

**DAVID CLEMENTS ECOLOGY LTD**

**PROPOSED GARW VALLEY CYCLE LINK, BRYNMENYN,  
BRIDGEND, GLAMORGAN**

**ECOLOGICAL ASSESSMENT**

**July 2011**

**David Clements Ecology Ltd  
Carlton House, 5 Herbert Terrace, Penarth, Glamorgan, CF64 2AH  
Tel: 029 20 350120 Fax: 029 20 711997  
info@dce.org.uk**

## SUMMARY

This report refers to a section of disused railway line at Brynmenyn, to the North of Bridgend, in Glamorgan. The site measures approximately 1km by 100m in extent, and lies to the north and east of the rural settlement of Brynmenyn in the Garw Valley at between 57-72m AoD. It comprises a disused railway line which is beginning to revegetate with a mixture of scrub, rough neutral grassland, ruderal vegetation and invasive species including Japanese knotweed and Himalayan balsam. The land rises gently as the track curves from south-west to north along its length. Semi-mature trees, some of which are of non-native origin, are scattered along the edges of the railway line, and there are seasonal ditches running on either side which were wet in parts at the time of survey. An area of wet woodland dominated by alder and willow ('carr') occurs alongside the northern section of track.

The old railway line runs between the semi-rural settlements of Brynmenyn and Abergarw at its southern end. As it runs north, it is bounded by fields and occasional, isolated residential properties. The Afon Garw runs parallel to the railway where it passes through the Bryngarw Country Park to the west, sometimes coming within 100m of the line. The A4064 trunk road lies to the east, also running parallel to the railway track. The Afon Garw passes under the railway line near its southern end and joins with the Afon Ogwr, which lies about 200m to the south. The site is proposed as a new cycle track linking up with National Cycle Route 4, which lies to the south west. A tarmac footpath adjoins the site from the adjacent Bryngarw Country Park, to the north.

The site does not contain or lie adjacent to any statutory or, as far as can be ascertained at present, non-statutory sites of designated wildlife interest.

The wet woodland habitats immediately adjacent to the northern section of section represents a 'Priority Habitat' of the UK and Welsh BAPs and is therefore considered to be of District value. The nearby Afon Garw and Afon Ogwr rivercourses are similarly considered to be of District value, although these lie off-site.

The scrub, grassland and other semi-natural habitats of the site are all currently considered to be of High Local value for wildlife. Although continuous sections of disused railway lines qualify for consideration as Sites of Importance for Nature Conservation in themselves, the habitats themselves narrowly fail to meet the necessary criteria in terms of 'contributory species', although in the case of the neutral grasslands this is only by one species. It is very likely that further survey at other times of the year would eventually succeed in recording the necessary minimum numbers of contributory species, at least for the grassland habitats. For the moment, however, the site is assessed as being of High Local value/borderline District value.

The vegetation near the ditches contains seven indicators of marshy grassland, which is again short of the qualifying threshold of 12 species which is recommended for the adjacent 'Mid-Valleys Area'. The presence of ant-hills in the southern area is a contributory factor for SINC qualification, but is not extensive enough to be considered on its own merit. The tree and scrub habitats are likely to be used by a range of common nesting birds, however, including several which are of conservation significance, and both these and other habitats are likely to be used for roosting, foraging, commuting and/or overwintering by a wide range of common mammals and other fauna, including reptiles, amphibians and invertebrates.

It is highly likely that bats forage and commute through the site, using the track as a linear corridor as they travel between their roosts and other feeding grounds. It is also possible that they may roost in some of the trees along the track, although this is considered unlikely. It is perhaps more likely that bats may roost in the walls of the old colliery overbridge, although this feature lies off-site and there is no evidence of this to date. The stone pillars of the metal bridge over the Afon Garw may also afford roosting potential, but this is also not considered to be of high probability.

Otter may occur on the nearby rivers, but probably only does so at low densities. Nevertheless, this species could occasionally use the ditches and other habitats of the site for foraging and/or commuting. The stands of Japanese knotweed are considered to be of Negligible wildlife value.

The site is proposed for redevelopment as a cycle track. No details of this development have been available to the present survey, but it is assumed that there is potential for adverse impacts including damage to and loss of habitats during the removal of the railway line; loss of habitats beneath new surfaces which are suitable for cycling (eg tarmac); increased disturbance as a result of increased use by the public, both on foot and on bicycles; hydrological impacts as a result of drainage; light-pollution of trackside and adjacent habitats if the cycleway is to be illuminated at night.

The impact of the proposed development could therefore potentially be of fairly high magnitude to the existing habitats, but given that these habitats are currently considered to have no greater than High Local value for wildlife, any adverse impacts are considered likely to have significance in the local context only. However, where the development comes into proximity to features of greater value, such as the wet woodland and/or the rivers, the potential impact may be of higher magnitude. Whilst the details of the development have not been determined at this stage, it is difficult to predict the outcome with regard to these habitats, although it is considered likely that they would be amenable to appropriate mitigation.

The proposed development could also potentially have adverse impacts in varying degrees on certain protected species, particularly nesting birds, foraging (and possibly roosting) bats, foraging otter and common reptiles. Mitigation measures with respect to these will therefore be required.

Notwithstanding the above, however, it is concluded that the proposed redevelopment of this site would be unlikely to entail any significant loss of wildlife features, provided adequate mitigation measures are implemented to avoid or minimise impacts to protected species and habitats of value. It is therefore considered on current evidence that the proposed redevelopment of this site would not be unacceptably constrained by biodiversity issues.

Appropriate mitigation measures are recommended.

## 1.0 INTRODUCTION

- 1.1 This report has been prepared by David Clements Ecology Ltd (DCE) on behalf of Bridgend County Borough Council (BCBC) and refers to a section of disused railway line at Brynmenyn, to the North of Bridgend, in Glamorgan. The site location and context is shown at Plan 1.
- 1.2 The site measures approximately 1km by 100m in extent, and lies to the north and east of the rural settlement of Brynmenyn in the Garw Valley at between 57-72m AoD. It comprises a disused railway line which is beginning to revegetate with a mixture of scrub, rough neutral grassland, ruderal vegetation and invasive species including Japanese knotweed and Himalayan balsam. The land rises gently as the track curves from south-west to north along its length.
- 1.3 Semi-mature trees, some of which are of non-native origin, are scattered along the edges of the railway line, and there are seasonal ditches running on either side which were wet in parts at the time of survey. An area of wet woodland dominated by alder and willow ('carr') occurs alongside the northern section of track.
- 1.4 The old railway line runs between the semi-rural settlements of Brynmenyn and Abergarw at its southern end. As it runs north, it is bounded by fields and occasional, isolated residential properties. The Afon Garw runs parallel to the railway where it passes through the Bryngarw Country Park to the west, sometimes coming within 100m of the line. The A4064 trunk road lies to the east, also running parallel to the railway track. The Afon Garw passes under the railway line near its southern end and joins with the Afon Ogwr, which lies about 200m to the south.
- 1.5 The site is proposed as a new cycle track linking up with National Cycle Route 4, which lies to the south west. A tarmac footpath adjoins the site from the adjacent Bryngarw Country Park, to the north.
- 1.6 The remainder of this report sets out the results of an ecological survey and assessment of the site. It also assesses the likely impact of the proposed cycle track development, and makes recommendations regarding the mitigation of any potentially adverse biodiversity impacts.

## 1.7 Designated Sites of Biodiversity Interest

### *Statutory Sites*

- 1.7.1 The site does not contain or lie adjacent to any statutory sites of nature conservation interest, such as Sites of Special Scientific Interest (SSSIs), National Nature Reserves (NNRs) or Local Nature Reserves (LNRs). The closest such site is the Blackmill Woodlands Special Area of Conservation (SAC), which lies within about 2km to the east, and which comprises one of the most southerly examples of sessile oak woodlands in Wales.

*Non-Statutory Sites*

- 1.7.2 Details of non-statutory sites of nature conservation interest, such as Sites of Importance for Nature Conservation (SINCs), are not available at the time of writing. As far as can be ascertained at present, however, the site does not lie adjacent to any such sites.

## 2.0 APPROACH AND METHODS

### 2.1 Survey Methodology

- 2.1.1 The site was surveyed on 21-22 June and 15 July 2011 during periods of good weather, being mainly warm and cloudy, with sunny intervals. The site was subject to an Extended Phase 1 survey as recommended by the Institute of Environmental Assessment (IEA 1995). This was based on the Phase 1 vegetation classification methodology developed by the former Nature Conservancy Council (NCC 1990), a nationally-accepted and standard method for the rapid survey and appraisal of ecological habitats which is based primarily on the recording of vegetation and its classification into defined habitat categories. Dominant and conspicuous flora species were recorded and ‘target notes’ were prepared for any features of particular interest.
- 2.1.2 This methodology also requires the recording of conspicuous fauna species such as birds, herptiles (ie amphibians and reptiles), mammals and invertebrates such as butterflies and dragonflies, paying particular attention to the presence (or possible presence) of any rare or protected species. Features such as walls, trees and rivercourses etc were inspected for evidence of fauna using close-focusing binoculars.
- 2.1.3 Where appropriate, the habitats of the site were also characterised against the descriptions provided by the National Vegetation Classification (NVC) as set out by Rodwell (1991 *et seq*).

### 2.2 Data Trawl

- 2.2.1 In addition to original survey, a data trawl was carried out in order to obtain access to any existing information about the site which may be held by nature conservation bodies in the region. The bodies contacted included:
- South East Wales Biological Records Centre (SEWBRcC)
  - Bridgend County Borough Council (BCBC) Ecologist

SEWBRcC is now the main repository for biodiversity and wildlife records in the south-east Wales region.

- 2.2.2 There do not appear to be any pre-existing records from the site.

### 3.0 SURVEY RESULTS

#### 3.1 Habitats & Vegetation

3.1.1 The results of the vegetation and habitats survey are shown on Plans 2 and 3 of this report, and are described briefly below. Lists of the species recorded are given at Appendix 1, and representative photographs are included at the end of the report. Please note that the proportions of Plan 3 have been modified out of scale in order to allow detailed plotting of habitats. Individual features which are referred to are shown in their true locations on Plan 2.

##### *Notable Plant Species*

3.1.2 No nationally rare or scarce species were recorded.

##### *Notable Habitats*

3.1.3 The site does not contain any 'Priority Habitats' as defined by the UK Biodiversity Action Plan (UK BAP: BRIG 2007) or its Welsh equivalent (WBP 2007), However, the northern section of the railway runs through an area of wet woodland (or 'carr') dominated by alder and grey willow, and there is an adjoining field of rush grassland lying to the east. In addition, the railway line passes over the course of the Afon Garw, a minor river. All three of these are listed as 'Priority Habitats' in the UK BAP and its Welsh equivalent.

##### *Scrub Communities*

3.1.4 Most of the length of the site is bounded on one or both sides by scrub, which is locally quite dense and grading into developing woodland. Scrub dominates the vegetation to the south of the Abergarw Road bridge, where it comprises mostly ash (*Fraxinus excelsior*), along with alder (*Alnus glutinosa*), hybrid oak (*Quercus X rosacea*) and grey willow (*Salix cinerea*). Sycamore (*Acer pseudoplatanus*), common hawthorn (*Crataegus monogyna*) and elder (*Sambucus nigra*) also occur occasionally. Woody shrubs such as honeysuckle (*Lonicera periclymenum*) and bramble (*Rubus fruticosus* agg) are common components of the understorey, together with ivy (*Hedera helix*) which grows up through the ballast substrate on the railway track. Himalayan honeysuckle (*Leycesteria formosa*) is found occasionally, along with other non-native species such as buddleia (*Buddleja davidii*) and wall cotoneaster (*Cotoneaster horizontalis*). Tall ruderal vegetation occur extensively at the edges of the scrub, including extensive stands of the invasive non-native species Himalayan balsam (*Impatiens glandulifera*), and one large stand of Japanese knotweed (*Fallopia japonica*), near the road bridge.

3.1.5 In the vicinity of the road bridge, the scrub canopy opens out, revealing a grassy bank to the south which is sparsely populated with alder, silver birch (*Betula pendula*), common hawthorn, oak and some domestic apple (*Malus pumila*). Traveller's joy (*Clematis vitalba*) and bramble are occasional components, along with some garden rose (*Rosa* sp) on the opposite side of the track. A belt of scrub continues south along the periphery of

the bare ground and grassland which borders the level crossing, where the canopy is mostly dominated by ash.

- 3.1.6 Across the road bridge to the east, the rail track continues northwards in a gentle curve. The marginal scrub close to the fast-flowing Afon Garw consists mostly of alder with hawthorn and ash saplings, mixed with bramble. Stands of Japanese knotweed and Himalayan balsam are frequent here. The track margins are more open, with incursions of grassland and stands of bracken (*Pteridium aquilinum*), particularly on the eastern edge.
- 3.1.7 The scrubby borders continue northwards for most of the track's remaining length, with the western side supporting the denser canopy for the most part. Banks rise on both sides, with the western being the steepest, especially alongside the old Brynmenyn Colliery site (see Plan 2). In this area, the scrub tends more towards semi-natural woodland, with abundant hazel (*Corylus avellana*), and some common hawthorn and sycamore, alongside the more frequent ash, hybrid oaks and grey willow. The ground flora consists mainly of ivy and young tree saplings, but also includes male-fern (*Dryopteris felix-mas*), herb-robert (*Geranium robertianum*), wood-avens (*Geum urbanum*) and cleavers (*Galium aparine*).
- 3.1.8 Along the mid-northerly section of the track, just north of the pylon-line (see Plan 2) the scrub thins out considerably, with frequent blackthorn (*Prunus spinosa*) shrubs, bramble and silver birch present in the canopy. Ruderal vegetation occurs throughout along the trackside edge of the scrub, mainly comprising Himalayan balsam, which is frequent throughout and dominant in many places.

#### ***Wet Woodland***

- 3.1.9 In the northern quarter of the site, the railway line passes through a small area of wet woodland ('carr') which is dominated by alder and grey willow. These species are also spread along the wet ditches which are present on either side of the track within the site, and continue extensively off-site, particularly to the east. Access into the woodland areas was not possible, as these lie off-site and are fenced. However, the area to the east appears to contain numerous seasonal pools, with wetland species such as soft rush (*Juncus effusus*), remote sedge (*Carex remota*), marsh thistle (*Cirsium palustre*), small sweet-grass (*Glyceria declinata*), creeping bent (*Agrostis stolonifera*) and hemlock water-dropwort (*Oenanthe crocata*) present, amongst others.

#### ***Mature Standard Trees***

- 3.1.10 Medium-mature trees are scattered along the edges of the site, associated with the scrubby boundaries, with the largest being found in the area north of the river bridge. These are of mostly ash (up to c80cm diameter at breast-height), hybrid oak (up to c60cm dbh) and occasional goat willow (*Salix caprea*) (up to c80cm dbh). Most of the oaks appear to be intermediate between sessile oak (*Quercus petraea*) and pedunculate oak (*Quercus robur*), although some seemingly pure strains of the latter are also present. Many of the larger trees have ivy cladding the trunks.



### ***Semi-improved Neutral Grassland***

- 3.1.11 The larger areas of neutral grassland are found mainly in the clearings indicated on Plan 3, although there is also a general scattering between the tracks and around the periphery of the ruderal vegetation elsewhere throughout. The grassy areas are generally grass-dominated and species-poor, and are mainly dominated by the same few grass species, namely red fescue (*Festuca rubra*), rough meadow-grass (*Poa trivialis*), cock's-foot (*Dactylis glomerata*), Yorkshire fog (*Holcus lanatus*), false oat-grass (*Arrhenatherum elatius*) and perennial rye-grass (*Lolium perenne*). Less frequently occurring, but locally common, are crested dog's-tail (*Cynosurus cristatus*), barren brome (*Anisantha sterilis*), creeping bent, soft brome (*Bromus hordeaceus*), Creeping soft-grass (*Holcus mollis*) and false brome (*Brachypodium sylvaticum*), the latter two grasses occurring near the woodland which adjoins the northern end of the site.
- 3.1.12 Broadleaved herbs are scattered at low densities throughout the grassy areas. These include ribwort plantain (*Plantago lanceolata*), perforate St John's-wort (*Hypericum perforatum*), common bird's-foot trefoil (*Lotus corniculatus*), common vetch (*Vicia sativa*), bush vetch (*Vicia sepium*), white clover (*Trifolium repens*), red clover (*Trifolium pratense*), common chickweed (*Stellaria media*), self-heal (*Prunella vulgaris*), daisy (*Bellis perennis*), eyebright (*Euphrasia* agg), cut-leaved cranesbill (*Geranium dissectum*), meadow buttercup (*Ranunculus acris*), creeping buttercup (*Ranunculus repens*), silverweed (*Potentilla anserina*) and yarrow (*Achillea millefolium*). More shaded areas support additional species such as herb-robert, ground-ivy (*Glechoma hederacea*) and wood avens.
- 3.1.13 Wetter areas occur near the ditches and elsewhere, and include species such as common figwort (*Scrophularia nodosa*), marsh cudweed (*Gnaphalium uliginosum*) and marsh bedstraw (*Gallium palustre*). Where the grassland vegetation becomes more skeletal, as on the periphery of bare ground associated with the railway track, species such as rough hawkbit (*Leontodon hispidus*), black medick (*Medicago lupulina*) and hop trefoil (*Trifolium campestre*) are locally common.

### ***Ruderal Vegetation***

- 3.1.14 The scrub-covered banks and grassy edges alongside the railway track also support a range of common ruderal herbs such as common ragwort (*Senecio jacobaea*), cleavers, rosebay willowherb (*Chamerion angustifolium*), great willowherb (*Epilobium hirsutum*), ground-elder (*Aegopodium podagraria*), foxglove (*Digitalis purpurea*), curled dock (*Rumex crispus*), hogweed (*Heracleum sphondylium*) and common nettle (*Urtica dioica*). In the northern half of the site, hedge woundwort (*Stachys sylvatica*), red campion (*Silene dioica*), hemp-agrimony (*Eupatorium cannabinum*), creeping thistle (*Cirsium arvensis*) and spear thistle (*Cirsium vulgare*) are locally frequent. Common hemp-nettle (*Galeopsis tetrahit*) and yellow cress (*Rorippa* sp) occur occasionally. Field horsetail (*Equisetum arvense*) and soft rush are scattered throughout the site, particularly in the damper areas such as alongside the boundary ditches, where species such as hairy sedge (*Carex hirta*) also occur. On the southern part of the site, near the level crossing, a small stand of yellow sedge (*Carex demissa*) grows amongst the willowherb and hard rush (*Juncus inflexus*).

- 3.1.15 The invasive non-native species Himalayan balsam is abundant in many areas, and comes to dominate extensive sections of the trackside areas in late summer. Bracken is also abundant on the north western bank where the site is more open, typically mixed in with bramble. There are also several large stands of Japanese knotweed.

#### ***Ephemeral /Short Perennial Vegetation***

- 3.1.16 An area of skeletal vegetation forms a thin ground cover between the neutral grassland and bare ground to the south of the level crossing. The broadleaved herbs most commonly found here are rough hawkbit, black medick, dandelion (*Taraxacum officianalis* agg), ribwort plantain, buttercups and hop trefoil. Grass species are mostly creeping bent and red fescue, with some taller false oat-grass scattered throughout.

#### ***Ditches***

- 3.1.17 A ditch runs parallel to the trackway on either side, with those in the northern half of the site being wet at the time of survey. The standing water in some of the ditches contains orange flocculation suggesting the presence of iron compounds in the water. The ditch banks are mostly ruderal vegetated (see above), with additional wetland species including wild angelica (*Angelica sylvestris*), field horsetail, hemlock water-dropwort, soft rush and marsh bedstraw. Himalayan balsam is ubiquitous throughout. Yorkshire fog and false oat-grass are common, with creeping bent and small sweet grass locally frequent. Emergent species occur locally, and include branched bur-reed and one stand of great reedmace (*Typha latifolia*). Water crowfoot (*Ranunculus (Batrachium)* sp) is present in the water occasionally.

#### ***Invasive Species***

- 3.1.18 As noted above, the invasive non-native species Himalayan balsam, Japanese knotweed and wall cotoneaster are all present on the site, with the former being particularly abundant. A large stand of Japanese knotweed grows close to the residential housing on the northern boundary bank near the road bridge, and there are several other stands growing along the track elsewhere. Wall cotoneaster grows sporadically in the scrub communities, particularly to the south. Immediately off-site to the north of the site, the hybrid knotweed *Fallopia X bohemica* occurs at the edge of the riverside woodland.

#### ***Afon Garw***

- 3.1.19 The Afon Garw mainly flows off-site, but passes under the railway near the southern end. It is also readily accessible near the northern end of the site. The river is generally broad and shallow, and is fairly rapid-flowing over a substrate of cobbles and silt, although there is also a large slower-flowing backwater behind created weirs near the northern end of the site. The river is evidently given to spate, however, as evidenced by flood debris in trees well above the water level at the time of survey. The banks are generally scoured and largely bare of vegetation, although Himalayan balsam and Japanese knotweed occur, together with occasional stands of hemlock water-dropwort.

**Off-site Ponds**

- 3.1.20 There is a small seasonal pond lying just off-site at the northern end on land between the Afon Garw and the tarmac footpath. This contained standing water in June, but was dry by the middle of July. The standing water was still, and the pond itself is heavily shaded, with tall tree canopy cover above consisting of ash and hazel with an understorey including ferns and ivy. The pond was not surveyed in detail, as it lies off-site and was not readily accessible, but did not appear to support any significant emergent or aquatic vegetation.
- 3.1.21 There are map references to ponds on the land immediately off-site to the east of the site at the northern end, but the density of Himalayan balsam and bramble was so great that it was impossible to survey this area. The ground was wet underfoot, however.

**3.2 Fauna**

**Bats**

- 3.2.1 All species of bat and their roosting sites are protected under the EU Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna (92/43/EEC; the ‘Habitats Directive’), implemented in the UK via the Conservation (Natural Habitats &c.) Regulations 2010 (the ‘Habitats Regulations’). The roosting places used by bats are also protected against unauthorised disturbance or obstruction under the amended Wildlife & Countryside Act 1981. Several bats are listed as ‘Priority Species’ for conservation in the UK Biodiversity Action Plan (BRIG 2007) and its Welsh equivalent (WBP 2007).
- 3.2.2 The larger trees of the site were surveyed visually from ground-level and were assessed for their potential to support roosting bats (see Plan 2). Details were as follows:

Tree No.	Species	Size (dbh)	Description	Potential
T1	Ash	40-50	Smooth bark, ivy covering, multi-boughed	Low
T2	Ash	40-50	As above	Low
T3	Ash	50 max	As above	Low
T4	Oak	60 max	Slightly rugose, ivy covering, multi-boughed	Low
T5	Sycamore	50 max	Smooth bark, multi-boughed	Low
T6	Goat willow	70-80	Rugose, ivy covering, multi-boughed	Low to Moderate
T7	Ash x 4	80 max	Slightly rugose, ivy covering	Low
T8	Ash	50	Smooth bark	Low
T9	Oak	50	Slightly rugose, spreading limbs	Low

- 3.2.3 None of the surveyed trees were of more than about 80cm dbh, with most being considerably less, and none possessed any features such as cracks, cavities and fissures which are considered likely to make them attractive to roosting bats. Accordingly, all were assessed as having only low potential for use by roosting bats, with the possible exception of Tree T6, a large old goat willow with low to moderate potential. Assessed against the criteria suggested by BCT (2007), none of the trees would merit further survey for use by bats.

- 3.2.4 The railway line runs past a disused colliery complex, assumed to be part of the former Brynmenyn Colliery (see Plan 2). This comprises the entrance to a drift tunnel and an associated stone-built overbridge and high retaining wall which runs parallel to the track for approximately 100m along its western side. Although lying just off-site, this area was inspected visually for bat-roosting potential. Superficially, the brick-lined arch of the overbridge looks likely to have some potential, although on closer inspection it was found to be draughty on the interior, being open at both ends. Although there are some holes and cavities in the brick lining, these tend to be quite shallow and exposed and overall the arch is fairly smooth-walled. Overall, the potential for bat-use is therefore assessed as no greater than low to moderate.
- 3.2.5 The face of the retaining wall, which runs parallel to the track, has numerous fissures and cracks in the masonry, some of which appeared to be quite deep: these may have some potential for bat use. The wall is quite tall (over 4m in places) and has quite a lot of ivy cover.
- 3.2.6 The entrance to the nearby drift mine is grilled, and the void beyond is completely filled with debris. All of the debris, and much of the walls below ground level, are stained by iron oxides which suggest that the ground-water level reaches the surface at least on occasion. The visible masonry above ground-level appears sound, with no obvious gaps or cavities. The potential for bat use of this feature was assessed as being low or very low.
- 3.2.7 No other mine structures were found at the time of survey, but old photographs suggest the presence of further tunnels and shafts in the vicinity, some of which may have bat-use potential.
- 3.2.8 There is a metal bridge over the Afon Garw where it passes under the railway line. This has stone pediments as shown in the site photographs, but no obvious gaps in the stonework were apparent. The deck of the bridge is largely absent. It is possible that this feature could be used for roosting by species such as Daubenton's bat, but this is not considered to be particularly likely. The fast-flowing and turbulent nature of the river probably renders it unsuitable for foraging by this species at this location.
- 3.2.9 There are records of bat species from within 0.5-1km of the site, mainly comprising common and soprano pipistrelles from residential properties (2005/08). Brown long-eared bat has also been recorded to the south of the site in 1982/83. A roost of lesser horseshoe bats, a rare species, has been recorded just over 1km to the north-west at Llynfi Power Station in 2004 (SEWBReC data).

### *Otter*

- 3.2.10 Otter is also a fully protected species, afforded legal protection which is similar to that of bats (see above). It is also a 'Priority Species' of the UK and Welsh BAPs.
- 3.2.11 The accessible sections of the Afon Garw and Afon Ogwr near to the site were surveyed for otter, but no evidence of this species was found. Otter was not recorded on this river system at the time of the last national survey (Jones & Jones 2001), and there are no known subsequent records from within 1km of the site (SEWBReC data). However, there is anecdotal evidence to suggest that otter, a highly mobile species, has

recolonised most major catchments in south Wales in the period since about 2000, sometimes at very low population densities, and there are recent records from other watercourses within about 5km. The presence of otter on the Afon Garw/Afon Ogwr therefore cannot be ruled out, and the probability of its occurrence is considered likely to increase in the future.

- 3.2.12 The habitats of the site are not especially suitable for otter, although it is possible that this species could occasionally range onto the site from the nearby Afon Garw, either whilst commuting or foraging, or may do so in the near future. Holting by otter in the area of wet woodland is also a possibility, particularly at times of flood, but is not considered to be especially likely at the present time.

### *Other Mammals*

- 3.2.13 There was no evidence to suggest the presence of any other specially protected mammals on the site, such as dormouse and badger etc, and the site was not assessed as being especially suitable for such species. A nut search was carried out for dormouse, a European Protected Species which is known to occur in wooded habitats in the region, but all of the hazelnuts which were found were assessed as having been opened by grey squirrel.
- 3.2.14 Several narrow mammal tracks were observed along the ditch bank on the eastern periphery of the wet woodland, leading down to the water and also running parallel to the fence. No evidence of which animal had produced these trails was apparent at the time of survey, although fox or domestic cats are likely. Further narrow tracks were observed in the understorey of the scrub close to the old colliery drift-mine entrance, but rabbit was the only mammal species noted in this area. Droppings and diggings by this species were found throughout the site in general.
- 3.2.15 Badger has been recorded from Bryngarw Country Park in 2009 (SEWBReC data), in the form of the skull of a dead male animal. There was no evidence from the present survey to suggest the presence of badger on the site, however, and the site was assessed as being generally of low suitability for this species due to the general dampness of the soils and/or the lack of suitable slopes or banks for setts. Scratches were found on several of the old timber railway sleepers at the northern end of the site which were suggestive of claw marks (see photos in appendix). These could conceivably have been of badger, but there were no other indications of this species. It is, however, possible that badger uses the site for commuting and/or foraging on occasion, although dogs are also known to frequent the site, and may explain the origin of these marks.
- 3.2.16 It is likely that a range of other common and ubiquitous mammals occur on the site, such as mice, voles and shrews etc, at least on occasion. These are likely to comprise resident species which are adapted to anthropogenic situations, such as brown rat or house mouse, as well as casual visitors such as fox. Fox scent was detected around the wetter areas of the site by the current survey, and some droppings attributable to this species were found.

***Birds***

- 3.2.17 Nearly all species of bird are protected against killing or injury as individuals under UK legislation, and this protection extends to their nests, eggs and young. A number of especially rare species are subject to enhanced protection under UK law by virtue of their listing on Schedule 1 of the Wildlife & Countryside Act 1981, and may not be disturbed whilst nesting.
- 3.2.18 There are records of various bird species from within 1km of the site, including notable species such as sparrowhawk, song thrush, bullfinch, lesser spotted woodpecker and wood warbler. Kingfisher and dipper occur in the riparian habitats, and the former has also occasionally been known to frequent gardens in the locality (SEWBReC data).
- 3.2.19 The present survey recorded 23 species of bird on the site, including great tit, blue tit, wren, chaffinch, bullfinch, blackbird, blackcap, robin, willow warbler, dunnock and buzzard. It is likely that a wide range of common birds including, for example, chaffinch, wren, blue tit, dunnock and/or blackbird, occur as nesting species in the trees and scrub of the site, and that a wide range of these and other bird species use the site for foraging purposes.

***Reptiles***

- 3.2.20 Four native reptile species occur in South Wales, comprising common lizard, slow-worm, adder and grass snake. These four species are all afforded so-called 'partial protection' under the amended Wildlife & Countryside Act 1981, which prohibits the deliberate killing or injury of individuals. However, there is no direct protection extended to the habitats which support these species. All four common reptiles are listed as 'Priority Species' in the UK BAP and its Welsh equivalent.
- 3.2.21 Common reptile species are difficult to detect in the field without recourse to targeted Phase 2 survey methods. Reliance was therefore placed on the subjective assessment of the habitats of the site with respect to their potential as dispersal, foraging and hibernating grounds for common reptiles, based on previous experience and on published information.
- 3.2.22 At the time of writing there are no records of reptiles from the site itself, and none were recorded by the present survey. The present assessment suggests, however, that the ruderal, grassland and scrub areas are all suitable for common reptiles such as common lizard, slow-worm and, possibly, grass snake, the latter particularly since there are waterbodies on the site, although it is likely that all of these would occur at fairly low densities. There are records of common lizard, grass snake and slow worm from within 0.5km of the site (SEWBReC data).

***Amphibians***

- 3.2.23 Five native amphibian species occur in South Wales, comprising common frog, common toad, smooth newt, palmate newt and great crested newt. The latter species is nationally rare and declining, and is afforded full protection under both UK and European legislation (see under bats, above), which also extends to the habitats which

support it. The other four species are not afforded any direct statutory protection, other than with respect to trade.

- 3.2.24 No amphibians have been recorded from the site to date. However, it is considered highly likely that common species such as frog, toad and/or palmate newt occur on the site at least on occasion, particularly in damp and shaded habitats such as the scrub patches, ruderal vegetation, ditches and taller grasslands etc, either whilst foraging, commuting and/or overwintering. There is at least one small pond just outside of the site boundary to the north which may be suitable as a breeding site for amphibians.
- 3.2.25 Great crested newt has been recorded in the Brynmenyn Country Park in 1998, within about 0.5km of the site (SEWBRc data). This species therefore could occur occasionally within the site whilst foraging, commuting or overwintering, although there is no evidence to date that it does so. The small seasonal pond lying off-site to the north could possibly be suitable for this species, but may dry out too soon in the summer to be suitable for breeding. Further survey would be required to establish the likelihood of this species occurring with greater certainty.

### ***Invertebrates***

- 3.2.26 Upwards of 30,000 species of invertebrates are recorded in Britain, occurring in every available habitat. About 40 species are afforded full statutory protection in the UK under either European or British legislation.
- 3.2.27 Several common invertebrates were recorded from the site during the present survey, including butterflies such as ringlet (*Aphantopus hyperantus*), comma (*Polygonia c-album*), small tortoiseshell (*Aglaia urticae*) and meadow brown (*Maniola jurtina*), and the hoverflies *Eristalis tenax* and *Episyrphus balteatus*. There are no existing invertebrate records for the site itself, but records for the locality include small blue (*Cupido minimus*) and small pearl-bordered fritillary (*Boloria selene*) butterflies and small yellow underwing moth (*Panemeria tenebrata*), but the occurrence of any except possibly the last of these species is considered extremely unlikely. Ruddy darter (*Sympetrum striolatum*) and golden-ringed dragonfly (*Cordulegaster boltonii*), the latter a local species, are also present in the locality, the former of which could breed on the site.
- 3.2.28 The small area of semi-improved neutral grassland to the south of the road bridge and level crossing supports several well-established nest hills of yellow meadow-ant (*Lasius flavus*), a common species although typically confined to semi-natural grassland habitats. Overall, the site is assessed as being likely to support a wide range of common and ubiquitous invertebrate species, but the probability of any rare or protected species being present is considered to be low.

## 4.0 ECOLOGICAL EVALUATION

4.1 There is currently no nationally accepted system for the categorising of sites or features of biodiversity significance below the level of national value, criteria for which are set out by the former Nature Conservancy Council (1989, as amended). However, guidance for the identification of non-statutory sites of county significance (ie SINCs) is available in this instance (WBP 2008A/B).

4.2 For the purposes of this study the habitats and features of the site have therefore been provisionally evaluated and graded in accordance with the categories set out in Appendix 2. The ecological assessment of the site is shown on Plan 4.

### *International, National & County Value*

4.3 No parts of the site are considered to fall into any of these categories.

### *District Value*

4.4 The wet woodland habitats immediately adjacent to the northern section of section represents a 'Priority Habitat' of the UK and Welsh BAPs and is therefore considered to be of at District value. The nearby Afon Garw and Afon Ogwr rivercourses are similarly considered to be of District value, although these lie off-site.

### *High Local Value (Borderline District Value)*

4.5 The scrub, grassland and other semi-natural habitats of the site are all currently considered to be of High Local value for wildlife. Although continuous sections of disused railway lines qualify for consideration as Sites of Importance for Nature Conservation in themselves (WBP 2008A), the habitats themselves are considered to narrowly fail to meet the necessary criteria in terms of 'contributory species' although in the case of the neutral grasslands this is only by one species, based on the SINC designation advice provided for the adjacent 'Mid-Valleys Area' (WBP 2008B). It is very likely that further survey at other times of the year would eventually succeed in recording the necessary minimum numbers of contributory species, at least for the grassland habitats. For the moment, however, the site is assessed as being of High Local value/borderline District value.

4.6 The vegetation near the ditches contains five indicators of marshy grassland, which is again short of the qualifying threshold of 12 species which is recommended for the adjacent 'Mid-Valleys Area' (WBP 2008B). The presence of ant-hills in the southern area is a contributory factor for SINC qualification, but is not extensive enough to be considered on its own merit. The tree and scrub habitats are likely to be used by a range of common nesting birds, however, including several which are of conservation significance, and both these and other habitats are likely to be used for roosting, foraging, commuting and/or overwintering by a wide range of common mammals and other fauna, including reptiles, amphibians and invertebrates.

4.7 It is highly likely that bats forage and commute through the site, using the track as a linear corridor as they travel between their roosts and other feeding grounds. It is also



possible that they may roost in some of the trees along the track, although this is considered unlikely. It is perhaps more likely that bats may roost in the walls of the old colliery overbridge, although this feature lies off-site and there is no evidence of this to date. The stone pillars of the metal bridge over the Afon Garw may also afford roosting potential, but this is also not considered to be of high probability.

- 4.8 Otter may occur on the nearby rivers, but probably only does so at low densities. Nevertheless, this species could occasionally use the ditches and other habitats of the site for foraging and/or commuting.

*Negligible Value*

- 4.9 The stands of Japanese knotweed are considered to be of Negligible wildlife value.

## 5.0 ASSESSMENT OF DEVELOPMENT IMPACTS

- 5.1 The railway track is proposed by Bridgend County Borough Council for redevelopment as a cycle track. No details of this development have been available to the present survey, but it is assumed that there is potential for adverse impacts including damage to and loss of habitats during the removal of the railway line; loss of habitats beneath new surfaces which are suitable for cycling (eg tarmac); increased disturbance as a result of increased use by the public, both on foot and on bicycles; hydrological impacts as a result of drainage; light-pollution of trackside and adjacent habitats if the cycleway is to be illuminated at night.
- 5.2 The impact of the proposed development could therefore potentially be of fairly high magnitude to the existing habitats, but given that these habitats are currently considered to have no greater than High Local value for wildlife, any adverse impacts are considered likely to have significance in the local context only. However, where the development comes into proximity to features of greater value, such as the wet woodland and/or the rivers, the potential impact may be of higher magnitude. Whilst the details of the development have not been determined at this stage, it is difficult to predict the outcome with regard to these habitats, although it is considered likely that they would be amenable to appropriate mitigation.
- 5.3 The proposed development could also potentially have adverse impacts in varying degrees on certain protected species, particularly nesting birds, foraging (and possibly roosting) bats, foraging otter and common reptiles. Mitigation measures with respect to these will therefore be required.
- 5.4 Notwithstanding the above, however, it is concluded that the proposed redevelopment of this site would be unlikely to entail any significant loss of wildlife features, provided adequate mitigation measures are implemented to avoid or minimise impacts to protected species and habitats of value. It is therefore considered on current evidence that the proposed redevelopment of this site would not be unacceptably constrained by biodiversity issues.

## 6.0 RECOMMENDATIONS

### 6.1 Key Recommendations

6.1.1 The following are mandatory requirements under current legislation:

- In the unlikely event that bats are discovered anywhere within the trees of the site at any point prior to or during works, all work in the immediate area should cease immediately and appropriate expert advice sought.
- If any bats are found or suspected to be using the derelict colliery structures, or the stone bridge pillars as a roosting site, then, depending upon the nature of the works to be carried out, the above conditions should apply.
- Any works must not cause disturbance or harm to any birds which are nesting on the site at the time. In the event that any nesting birds are discovered immediately prior to or during any works, all work in the immediate area should cease immediately and appropriate expert advice sought.

6.1.2 In both cases, the ‘immediate area’ should include any bat-occupied void in its entirety, and any other structure for an area of at least 5m radius around the find-site. If necessary, the affected area should be clearly demarcated on the ground (eg by means of striped bunting) and made off-limits to all site personnel until inspected by an appointed expert. Appropriate measures to rectify the situation in accordance with statutory obligations and responsibilities will be determined at the time by the appointed expert, and may include consultations with the statutory agencies and the seeking of a derogation licence.

6.1.3 In the event that roosting bats are subsequently found to be present it will be necessary to obtain a derogation licence from the Welsh Assembly Government, and to formulate an appropriate plan of mitigation to the satisfaction of both the Assembly and their statutory advisors, the Countryside Council for Wales (CCW).

6.1.4 Any works affecting the trees and scrub should avoid the main bird-nesting season, which runs approximately from March to August inclusive. Alternatively, any works which must necessarily be carried out during this period should be preceded by a survey to ensure that no nesting birds are present. This restriction also applies to any other habitats which are found to support nesting birds, including ground-nesting species.

6.1.5 Mitigation for common reptiles should concentrate primarily on minimising the potential for causing the death and injury of individuals during site clearance and building operations: this is a statutory requirement. Mitigation in this instance could probably be achieved through a combination of ‘species deterrence’ measures in the run-up to the commencement of construction, coupled with ‘destructive searching’ of habitats where the risk of encountering reptiles is highest. However, a full method statement with respect to reptiles should be prepared in consultation with the BCBC Ecologist, prior to construction.

- 6.1.6 Current CCW guidance with respect to reptiles is attached at Appendix 3. It should be noted that destructive searching (DS) operations for reptiles are seasonally constrained, and cannot be carried out during the hibernation period, which extends approximately from November to February inclusive. Work outside of this period considerably reduces the probability of vulnerable torpid and/or immobile hibernating individuals being encountered and potentially harmed.
- 6.1.7 It is recommended that further survey is carried out to determine the likely presence or absence on the site for great crested newt. This species is present within 0.5km of the site, and a waterbody exists close to the site boundary which constitutes suitable habitat. Although the water level was found to be considerably lower by the time of the later survey on 13 July, breeding by great crested newt would still be potentially possible, especially during wetter summers. If present, great crested newt would use the environs of the site for foraging and hibernation during the non-breeding months, and this would therefore have to be taken into consideration during any future site clearance works.
- 6.1.8 The spread of Japanese knotweed during site clearance, demolition or construction works is controlled by legal requirements. Appropriate measures should therefore be implemented to clear this species from the site, and to ensure the safe disposal of any Japanese knotweed material, or any soils which may be contaminated by this species, in accordance with current regulations. Appropriate control measures are suggested at Appendix 4.

## 6.2 **Additional Recommendations**

1. Attempts should be made to eradicate Himalayan balsam from the site, by means of repeated cutting during the growing season and treatment of the cut stems with an appropriate herbicide (eg Glyphosate Biactive) using a knapsack sprayer or weed-wipe. Care should be taken not to affect other vegetation nearby. Wall cotoneaster should also be removed from the site, either by means of uprooting or cutting and treatment of trunks.
2. Consideration should be given to the installation of bird boxes in suitable locations within the peripheral landscaping of the site. These should be sited in such a manner that predators such as cats cannot reach them, and be at least 4m (preferably 5m) above ground level. Bird boxes should ideally be of 'woodcrete' construction (such as those manufactured by Schwegler Ltd – see Appendix 5), since these are much more robust and longer-lived than traditional wooden boxes and require less after-maintenance.
3. Consideration should also be given to the installation of bat boxes in suitable locations within the peripheral landscaping of the site. These should also be at least 4m (preferably 5m) above ground level and sited in locations where passers-by and predators such as cats cannot reach them, and where the entrances will not be illuminated at night. It is recommended that purpose-manufactured bat roosting boxes are used, ideally of 'woodcrete' construction (such as those manufactured by Schwegler Ltd – see Appendix 5) since these are much more robust and longer-lived than traditional wooden boxes and require less after-maintenance.

4. In the event of artificial night-time lighting being employed along the cycleway, it is recommended that this should achieve zero lux within a maximum of 2m of the edges of the trackway.
5. All contractors carrying out scrub clearance works should be warned of the *possible* presence of nesting birds, roosting bats and/or common reptiles, and of their protected status. It should be clearly understood that in the event of any being found during works, all works should cease in the affected area until appropriate expert advice has been sought.
6. A Biodiversity Management Plan should be drawn up for the clearance and construction stages of the redevelopment, and responsibility for its implementation should be assigned to an appropriately qualified and/or experienced member of the development team who will act as an 'Ecological Clerk of Works'.
7. The services of an appropriately qualified and licensed ecologist should be available on an 'on-call' basis throughout the development in order to deal promptly with any protected species issues, or other issues, which may arise during the works.

## 7.0 REFERENCES

**Bat Conservation Trust (BCT 2007)** *Bat Surveys – Good Practice Guidelines*. Bat Conservation Trust, London.

**Biodiversity Reporting & Information Group (BRIG 2007)** *Report on the Habitats & Species Review: A Report to the UK Biodiversity Partnership*. Joint Nature Conservation Committee, Peterborough.

**Institute of Environmental Assessment (IEA 1995)** *Guidelines for Baseline Ecological Assessment*. IEA Lincoln.

**Jones, T & Jones, A (2002)** *Otter Survey of Wales, 2002*. The Environment Agency, Bristol.

**Nature Conservancy Council (NCC 1989)** *Guidelines for the Selection of Biological SSSIs*. NCC Peterborough.

**Nature Conservancy Council (NCC 1990)** *Handbook for Phase 1 Habitat Survey: a Technique for Environmental Audit*. NCC Peterborough.

**Rodwell, J (Ed) (1991- 2000)** *British Plant Communities*. Vols 1-5. Cambridge University Press.

**Wales Biodiversity Partnership (WBP 2008A)** *Wildlife Sites Guidance Wales: A Guide to Develop Local Wildlife Systems in Wales*. Wales Biodiversity Partnership/Welsh Assembly Government.

**Wales Biodiversity Partnership (WBP 2008B)** *Criteria for the Selection of Sites of Importance for Nature Conservation in the County Boroughs of Blaenau Gwent, Caerphilly, Merthyr Tydfil & Rhondda Cynon Taff (The ‘Mid-Valleys Area’)*. Wales Biodiversity Partnership/Welsh Assembly Government.

**Wales Biodiversity Partnership (WBP 2007)** *List of Species & Habitats of Principal Importance for Conservation of Biological Diversity in Wales, December 2007*. Wales Biodiversity Partnership/Welsh Assembly Government.

## APPENDIX 1: SPECIES RECORDED

All species recorded by DCE 2011, unless otherwise indicated:

		<i>Status</i>	<i>Contributory Species</i>				
			<i>NG</i>	<i>AG</i>	<i>MG</i>	<i>CG</i>	<i>PIL</i>
<b><i>Trees &amp; Shrubs</i></b>							
<i>Acer pseudoplatanus</i>	Sycamore						
<i>Alnus glutinosa</i>	Common alder						
<i>Betula pendula</i>	Silver birch						
<i>Buddleia davidii</i>	Buddleia						
<i>Corylus avellana</i>	Hazel						
<i>Cotoneaster horizontalis</i>	Wall cononeaster						
<i>Crateagus monogyna</i>	Hawthorn						
<i>Fraxinus excelsior</i>	Ash						
<i>Malus pumila</i>	Domestic apple						
<i>Prunus spinosa</i>	Blackthorn						
<i>Quercus robur</i>	Pedunculate oak						
<i>Quercus X rosacea</i>	Hybrid oak						
<i>Rosa sp</i>	Rose (garden escape)						
<i>Rubus fruticosus agg</i>	Bramble						
<i>Salix caprea</i>	Goat willow						
<i>Salix cinerea</i>	Grey willow						
<i>Ulex europaeus</i>	Common gorse						
<b><i>Vascular Plants</i></b>							
<i>Achillea millefolium</i>	Yarrow						
<i>Aegopodium podagraria</i>	Ground elder						
<i>Agrostis stolonifera</i>	Creeping bent-grass						
<i>Angelica sylvestris</i>	Wild angelica				MG		
<i>Anisantha sterilis</i>	False brome						
<i>Arrhenatherum elatius</i>	False oat grass						
<i>Asplenium sp</i>	Fern						
<i>Brachypodium sylvaticum</i>	False brome						
<i>Bromus hordeaceus</i>	Soft brome						
<i>Carex demissa</i>	Common yellow sedge				MG		
<i>Carex hirta</i>	Hairy sedge						
<i>Carex remota</i>	Remote sedge						
<i>Chamerion angustifolium</i>	Rosebay willowherb						
<i>Circaea lutetiana</i>	Enchanter's nightshade						
<i>Cirsium arvense</i>	Creeping thistle						
<i>Cirsium palustre</i>	Marsh thistle						
<i>Cirsium vulgare</i>	Spear thistle						
<i>Cynosurus cristatus</i>	Crested dog's tail						
<i>Clematis vitalba</i>	Traveller's Joy						
<i>Dactylis glomerata</i>	Cocksfoot						
<i>Digitalis purpurea</i>	Foxglove						
<i>Dryopteris filix-mas</i>	Male fern						
<i>Equisetum arvense</i>	Field horsetail						
<i>Epilobium hirsutum</i>	Great willowherb						
<i>Epilobium montanum</i>	Broad leaved willowherb						
<i>Eupatorium cannabinum</i>	Hemp-agrimony				MG		
<i>Euphrasia agg</i>	Eyebright		NG				
<i>Fallopia x bohemica</i>	Giant knotweed hybrid						
<i>Fallopia japonica</i>	Japanese knotweed						
<i>Festuca rubra</i>	Red fescue						
<i>Galeopsis tetrahit</i>	Common hemp nettle						
<i>Galium aparine</i>	Cleavers						
<i>Galium palustre</i>	Common marsh bedstraw				MG		

DAVID CLEMENTS ECOLOGY LTD

<i>Geranium dissectum</i>	Cut leaved cranesbill					
<i>Geranium robertianum</i>	Herb Robert					
<i>Geum urbanum</i>	Wood avens					
<i>Glechoma hederacea</i>	Ground ivy					
<i>Glyceria declinata</i>	Small sweet grass			MG		
<i>Gnaphalium uliginosum</i>	Marsh cudweed					
<i>Hedera helix</i>	Ivy					
<i>Heracleum spondylium</i>	Hogweed					
<i>Holcus lanatus</i>	Yorkshire Fog					
<i>Holcus mollis</i>	Creeping soft grass					
<i>Hypericum perforatum</i>	Perforate St John's Wort	NG				
<i>Impatiens glandulifera</i>	Himalayan balsam					
<i>Juncus bufonius</i>	Toad rush					
<i>Juncus effusus</i>	Soft rush					
<i>Juncus inflexus</i>	Hard rush					
<i>Lapsana communis</i>	Nipplewort					
<i>Leontodon hispidus</i>	Rough hawkbit	NG				
<i>Lolium perenne</i>	Perennial rye grass					
<i>Lotus corniculatus</i>	Birds foot trefoil	NG			CG	PIL
<i>Lonicera perclymenum</i>	Honeysuckle					
<i>Luzula campestris</i>	Field woodrush	NG				
<i>Lysmachia nummularia</i>	Creeping Jenny			MG		
<i>Matricaria chamomilla</i>	Scented mayweed					
<i>Medicago lupulina</i>	Black medick				CG	
<i>Oenanthe crocata</i>	Hemlock water dropwort			MG		
<i>Plantago lanceolata</i>	Ribwort plantain					
<i>Plantago major</i>	Greater plantain					
<i>Poa trivialis</i>	Rough meadow grass					
<i>Potentilla anserina</i>	Silverweed					
<i>Potentilla reptans</i>	Creeping cinquefoil					
<i>Prunella vulgaris</i>	Self heal					
<i>Pteridium aquilinum</i>	Bracken					
<i>Ranunculus acris</i>	Meadow buttercup					
<i>Ranunculus (Batrachium) sp</i>	Water crowfoot					
<i>Ranunculus repens</i>	Creeping buttercup					
<i>Rorippa sp</i>	Yellow cress					
<i>Runex crispus</i>	Curled dock					
<i>Scrophularia nodosa</i>	Common figwort					PIL
<i>Senecio jacobaea</i>	Common ragwort					
<i>Senecio vulgaris</i>	Common groundsel					
<i>Silene dioica</i>	Red campion					
<i>Sparganium erectum</i>	Branched bur-reed					
<i>Stachys sylvatica</i>	Hedge woundwort					
<i>Stellaria graminea</i>	Lesser stitchwort	NG				
<i>Stellaria media</i>	Common chickweed					
<i>Taraxacum officinalis agg</i>	Dandelion					
<i>Torrilis japonica</i>	Upright hedge parsley					
<i>Trifolium campestre</i>	Hop trefoil				CG	PIL
<i>Trifolium pratense</i>	Red clover	NG				
<i>Trifolium repens</i>	White clover					
<i>Typha latifolia</i>	Greater reedmace					
<i>Urtica dioica</i>	Nettle					
<i>Vicia sativa</i>	Common vetch					
<i>Vicia sepium</i>	Bush vetch					
	<b>Contributory species</b>		7		7	3 3



<b>Invertebrates</b>		<b>Status/Comments</b>
<i>Aglais urticae</i>	Small tortoiseshell butterfly	Common
<i>Aphantopus hyperantus</i>	Ringlet butterfly	Locally common
<i>Bombus spp</i>	Bumble bee	
<i>Episyrphus balteatus</i>	Marmalade hoverfly	Common
<i>Eristalis tenax</i>	Drone fly	Common
<i>Lasius flavus</i>	Yellow meadow ant	Common
<i>Maniola jurtina</i>	Meadow brown butterfly	Common
<i>Polygonia c-album</i>	Comma butterfly	Common

Birds		IUCN Red List (Global Status)	SPEC (European Status)	EU Birds Directive (European Status)	Wildlife & Countryside Act	UK BAP	Wales BAP	UK BOCC	Wales BOCC	SINC Status (Breeding)	SINC Status (Wintering)	Bridgend LBAP	Status in Glamorgan
<i>Turdus merula</i>	Blackbird				G								Common resident breeder
<i>Sylvia atricapilla</i>	Blackcap				G								Common breeding summer visitor and passage migrant; locally common winter visitor, especially to suburban parks and gardens
<i>Pyrrhula pyrrhula</i>	Bullfinch				G	P	W	A	R	B	B		Common resident breeder
<i>Buteo buteo</i>	Buzzard				G								Common resident breeder
<i>Fringilla coelebs</i>	Chaffinch				G								Common resident breeder, winter visitor and passage migrant
<i>Phylloscopus collybita</i>	Chiffchaff				G								Common breeding summer visitor and passage migrant; locally common winter visitor
<i>Corvus corone</i>	Crow, carrion			2B	V								Common resident breeder
<i>Streptopelia decaocto</i>	Dove, collared				V								Common resident breeder
<i>Prunella modularis</i>	Duncock (hedge accentor)				G	P	W	A					Common resident breeder
<i>Regulus regulus</i>	Goldcrest				G				A				Locally common breeding summer visitor and passage migrant, though numbers can be depleted in harsh winters
<i>Carduelis carduelis</i>	Goldfinch				G								Common resident breeder, passage migrant and winter visitor
<i>Carduelis chloris</i>	Greenfinch				G								Common resident breeder, passage migrant and winter visitor
<i>Garrulus glandarius</i>	Jay			2B	V								Common resident breeder and occasional passage migrant
<i>Pica pica</i>	Magpie			2B	V								Common resident breeder
<i>Columba palumbus</i>	Pigeon, wood			2A C. c. azorica = 1	V								Common resident breeder
<i>Erithacus rubecula</i>	Robin				G								Common resident breeder
<i>Turdus philomelos</i>	Thrush, song				G	P	W	R	A	B	B		Common resident breeder
<i>Parus caeruleus</i>	Tit, blue				G								Common resident breeder
<i>Parus ater</i>	Tit, coal			P. a. cypristes = 1	G				A				Common resident breeder
<i>Parus major</i>	Tit, great				G								Common resident breeder
<i>Aegithalos caudatus</i>	Tit, long-tailed				G				A				Common resident breeder
<i>Dendrocopos major</i>	Woodpecker, great spotted			D. m. canariensis & thanneri = 1	G								Common resident breeder
<i>Troglodytes troglodytes</i>	Wren			T. t. fridariensis = 1	G								Common resident breeder

**IUCN (World Conservation Union) Red List of Threatened Species: compiled by BirdLife International (updated 2009/2010)**

**CR** : Critically Endangered

**EN** : Endangered

**VU** : Vulnerable

**NT** : Near Threatened

A blank cell indicates LC (Least Concern) or species not categorised (data deficient) for relative extinction risk at EU level.

**SPEC (Species of European Conservation Concern): compiled by BirdLife International (updated 2004)**

1 : Species of global conservation concern.

## APPENDIX 2: DEFINITIONS OF SITE VALUE

### International Value

Site carrying an internationally recognised designation such as Ramsar Site, World Heritage Site, Special Protection Area, Special Area of Conservation, Biosphere Reserve or Biogenetic Reserve, or:

*Habitats*: site supporting nationally significant areas of habitats of defined international community interest.

*Species*: site supporting nationally significant populations of species of defined international community interest.

### National Value

Site meeting published Site of Special Scientific Interest (SSSI) designation criteria (NCC 1989), whether so designated or not.

*Habitats*: site supporting nationally significant areas of habitats of defined national rarity or interest.

*Species*: site supporting nationally significant populations or communities of UK Red Data Book, Nationally Notable or protected species (other than badger).

### County Value

Site identified as a County Wildlife Site (CWS), Site of Importance to Nature Conservation (SINC) or similar at the county level (ie greater than district, borough or city level); meeting published CWS designation criteria (where these exist), but falling short of SSSI designation criteria, whether designated as a CWS or not.

*Habitats*: site supporting good examples of nationally threatened habitats, or extensive areas of habitats which are rare or unique in the county.

*Species*: site supporting large or strong populations or communities of nationally rare or protected species (other than badger), or of species which are rare in the county and uncommon nationally.

### District Value

Sites failing to meet County Value criteria, but nevertheless supporting habitats, species or communities which appreciably enrich the ecological resource of the county, especially by virtue of their size or extent.

*Habitats*: sites supporting habitats uncommon in the county, small but unmodified fragments of nationally threatened habitats, or comprising extensive areas or systems of semi-natural habitats.

*Species*: sites supporting nationally rare species, or strong populations or communities of regionally uncommon species, which would not otherwise be present (ie they are critically dependant on the site characteristics).

### Local Value

Habitats which fail to meet District Value criteria, but which appreciably enrich the ecological resource of the locality. This category can be further divided into:

- **High Local Value**: just failing to meet District Value Criteria; supporting species which are notable or uncommon in the county; or species which are uncommon, local or habitat-restricted nationally, and which might not otherwise be present in the area.
- **Local Value**: sites which are of ecological value only in the context of their immediate surroundings. Rare or uncommon species may occur but are not restricted to the site or critically dependant upon it for their survival in the area.

Sites failing to meet any of the above can be considered as being of '**Negligible**' ecological value.

## **APPENDIX 3: REPTILE MITIGATION MEASURES – CCW GUIDANCE (Draft Feb 2005)**

For any development site which supports reptiles, or which contains habitats with the potential to support reptiles, CCW recommends detailed survey at an early stage. Where suitable survey information is unavailable, however, or where there is insufficient time to carry out the necessary surveys, it should be assumed that any habitats on the site which are suitable for reptiles do indeed support reptiles, and mitigate accordingly.

### **Legislation**

The four most common British reptiles (comprising grass snake, adder, slow-worm and common lizard) are afforded so-called 'partial protection' under the Wildlife and Countryside Act 1981 (as amended). This protects individuals of all species from 'intentional' or 'reckless' killing and injury, but does not confer any direct protection to the habitats which support them.

Where it can reasonably be predicted that reptiles could potentially be killed or injured by activities such as site clearance, earthworks or construction operations etc, to carry out such activities in the absence of appropriate mitigation could legally constitute intentional or reckless killing or injuring, and could result in prosecution.

Where reptiles (other than sand lizard, smooth snake and turtles, all of which are subject to additional restrictions under the law) are present, or potentially present, on a development site, the developer should consider the need for mitigation at an early stage in the development programme. The presence of reptiles on a development site will not necessarily prevent the development from taking place, but it means that 'reasonable' mitigation measures must be put in place to prevent, as far as possible, the killing or injuring of any reptiles.

It is not necessary to obtain a licence to carry out works which affect reptiles, but it is always advisable to seek guidance in any case where a development could potentially cause impacts to reptiles, and to obtain advice regarding what would constitute 'reasonable' mitigation, although it is ultimately up to the developer to decide what is 'reasonable' (and to accept any consequences which may ensue). In most cases, the services of an appropriately qualified and experienced reptile consultant will be required.

The remainder of this document sets out the main elements of a typical reptile clearance strategy. It is recognised, however, that not all of the elements listed below will be necessary or appropriate in all cases, and that individual strategies will vary from site to site.

### **Reptile Clearance Methodology**

If reptiles are confirmed as being present (or are assumed to be present, for example from habitat assessment) then measures should be put in place to avoid or minimise the killing and injuring of reptiles as a result of development operations. Ideally, a 'Reptile Mitigation Strategy' should be drawn up for the site by a suitably qualified person, and agreed in advance with either the CCW or the relevant Local Authority Ecologist.

Wherever possible, reptiles should be accommodated within the site, or on one or more adjacent or nearby site. The translocation of reptiles to a different site which lies at a distance from the development site should only be undertaken as a last resort. Where reptiles cannot be accommodated within the site, a suitable receptor site should be identified in advance and surveyed for suitability. If a reptile population already exists on the receptor site, then advance enhancement works to increase the 'carrying capacity' of the receptor site may be necessary. Adequate time should be allowed in the development programme for the safe clearance of reptiles ahead of any potentially harmful works using suitable means, which may vary from site to site.

It should be noted that the clearance of reptiles from a site can only be undertaken when the reptiles are active (ie, during the spring, summer and autumn months) and should never be attempted during the winter hibernation period (which runs approximately from November to March inclusive). This constraint may lead to conflict with other issues – the presence of nesting birds, for example, all species of which are protected against disturbance – which will also need to be taken into account and mitigated for accordingly<sup>1</sup>.

---

<sup>1</sup> Hedgerow translocations or clearance of habitats such as trees, scrub, bramble or reedbed etc can lead to direct conflicts, which may require phased clearance or other mitigation measures to overcome.

Mitigation measures should apply to all areas of the site which will be subject to potentially harmful impacts, including the laying of haul routes, siting of contractors' compounds and the bulk storage of materials and soils etc. It should be remembered that reptiles may be present beneath the soil at depths of up to 250mm or more, as well as in locations such as amongst tree roots or buried rubble and brick waste etc.

### Typical Mitigation Procedure

1. Where there are suitable receptor sites adjacent to the development site, mitigation should commence with the removal of tall vegetation from all areas affected by development to make them less attractive to reptiles, and to encourage them to move away voluntarily into adjacent habitats. Vegetation should initially be cut to a height of about 200mm, starting furthest away from the adjacent habitats and working towards them, so as to drive any reptiles which may be present towards the receptor habitats. All cutting must be done by hand (eg by strimmer or brush-cutter), rather than by tractor-drawn mowers, so as to minimise the risk of causing reptile casualties. All arisings should be removed immediately from the site following cutting.

After a maximum of two days, the vegetation of the site should be cut again in a similar pattern to a height of about 50mm, taking great care to avoid injuring any reptiles which may be present and with all arisings again being removed from the site. The vegetation of the site should then be maintained in this short condition for a minimum of two further days before proceeding to Step 2.

In some rare situations this staged cutting, coupled with the careful removal of any structures which may be used by sheltering reptiles (eg rubble piles, timber piles, drystone walls etc – see Step 3 below) may be sufficient to achieve 'clearance' of the site by rendering it so unsuitable for reptiles that no further measures are required. In these circumstances, the site should then be maintained in this unsuitable condition until the commencement of development works, which should then be preceded by 'destructive searching' (see Step 8 below). These situations are likely to be very unusual, however, and will require careful assessment in advance by an appropriately qualified person.

Where there are no suitable habitats in the surrounding area for reptiles to relocate to (for example if the site is surrounded by roads or hard standings, or is hemmed in by other developments) then this step should be ignored.

2. Reptile-proof fencing should be erected around the perimeter of the affected areas of the site. These should be erected in accordance with published specifications such as that contained in the Highways Agency's *Design Manual for Road & Bridges* (Vol 10(4) (7) HA116/05 *Nature Conservation Advice in Relation to Reptiles and Roads* or the forthcoming *Reptile Mitigation Guidelines* (English Nature). The fencing will normally be required to extend below ground level for a depth of about 250mm, and both the installation and fabrication process may require careful supervision by a suitably qualified reptile handler to ensure that no reptiles are accidentally injured in the process. On large sites it may be useful, and will probably speed up the process, if the site is subdivided into smaller parcels.

Reptile-proof fences may be either vertical 'no-pass' fences or sloping 'one-way' fences. The former will prevent the movement of reptiles in either direction, whilst the latter can be erected in areas where the site lies immediately adjacent to a suitable receptor sites, and will allow reptiles to leave the development area voluntarily.

3. Within the enclosed parcels, any rubble piles, drystone walls, tree roots, buried rubble and timber piles etc should be dismantled by hand to prevent reptiles from using them to shelter in. All arisings should be removed from the site. As far as possible, these operations should be carried out by hand, with the minimum tracking by any vehicles or machinery across the site. Complex or large structures may need to be carefully dismantled under the supervision of a reptile handler who can halt the works and rescue any reptiles which may be found sheltering in them.
4. Following the clearance of sheltering places, the vegetation of the enclosed parcel should be cut, if it has not already been so. Cutting should initially be to a height of about 200mm, starting at the centre of the parcel and working outwards towards the edges. All cutting must be done by hand (eg by strimmer or brush-cutter), rather than by tractor-drawn mower, so as to minimise the risk of causing reptile casualties. All arisings should be removed immediately from the site following cutting.

Note that for a linear site, such as a cycle-path or verge, strimming should be undertaken from the path working ahead and outwards at the same time, effectively cutting a 'V'-shape.

5. After cutting, the site should be strewn with 'refugia'. These should comprise a combination of suitable materials such as sheet metal, timber (eg chipboard), roofing felt and carpet tiles. These will be used by reptiles for sheltering beneath, or for basking on, where they can be found and caught more easily. If the vegetation is already shorter than 200mm, refugia may be laid out straight away without cutting the vegetation. Refugia should be spread evenly around the site at a high density (ie about 100 per hectare).
6. Depending on the site, visits should be made to the site by a reptile handler over at least the next two days to check beneath the refugia, collect any reptiles which may be beneath them and remove them to the receptor habitats. In practice, it will usually take at least a week for the refugia to 'bed in', and daily reptile collection visits may need to take place over a period of several weeks. Reptile collecting visits must be undertaken in suitable weather conditions, ie in dry, still conditions with air temperatures in excess of 10°C.
7. Daily or near-daily reptile collection and removal visits should continue until reptile numbers under the refugia begin to decline noticeably, at which point the vegetation of the site can be cut again, using the same methodology as at Step 4, but this time to a height of 100mm. Daily reptile collection and removal visits should continue for a further minimum of three days, in suitable weather conditions.
8. When reptile numbers are again detected to be declining, a final cut can be made to achieve very short, close-cropped vegetation of about 40-50mm height, again using the same methodology as at Step 4. This staged removal of the vegetation is likely to drive reptiles to make greater and greater use of the refugia, by removing alternative sheltering places and rendering the rest of the site unattractive to reptiles.

Depending on the individual circumstances of the site, it may be advisable to review the spread and location of refugia, and to begin to cluster these towards the edges of the site or in selected locations, although if this is done then the areas where refugia are no longer present must be kept in a highly unattractive state for reptiles. The manipulation of refugia numbers and locations may be used to reduce the amount of time needed for a reptile handler to check for reptiles. On a small site, however, there is probably no point in moving the refugia, and moving refugia may reduce capture efficiency<sup>2</sup>. This is a matter which will require expert assessment.

It is essential that the integrity of the reptile-proof fences is maintained throughout the trapping period. These should be checked on every visit, and any breaks repaired within 24 hours, otherwise reptiles could re-enter the trapping area from outside. An advantage of subdividing the trapping areas into compartments is that any breaks in the perimeter fence which do occur, and which go undetected for any length of time, will only affect the compartment it lies alongside, and not the whole trapping area.

On sites where vandalism is a significant problem, it may be necessary to institute security measures to ensure that the reptile-proof fences remain intact throughout the trapping period. The measures necessary will vary from site to site, but could include the use of 'Heras' fencing and/or the presence of site security personnel in extreme cases.

9. Daily or near-daily reptile collection visits should carry on until 10 successive nil-returns have been achieved, in suitable weather conditions, following the last vegetation cut. Following a final inspection by a suitably qualified person (the final inspection can be done at the same time as the last check of the refugia). At this point, the trapping records should be summarised and sent to the relevant Species Officer at the CCW. Although there is no obligation to do this, it will assist in maintaining a clear position with the statutory body and will encourage a cooperative dialogue. This may be useful in establishing that there has been full and reasonable compliance with the legal requirements in the event of a challenge arising.

Note that there is no need to have 10 successive nil-returns between the vegetation cuts, but that these cuts should be at least 2 days apart and the numbers should be showing a decline (the exact time taken should be determined by the reptile handler in charge, and will vary from site to site).

10. CCW will then write to the developer to "release" the site to the developer or site engineers. Again, there is no obligation to obtain written consent from the CCW, but it will further demonstrate that there has been best-practice compliance to the satisfaction of the statutory body.
11. The area cleared of reptiles should then ideally be immediately stripped of all vegetation and the topsoil removed, leaving bare subsoil. This final stripping may be done with machinery (ideally using a bucket with

---

<sup>2</sup> Reptiles usually take a while to find refugia (hence the 'bedding in'), and once they do they tend to use them habitually. Moving refugia may simply confuse the animals and be counterproductive.

tines)<sup>3</sup>. In some cases it may be desirable that the site is 'destructively searched' prior to development, especially if the trapping out has not gone absolutely to plan (eg vandalism problems etc). This means that the topsoil layer to a depth of about 250mm is removed from the site in strips or sections, working sequentially across the site, using a digger with a tined bucket, under the supervision of a reptile handler who is able to check for the presence of any reptiles remaining in the soil. Where such reptiles are found, the reptile handler will stop the works, rescue the animal and release it to the receptor area.

12. The edges of the cleared area should be marked with high-visibility temporary fencing to prevent accidental trafficking of vehicles on the uncleared parts of the site (if any).
13. If there is any delay between the end of the reptile clearance operation and the commencement of development, measures must be taken to prevent the recolonisation of the site by reptiles from adjacent habitats, unless there is no such habitat adjacent to the site. To prevent reptiles re-entering the cleared area, the developer must therefore either:
  - a) Keep the area in the cleared condition obtained at Step 9 - bare earth with no vegetation. To keep the area bare, the developer could consider using an approved herbicide. Or:
  - b) Retain the reptile-proof fencing until development works are underway in the area concerned. If this option is chosen, the integrity of the reptile-proof fences will need to be checked regularly throughout the intervening period (ie daily or near-daily), and any breaks repaired within 24 hours. If undetected breaks occur for any length of time, the affected area (or compartment) will need to be trapped out again by repeating Steps 5-9 above.

Maintenance of the site in a cleared and reptile-proof condition is really only critical during the reptiles' active period, since recolonisation is not likely to occur during the winter months. Therefore if a site has been cleared of reptiles in summer prior to development in winter, the reptile-proof fences can be removed (or allowed to deteriorate) once the hibernation period has begun (ie after about the end of October). If the start of development is subsequently delayed beyond the end of the hibernation period, however, (ie after about the end of March) it may be necessary to reinstall the fences, or even re-trap the site.

The site can be re-opened to reptiles by removing the fencing after all construction works are complete.

### **Catching Methods**

The use of refugia at high densities (100/ha) can be very effective for collecting slow-worms. However, other species are less readily found under refugia, and can be much more difficult to catch. 'Noosing' of common lizards whilst sunning on refugia can be effective, but requires skill and is very time-consuming. Snake catching is also a specialised skill, and carries health and safety implications. However, both snakes and common lizards tend to be more mobile than slow-worms, and are therefore more likely to respond to the vegetation clearance and remove themselves from the trapping area where one-way fences make this possible.

### **Keeping Records**

For trapping records, we recommend logging the date, time, weather conditions, temperature, minimum night temp (night before), species caught and location caught (a rough map would suffice, eg area A, B or C) and, if possible, the sex and age of the animals, and if gravid. Ideally a report of the trapping operation, in which all of the capture records are summarised and evaluated, should be prepared at the end of the operation and submitted to the CCW and/or the local authority ecologist. There is no obligation to do so, but the keeping of clear and unambiguous records may be essential in establishing that there was full and reasonable compliance with the law in the event of there being any challenge to the methods used.

### **When to Trap**

Ideally clearance should begin as early as 1 April, with the aim of the site being cleared by the end of July. Clearance operations are less desirable later in the summer, since after about June there is the chance that juvenile animals will also be present, which as well as being extremely difficult to see and catch, may also significantly increase the number of animals on the site.

---

<sup>3</sup> It is worth noting that there can be a conflict on sites where there is also an archaeological watching brief: archaeologists usually specify a bladed bucket to produce smearing in which archaeological layers can be seen. A tined bucket makes this much more difficult.

**Post-development Monitoring**

In addition to the above, we would encourage the developer to put in place a scheme to monitor the effects of the development on the reptiles and to see if the mitigation has been successful. The design of any monitoring exercises should be discussed in advance with the CCW.



## APPENDIX 4: TREATMENT OF JAPANESE KNOTWEED

### Introduction

Japanese knotweed (*Fallopia japonica*) is a vigorously-growing non-native perennial plant which suppresses other vegetation and can damage riverbank protection works, tarmac surfaces and paving etc. Knotweed infestation can easily be spread by the accidental distribution of soils containing root fragments or rhizomes during earthworks for developments. Under The Wildlife and Countryside Act 1981 it is illegal to deliberately allow the spread of Japanese knotweed. Excavated soil from areas where Japanese knotweed is established must either be disposed of on site, in accordance with the Environment Agency (EA) code of practice, or taken off the site to a licensed landfill site and not re-used in further construction or landscaping.

### Measures for Containment & Eradication

Access to an infested site should be via a single designated point, where a hygiene facility for personnel and a wheel-washing facility for vehicles should be provided. Areas of knotweed should be securely fenced-off, preferably with high visibility Netlon fencing, prior to treatment. Effective control measures must be implemented before there is any gross disturbance to the soils of the site.

There are a number of options available for the on-site control of Japanese knotweed. These are as follows:

1. Chemical Control – Early Season
2. Chemical Control – Late Season
3. Mechanical Control
4. Combined Control

These are described in greater detail below.

#### 1) Chemical Control – Early Season

This method usually takes a minimum of 3 years to fully control the growth of Japanese knotweed, and may not result in total eradication. Prior to treatment, stands of the plant should be cut and cleared, and an appropriate and approved herbicide (eg Glyphosate Bioactive) applied to the resulting new growth. All cuttings should be collected and burned<sup>4</sup>. Herbicide treatment should take place from May onwards. A non-persistent herbicide should be used to avoid contaminating any watercourses within or near the site, and the EA consulted over work in close proximity to the watercourse.

Stems must not be pulled, which tends to remove the highly infectious crown material with the stem. Where it is the intention to treat regrowth with a herbicide, cut material should be removed from the treatment area to allow effective spray contact with the emergent growth. It should be policy to chemically treat knotweed, rather than continuously cut the regrowth.

Cut stems should be left in a situation that will encourage drying. This can be achieved by laying the cut stem on the cut stumps of the knotweed (cut at about 200mm), thus preventing contact between the stems and the soil. Once the stems have dried to a deep brown colour, they are dead. This is not the case with crown or rhizome material.

Once the vegetation has died back, all above-ground stems of the plant should be cut and/or collected and burnt. Herbicide should be re-applied when the regrowing shoots reach 0.5m in height.

Japanese knotweed flowers between August and October and is attractive to bees. Herbicide spraying should therefore take place in early morning or evening in the summer months, in order to avoid causing bee mortality. Herbicides can only be handled and applied by persons holding a current certificate of competence from the National Proficiency Tests Council (NPTC).

#### 2) Chemical Control – Late Season

Recent trials have shown that better results can be achieved by applying a systemic herbicide (eg Glyphosate Bioactive) to uncut foliage and stems at the end of the growing season (eg August to September). The foliage should be comprehensively wetted with herbicide during a period of dry weather, before the first frosts have begun to wilt the foliage, for example using a knapsack sprayer. The herbicide is then translocated down into the rhizomes in large quantities as the plant withdraws nutrients from the above-ground growth, prior to winter die-back, thus killing the rhizome as well.

---

<sup>4</sup> The EA require 2 weeks notice prior to burning, and the EA and/or the local planning authority may refuse permission for on-site burning.

Trials have shown that when properly applied, this technique can achieve up to 100% kill within the first year, although follow-up monitoring and subsequent treatment of regrowth is advised for at least two years following the initial treatment. There may, however, be problems in achieving adequate access and herbicide application in large stands of knotweed, which may be better treated using one or more of the other options available. Precautions regarding watercourses and herbicide handling are as per Option (1) above.

### **3) Mechanical Control**

To reduce the risk of transferring infestations on vehicles, excavators with caterpillar tracks should be avoided in infested areas. The entire root and stem system should be excavated up to 7m laterally and 2m deep in areas of infestation. On-site burial should be performed to a depth of at least 5m. The contaminated soil material should be laid in layers less than 1m in depth and covered with a geotextile layer (eg LowTrak) or a heavy gauge polythene sheet, prior to infilling. Site managers should check the periphery of the excavation for rhizome, to ensure that an adequate volume of material has been removed to account for all of the infective material.

The on-site disposal area will require a Landfill Tax Exemption for contaminated soil from Customs & Excise, and a registered exemption of the Waste Management Regulations 1994, as it is considered to be a soil contaminant. The local Environment Agency office will require one week's notification prior to burial being carried out.

The location of the burial point should be recorded, as further chemical treatment may be required in the future. All machinery involved with the excavation, transporting and disposing of the Japanese Knotweed should be cleaned thoroughly at the disposal site. Alternatively, contaminated soil material may be taken off-site to a licensed landfill facility utilising vehicles licensed to carry contaminated waste.

### **4) Combined Control**

Combined mechanical and herbicide treatment can be an effective method in reducing the need for subsequent chemical control. Should burial of infested soils not be practical, another option is to create an *in-situ* disposal area. Using an excavator, the plant material should be scraped from an infested area into a pile, together with the upper 50cm of topsoil containing the crowns and rhizomes, and stockpiled separately from other materials.

The majority of Japanese knotweed rhizome exists in the upper layers of topsoil. An excavator may be used to scrape surface crowns and rhizomes into a pile. The exposed ground can then be cultivated to a depth of 50cm, and the piled material re-spread over the cultivated area. This process stimulates the rhizome to produce a higher density of stems, which renders it more vulnerable to herbicide treatment. Subsequent herbicide treatment has been observed to eradicate knotweed after only two applications, which may be performed within the same growing season.

Digging can be carried out during the winter months, and regrowth treated during the spring and summer. Extreme care must be taken to ensure that all equipment used on site is free of Japanese knotweed material before leaving the site, to avoid contravention of the Wildlife & Countryside Act, 1981. To reduce the risk of contaminating vehicles, excavators with caterpillar tracks should be avoided.

The infested material should be chemically treated and/or burned in accordance with a registered exemption from the Waste Management Regulations 1994. The Environment Agency require 2 weeks notification prior to the burial/burning activity. Great care must be taken with this method to avoid the accidental spreading of contaminated soils away from the disposal area.

Soil contaminated with knotweed may also be stockpiled on an area of the site that will remain undisturbed. Knotweed regrowth should be regularly treated with herbicide to avoid re-infestation. The upper 50cm of topsoil, which will contain all the crowns and the majority of the rhizome should be stockpiled separately from the other, less infested material. This will avoid burial of the bulk of the rhizome at the bottom of a large stockpile, where it may remain dormant and escape treatment. Regrowth, which will predominantly arise from the stockpile of topsoil, can then be treated until the knotweed is killed. Larger pieces of rhizome and crowns can be isolated and burned where appropriate.

### **Herbicide Use**

Wherever there is a risk of contamination to a watercourse, choice is limited to formulations of Glyphosate and 2,4-D Amine that are approved for use in or near water. Not all herbicides containing these active ingredients are suitable for use in or near water. Use of a herbicide in or near water requires consultation with the Environment Agency. If the site poses no risk to a watercourse, there is a greater choice of herbicide. Where soil is intended for continued use, or immediate reuse, for landscaping purposes, a non-residual herbicide, such as Glyphosate or 2,4-D

Amine would be appropriate. In the event that replanting is likely to be delayed for a period of at least six weeks, a formulation containing triclopyr may be considered. If it is the intention to cover the area in a hard surface, or delay replanting for at least two years, persistent chemicals such as picloram and imazapyr would be appropriate.

Developers are advised to seek the advice of a qualified landscape gardener or BASIS-registered<sup>5</sup> pesticides advisor, prior to commencing a spraying programme. When using a herbicide, always adhere to the advice given on the label.

<b>Herbicide</b>	<b>Affects grasses?</b>	<b>Approved for use in or near water?</b>	<b>Persistency</b>
Glyphosate	Yes	Yes	Non-persistent
2,4-D Amine	No	Yes	1 month
Triclopyr	No	No	6 weeks
Imazapyr	Yes	No	9 months
Picloram	No	No	2 years

Under the Duty of Care<sup>6</sup>, persistent chemicals must be included within the description of the waste if the material is being disposed of within the period of activity of that particular chemical. If it is intended to bury knotweed on site, it is essential that non-persistent herbicides, such as glyphosate, be used.

**Summary**

The best economic control option on any given site will be dependent upon the amount and the location of the Japanese knotweed on site, together with constraints imposed by the construction programme and any implications in relation to areas potentially identified as control or burial sites.

Experience has shown that dealing with the Japanese knotweed on site tends to be more cost-effective than off-site removal. The cost of disposal of contaminated soils to a licensed landfill site at the present time is approximately £30-35/m<sup>3</sup> (2005 costs). On-site disposal is, however, dependent upon the identification of a suitable disposal location within the footprint of the scheme.

---

<sup>5</sup> BASIS is an organisation committed to ensuring individuals involved in the handling and use of pesticides are competent. BASIS maintain a register of trained advisors, who need to demonstrate an annual programme of continual professional development to maintain their qualification. Details on the BASIS Professional Register are available from 34, St John Street, Ashbourne, Derbyshire DE6 1GH. Tel: 01335 343945.

<sup>6</sup> Section 34 of the Environmental Protection Act 1990 (EPA90) imposes a duty of care on persons concerned with controlled waste. The duty applies to any person who produces, imports, carries, keeps, treats or disposes of controlled waste, or as a broker has control of such wastes. Breach of the duty of care is an offence, with a penalty of an unlimited fine if convicted on indictment.

**APPENDIX 5: BAT & BIRD BOXES EXAMPLES**



Schwegler 2F bat box



Schwegler 2FF bat box



Schwegler 1B bird box



Schwegler 2H robin box

**PHOTOGRAPHS OF SITE, June 2011**



Scrub, south section of track, with gravel substrate



Typical bankside vegetation, south section



Ephemeral vegetation adjoining grassland



Scrub & ruderal vegetation bordering grassland, south



Grassland, near level crossing bridge



Facing level crossing bridge, north easterly direction



Scrub and ruderal vegetation near road bridge



Track partly blocked by scrub



Vegetation approaching Brynmenyn village



View from road bridge to south track area



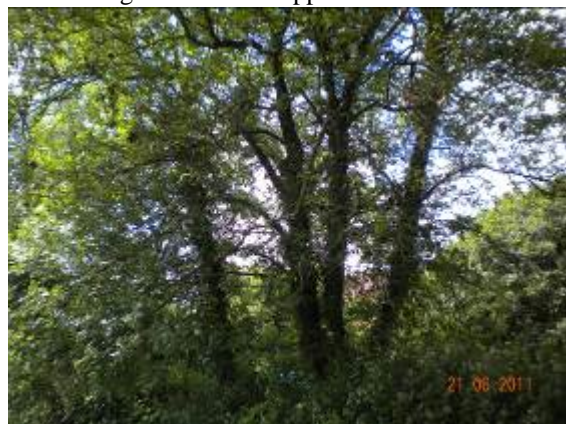
Afon Garw from metal bridge



Metal bridge with stone supports



Track section north of bridge, facing south



Typical ash boughs in scrub canopy (T2group)



Tall trees on western boundary (T3 group)



T4 group on eastern boundary



Tunnel & overbridge, old Brynmenyn colliery



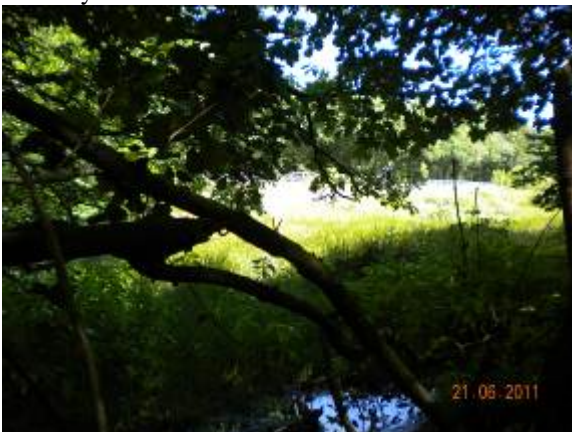
Cracks in wall of overbridge, Brynmenyn colliery



Himalayan balsam encroachment on track



Stand of Japanese knotweed, eastern track border



Alder & willow carr, offsite western boundary



Alder & willow carr, closer view



Ditch, eastern side, near carr



Vegetation of ditch, eastern side, near carr



Ditch, western side, with branched bur-reed( lower rhs)



Hogweed & tall ruderal vegetation, western ditch



Eastern ditch and boundary (carr offsite)



Western ditch and boundary (carr offsite)



Vegetation, eastern ditch



Wild angelica, western ditch





Northern section of track, canopy much reduced



Northern section of track, facing south



Spreading pedunculate oak, T9



Goat willow, T6



Scratch marks, track sleeper



Scratch marks, track sleeper



Area of bracken, north west side of track



Damp, ruderal vegetation, north track area



Japanese knotweed, north west end of site



Northern end of site joins cycle path



Offsite pond between footpath & Afon Garw



Afon Garw, close to footpath (offsite)

# Garw Valley Cycle Link, nr Bridgend Ecological Assessment

## Plan 1: Site Location & Context

DCE 598

NTS

Jul 2011

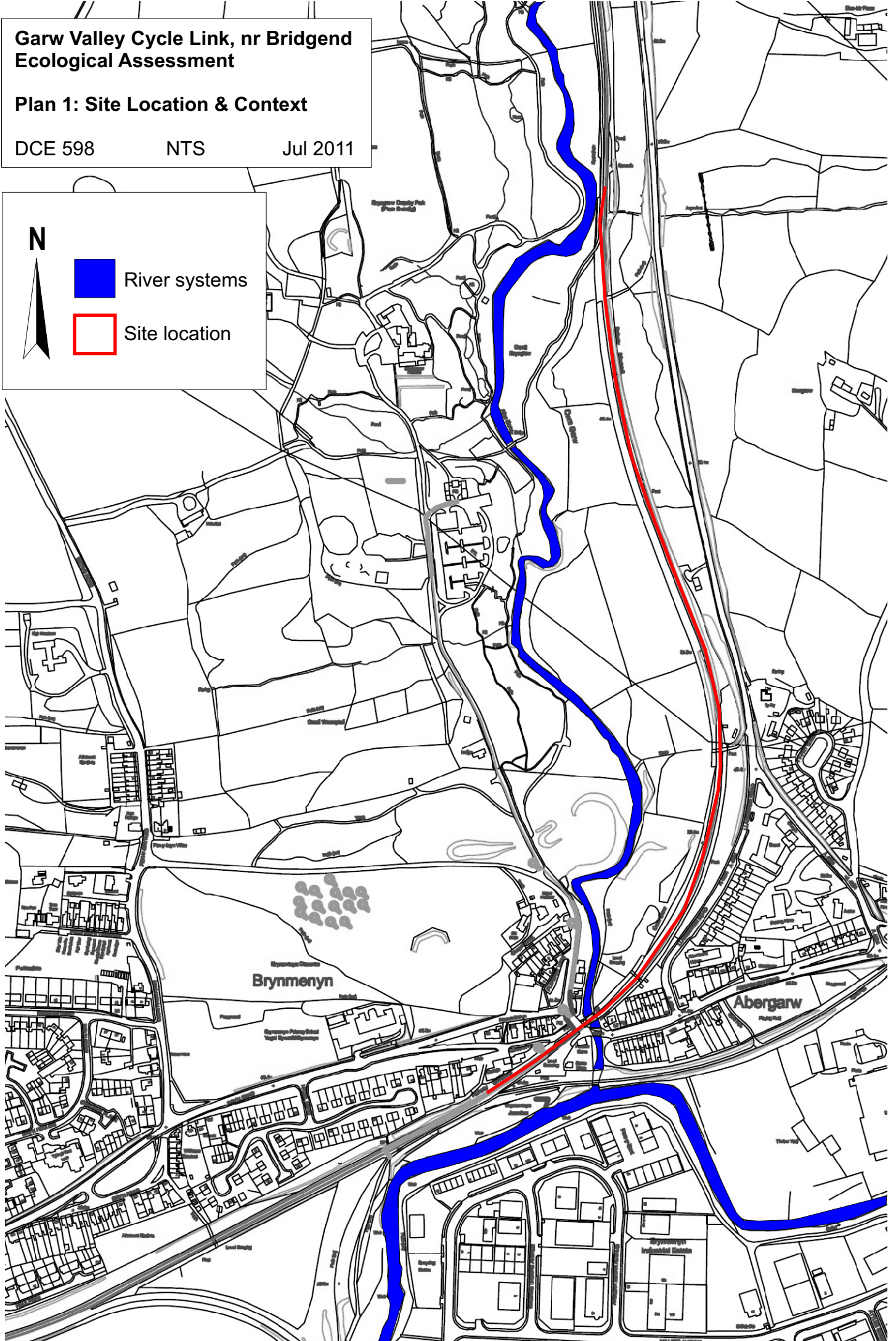
N



River systems



Site location



**Garw Valley Cycle Link, nr Bridgend  
Ecological Assessment**

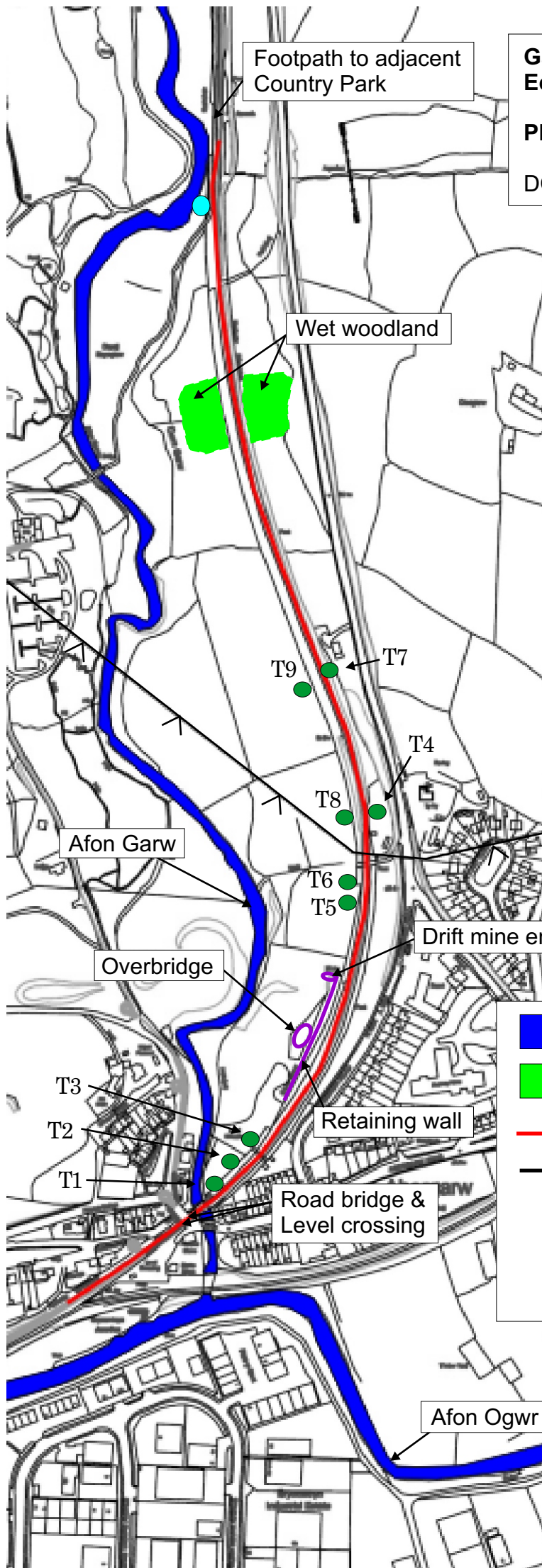
**Plan 2: Location of Features**

DCE 598

NTS

Jul 2011

N



Footpath to adjacent  
Country Park

Wet woodland

T9

T7

T4

T8

T6

T5

Afon Garw

Drift mine entrance

Overbridge

Retaining wall





Road bridge &  
Level crossing

T3

T2

T1

Afon Ogwr

-  Major watercourse
-  Wet woodland ('carr')
-  Site location
-  Pylon
-  Tree >50cm dbh
-  Seasonal pond (off-site)

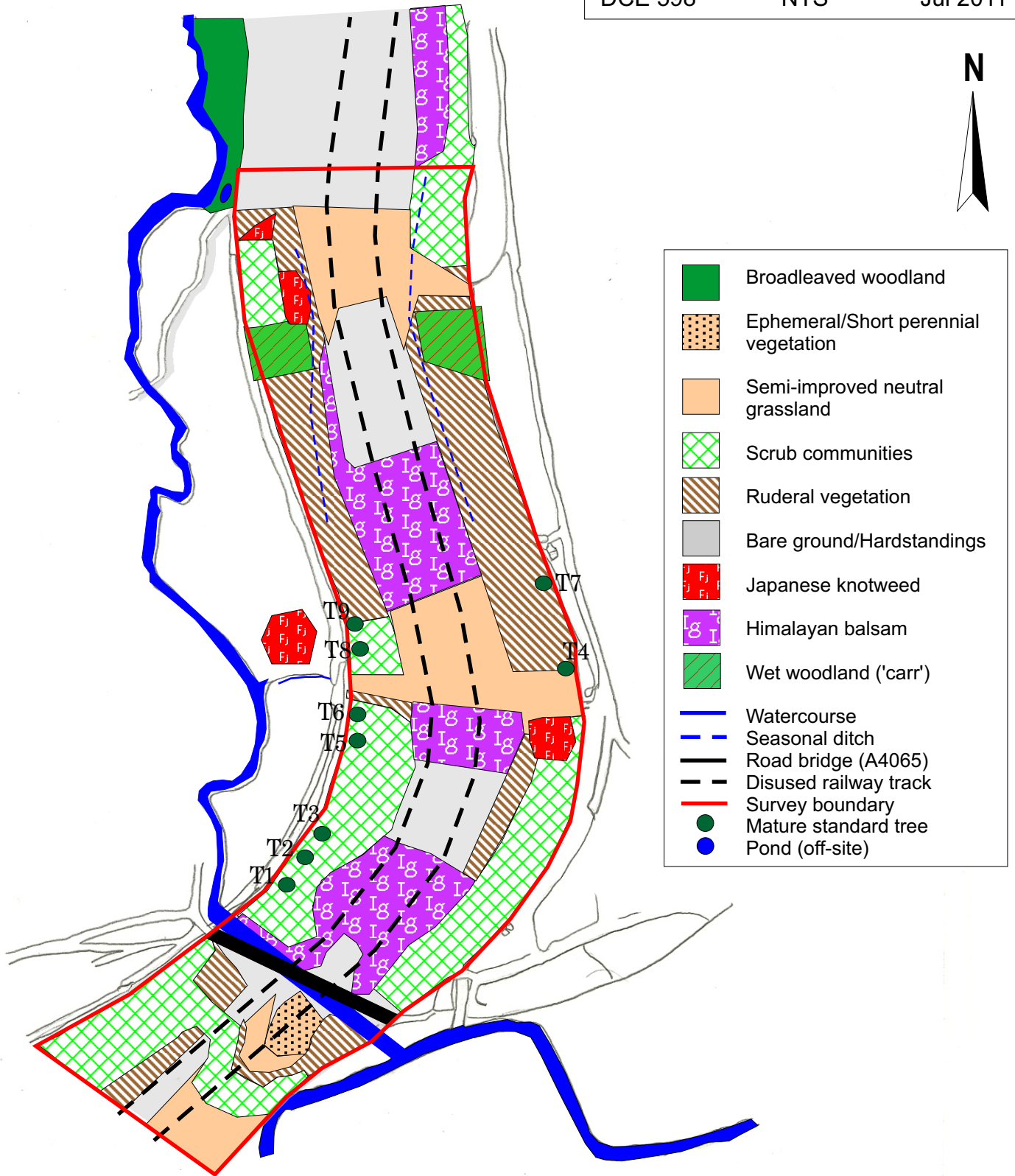
**Garw Valley Cycle Link, nr Bridgend  
Ecological Assessment**

**Plan 3: Habitats & Vegetation**

DCE 598

NTS

Jul 2011



-  Broadleaved woodland
-  Ephemeral/Short perennial vegetation
-  Semi-improved neutral grassland
-  Scrub communities
-  Ruderal vegetation
-  Bare ground/Hardstandings
-  Japanese knotweed
-  Himalayan balsam
-  Wet woodland ('carr')
-  Watercourse
-  Seasonal ditch
-  Road bridge (A4065)
-  Disused railway track
-  Survey boundary
-  Mature standard tree
-  Pond (off-site)

NB: Width of survey area has been artificially increased out of scale for ease of habitat-mapping

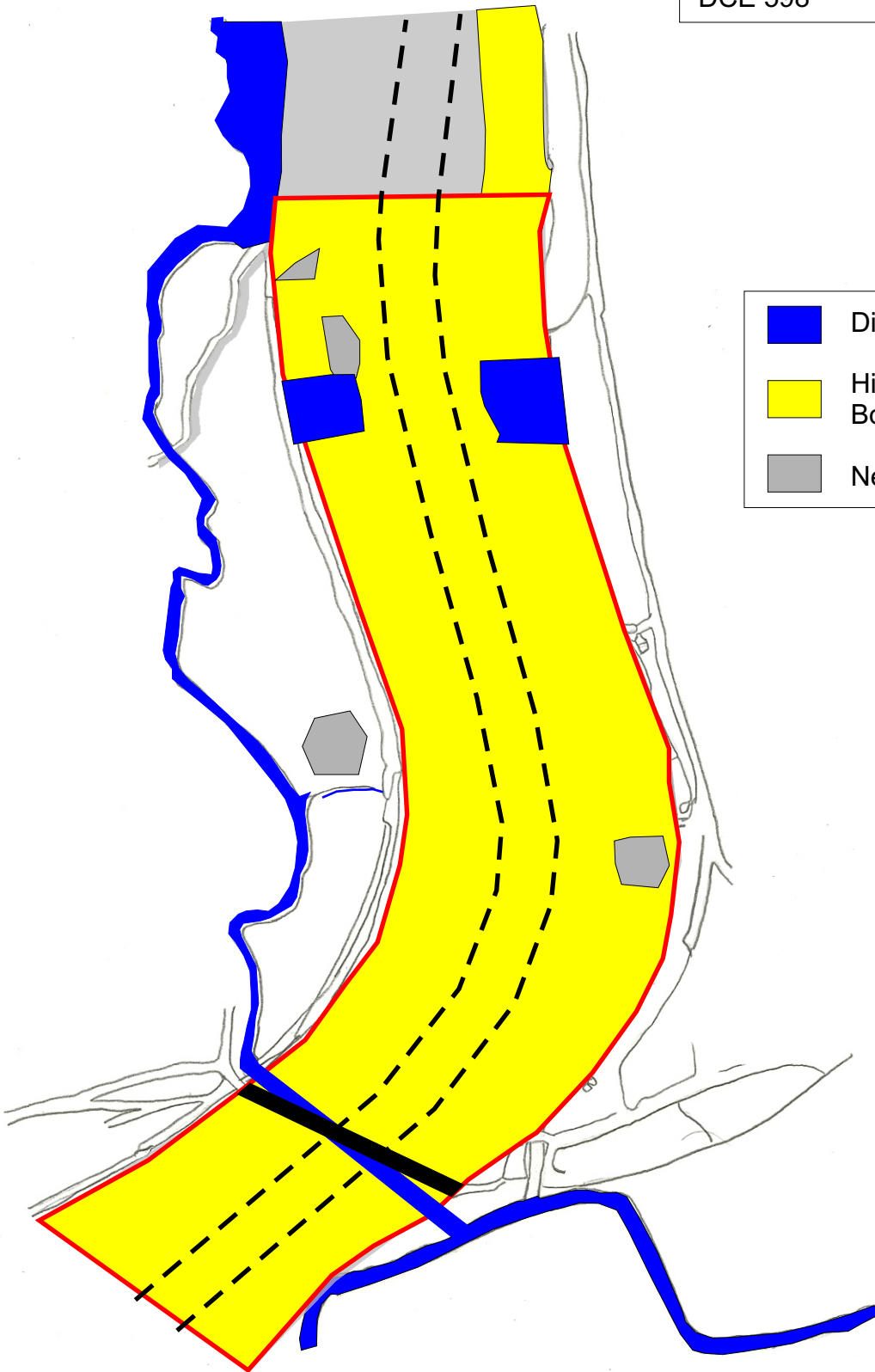
**Garw Valley Cycle Link, nr Bridgend  
Ecological Assessment**

**Plan 4: Ecological Evaluation**

DCE 598

NTS

Jul 2011



-  District Wildlife Value
-  High Local Wildlife Value/  
Borderline District Value
-  Negligible Wildlife Value

NB: Width of survey area has been artificially increased out of scale for ease of habitat-mapping