blue and other rare butterflies, moths and other invertebrates

The populations will be stable or increasing. The grassland and adjacent habitats will be in optimal condition suitable for the breeding success of these species. In most instances the adults form breeding colonies on discrete patches of habitat where the preferred food plant grows and rarely move far from them. For example, in the instance of silver studded-blue butterfly, this species requires grassland maintained as a sward containing an abundance of larval food plants such as common rock-rose and common bird's-foot-trefoil on south-facing slopes that are rapidly warmed by the sun. Sites for egg laying will require a combination of bare rock and very short vegetation. The larvae (caterpillars) have a close relationship with ants, so an abundance of ant nests for protection and pupation is required. Adjacent habitats should provide taller vegetation such as tussocky grasses, heath, gorse and bracken for shelter and roosting. Loss of these habitats to cool, damp and shady woodland needs to be avoided. In most instances this has encroached from the lower slopes.

Mosaics of suitable habitat over at least 10% of the site, principally the mid-slopes of Cefn yr Ogof hillside and south west facing sides of Pen y Corddyn Mawr and associated disused quarries, will be maintained to provide for the continued breeding success of the populations.

Rare plants, mosses and a lichen

The populations of wild cabbage, dwarf mouse-ear, hoary rock-rose, stinking hellebore, white horehound, ivy broomrape, spring cinquefoil, whitebeam, mosses and lichen should be maintained, and conditions provided for them to increase where possible. With the exception of the stinking hellebore, ivy broomrape and whitebeam (which are denizens of open woodland) all of the others occur in grassland with associated rocky habitats where soils are thin and cliffs, so require there to be a short sward less than 10cm tall (and often some bare ground for seedling or sporeling establishment), in full sunlight and do best on south-facing slopes. The mosses require open, well-lit habitats where there is some bare soil, or soil in rock crevices and where competition from higher (vascular) plants is reduced. Areas with populations of both higher and lower rare plants should be free from shading by encroaching trees and shrubs, both non-native and native. Some grazing or browsing by herbivores is acceptable but not so intense that the growing tips are continually bitten away and thus plants never gain an opportunity to flower and set seed.

What management is needed on Llanddulas Limestone & Gwrych Castle Wood SSSI and why?

Although Llanddulas Limestone & Gwrych Castle Wood is an excellent place for wildlife it will only remain so if the necessary management continues. CCW's priority is to work with you to ensure that this management is carried out.

What does this mean in practice?

There are a number of different factors that could damage the special features at Llanddulas Limestone & Gwrych Castle Wood if they are not properly managed. These are the ones we regard as most important:

Limestone grassland and dry heath

- **Grazing**

The limestone grassland is maintained by a combination of livestock grazing, principally sheep, and rabbits, although some persists in the absence of grazing. The heath requires some light grazing but maintenance is dependent upon intervention by either burning or cutting in due season. Where livestock grazing occurs this should be at an appropriate level and periods so as to maintain the grassland and heath as open habitats. Should the site become under-grazed there would be a shift from open, short swards dominated by fine-leaved grasses and herbs towards those dominated by tall, tussocky grasses and a consequent impoverishment of species. Continued neglect would lead to invasion by bracken, gorse and other scrub and tree species. Overgrazing accompanied by nutrient enrichment, either by dunging or artificial

fertiliser would lead to further impoverishment of the species richness and increases in undesirable species such as rye-grass and white clover.

- **Invasive scrub, trees and bracken**

Photographs taken at the beginning of the twentieth century show much of the site devoid of scrub and trees and some slopes such as those on the lower side of Craig y Forwyn that now have a closed canopy of woodland completely open and presumably predominantly grassland and bare limestone scree. Apart from the cost, it would not now be desirable to attempt to return these areas to open habitats. Nevertheless, these do serve as a warning of what will be lost if vigilance is not maintained to ensure that invasive species in the grassland and heath are removed at every opportunity. Grassland and heath should occupy at least a third of the site. Removal of scattered scrub where this is likely to lead to loss of grassland and heath is essential if these open habitats are to be maintained.

Dense stands of gorse and bracken will also need to be controlled and if not removed, because of their value as shelter and resting sites for invertebrates, at least managed on rotation so as to create a diversity of age, structure and patch pattern. Bracken management could be carried out by either mechanical or chemical means except that in the latter instance care will be needed to avoid damaging non-target sensitive species in the vicinity, such as other ferns and western gorse. Major threats are posed by the spread of non-native cotoneaster and self-sown pine trees onto the un-grazed hillsides of Cefn yr Ogof .

- **Burning**

Until the late twentieth century most of the heath was burnt each year at the beginning of spring. This practice probably also included associated stands of gorse. Unfortunately this healthy management practice was discouraged and currently, only small-scale burning occurs and regeneration of the heath is poor. Where livestock does not graze the heath, it would especially benefit by rotational burning of heath by small patch burning or where this is not feasible near forestry plantations by swiping (mowing). This would have the additional benefit of giving check to invasive woody species.

- **Recreational pressure**

There is a network of footpaths across the site mainly used by the public for dog walking and air and exercise. Some is open access land. The impact of trampling and nutrient enrichment should be monitored to ensure that sensitive areas of the site are not eroded or otherwise damaged or if so, remedial action put in place. Unfortunately these paths also provide access to unauthorized motorcycles with consequent damage to grassland by the creation of wheel ruts. Action should be taken to prevent access for motorcycling. This has also been a problem within the woodland, particularly that on the lower slopes of Craig y Forwyn. Some cliff sections have been used for rock climbing. The impact of this needs to be monitored and if found to have a detrimental impact upon either rare plants, such as wild cabbage or whitebeam or nesting birds, climbing may need to be discouraged.

Woodland

- **Species that are not locally native**

Sections of the woodland have in the past been replanted with sycamore, beech or pines, or a mixture of these with other exotic conifers. Where these species occur the shrub, field and ground layers of the woodland are impoverished because of the dense shade cast by the tree canopy. This leads to species poverty and lack of seedling and sapling regeneration by desirable species such as ash, sessile oak, wild cherry, wych elm and hazel. Sycamore, beech and pines will be removed only where they are of scattered distribution, and tolerated in the short term where they comprise over half the canopy. There is localized dominance of the field and ground layers by non-native cotoneaster, for example in the woodlands below the cliffs of Cefn yr Ogof. Attempts to remove this invasion may not be successful until this section of woodland is relieved from the rain of cotoneaster berries from the cliffs above.

- **Silvicultural operations**

Problems with access for timber harvesting vehicles mean that there are only limited opportunities for forestry operations. Timber extraction may damage the woodland flora if carried out insensitively (this includes damage from windblow after harvest, and from access routes used for transport of felled timber). Felling coupes should therefore be as small as practicable, with damage to standing trees and the woodland flora kept to a minimum. In the absence of natural regeneration by ash, oak or other desired woody species replanting of felling coups to provide standard trees will favour ash and oak. Selected parts of the woodland would benefit from introduction of a coppice rotation (7–15 years length) as this would, by diversifying the age and structure of the woodland, bring additional benefits to the associated fauna and flora. Forestry operations should be compatible with conservation aims.

Lesser horseshoe bat

- **Disturbance**

  Bats are very susceptible to disturbance whilst hibernating. Winter monitoring visits should therefore be restricted to at most two per winter. If bats are disturbed repeatedly during the winter, arousal from hibernation will result in increased use of stored body fat, which may increase the risk of mortality before spring.

  It is therefore important that management operations are undertaken at a time of year when disturbance would be unlikely, i.e. May to August. Management works within 100m of the roost entrances should only be carried out after consultation with CCW. No works should be undertaken whilst the bats are hibernating.

  Only one of the eleven key hibernation sites has had its entrance grilled to prevent disturbance. Other entrances may need to be restricted by grilling but some of these are very large and probably prohibitively expensive to completely grille these at the mouth. Grilles will need to be constructed under expert advice to ensure they are suitable for use by bats.

- **Alterations to airflow**

  Caves and mines must be protected from alterations to airflow. Airflow regimes within caves and mines should maintain constant humidity and temperature between 8-12^{o}C. It is therefore important to ensure that entrances are kept unobstructed. Similarly it is important to avoid any unplanned new entrances, which may cause changes to ventilation.

- **Integrity and accessibility of cave and mine entrances**

  It is important to maintain the accessibility and integrity of the entrances to cave and mine systems. Vegetation growth close to cave and mine entrances is desirable for the purposes of providing cover for dispersing bats. However, management undertaken to remove excessive vegetation growth around cave/mine entrances may periodically be required. Management works may also be required to maintain the structural integrity and condition of roost entrances.

- **Foraging habitat**

  Lesser horseshoe bats principally feed on flies (mainly midges), small moths, caddis flies, lacewings, beetles, small wasps and spiders. Suitable foraging habitat includes dense broadleaved woodland, scrub, and pasture. The size of the colony of lesser horseshoe bats suggests that suitable foraging habitats exist within the site. It is therefore important that the proportions of surrounding woodland scrub and pasture immediately surrounding entrances remains relatively constant.

- **Dispersal routes**

  The preferred habitats that lesser horseshoe bats use as cover for dispersal include woodlands, hedgerows, scrub and along linear man made features such as walls. The landscape around the roost site includes woodland (including some conifer plantations), hedgerows, scrub (including heath) and calcareous grassland. If linking habitats between roosts are lost, bat flight patterns could be disturbed which could lead to alterations to the size of this bat colony. The management of these areas should therefore aim to maintain tree cover whenever possible. Existing woodland should be carefully managed to ensure continuity of habitat, and whenever gaps exist, hedges planted to ensure continuity of corridors.

<u>Silver studded-blue and other rare butterflies, moths and other invertebrates</u>

Management issues are as for the limestone grassland and heath as described above with additionally:

- **Habitat mosaics**

The continuous availability of discrete patches of habitat, being a mix of open ground, short turf, food plants and sheltering bracken and scrub is essential. Succession of large sections of the most suitable parts of the site, for example the disused quarries, to encroaching dense scrub and woodland must be prevented. Control of scrub and

trees by cutting (to include removal of the cut material) so as to keep open existing areas and provide nearby fresh open ground sites for re-colonisation should be undertaken annually.

Rare Plants, Mosses and Lichen

Management will be assisted by that described above providing that in so doing the species themselves are not inadvertently damaged or destroyed.

Finally

Our knowledge and understanding of wildlife/geology is continually improving. It is possible that new issues may arise in the future, whilst other issues may disappear. This statement is written with the best information we have now, but may have to change in the future as our understanding improves. Any information you can provide on the wildlife of your site, its management and its conservation would be much appreciated.

If you would like to discuss any aspect of your SSSI, or have any concerns about your SSSI, please contact your local CCW office.

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