

CORE MANAGEMENT PLAN INCLUDING CONSERVATION OBJECTIVES

FOR

CARDIFF BEECH WOODS SPECIAL AREA OF CONSERVATION (SAC)

**(Underpinned by Garth Wood
SSSI, Castell Coch Woodlands
and Road Section SSSI, and
Fforestganol a Chwm Nofydd
SSSI)**

Version	Date	Summary of changes made	Approved by
Version 2	28 April 2014	Current version. Version 1 (2008 S.Revill) incorporated into new template. Conservation Objectives rewritten and plan updated as appropriate, by A.Hunt, S.Revill and S.Westwood.	Gareth O'Shea
Version 1	12/12/2008		David Mitchell

Contents

Preface

1. Vision for the Site

2. Site Description

- 2.1 Area and Designations Covered by this Plan
- 2.2 Outline Description
- 2.3 Outline of Past and Current Management
- 2.4 Management Units
- 2.5 Position within an ecological network

3. The Features

- 3.1 Confirmation of Features
- 3.2 Features and Management Units

4. Conservation Objectives

Background to Conservation Objectives

- 4.1 Conservation Objective for Feature 1: *Asperulo-Fagetum* beech forests (EU Habitat Code 9130)
- 4.2 Conservation Objective for Feature 2: *Tilio-Acerion* forests of slopes, screes and ravines (EU Habitat Code 9180)

5. Management Objectives for SSSI-only Features

- 5.1 Conservation Objective for Feature 3: Semi-natural broadleaved woodland
- 5.2 Conservation Objective for Feature 4: *Porrhomma rosenhaueri* (a cave-dwelling spider)
- 5.3 Conservation Objective for Feature 5: Geological exposures

6. Assessment of Status and Management Requirements

- 6.1 Status and Management Requirements of Feature 1: *Asperulo-Fagetum* beech forests
- 6.2 Status and Management Requirements of Feature 2: *Tilio-Acerion* forests of slopes, screes and ravines
- 6.3 Status and Management Requirements of Feature 3: Semi-natural broadleaved woodland
- 6.4 Status and Management Requirements of Feature 4: *Porrhomma rosenhaueri* (a cave-dwelling spider)
- 6.5 Status and Management Requirements of Feature 5: Geological exposures

7. Action Plan: Summary

7.1 Actions in Natural Resources Wales' actions database

7.2 Ongoing management

8. Glossary

9. References

10. Appendices

**10.1 Appendix 1.1: Performance indicators for Feature 1:
Asperulo-Fagetum beech forests (EU Habitat Code 9130)**

10.2 Rationale behind the performance indicators.

**10.3 Appendix 1.2: Performance indicators for Feature 2:
Tilio-Acerion forest of slopes, screes and ravines (EU
Habitat Code 9180)**

PREFACE

This document provides the main elements of Natural Resources Wales' management plan for the site(s) named. It sets out what needs to be achieved on the site(s), and advice on the action required. This document is made available through Natural Resources Wales' web site and may be revised in response to changing circumstances or new information. This is a technical document that supplements summary information on the Natural Resources Wales' web site.

One of the key functions of this document is to provide Natural Resources Wales' statement of the Conservation Objectives for the relevant Natura 2000 site(s). This is required to implement the Conservation of Habitats and Species Regulations 2010, as amended. As a matter of Welsh Government Policy, the provisions of those regulations are also to be applied to Ramsar sites in Wales.

1. VISION FOR THE SITE

This is a descriptive overview of what needs to be achieved for conservation on the site. It brings together and summarises the Conservation Objectives (part 4) into a single, integrated statement about the site.

This is a descriptive overview of what needs to be achieved for conservation on the site. It brings together and summarises the Conservation Objectives (part 4) into a single, integrated statement about the site.

The site is dominated by semi-natural broadleaved woodland. There is a range of woodland communities, composed of locally native species, such as Beech *Fagus sylvatica*, Ash *Fraxinus excelsior*, and Oak *Quercus robur*. Large areas are predominantly Beech *F. sylvatica*, with their bright green leaves forming what appears to be a dense canopy overhead. Natural woodland processes however ensure a dynamic shifting pattern of canopy gaps. Areas of steep or rocky ground support Ash *F. excelsior*, Wych Elm *Ulmus glabra* and Field Maple *Acer campestre*. Sycamore *Acer pseudoplatanus* is a small component, accepted here as a natural part of the system. The distinctive bark of Hornbeam *Carpinus betulus* can also be seen.

Viable saplings emerge from the understorey, of locally native Beech *F. sylvatica*, Ash *F. excelsior* and Oak *Q. robur*. Trees of different ages are present; wizened veterans and the middle-aged, contrasting with fresh young growth.

Away from the network of public footpaths and bridleways, large trees are present with potential to fall and create gaps in the canopy. Areas of advanced regeneration are maintained; saplings waiting their turn for a canopy gap and opportunity to flourish. Both standing and fallen dead wood abound with invertebrate life and fungi.

In spring, the garlicky smell of Ramsons *Allium ursinum* and the blue haze of Bluebells *Hyacinthoides non-scripta* draw attention to the ground layers which also yield Sanicle *Sanicula europaea*, Bird's-nest Orchids *Neottia nidus-avis*, Dog's Mercury *Mercurialis perennis* and Dryopteris species ferns. These plants remind us that the woodlands are centuries old and the soils are often lime-rich.

In Garth Cave, the cave-dwelling spider *Porrhomma rosenhaueri* lives undisturbed.

Interesting sequences of rock layers are clear and observable along Castell Coch Road Section, providing a window into the Earth's past.

Cultural heritage interest and recreational use is promoted alongside the nature conservation interest of the site. A safe environment is maintained for public access through the woodland. Recreational use is controlled and restricted to the extensive network of pathways and access routes, leaving natural woodland processes unhindered away from areas of public use. The balance of interests is maintained for all to enjoy - now and in the future.

Connections within the component parts of the SAC and with adjacent woodland SSSI are maintained and enhanced. Ancient woodland and semi-natural habitat in the vicinity is protected by appropriate designation, and connections and condition are maintained and enhanced. The wider functional network of habitat is taken into account when considering development proposals in the vicinity and should not become more fragmented. The air quality of the woodland is good: any potential atmospheric pollution, independently and cumulatively, from adjacent roads, quarrying, industrial processes and development is regularly reviewed and controlled. There is a SAC air quality management plan, to develop an integrated approach between regulatory bodies. Water supply and quality is not adversely affected by adjacent forestry operations or quarrying. There is no loss or impact to the woodland due to mineral extraction.

The purpose of the designation of Natura 2000 sites is to help secure the maintenance or restoration of habitats and species to favourable conservation status for the foreseeable future. Given that we foresee a changing climate, despite the uncertainty of the nature, degree and timing of those changes, we must address the need to ensure the resilience of each site to that changing environment. This will be achieved in the first instance by ensuring favourable condition of the important features, since a healthy feature is likely to be more resilient to the effects of climate change than one which is already stressed. Secondly, consideration must be given to those structures, functions and processes which maintain or boost the resilience of ecosystems to climate stress, including the avoidance, reduction or mitigation of other stress factors such as invasive species, nutrient enrichment, habitat and population fragmentation.

This site forms part of a wider network, and is ecologically connected with its surroundings and with other designated sites in the region. Although the focus of this document is on the individual site, the conservation objectives and management requirements need to be considered in the wider context. A connected network of sites is more robust than sites in isolation, and more resilient to pressures such as climate change.

2. SITE DESCRIPTION

2.1 Area and Designations Covered by this Plan

Grid reference(s): ST 118824 (approximate central point of the SAC)

Unitary authorities:

- Caerdydd/ Cardiff;
- Rhondda, Cynon, Taf

Area (hectares): 115.62

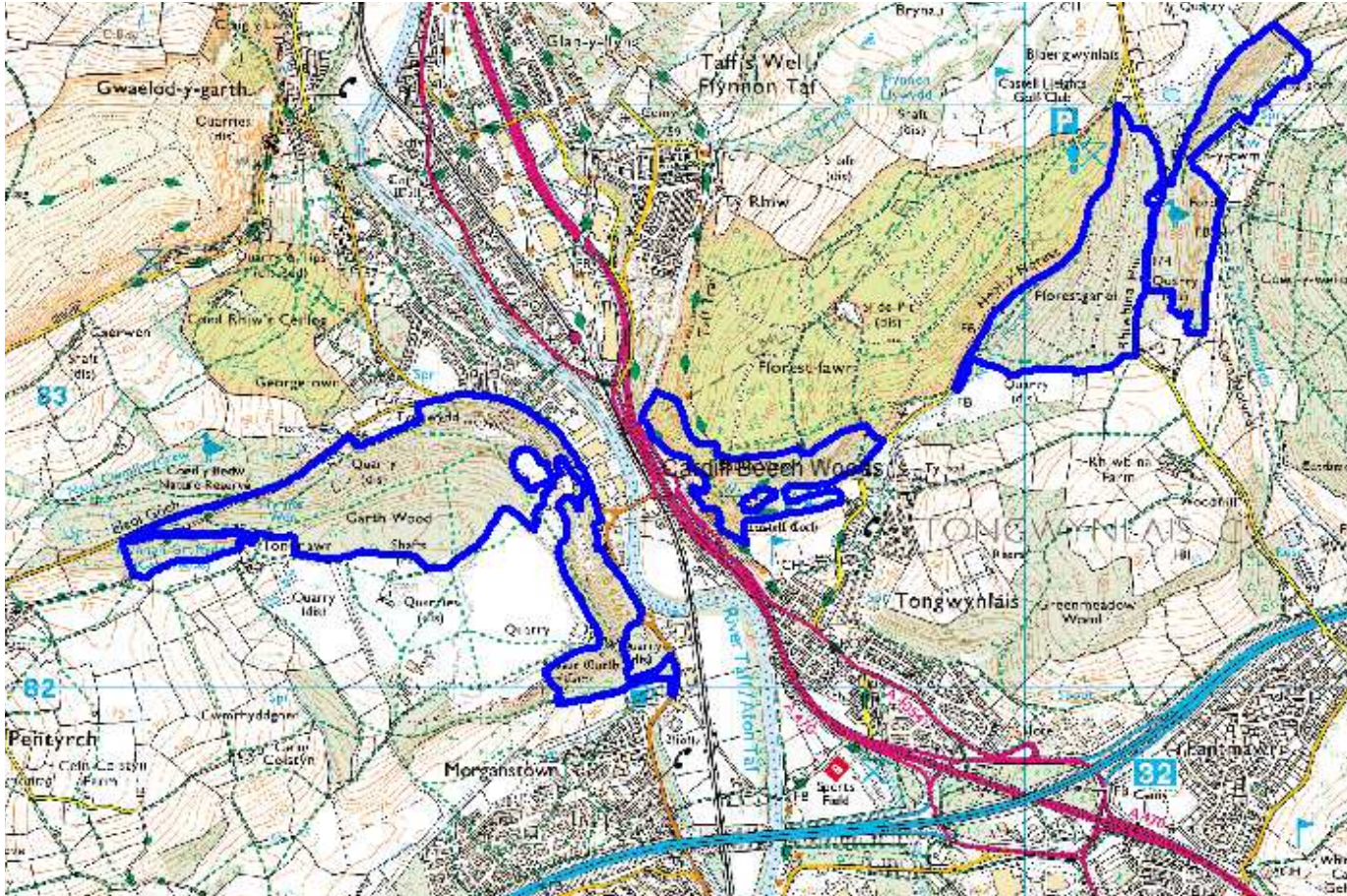
Designations covered:

The Cardiff Beech Woods Special Area of Conservation (SAC) is underpinned by three component Sites of Special Scientific Interest (SSSIs):

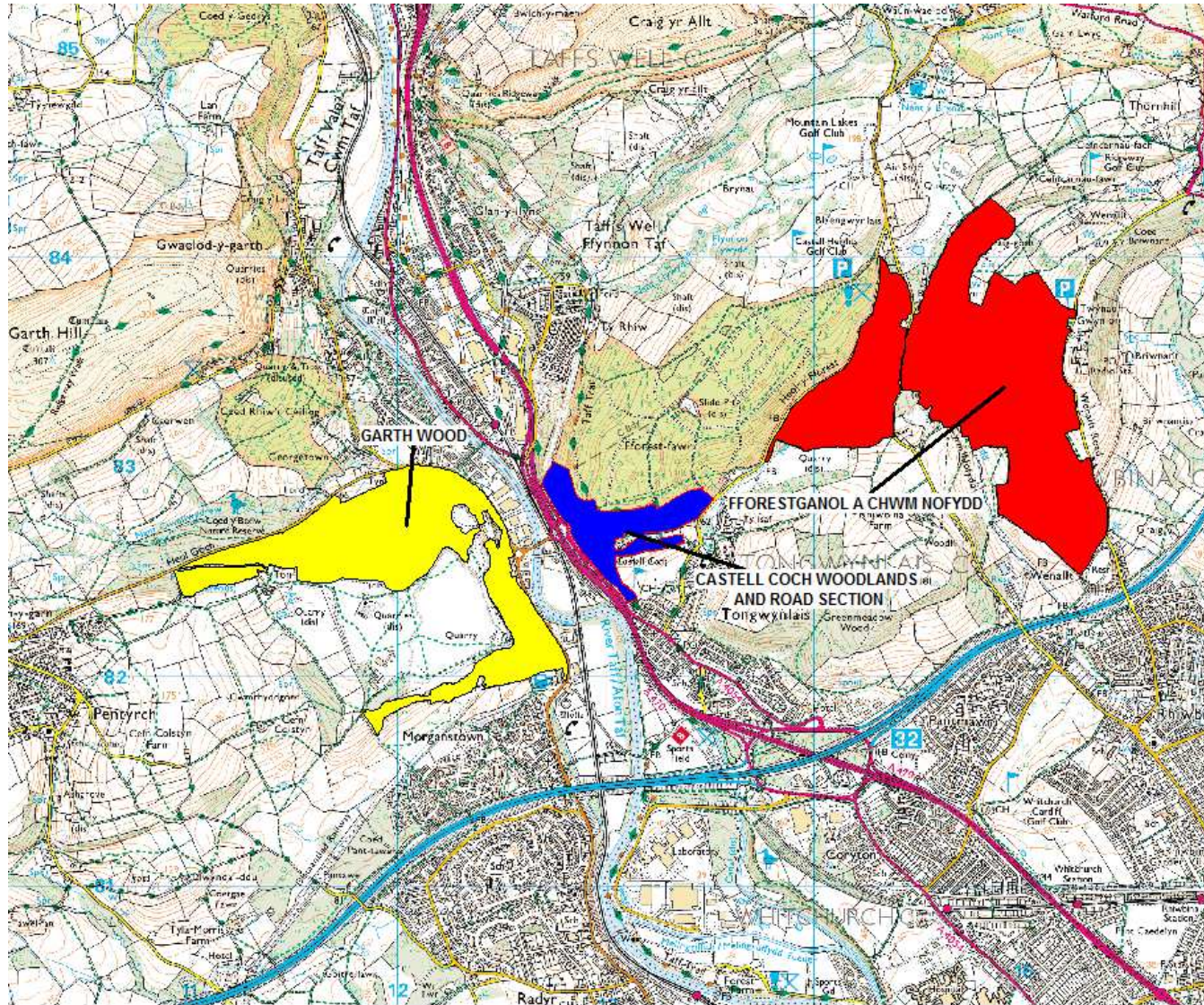
- Garth Wood SSSI (grid reference ST 125825).
This was re-notified in 2001 to make the SSSI boundary identical to that of the SAC where they overlap. The SAC habitats occupy 67.9% of the SSSI. The rest of the SSSI supports semi-natural broadleaved woodland that does not meet SAC criteria. In addition, the SSSI supports a population of *Porrhomma rosenhaueri* (a cave dwelling spider) found within Lesser Garth Cave.
- Fforestganol a Chwm Nofydd SSSI (grid reference ST 147835).
This was re-notified in 2001 to make the SSSI boundary identical to that of the SAC where the two overlap and to amalgamate the two SSSIs of Fforestganol, Tongwynlais and Cwm Nofydd. The SAC habitats occupy 12.9% of the SSSI. The rest of the SSSI supports semi-natural broadleaved woodland that does not meet SAC criteria. The site also includes Fforest Ganol and Cwm Nofydd Local Nature Reserve, which falls within the SAC and SSSI boundary.
- Castell Coch Woodlands and Road Section SSSI (grid reference ST 131827).
This was notified in 1990. The SAC habitats occupy 71% of the SSSI. The rest is made up of the geological interest of the Road Section.

Detailed maps of the designated sites are available on the Natural Resources Wales (NRW) web site.

Summary maps showing the coverage of this document are shown below.



© Natural Resources Wales. All rights reserved.
Contains Ordnance Survey Data. Ordnance Survey Licence number 100019741. Crown Copyright and Database Right (2013).
Map 1. Showing the boundary of Cardiff Beech Woods SAC in blue



© Natural Resources Wales. All rights reserved.
 Contains Ordnance Survey Data. Ordnance Survey Licence number 100019741. Crown Copyright and Database Right (2013).
Map 2. Showing Cardiff Beech Woods component SSSIs

2.2 Outline Description

Cardiff Beech Woods SAC represents an area of semi-natural broadleaved woodland dominated by Beech *Fagus sylvatica*. There are two European features of interest present, *Asperulo-Fagetum* beech forests (45ha) and *Tilio-Acerion* forests of slopes, screes and ravines (30ha). Both of these features are present within Garth Wood and Fforestganol a Chwm Nofydd SSSI but only the *Asperulo-Fagetum* is found within Castell Coch Woodlands and Road Section SSSI.

Cardiff Beech Woods is considered to be one of the best areas in the United Kingdom for *Asperulo-Fagetum* beech forests. The site contains one of the largest concentrations of *Asperulo-Fagetum* beech forests in Wales, and represents the habitat close to the western limit of its past native range in both the UK and Europe. The woods show mosaics and transitions to other types, including more acidic *Fagus sylvatica* woodland and Oak *Quercus robur* and Ash *Fraxinus excelsior* woodland. Characteristic and notable species in the ground flora include Ramsons *Allium ursinum*, Sanicle *Sanicula europaea*, Bird's-nest Orchid *Neottia nidus-avis* and Yellow Bird's-nest *Hypopitys monotropa*.

This habitat type occurs on circumneutral to calcareous soils. In the UK it mostly corresponds to National Vegetation Classification (NVC) type W12 *Fagus sylvatica* – *Mercurialis perennis* woodland, but more calcareous stands of NVC type W14 *Fagus sylvatica* – *Rubus fruticosus* woodland may also conform to this habitat type. The two NVC types often occur together on a site. At Cardiff Beech Woods the majority of the *Asperulo-Fagetum* is W12a *Mercurialis perennis* sub-community with small areas of W12b *Sanicula europaea* sub-community.

The area is considered to support a significant presence of *Tilio-Acerion* forests of slopes, screes and ravines. These woods consist of *F. excelsior*, Wych Elm *Ulmus glabra*. Introduced Sycamore *Acer pseudoplatanus* is often present.

The habitat type is found on calcareous substrates. The main NVC types conforming to *Tilio-Acerion* forests are the 'western' forms (sub-communities d-g) of W8 *Fraxinus excelsior* – *Acer campestre-Mercurialis perennis* woodland, and the equivalent north-western community W9 *Fraxinus excelsior* – *Sorbus aucuparia* – *Mercurialis perennis* woodland. At Cardiff Beech Woods the *Tilio-Acerion* comprises W8e *Geranium robertianum* sub-community, W8f *Allium ursinum* sub-community and W8b/d *Anemone nemorosa* / *Hedera helix* intermediate form.

Semi-natural broadleaved woodland is a feature of all three component SSSIs. In addition, Garth Wood SSSI supports a nationally rare cave dwelling spider *Porrhomma rosenhaueri*, and Castell Coch Woodlands and Road Section SSSI supports geological exposures.

The geological exposures present at Castell Coch Road Section show a sequence of rocks that includes the Devonian Old Red Sandstone and the younger Carboniferous Limestone. This site illustrates the boundary and environmental changes between the Devonian and Carboniferous periods. The Devonian rocks here come from a river delta environment, while the Carboniferous rocks were formed in shallow seas. The Carboniferous Limestone also includes a number of

fossil-rich layers, including the remains of coral-like creatures (bryozoa and crinoids) and hinged shells (brachiopods).

2.3 Outline of Past and Current Management

General

There is a history of timber exploitation in some areas. Fellings in the 20th century have resulted in some areas of even-aged woodland structure with no successful natural regeneration.

Where there has been much disturbance from past quarrying and iron working, natural colonisation has been encouraged. However, some active woodland management is required to address health and safety issues arising in these areas.

The presence of a number of species considered to be non-native e.g. Sycamore *Acer pseudoplatanus* and Japanese Knotweed *Fallopia japonica*, is currently under review to determine any detrimental effects on the woodland communities of special interest.

Cardiff Council, CADW and Natural Resources Wales (formerly the Forestry Commission) carry out woodland management for conservation purposes and occasionally health and safety purposes.

The long term aim is to apply minimal management to the more mature areas of woodland to allow gap creation and regeneration processes to occur naturally. However, in the younger more even-aged stands in Fforestganol [units FCN1 (330) FCN3 (332) and FCN4 (333)], suitable high forest management may be appropriate.

For further details of current management issues, please see sections 6 and 7 of this report.

Garth Wood

Much of the woodland appears to have been managed in the past as high forest and includes areas that have been planted with Beech *Fagus sylvatica* and Pine species, *Pinus sp.* Past and current quarrying in this area has caused disturbance and natural colonisation of these areas continues to be encouraged.

Tree felling for health and safety purposes has been undertaken along the road boundary, in conjunction with Cardiff Council.

Castell Coch Woodlands

The last major management of the Castell Coch woodland took place over 50 years ago when the last bout of thinning occurred. Subsequent canopy gaps have appeared as a result of tree falls and some selective thinning. For the health and safety of the public who visit this site, dangerous trees adjacent to access routes are felled. There has also been sporadic removal of Sycamore *A. pseudoplatanus*. All fallen trees are left in situ and dead wood has increased the biological diversity of the woodland. In addition, natural regeneration is occurring throughout the woodland, both underneath the canopy and within the gaps.

Natural Resources Wales (formerly the Forestry Commission) is working with CADW and Cardiff Council in allowing the natural woodland processes to continue, allowing wildlife to flourish on the site.

Fforestganol a Chwm Nofydd

The woodland has been managed for some time for nature conservation. Selective thinning, removal of Sycamore *A. pseudoplatanus* and ride creation have occurred in the past. The long term aim is to apply minimal management to the more mature areas of woodland to allow gap creation and regeneration processes to occur naturally. However, in the younger more even-aged stands in Fforestganol [units FCN1 (330) FCN3 (332) and FCN4 (333)], suitable high forest management may be appropriate.

Fforestganol a Chwm Nofydd and Castell Coch Woodlands and Road Section experience heavy recreational pressure. Parts of the woodland are actively managed by Cardiff Council and CADW respectively for health and safety reasons, particularly along paths and roads. Recently mountain biking has become a serious concern, particularly in Fforestgannol, and impacts need to be kept under review. A community engagement exercise with the mountain biking community may be appropriate.

Scramble biking in Garth Wood has also become a concern and impacts need to be kept under review.

2.4 Management Units

The area covered by this plan has been divided into management units to enable practical communication about features, objectives, and management. This will also allow us to differentiate between the different designations where necessary. In this plan the management units have been based mainly on tenure, but also with reference to features and land management requirements.

Maps showing the management units referred to in this plan are on this site's web page.

The following table confirms the relationships between the management units and the designations covered:

Unit reference	Unique unit number	SAC	SSSI	Natural Resources Wales Owned/Managed	LNR
Garth Wood SSSI					
GW 1	339	✓	✓	x	
GW 2	340	x	✓	x	
GW 3	341	x	✓	x	
Castell Coch Woodlands & Road Section SSSI					
CC 1	335	x	✓	x	
CC 2	336	x	✓	x	
CC 3	337	✓	✓	✓	
CC 4	338	✓	✓	x	
Fforestganol & Cwm Nofydd SSSI					
FCN 1	330	✓	✓	x	
FCN 2	331	✓	✓	x	
FCN 3	332	✓	✓	x	✓
FCN 4	333	✓	✓	x	✓
FCN 5	334	x	✓	x	✓

2.5 Position within an ecological network

Cardiff Beech Woods SAC contains one of the largest concentrations of *Asperulo-Fagetum* in Wales, and represents the habitat close to the western limit of its past native range in both UK and Europe. The SAC lies at the southern edge of the South Wales' coalfield, bisected by the River Taff and the A470. It is separated by minor roads from Coed y Bedw SSSI and non-SAC woodland at Fforestganol a Chwm Nofydd SSSI. Glamorgan Canal/Long Wood SSSI is within 1km, although separated by a major motorway junction. The geological SSSI Cwarrau Ton Mawr a Ffynnon Taf/Ton Mawr and Taffs Well Quarries is part-encircled by Garth Wood. The SAC is well connected to other woodland and to some extent other semi-natural habitat, including the grassland Caeau Blaen-bielly SSSI. It sits within a significant functional woodland network, extending onto the coalfield, although this becomes more fragmented in the countryside south and south-west of the SAC. The Border-Vale or edge of the coalfield is relatively rich in semi-natural habitat. As a result there are various Sites of Interest for Nature Conservation (SINCs) close by, many of which are Ancient Woodland. These include Coed Rhiw'r Ceiliog and Tyn-y-Coed Complex. The nearby woodland SSSI and SINCs include some Ash *Fraxinus excelsior* and Beech *Fagus sylvatica* woodland, but in small quantity or not necessarily referable to *Tilio-Acerion* or *Asperulo-Fagetum*.

The nearest SAC sites designated for the same Annex 1 features are: Wye Valley Woodlands/Coetiroedd Dyffryn Gwy (Wales), 40km to the east (*Tilio-Acerion* and *Asperulo-Fagetum*); Cwm Clydach Woodlands/Coedydd Cwm Clydach, 30km north-east (*Asperulo-Fagetum*) and Gower Ash Woods/Coedydd Ynn Gwyr, 55km west (*Tilio-Acerion*). At these three sites *Tilio-Acerion* and/or *Asperulo-Fagetum* were the primary reason for selection and these SACs are considered amongst the best areas for these features in the United Kingdom. In addition, the SACs Cernydd Carmel, 60km west, Coedydd Nedd a Mellte, 33km north-west and Usk Bat sites/Safleodd Ystumod Wygs, 30km north-east, are considered to support a

significant presence of *Tilio-Acerion*. NRW Forest Resource plans may provide a mechanism for habitat restoration and connectivity between sites.

3. THE FEATURES

3.1 Confirmation of Features

Designated feature	Relationships, nomenclature etc	Conservation Objective in parts 4 and 5
SAC features		
Annex I habitats that are a primary reason for selection of this site 1. <i>Asperulo-Fagetum</i> beech forests (EU Habitat Code 9130)	Generally referred to as ' <i>Asperulo-Fagetum</i> ' throughout this document.	4.1
Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site 2. <i>Tilio-Acerion</i> forests of slopes, screes and ravines (EU Habitat Code 9180)	Generally referred to as ' <i>Tilio-Acerion</i> ' throughout this document.	4.2
SPA features		
Not applicable		
Ramsar features		
Not applicable		
SSSI features		
3. Semi-natural broadleaved woodland	Part of SAC designated features	5.1
4. <i>Porrhomma rosenhaueri</i> (a cave dwelling spider)	Within SAC boundary	5.2
5. Geological exposures	Supports part of SAC designated feature	5.3

3.2 Features and Management Units

This section sets out the relationship between the designated features and each management unit. This is intended to provide a clear statement about what each unit should be managed for, taking into account the varied needs of the different special features. All features are allocated to one of seven classes in each management unit. These classes are:

Key Features

KH - a 'Key Habitat' in the management unit, i.e. the habitat that is the main driver of management and focus of monitoring effort, perhaps because of the dependence of a key species (see KS below). There will usually only be one Key Habitat in a unit but there can be more, especially with large units.

KS – a ‘Key Species’ in the management unit, often driving both the selection and management of a Key Habitat.

Geo – an earth science feature that is the main driver of management and focus of monitoring effort in a unit.

Other Features

Sym - habitats, species and earth science features that are of importance in a unit but are not the main drivers of management or focus of monitoring. These features will benefit from management for the key feature(s) identified in the unit. These may be classed as ‘Sym’ (sympathetic) features because:

(a) they are present in the unit but may be of less conservation importance than the key feature; and/or

(b) they are present in the unit but in small areas/numbers, with the bulk of the feature in other units of the site; and/or

(c) their requirements are broader than and compatible with the management needs of the key feature(s) e.g. a mobile species that uses large parts of the site and surrounding areas: and/or

(d) key features (KH, KS) are closely associated with these features, and the conservation of key features depends on them being managed appropriately.

Nm - an infrequently used category where features are at risk of decline within a unit as a result of meeting the management needs of the key feature(s) i.e. under Negative Management. These cases will usually be compensated for by management elsewhere in the plan, and can be used where minor occurrences of a feature would otherwise lead to apparent conflict with another key feature in a unit.

Mn - Management units that are essential for the management of features elsewhere on a site e.g. livestock over-wintering area included within designation boundaries, buffer zones around water bodies etc.

x – Features not known to be present in the management unit.

The tables below set out the relationship between the features and management units identified in this plan:

Garth Wood	Management Unit		
Unique unit number	339	340	341
Unit reference	1	2	3
Unit name	GW 1	GW 2	GW 3
SAC	✓	x	x
SSSI	✓	✓	✓
NNR/Natural Resources Wales managed			
SAC features			
<i>Asperulo-Fagetum</i> beech forests	KH	x	x
<i>Tilio-Acerion</i> forests	KH	x	x
SSSI features			
Semi-natural broadleaved woodland	Sym	KH	KH
<i>Porrhomma rosenhaueri</i>	KS	Sym	x

Castell Coch Woodlands & Road Section		Management Unit			
Unique unit number	335	336	337	338	
Unit reference	1	2	3	4	
Unit name	CC 1	CC 2	CC 3	CC 4	
SAC	x	x	✓	✓	
SSSI	✓	✓	✓	✓	
NNR/Natural Resources Wales managed					
SAC features					
<i>Asperulo-Fagetum</i> beech forests	x	x	KH	KH	
<i>Tilio-Acerion</i> forests	x	x	x	x	
SSSI features					
Semi-natural broadleaved woodland	NM	NM	Sym	Sym	
Geological	Geo	Geo	x	x	

Fforestganol a Chwm Nofydd		Management Unit			
Unique unit number	330	331	332	333	334
Unit reference	1	2	3	4	5
Unit name	FCN 1	FCN 2	FCN 3	FCN 4	FCN 5
SAC	✓	✓	✓	✓	x
SSSI	✓	✓	✓	✓	✓
NNR/Natural Resources Wales managed					
SAC features					
<i>Asperulo-Fagetum</i> beech forests	KH	KH	KH	KH	x
<i>Tilio-Acerion</i> forests	KH	x	KH	KH	x
SSSI features					
Semi-natural broadleaved woodland	Sym	Sym	Sym	Sym	KH

The above management units reflect the presence of *Asperulo-Fagetum* beech forests and *Tilio-Acerion* forests of slopes, screes and ravines. Both of these features are present within Garth Wood SSSI and Fforestganol a Chwm Nofydd SSSI but only *Asperulo-Fagetum* is found within Castell Coch Woodlands and Road Section SSSI. The semi-natural broadleaved woodland feature of the SSSIs will benefit from sympathetic habitat management in these units.

The presence of the cave dwelling spider *Porrhomma rosenhaueri* as features of Garth Wood SSSI is considered compatible with the management needs of the woodland habitat in these units.

A small part of the semi-natural broadleaved woodland feature is present in units CC1 (335) and CC2 (336) of the Castell Coch Woodlands and Road Section SSSI

and is considered potentially at risk of decline with these units as a result of meeting the management needs of the geological feature. However, this is considered to be compensated for by management elsewhere.

4. CONSERVATION OBJECTIVES

Background to Conservation Objectives:

a. Outline of the legal context and purpose of conservation objectives.

Conservation Objectives for individual SACs and SPAs are required by the 1992 'Habitats' Directive (92/43/EEC). The aim of the Habitats Directive is the maintenance, or where appropriate the restoration, of the 'favourable conservation status' (FCS) of habitats and species listed in the Annexes to the Directive (see Box). Therefore FCS provides the overarching framework for defining the conservation objectives for individual SACs.

Although neither the Birds Directive nor the Ramsar Convention refer to FCS, Natural Resources Wales considers that the overall aim of both those legal instruments is sufficiently similar to FCS to make it practical and proportionate to use the same guiding principle when establishing the conservation objectives for SPAs and Ramsar sites, as well as SACs. Therefore the Habitats Directive definition of FCS is considered to provide the overarching framework for conservation objectives for all SACs, SPAs and Ramsar sites in Wales.

Favourable conservation as defined in Articles 1(e) and 1(j) of the Habitats Directive

"The conservation status of a natural habitat is the sum of the influences acting on it and its typical species that may affect its long-term natural distribution, structure and functions as well as the long term survival of its typical species. The conservation status of a natural habitat will be taken as favourable when:

- its natural range and areas it covers within that range are stable or increasing, and
- the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- the conservation status of its typical species is favourable.

The conservation status of a species is the sum of the influences acting on the species that may affect the long-term distribution and abundance of its populations. The conservation status will be taken as 'favourable' when:

- population dynamics data on the species indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis."

The achievement of FCS is not an objective that applies at the level of the individual sites. Rather, it is a wider objective to which each individual site contributes. Therefore the conservation objectives for an individual site are intended to express what is considered to be that site's appropriate contribution to achieving FCS. Since SACs are the most important mechanism in the Habitats Directive for achieving FCS, and the sites represent the most important areas for conservation of the Annex I habitat types and Annex II species, the objectives for each individual SAC should seek to ensure that the site makes a substantial contribution which properly reflects its importance in a local, national and European context and the particular reasons why the site was selected for inclusion in the network. A similar approach is taken to setting conservation objectives for SPAs and Ramsar sites.

Achieving the conservation objectives of individual sites requires appropriate management and the control of factors which are influencing, or may influence, the features.

The conservation objectives have a number of specific roles:

- **Communication**
The conservation objectives should help convey to stakeholders what are the reasons for the designation and what it is intended to achieve.
- **Site planning and management**
The conservation objectives guide management of sites, to maintain or restore the designated habitats and species. They provide the basis for identifying what management is required both within the site boundary, and outside it, where achieving the objectives requires action to be taken outside the site.
- **River Basin Management Planning**
Conservation Objectives for aquatic and water dependent Natura 2000 features are also used as the "standards and objectives" referred to in Article 4 (1c) of the Water Framework Directive (WFD) (2000/60/EC). In 2009, Welsh Ministers decided that where Natura 2000 conservation objectives are more stringent than 'Good Ecological Status' (GES) as defined in the WFD, they (and the standards they contain) are the objectives referred to in Article 4(1c) of the WFD.
- **Assessing plans and projects**
Article 6(3) of the 'Habitats' Directive requires the assessment of proposed plans and projects in view of a site's conservation objectives. Subject to certain exceptions, plans or projects may not proceed unless it is established that they will not adversely affect the integrity of sites. There are similar requirements for the review of existing decisions and consents.
- **Monitoring and reporting**
In addition to foregoing purposes, conservation objectives provide the basis for defining the evidence that will be used for assessing the condition of a feature and the status of factors that affect it. That evidence is contained in a separate but closely related set of 'performance indicators' which provide the basis for monitoring and reporting. To avoid confusion between the conservation objectives and the measures specified in performance

indicators, the performance indicators are set out in an Appendix to this document.

The conservation objectives in this document reflect Natural Resources Wales' current information and understanding of the site and its features and their importance in an international context. The conservation objectives are subject to review by Natural Resources Wales in the light of new knowledge.

b. Format of the conservation objectives

Each conservation objective is a composite statement defining a site-specific aspiration for each designated feature. This composite statement contains clauses that correspond to all the elements of FCS, namely:

For habitat features:

- Extent should be stable in the long term, or where appropriate increasing*;
- Quality (including in terms of ecological structure and function) should be being maintained, or where appropriate improving;
- Populations of the habitat's typical species must be being maintained or where appropriate increasing*;
- Factors affecting the extent and quality of the habitat and its typical species (and thus affecting the habitat's future prospects) should be under appropriate control.

For species features:

- The size of the population should be stable or increasing, allowing for natural variability, and sustainable in the long term;
- The distribution of the population should be being maintained*;
- There should be sufficient habitat, of sufficient quality, to support the population in the long term;
- Factors affecting the population or its habitat should be under appropriate control.

The elements above constitute a generic checklist or guide to the elements that should normally be included in the conservation objectives, in order to ensure that the site makes an effective and appropriate contribution to achieving favourable conservation status for the habitats and species for which it is designated.

There is one conservation objective for each designated feature listed in part 3. In some cases, where there are distinct areas or forms of a designated habitat or separate populations of a designated species within a site, the conservation objective is sub-divided into different sections to enable different aspirations to be expressed for different occurrences of the features within the site.

As well as describing the aspirations for the condition of the feature, each conservation objective contains a statement that the factors which significantly affect the feature are under appropriate control.

4.1 Conservation Objective for Feature 1: *Asperulo-Fagetum* beech forests (EU Habitat Code 9130)

The extent should be stable in the	The existing extent of <i>Asperulo-Fagetum</i> beech forests will be maintained (minimum area of 45ha). The extent of
---	---

<p>long term, or where appropriate increasing.</p>	<p><i>Asperulo-Fagetum</i> may increase, but not at the expense of the existing <i>Tilio-Acerion</i>. Some change in the distribution of community types would be accepted providing there was no overall loss of either <i>Asperulo-Fagetum</i> or <i>Tilio-Acerion</i>.</p>
<p>Quality (including in terms of ecological structure and function) should be being maintained, or where appropriate improving.</p>	<p>The <i>Asperulo-Fagetum</i> beech forests will display the full range of structure, ecological processes and species expected of this habitat at this location.</p> <p>Provided these broad qualities are met across the whole woodland area, some heterogeneity in condition is both natural and acceptable, but the majority of the <i>Asperulo-Fagetum</i> within Garth Wood will be of high quality (at least 70%) and the majority of the <i>Asperulo-Fagetum</i> in Castell Coch will be of high quality (at least 60%). Where:</p> <ul style="list-style-type: none"> • Most (at least 95%) of canopy forming trees will be locally native species such as Beech <i>Fagus sylvatica</i>, Ash <i>Fraxinus excelsior</i> and Oak <i>Quercus robur</i>; • Beech <i>F. sylvatica</i> will be constant and dominant in the tree canopy; • Non-native species are largely absent; • Trees of all broad age classes should be present; • Beech <i>F. sylvatica</i> regeneration is present in the form of scattered saplings and dense stands of saplings; • The ground flora will include species typical of this habitat e.g. Dog's Mercury <i>Mercurialis perennis</i>, Bluebells <i>Hyacinthoides non-scripta</i> and Ramsons <i>Allium ursinum</i>; • Dead wood, both standing and fallen, is present throughout the woodland; • 5% or less of ground flora is disturbed, including by new or enlarged tracks. <p>In Fforestganol [unit FCN 1 (330)] there are small pockets of <i>Asperulo-Fagetum</i> and these should be maintained. The remaining woodland in this unit is transitional between <i>Asperulo-Fagetum</i> and <i>Tilio-Acerion</i>. The woodland is high quality as above except:</p> <ul style="list-style-type: none"> • Beech <i>F. sylvatica</i> is not necessarily dominant but is present throughout; and • Advanced regeneration of native species, including Beech <i>F. sylvatica</i> is present (rather than just Beech). <p>In Cwm Nofydd (units FCN2 (331) and FCN3 (332)) a stand of <i>Asperulo-Fagetum</i> should continue to be present and of high quality as above.</p>
<p>Populations of the habitat's typical species must be being maintained or where</p>	<p>The <i>Asperulo-Fagetum</i> will also support a range of other typical species associated with all elements of a high quality beech woodland ecosystem. This includes soil flora and fauna, invertebrates, deadwood fauna, plants, breeding birds and mammals as well as higher plants highlighted above.</p>

<p>appropriate increasing.</p>	<p>In particular:-</p> <p>The typical transitions and mosaics within the beech woodland are maintained.</p> <p>Under the Beech <i>F. sylvatica</i> canopy typical rare flora including Bird's-nest Orchid <i>Neottia nidus-avis</i> and Yellow Bird's –nest <i>Hypopitys monotropa</i> are found.</p> <p>Dense patches of regenerating Beech <i>F. sylvatica</i> are present within Castell Coch Woodlands and Garth Wood, providing a valuable sub-habitat for breeding birds.</p> <p>There are pockets of ground flora comprising species of lime-rich beech woodland across the site, including Ancient Woodland indicators such as Wood Anemone <i>Anemone nemorosa</i>, Ramsons <i>Allium ursinum</i> and Sanicle <i>Sanicula europaea</i>.</p> <p>Wintering Brambling <i>Fringilla montifringilla</i> and Chaffinch <i>Fringilla coelebs</i> feast on beech-mast. Wood Warblers <i>Phylloscopus sibilatrix</i> breed in areas where the shrub layer and ground flora is typically sparse.</p> <p>Lesser horseshoe bats <i>Rhinolophus hipposideros</i> have been recorded in Lesser Garth Cave in Garth Wood and both Lesser Horseshoe bats <i>R. hipposideros</i> and Greater Horseshoe bats <i>Rhinolophus ferrumequinum</i> have been recorded in or close to the SAC.</p>
<p>Factors affecting the extent and quality of the habitat and its typical species (and thus affecting the habitat's future prospects) should be under appropriate control.</p>	<p>Factors affecting the extent and quality of beech forest should be under appropriate control, including:</p> <ul style="list-style-type: none"> • There are no adverse impacts on the <i>Asperulo-Fagetum</i> beech forests from air pollution; • There are no adverse impacts on surface water supply and quality from commercial forestry and quarrying operations; • There is little evidence of grazing or browsing damage; • Recreational use of the site (including associated health and safety works) will continue to be managed so it does not damage the wildlife interest of the site.

4.2 Conservation Objective for Feature 2:
***Tilio-Acerion* forests of slopes, screes and ravines (EU Habitat Code 9180)**

<p>Extent should be stable in the long term, or where appropriate increasing.</p>	<p>The existing extent of <i>Tilio-Acerion</i> forests will be maintained (minimum area of 30ha). The extent of <i>Tilio-Acerion</i> may increase, but not at the expense of the existing <i>Asperulo-Fagetum</i> forests. Some change in the distribution of community types would be accepted providing there was no overall loss of either <i>Tilio-Acerion</i> or <i>Asperulo-Fagetum</i>.</p>
---	--

	<p>The <i>Tilio-Acerion</i> is present in units GW1 (339), FCN4 (333), FCN3 (332), FCN2 (331), FCN1 (330).</p>
<p>Quality (including in terms of ecological structure and function) should be being maintained, or where appropriate improving.</p>	<p>The <i>Tilio-Acerion</i> forests will display the full range of structure, ecological processes and species expected of this habitat at this location.</p> <p>The <i>Tilio-Acerion</i> within Garth Wood and units FCN3 (332) and FCN4 (333) within Fforestganol a Chwm Nofydd will be of high quality where:</p> <ul style="list-style-type: none"> • Most (at least 95%) of canopy forming trees will be locally native species such as Ash <i>Fraxinus excelsior</i>, Beech <i>Fagus sylvatica</i> and Oak <i>Quercus robur</i>; • Ash <i>F. excelsior</i> is common throughout, in a mixed woodland; • Non-native species are largely absent; • Trees of all broad age classes should be present; • Advanced Ash <i>F. excelsior</i> regeneration (regeneration under a closed canopy) is present; • The ground flora will include species typical of this habitat e.g. Enchanter's Nightshade <i>Circaea lutetiana</i>, Sanicle <i>Sanicula europaea</i> and Ramsons <i>Allium ursinum</i>; • Dead wood, both standing and fallen, is present throughout the woodland; • 5% or less of ground flora is disturbed, including by new or enlarged tracks. <p>In Fforestganol a Chwm Nofydd unit FCN1 (330) there are small pockets of <i>Tilio-Acerion</i> and these should be maintained. The remaining woodland in this unit is transitional between <i>Asperulo-Fagetum</i> and <i>Tilio-Acerion</i>. The woodland is high quality as above except:</p> <ul style="list-style-type: none"> • Ash <i>F. excelsior</i> is not necessarily dominant but is present throughout, and; • Advanced regeneration of native species, including Ash <i>F. excelsior</i> is present (rather than just Ash).
<p>Populations of the habitat's typical species must be being maintained or where appropriate increasing.</p>	<p>The <i>Tilio-Acerion</i> forest will also support a range of other typical species associated with all elements of a high quality <i>Fraxinus excelsior</i> woodland ecological system. This includes soil flora and fauna, invertebrates, deadwood fauna, plants, breeding birds and mammals as well as higher plants highlighted above.</p> <p>In particular:-</p> <p>The existing hydrological features are maintained. This includes a variety of calcareous seepages and springs and associated flora and fauna, e.g. bryophytes and craneflies. In 1994 this site was considered one of the top sites in Wales for its seepage invertebrates (Stubbs 1994).</p>

	<p>Typical ground flora species include Hart's-tongue Fern <i>Phyllitis scolopendrium</i>, Ferns <i>Dryopteris spp.</i>, Ramsons <i>Allium ursinum</i>, Dog's Mercury <i>Mercurialis perennis</i>, Enchanter's Nightshade <i>Circaea lutetiana</i>, Sanicle <i>Sanicula europaea</i>, and Bluebell <i>Hyacinthoides non-scripta</i>. Also populations of Herb Paris <i>Paris quadrifolia</i> and Goldilocks Buttercup <i>Ranunculus auricomus</i>.</p> <p>Hawfinch <i>Coccothraustes coccothraustes</i> is found where Hornbeam <i>Carpinus betulus</i> grows.</p> <p>The typical transitions and mosaics within the <i>Tilio-Acerion</i> forests are maintained.</p> <p>Lesser Horseshoe bats <i>Rhinolophus hipposideros</i> have been recorded in Lesser Garth Cave in Garth Wood and both Lesser Horseshoe bats <i>R. hipposideros</i> and Greater Horseshoe bats <i>Rhinolophus ferrumequinum</i> have been recorded in or close to the SAC.</p>
<p>Factors affecting the extent and quality of the habitat and its typical species (and thus affecting the habitat's future prospects) should be under appropriate control.</p>	<p>Factors affecting the extent and quality of <i>Tilio-Acerion</i> forests should be under appropriate control, including:</p> <ul style="list-style-type: none"> • There are no adverse impacts on the <i>Tilio-Acerion</i> forests from air pollution; • There are no adverse impacts on surface water supply and quality from commercial forestry and quarrying operations; • There is little evidence of grazing or browsing damage; • Recreational use of the site will continue to be managed so it does not damage the wildlife interest of the site.

5. MANAGEMENT OBJECTIVES FOR SSSI-ONLY FEATURES

Conservation objectives for SSSI features are not covered by the requirements of the Habitat Regulations which relates to features of international sites.

The following visions and performance indicators for SSSI features will be used to guide the SSSI management.

5.1 Conservation Objective for Feature 3: Semi-natural Broadleaved Woodland

<p>Extent should be stable in the long term, or where appropriate increasing.</p>	<p>The existing semi-natural woodland will be maintained.</p>
<p>Quality (including in terms of ecological structure and function) should be being maintained, or where appropriate improving.</p>	<p>The semi-natural woodland will display the full range of structure, ecological processes and species expected of this habitat at this location.</p> <p><i>Castell Coch</i> All the woodland within Castell Coch Woodlands and Road Section SSSI is referable to <i>Asperulo-Fagetum</i>, so the Conservation Objectives for feature 1 apply.</p> <p><i>Fforestganol a Chwm Nofydd</i> Approximately half of Fforestganol a Chwm Nofydd SSSI is within the SAC so the Conservation Objectives for feature 1 and feature 2 apply.</p> <p>For those parts outside the SAC, the woodland will be of high quality, where:</p> <ul style="list-style-type: none"> • Most (at least 95%) of canopy forming trees will be locally native species such as Beech <i>Fagus sylvatica</i>, Ash <i>Fraxinus excelsior</i> and Oak <i>Quercus robur</i>; • Non-native species are largely absent; • Trees of all broad age classes should be present; • Regeneration is present in the form of scattered saplings and dense patches of saplings; • The ground flora will include species typical of this habitat e.g. Dog's Mercury <i>Mercurialis perennis</i>, Bluebells <i>Hyacinthoides non-scripta</i> and Ramsons <i>Allium ursinum</i>; • Dead wood, both standing and fallen, is present throughout the woodland; • 5% or less of ground flora is disturbed, including by new or enlarged tracks. <p><i>Garth Wood</i> The majority of the woodland within Garth Wood SSSI is within the SAC so the Conservation Objectives for feature 1 and feature 2 apply.</p>

	<p>The majority of woodland in the non-SAC units [GW2 (340) and GW3 (341)] will be of high quality, where:</p> <ul style="list-style-type: none"> • Most (at least 95%) of canopy forming trees will be locally native species such as Beech <i>Fagus sylvatica</i>, Ash <i>Fraxinus excelsior</i> and Oak <i>Quercus robur</i>; • Non-native species are largely absent; • Trees of all broad age classes should be present; • Regeneration is present in the form of scattered saplings and dense patches of saplings; • The ground flora will include species typical of this habitat e.g. Dog's Mercury <i>Mercurialis perennis</i>, Bluebells <i>Hyacinthoides non-scripta</i> and Ramsons <i>Allium ursinum</i>; • Dead wood, both standing and fallen, is present throughout the woodland; • 5% or less of ground flora is disturbed, including by new or enlarged tracks.
<p>Populations of the habitat's typical species must be being maintained or where appropriate increasing.</p>	<p>The woodland will also support a range of other typical species associated with all elements of a high quality semi-natural woodland ecosystem. This includes soil flora and fauna, invertebrates, deadwood fauna, plants, breeding birds and mammals as well as higher plants highlighted above.</p> <p>In particular:-</p> <p>Ferns <i>Dryopteris spp.</i>, Ramsons <i>Allium ursinum</i>, Dog's Mercury <i>Mercurialis perennis</i>, Wood Anemone <i>Anemone nemorosa</i>, and Bluebells <i>Hyacinthoides non-scripta</i>.</p> <p>The typical transitions and mosaics within the semi-natural woodland are maintained, as are those between the woodland and adjacent <i>Asperulo-Fagetum</i> forests.</p> <p>Hawfinch <i>Coccothraustes coccothraustes</i> is found where Hornbeam <i>Carpinus betulus</i> grows, within Fforestganol a Chwm Nofydd SSSI.</p> <p>The existing hydrological features are maintained. This includes a variety of calcareous seepages and springs (in particular within Fforestganol a Chwm Nofydd) and associated flora and fauna (in particular bryophytes and craneflies).</p> <p>Dormice <i>Muscardinus avellanarius</i> have been recorded in Fforestganol a Chwm Nofydd.</p> <p>Lesser Horseshoe bats <i>Rhinolophus hipposideros</i> have been recorded in Lesser Garth Cave in Garth Wood SSSI and both Lesser Horseshoe bats <i>R. hipposideros</i> and</p>

	Greater Horseshoe bats <i>R. ferrumequinum</i> have been recorded in the SSSIs.
Factors affecting the extent and quality of the habitat and its typical species (and thus affecting the habitat's future prospects) should be under appropriate control.	<p>Factors affecting the extent and quality of the semi-natural woodland should be under appropriate control.</p> <p>The factors listed under feature 1 and feature 2 apply.</p>

5.2 Conservation Objective for Feature 4: *Porrhomma rosenhaueri* (cave dwelling spider)

Although within the SAC boundary, the conservation objectives for this SSSI feature are unlikely to impact on the qualifying features 1 and 2 of the SAC. There is limited information on the extent or requirements for this spider. The following is therefore of a general nature reflecting our current knowledge and likely to change when more information is available.

Currently, the information available on this species is very limited making measurable objectives hard to define (Carter 2010).

The size of the population should be stable or increasing, allowing for natural variability, and sustainable in the long term.	<p>The size of the existing population will be maintained, and may increase.</p> <p>Based on work undertaken to date (Carter and Mann 1997, and Carter 2010), it is suggested that the <i>Porrhomma rosenhaueri</i> population is in favourable condition where, either:</p> <ul style="list-style-type: none"> - 6 or more live individuals and fifteen fresh unoccupied webs are found along the defined transect, with at least one spider in each of the three transect sections. <p>or:</p> <ul style="list-style-type: none"> - 20 spiders are recorded along the transect with at least 2 spiders in each transect section. <p>Variation in the population dynamics can only be more fully assessed through further survey work to build on the existing information (Carter 2010).</p>
The distribution of the population should be being maintained or where appropriate	<p>The distribution of the existing population will be maintained, and may increase.</p> <p>There is little knowledge of the distribution of the population within the cave system. However, based on work undertaken to date (Carter and Mann 1997, and Carter</p>

increasing.	2010), live <i>P. rosenhaueri</i> spiders and evidence of spiders, were recorded throughout the whole section of cave surveyed.
There should be sufficient habitat, of sufficient quality, to support the population in the long term.	<p>Sufficient habitat must exist to support the population in the long term.</p> <p>Although there is information on the extent of the cave system, there is little knowledge about the quality of the cave habitat required to support the feature. Carter (2010) found good numbers of live spiders and from this it can be assumed that the habitat is in favourable condition and this is supported by the presence of other important cave dwelling species through the cave, such as Collembola.</p>
Factors affecting the population or its habitat should be under appropriate control.	<p>Garth Wood experiences some recreational pressure but access to the caves is restricted. However, caving does occur and needs to be kept under review.</p> <p>Whilst the entrance to Lesser Garth Cave is covered by a gated grille, this has been vandalised and needs to be maintained in order to control entry to the cave.</p> <p>Site-specific safety issues which may arise from the presence of the caves and old quarry workings need to be addressed by management.</p>

5.3 Conservation Objective for Feature 5: *Geological Exposures*

Extent should be stable in the long term, or where appropriate increasing.	<p>The extent of the existing rock outcrop will be maintained. The extent of visible exposure may increase but not at the expense of the existing <i>Asperulo fagetum</i> and <i>Tilio-acerion</i> woodland.</p> <p>The rock outcrop to be of sufficient extent and visibility to enable a full understanding of the feature, and reasonably accessible.</p>
Quality (including in terms of ecological structure and function) should be being maintained, or where appropriate improving.	The quality of the existing rock outcrop will be maintained, sufficient to enable a full understanding of the feature.
Populations of the habitat's typical species must be being maintained or	N/A

<p>where appropriate increasing.</p>	
<p>Factors affecting the extent and quality of the habitat and its typical species (and thus affecting the habitat's future prospects) should be under appropriate control.</p>	<p>All factors affecting the extent and quality of the geological exposures are under control, namely:</p> <p>Natural woodland processes – control of growth of scrub and other vegetation on the rock face/ledges and floor which has the potential to cover the exposures.</p> <p>Invasive species (including Japanese Knotweed <i>Fallopia japonica</i> and Cotoneaster) are managed appropriately.</p> <p>Natural erosion and deposition processes - weathering and erosion of the rock face, mass movement of scree, wash of soil from the top of exposures, solution, and karstification may also cover the exposures. This can be followed by growth of vegetation. Both should be managed.</p> <p>Recreational use – climbing activity along the road section should be kept under review.</p>

6. ASSESSMENT OF STATUS AND MANAGEMENT REQUIREMENTS

This section provides:

- A summary of the assessment of the status of each feature.
- A summary of the management issues that need to be addressed to maintain or restore each feature.

6.1 Status and Management Requirements of Feature 1: *Asperulo-Fagetum* beech forests (EU Habitat Code 9130)

Status of Feature 1

Condition

The sites were monitored in March 2004 and April-May 2009 to gather information on the extent or condition of the habitat. The current feature status for the *Asperulo-Fagetum* beech forests is **Favourable** (2009).

Trend

The feature was reported as unfavourable in the last monitoring round however this change in reporting category does not represent a change in condition. Rather it is a result of us having a better understanding of the woodland, and what we can expect of it, and final agreement over suitable methods used to assess woodland features.

Factors

Recreation

All component SSSIs are used to a greater or lesser extent for recreation purposes. Castell Coch Woodlands and Fforestganol a Chwm Nofydd experience the most recreation pressure, and are popular for walking, climbing and mountain biking. Recently mountain biking has become a serious concern in Fforestganol, and impacts need to be kept under review. A community engagement exercise with the mountain biking community may be appropriate. This issue is translated into a target of <5% disturbance to ground flora. This target is currently being met within the SAC but is thought to be affecting the underpinning SSSI feature, therefore will need to be kept under review.

Grazing/browsing

The target for grazing/browsing has been met. However, there is some damage to medium aged trees from grey squirrels in Castell Coch which should be kept under review.

Air pollution

There is potential for atmospheric pollution, independently and cumulatively, from adjacent roads, quarrying, industrial processes and development. Critical loads are already exceeded for certain pollutants. At present the impact of this on the features is unquantified but this should be addressed in more detail in the future as more is learned about effects of air pollution and methods for monitoring its effects on vegetation.

Please refer to the following report for further details:

Wilkinson, K. (April & May 2009) Cardiff Beech Woods SAC Monitoring Report, *Asperulo-Fagetum* beech forests (9130) draft Monitoring Round 2 (2007-2012).

Management Requirements of Feature 1

The following summarises the current management requirements of the feature based on the current feature status for the *Asperulo-Fagetum* beech forests (May 2009).

It is very important to recognise that management may need to change with time. Problems that we are aware of today may be resolved or completely removed and new unforeseen problems may arise. New improved management techniques may also become available. Consequently the management outlined in this document is considered appropriate for the short term but may need to change in the long term.

Woodland Management

The long term aim in the more mature areas of woodland is to allow woodland processes to occur naturally over time. Tree falls create canopy gaps to encourage natural regeneration. All fallen trees and standing dead wood are left in situ, where safe, to increase the dead wood component of the woodland. However, in the younger more even-aged stands in Fforestganol [units FCN1 (330) FCN3 (332) and FCN4 (333)], suitable high forest management may be appropriate.

The presence of a number of species considered to be non-native e.g. Japanese Knotweed *Fallopia japonica*, will be kept under review and managed as necessary. Control measures may be required before monitoring indicates any detrimental effects on the woodland communities of special interest.

Natural Resources Wales will continue to work with CADW and Cardiff Council regarding the condition of the woodland. Localised intervention in certain areas could enhance natural processes, for example:

- Garth Wood – removal of Pine *Pinus* species in areas previously managed as high forest to encourage natural regeneration of native species. Tree felling for health and safety purposes alongside the road edge.
- Castell Coch Woodlands – some site-specific health and safety issues need to be addressed by management. Browsing by squirrels to be kept under review.
- Fforestganol a Chwm Nofydd – selective halo thinning and gap creation within areas of even age structure to break up uniformity where appropriate. Japanese Knotweed *Fallopia japonica* is present in unit FCN 3 (332) and will need management.

Please refer to Section 7 for the Action Plan, which assesses the specific management actions required on each management unit.

Recreational Management

All component SSSIs are used to a greater or lesser extent for recreation purposes. Castell Coch Woodlands and Fforestganol a Chwm Nofydd experience the most recreation pressure, and are popular for walking, climbing and mountain biking.

The Taff Trail runs through part of the Castell Coch Woodlands site and the historic building of Castell Coch attracts many visitors, which increases the access pressure

on the woodlands. The road section is becoming increasingly popular for climbing, but this is unlikely to be a problem for the geological interest of the site. However, climbing could be potentially damaging to trees at the top of the crag and needs to be kept under review. Fforestganol a Chwm Nofydd Local Nature Reserve also attracts a significant number of visitors.

Management of access is nominally through the individual site owners but there are potential conflicts between different users which to date have been addressed through the Local Authority Access Forum. Access issues need to be kept under review. Recently mountain biking in Fforestganol, and scramble biking in Garth Wood, has become a serious concern and impacts need to be kept under review. A community engagement exercise with the mountain biking community may be appropriate.

There is pressure to open up additional areas for access, with potential adverse implications for the ground flora and, depending on the scale of the proposals, the trees themselves. Again, this needs to be kept under review and advice provided through the relevant strategic planning processes and user groups.

Natural Resources Wales will continue to work with Cardiff Council to ensure that the Taff Trail has no adverse effects on the habitat feature. We will also work with the climbing clubs and Cardiff Council to ensure the trees alongside the Castell Coch Road Section are unaffected by climbing and other activities. We will work with Cardiff Council and local access groups to manage mountain and scramble biking issues.

Management of the recreational use of the woodlands should focus on maintaining the network of public footpaths and access routes. Regular maintenance of the footpaths and bridleways is essential to stop them spreading onto the adjacent woodland habitat. There should be no new tracks. By restricting recreational use of the woodlands to certain areas and paths, natural woodland processes can be left to occur away from these areas of recreational use and without the need for intervention from a public health and safety perspective.

A balance is sought between managing the recreational use, cultural heritage value and nature conservation importance of the woodlands. Natural Resources Wales will continue to work with CADW and Cardiff Council in this regard.

Please refer to Section 7 for the Action Plan, which assesses the specific management actions required on each management unit.

6.2 Status and Management Requirements of Feature 2: *Tilio-Acerion* forest of slopes, screes and ravines (EU Habitat Code 9180)

Status of Feature 2

Condition

The sites were monitored for the *Tilio-Acerion* feature in May 2009 and January 2010.

The overall condition of the *Tilio-Acerion* woodland of Cardiff Beech Woods is considered to be in **Unfavourable** condition (January 2010).

The *Tilio-Acerion* has to be favourable in both Cwm Nofydd and Garth Wood for the feature overall to be considered favourable. Cwm Nofydd is unfavourable due to a lack of mature trees. This block of woodland is even aged and lacks structural maturity. Garth Wood is considered to be favourable.

Trend

Due to differences in monitoring methods and problems with determining trends from data gathered using the JNCC structured walk monitoring method we cannot report a decline or improvement in condition since the monitoring was undertaken in 2004.

Factors

Recreation

All component SSSIs are used to a greater or lesser extent for recreation purposes. Castell Coch Woodlands and Fforestganol a Chwm Nofydd experience the most recreation pressure, and are popular for walking, climbing and mountain biking. Recently mountain biking has become a serious concern in Fforestganol, and impacts need to be kept under review. A community engagement exercise with the mountain biking community may be appropriate. This issue is translated into a target of <5% disturbance to ground flora. This is currently being met, however will need to be kept under review. Scramble biking in Garth Wood is also a concern and impacts need to be kept under review.

Grazing/browsing

The target for grazing/browsing has been met.

Air pollution

There is currently no evidence that potential aerial pollution from the A470 is having an adverse impact on the features but this may need to be addressed in more detail in the future as more is learned about effects of air pollution and methods for monitoring its effects on vegetation.

Please refer to the following report for further details:

Wilkinson, K (April and May 2009 and January 2010) Cardiff Beech Woods SAC Monitoring Report, *Tilio-Acerion* forests of slopes, screes and ravines (9180), Monitoring Round 2 (2007-2012).

Management Requirements of Feature 2

The following summarises the current management requirements of the feature based on the current feature status for the *Tilio-Acerion* forests of slopes, screes and ravines (January 2010).

It is very important to recognise that management may need to change with time. Problems that we are aware of today may be resolved or completely removed and new unforeseen problems may arise. New improved management techniques may also become available. Consequently the management outlined in this document is considered appropriate for the short term but may need to change in the long term.

Woodland Management

Much of the areas described as true *Tilio-Acerion* occur on steep rocky ground, particularly in Garth Wood where it is not possible, for health and safety reasons, to undertake any management.

Some tree felling works have been undertaken in the vicinity of the road along the boundary of Garth Wood for health and safety reasons.

The long term aim in the more mature areas of woodland is to allow woodland processes to occur naturally over time. Tree falls create canopy gaps to encourage natural regeneration. All fallen trees and standing dead wood are left in situ, where safe, to increase the dead wood component of the woodland. However, in the younger more even-aged stands in Fforestganol [units FCN1 (330) FCN3 (332) and FCN4 (333)], suitable high forest management may be appropriate.

Natural Resources Wales will continue to work with the owners of Garth Wood, CADW and Cardiff Council in this regard.

Recreational Management

Recreation within the areas supporting this habitat feature is restricted due to the steep and rocky nature of the terrain. Therefore the recreational pressure on areas of *Tilio-Acerion* is less than on areas of *Asperulo-Fagetum* habitat. Nonetheless, given the high recreation pressure experienced by Fforestganol a Chwm Nofydd, which supports areas of *Tilio-Acerion* habitat, aspects of recreational management still apply to this feature.

As discussed above for the *Asperulo-Fagetum* feature, management of the recreational use of the woodlands should focus on maintaining the network of public footpaths and access routes. By restricting recreational use of the woodlands to certain areas and paths, natural woodland processes can be left to occur away from these areas of recreational use and without the need for intervention from a public health and safety perspective.

A balance is sought between managing the recreational use, cultural heritage value and nature conservation importance of the woodlands. Natural Resources Wales will continue to work with CADW and Cardiff Council in this regard.

Please refer to Section 7 for the Action Plan, which assesses the specific management actions required on each management unit.

6.3 Status and Management Requirements of Feature 3: Semi-natural Broadleaved Woodland

Status of Feature 3

Castell Coch

All the woodland within Castell Coch Woodlands and Road Section SSSI is referable to *Asperulo-Fagetum*, therefore it is possible to derive the condition of the woodland SSSI feature from the work undertaken as part of the 2009 monitoring for the SAC. The woodland feature is therefore considered to be in **favourable** condition.

Fforestganol a Chwm Nofydd

Approximately half of the woodland within this SSSI lies within the SAC. In spring 2013, monitoring was undertaken in the SSSI unit (FCN 5 (334)) and this data will be analysed during winter 2013/14 and a monitoring report finalised by March 2014.

Based on this and survey work undertaken as part of the SSSI re-notification process, we consider that as a whole the SSSI is **unfavourable**.

Garth Wood

The majority of Garth Wood SSSI lies within the SAC. Therefore some additional monitoring of the non-SAC areas is required before the condition can be fully determined. However, it is possible to derive the condition of the woodland SSSI feature from the work undertaken as part of the 2009 monitoring for the SAC. The woodland feature is therefore considered to be **favourable**.

Management Requirements of Feature 3

As per features 1 and 2.

The long term aim is to apply minimal management to the more mature areas of woodland to allow gap creation and regeneration processes to occur naturally. However, in the younger more even-aged stands in Fforestganol [units FCN1 (330) FCN3 (332) and FCN4 (333)], suitable high forest management may be appropriate.

6.4 Status and Management Requirements of Feature 4:

Porrhomma rosenhaueri (a cave dwelling spider)

Status of Feature 4

From information presented in Carter 2010, the spider *Porrhomma rosenhaueri* is considered to be in favourable condition (December 2009) in the Lesser Garth Cave.

Management Requirements of Feature 4

Recreational Management

A gated grille is in place at the entrance to Lesser Garth Cave restricting access (but not restricting access to the cave by bats). However, this grille has been vandalised and some access is enabled, with human disturbance largely limited to the cave entrance and the first sections of the passage. This disturbance may have adverse effects on the environmental conditions within the cave. Upkeep of this gated grille is required to control access to the caves.

6.5 Status and Management Requirements of Feature 5:

Geological Exposures

Status of Feature 5

Castell Coch Road Section was monitored for the geological feature in July 2013. The overall condition of the geological exposures feature of Castell Coch Woodland and Road Section SSSI is considered to be in **favourable** condition (July 2013).

Management Requirements of Feature 5

Recreational Management

The road section is becoming increasingly popular for climbing. Although this is unlikely to be a problem for the geological part of the site, this will be kept under review.

Vegetation Management

The natural processes of erosion and deposition can cause debris to build up over the rocks, and this can be followed by growth of vegetation. This process means the rocks can become completely covered and inaccessible. The cleaning of certain areas of the site has been undertaken in the past and this work will be periodically undertaken again. The current lack of vehicular access means that such work has to be done by hand.

Invasive species (Japanese Knotweed *Fallopia japonica* and Cotoneaster) have been noted and will need to be managed appropriately.

Management of vegetation and scree accumulation may be needed to maintain the exposures if monitoring indicates any detrimental effects on the geological features.

Natural Resources Wales will continue to work closely with Cardiff Council and Welsh Government on any management required keeping the road section clear, accessible and observable.

7. ACTION PLAN: SUMMARY

This section takes the management requirements outlined in Section 5 a stage further, assessing the specific management interventions required on each management unit. This information is presented in two parts:

- A summary of the information held in Natural Resources Wales' Actions Database for sites
- A summary of on-going management which is not recorded in Natural Resources Wales' actions database

7.1 Actions in Natural Resources Wales' actions database

Site Name(s): Cardiff Beech Woods (SAC)

Unit reference	Unique Unit Number	Unit Name	Summary of Conservation Management Issues	Action needed?
1	000330	FCN 1 (Fforestganol)	<p>This unit is owned by Cardiff Council and has been managed for some time for nature conservation. Selective thinning, removal of sycamore and ride creation have occurred in the past. There are areas of woodland where all the trees are of similar age and there is little regeneration. Since 2010 Cardiff Council has actively managed areas within the wood under a 'Better Woodlands for Wales' grant, with guidance from NRW. Work has involved gap creation and halo thinning in order to vary the age structure of the woodland. This work has now come to an end but further management may be appropriate in the future. Areas with good or developing structure will be left to evolve naturally.</p> <p>Heavy recreational pressure by walkers, cyclists and horse-riders is experienced in this unit. Recently mountain biking has become a serious concern,</p>	Yes

			<p>and impacts need to be kept under review. A community engagement exercise with the mountain biking community may be appropriate.</p> <p>Any potential atmospheric pollution, independently and cumulatively, from adjacent roads, quarrying, industrial processes and development should be regularly reviewed and controlled through an integrated approach between regulatory bodies. Critical loads are already exceeded for certain pollutants. At present the impact of this on the features is unquantified but this should be addressed in more detail in the future as more is learned about effects of air pollution and methods for monitoring its effects on vegetation.</p>	
2	000331	FCN 2 (Cwm Nofydd - Cefncarnau-fawr Farm)	<p>The unit is in private ownership, comprising a small area in the north of the site. The long term aim is to allow woodland processes, including gap creation and regeneration, to evolve naturally over time.</p> <p>The unit does not experience the heavy recreational pressure of adjacent units.</p> <p>Any potential atmospheric pollution, independently and cumulatively, from adjacent roads, quarrying, industrial processes and development should be regularly reviewed and controlled through an integrated approach between regulatory bodies. Critical</p>	No

			loads are already exceeded for certain pollutants. At present the impact of this on the features is unquantified but this should be addressed in more detail in the future as more is learned about effects of air pollution and methods for monitoring its effects on vegetation.	
3	000332	FCN 3 (Cwm Nofydd - north)	<p>This unit is owned by Cardiff Council and has been managed for some time for nature conservation. Selective thinning, removal of sycamore and ride creation have occurred in the past. There are areas of woodland where all the trees are of similar age and there is little regeneration. The long term aim is to allow woodland processes, including gap creation and regeneration, to evolve naturally over time. Selective halo thinning and group thinning may be required to improve biodiversity in areas where past management has resulted in stands of even aged trees. Areas with good or developing structure will be left to evolve naturally.</p> <p>Japanese Knotweed has been noted in this unit and will need management. Heavy recreational pressure by walkers, cyclists and horse-riders is experienced in this unit.</p> <p>Any potential atmospheric pollution, independently and cumulatively, from adjacent roads, quarrying, industrial processes and development should be regularly</p>	Yes

			<p>reviewed and controlled through an integrated approach between regulatory bodies. Critical loads are already exceeded for certain pollutants. At present the impact of this on the features is unquantified but this should be addressed in more detail in the future as more is learned about effects of air pollution and methods for monitoring its effects on vegetation.</p>	
4	000333	FCN 4 (Cwm Nofydd - south)	<p>This unit is owned by Cardiff Council and has been managed for some time for nature conservation. Selective thinning, removal of Sycamore and ride creation have occurred in the past. There are areas of woodland where all the trees are of similar age and there is little regeneration. The long term aim is to allow woodland processes, including gap creation and regeneration, to evolve naturally over time. Selective halo thinning or group thinning may be required to improve biodiversity in areas where past management has resulted in stands of even aged trees. Areas with good or developing structure will be left to evolve naturally. Recreational pressure is considered to be less in this unit than adjacent units.</p> <p>Any potential atmospheric pollution, independently and cumulatively, from adjacent roads, quarrying, industrial processes and development should be regularly reviewed and controlled</p>	Yes

			<p>through an integrated approach between regulatory bodies. Critical loads are already exceeded for certain pollutants. At present the impact of this on the features is unquantified but this should be addressed in more detail in the future as more is learned about effects of air pollution and methods for monitoring its effects on vegetation.</p>	
8	000337	CC 3 (Forestry Commission)	<p>This unit is owned by Natural Resources Wales (formerly Forestry Commission). The long term aim is to allow woodland processes, including gap creation and regeneration, to evolve naturally over time. All fallen trees are left in situ, where safe, to increase the dead wood component of the woodland. Heavy recreational pressure by walkers, cyclists and horse-riders is experienced and some site-specific health and safety issues need to be addressed by management.</p> <p>Any potential atmospheric pollution, independently and cumulatively, from adjacent roads, quarrying, industrial processes and development should be regularly reviewed and controlled through an integrated approach between regulatory bodies. Critical loads are already exceeded for certain pollutants. At present the impact of this on the features is unquantified but this should be addressed in more detail in the future as more is learned about effects of air</p>	Yes

			<p>pollution and methods for monitoring its effects on vegetation.</p> <p>Commercial forestry to the north of this unit may have implications for surface water supply and quality and should be kept under review. There is considerable development pressure in the vicinity and a potential range of impacts arising from increasing urbanisation.</p>	
9	000338	CC 4 (Castell Coch)	<p>This unit is owned by CADW and a private land owner. Selective thinning, removal of Sycamore and ride creation have occurred in the past. The long term aim is to allow woodland processes, including gap creation and regeneration, to evolve naturally over time. Areas with good or developing structure will be left to evolve naturally. All fallen trees are left in situ, where safe, to increase the dead wood component of the woodland. Heavy recreational pressure by walkers, cyclists and horse-riders is experienced and some site-specific health and safety issues need to be addressed by management. A protocol has been agreed with CADW whereby they seek yearly assent for any health and safety related tree works required in the vicinity of public footpaths.</p> <p>Any potential atmospheric pollution, independently and cumulatively, from adjacent roads, quarrying, industrial processes and development should be regularly</p>	Yes

			<p>reviewed and controlled through an integrated approach between regulatory bodies. Critical loads are already exceeded for certain pollutants. At present the impact of this on the features is unquantified but this should be addressed in more detail in the future as more is learned about effects of air pollution and methods for monitoring its effects on vegetation.</p> <p>Commercial forestry to the north of this unit may have implications for surface water supply and quality and should be kept under review. There is considerable development pressure in the vicinity and a potential range of impacts arising from increasing urbanisation.</p>	
10	000339	GW 1 (SAC woodland)	<p>This unit is owned by a quarry company. Much of the woodland appears to have been managed in the past as high forest and includes areas that have been planted with Beech and Pine. There are areas of semi-natural woodland and plantation where all the trees are of similar age and there is little regeneration. Selective halo thinning or group thinning of these areas may be required. Areas with good or developing structure will be left to evolve naturally. Past and current quarrying in this area has caused disturbance to the habitat and natural colonisation of these areas continues to be encouraged. Health and safety issues also need</p>	Yes

			<p>consideration.</p> <p>Any potential atmospheric pollution, independently and cumulatively, from adjacent roads, quarrying, industrial processes and development should be regularly reviewed and controlled through an integrated approach between regulatory bodies. Critical loads are already exceeded for certain pollutants. At present the impact of this on the features is unquantified but this should be addressed in more detail in the future as more is learned about effects of air pollution and methods for monitoring its effects on vegetation.</p> <p>Footpaths are present along the northern boundary and within the north-west corner of the site. Recently scramble biking has become a concern, and impacts need to be kept under review.</p>	
--	--	--	--	--

7.2 Ongoing management

INTENTIONALLY BLANK

8. GLOSSARY

This glossary defines some of the terms used in this **Core Management Plan**. Some of the definitions are based on definitions contained in other documents, including legislation and other publications of Natural Resources Wales and the UK nature conservation agencies.

Action	A recognisable and individually described act, undertaking or project of any kind, specified in section 5 or 6 of a Core Management Plan or Management Plan, as being required for protecting, managing or enhancing one or more of the features for which a site is designated.
Attribute	A quantifiable and monitorable characteristic of a feature that, in combination with other such attributes, describes its condition.
Common standards	See JNCC common standards.
Condition	A description of the state of a feature in terms of qualities or attributes that are relevant in a nature conservation context. For example, the condition of a habitat usually includes its extent and species composition and might also include aspects of its ecological functioning, spatial distribution and so on. The condition of a species population usually includes its total size and might also include its age structure, productivity, relationship to other populations and spatial distribution. Aspects of the habitat(s) on which a species population depends may also be considered as attributes of its condition. Condition is considered favourable when all the conservation objectives are being met.
Conservation management	Acts or undertaking of all kinds, including but not necessarily limited to actions, taken with the aim of achieving the conservation objectives of a site. Conservation management includes the taking of statutory and non-statutory measures, it can include the acts of any party and it may take place outside site boundaries as well as within sites. Conservation management may also be embedded within other frameworks for land/sea management carried out for purposes other than achieving the conservation objectives.
Conservation objective	The expression of the desired state of a feature, expressed as a composite statement defining the condition that we wish the feature to be in. Each feature has one conservation objective.

Core Management Plan	A Natural Resources Wales document containing the conservation objectives for a site and a summary of other information contained in a full site Management Plan.
Factor	Anything that has influenced, is influencing, or may influence the condition of a feature. Factors can be natural processes, human activities or effects arising from natural process or human activities. They can be positive or negative in terms of their influence on features, and they can arise within a site or from outside the site. Physical, socio-economic or legal constraints on management of the site can also be considered as factors.
Favourable condition	See condition.
Favourable conservation status	The Habitats Directive definition of Favourable Conservation Status (FCS) is given in full in section 4.
Feature	The species population, habitat type or other entity for which a site is designated. The ecological or geological interest which justifies the designation of a site and which is the focus of conservation management.
Integrity	See Site integrity.
JNCC common standards	A set of principles developed jointly by the UK nature conservation agencies to help ensure a consistent approach to monitoring and reporting on the features of sites designated for nature conservation, supported by guidance on identification of attributes and monitoring methodologies.
Key Feature	The habitat or species population within a management unit that is the primary focus of management and monitoring in that unit.
Management Plan	The full expression of a designated site's legal status, vision, features, conservation objectives, performance indicators and management requirements. A complete management plan may not reside in a single document, but may be contained in a number of documents (including in particular the Core Management Plan) and sets of electronically stored information.

Management Unit

An area within a site, defined according to one or more of a range of criteria, such as topography, location of features, tenure, patterns of land/sea use. The key characteristic of management units is to reflect the spatial scale at which site management and monitoring can be most effectively organised. They are used as the primary basis for differentiating priorities for conservation management and monitoring in different parts of a site, and for facilitating communication with those responsible for management of different parts of a site.

Monitoring

An intermittent (regular or irregular) series of observations in time, carried out to show the extent of compliance with a formulated standard or degree of deviation from an expected norm. In monitoring of sites designated for habitat and species conservation, the formulated standard is the quantified expression of favourable condition based on attributes.

Operational limits

The levels or values within which a factor is considered to be acceptable in terms of its influence on a feature. A factor may have both upper and lower operational limits, or only an upper limit or lower limit. For some factors an upper limit may be zero.

Performance indicators

The attributes and factors together with their associated target values (or ranges of values) which provide the standard against which information from monitoring and other sources is used to determine the degree to which the conservation objectives for a feature are being met.

Plan or project

Project: Any form of construction work, installation, development or other intervention in the environment, the carrying out or continuance of which is subject to a decision by any public body or statutory undertaker.

Plan: a document prepared or adopted by a public body or statutory undertaker, intended to influence decisions on the carrying out of **projects**.

Decisions on plans and projects which affect Natura 2000 and Ramsar sites are subject to specific legal and policy procedures.

Site integrity	This is defined in Welsh Government policy as the coherence of a site's ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it is designated.
Site Management Statement (SMS)	The document containing Natural Resources Wales' views about the management of a site issued as part of the legal notification of an SSSI under section 28(4) of the Wildlife and Countryside Act 1981, as substituted.
Special Feature	See feature.
Specified limits	The levels or values for an attribute which define the degree to which the attribute can fluctuate without creating cause for concern about the condition of the feature. The range within the limits corresponds to favourable, the range outside the limits corresponds to unfavourable. Attributes may have lower specified limits, upper specified limits, or both.
Unit	See management unit.
Vision Statement	The statement conveying an impression of the whole site in the state that is intended to be the product of its conservation management. A 'pen portrait' outlining the conditions that should prevail when all the conservation objectives are met. A description of the site as it would be when all the features are in favourable condition.

9. REFERENCES

- Byrne, C.** (2013). – Castell Coch Woodlands and Road Section SSSI Monitoring of Geological Features.
- Carter, J. & Mann, D.J.** (1997). *Report on the Survey of Lesser Garth Cave, Cardiff, for the troglobitic spider Porrhomma rosenhaueri, Koch (Araneae: Linyphiidae), with notes on other invertebrate species found.* National Museum and Galleries of Wales survey report.
- Carter, J. D.** (2010). Monitoring Invertebrate features on SSSI - *Porrhomma rosenhaueri* in Lesser Garth Cave, Cardiff. CCW Contract Science Report No: 907, 28pp, Countryside Council for Wales, Bangor.
- Castell Coch Woodlands and Road Section SSSI – Citation. CCW document.
- Castell Coch Woodlands and Road Section SSSI – Site Management Statement. CCW document.
- Cooke, R.** (1990). *Castell Coch Woodland SSSI NVC survey.* CCW internal document.
- Countryside Council for Wales** (2007) *Site Issues Briefing for Cardiff Beech Woods SAC.*
- Ecotech** (1997). *NVC Survey of Cwm Nofydd.* CCW internal document.
- Ecotech** (1997). *NVC Survey of Fforest Ganol.* CCW internal document.
- Ecotech** (1997). *NVC Survey of Garth Wood.* CCW internal document.
- Fforestganol a Chwm Nofydd SSSI – Citation. CCW document.
- Fforestganol a Chwm Nofydd SSSI – Site Management Statement. CCW document.
- Garth Wood SSSI – Citation. CCW document.
- Garth Wood SSSI – Site Management Statement. CCW document.
- Hopkins, J.J., Allison, H.M., Walmsley, C.A., Gaywood, M., Thurgate, G.** (2007). *Conserving biodiversity in a changing climate: guidance on building capacity to adapt.* Defra on behalf of UKBAP.
- Joint Nature Conservation Committee (JNCC)**, Cardiff Beech Woods SAC (UK0030109) Site Details
<http://www.jncc.gov.uk/ProtectedSites/SACselection/sac.asp?EUCode=UK0030109>
- Revill, S.** (2008). *Core Management Plan for Cardiff Beech woods SAC.* CCW internal document.

Rodwell, J. S. (ed) (1991). *British Plant Communities. Vol. 1: Woodlands and Scrub*. Cambridge University Press.

Stace, C. (2010). *New flora of the British Isles*, 3rd edition. Cambridge University press, Cambridge.

Stubbs, A. (1994). *Letter re visit to Glamorganshire and Carmarthenshire, June 1994 re calcareous seepage sites, to Gill Barter CCW, Ian Morgan & Adrian Fowles CCW*. Internal CCW Document, Cardiff and Newport Site Data Base. (JNCC, Invertebrate Site Register).

Westwood, S. & Wilkinson, K. (2010). *Additional NVC survey of Garth Wood*. CCW Internal Document.

Wilkinson, K. (April & May 2009). *Cardiff Beech Woods SAC Monitoring Report, Asperulo-Fagetum beech forests (9130) draft Monitoring Round 2 (2007-2012)*. CCW Internal Report.

Wilkinson, K (April and May 2009 and January 2010). *Cardiff Beech Woods SAC Monitoring Report, Tilio-Acerion forests of slopes, screes and ravines (9180), Monitoring Round 2 (2007-2012)*. CCW Internal Report.

Wilson, L., McCall, R., Astbury, S., Bhogal, A. & Walmseley, C. (2013). *Climate vulnerability assessment of designated sites in Wales, revised and updated final report*. CCW Contract Science Report N0 1017. CCW, ADAS, WAG.

www.apis.ac.uk

www.cardiff.gov.uk designated nature conservation sites

10. APPENDICES: PERFORMANCE INDICATORS

These performance indicators describe the evidence, including in particular evidence to be obtained from monitoring of sites and features, that will be used to inform judgements about whether or not the conservation objectives (in section 4 of the Core management plans) are being met.

These performance indicators should NOT be used as a substitute for the conservation objectives, including in particular for the purposes of assessing plans and projects. The assessment of plans and projects should be made in view of the conservation objectives set out in section 4.

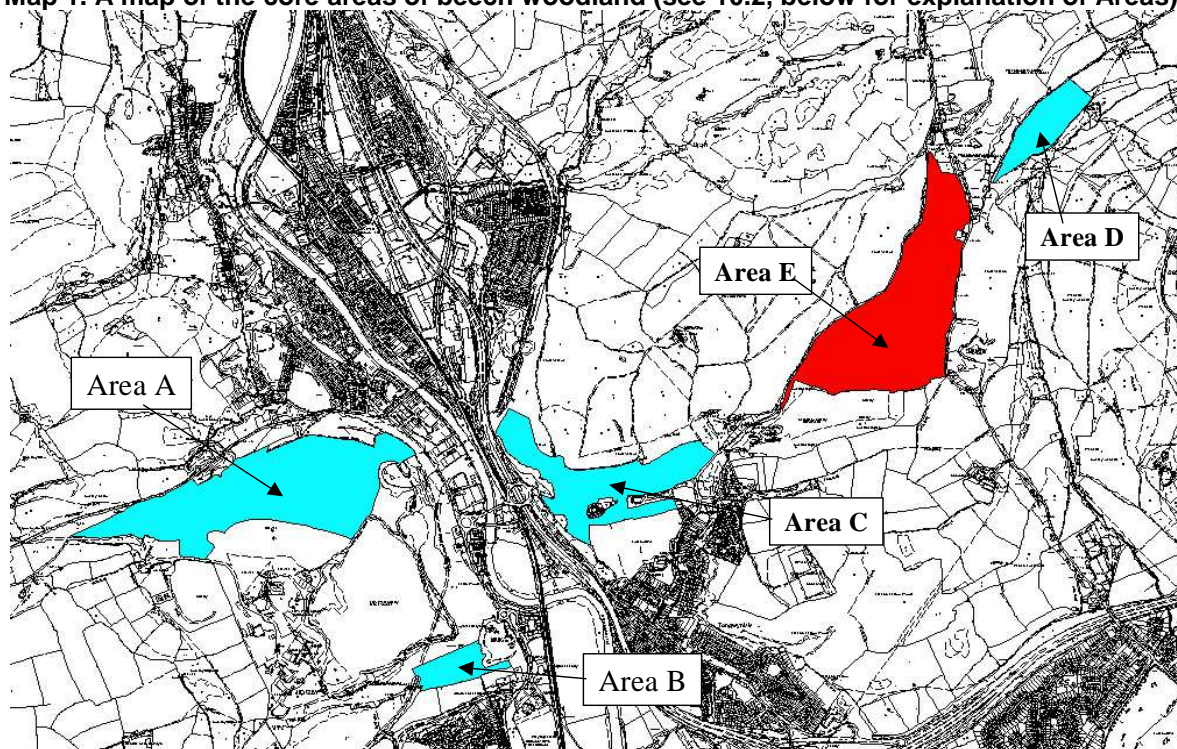
10.1 Appendix 1.1: Performance indicators for Feature 1: *Asperulo-Fagetum* beech forests (EU Habitat Code 9130)

Performance indicators for maintenance management		To maintain the beech woodland of the Cardiff Beech Woods SAC in favourable condition where:
Extent	Upper limit	None set (However, it will be limited by the targets set in the conservation objective for the <i>Tilio-Acerion</i> feature)
	Lower limit	As mapped (Garth Wood and Fforestganol a Chwm Nofydd mapped in 1997 by Ecotech and Castell Coch in 1990 by R. Cooke)
Quality	Lower limit	<p>All of the following criteria are met:</p> <p>Within each of areas A, B and C:</p> <ul style="list-style-type: none"> At least 95% of the canopy forming trees are native per 50 X 50 m area and at least 50% of the canopy forming trees per 50 x 50 m area are beech. There are, on average, at least 5 mature trees per 50 x 50m area. There are, on average, at least 5 viable beech saplings per 50 x 50m area. There are, on average, at least 2 pieces of dead wood per 50 x 50m area. <5% of the ground flora is disturbed <p>Within area D there is a continued presence of beech woodland.</p> <p>Within area E beech is at least present as a viable sapling, a sub-canopy or canopy tree in all 50 x 50 m area.</p> <p>There should be a minimum of 5 areas of dense, viable, beech regeneration across the total area of beech woodland in areas A-C.</p> <p>Map 1 shows the locations of Area A-E</p>
Beech woodland		The canopy is generally dominated by Beech <i>Fagus sylvatica</i> however in some areas Ash <i>Fraxinus excelsior</i>

	shares dominance. The shrub layer is sparse with scattered Hazel <i>Corylus avellana</i> and <i>Fagus</i> saplings and occasional Holly <i>Ilex aquifolium</i> . The field layer is also characterised by its sparse-ness, largely due to the presence of deep leaf litter, low light levels and thin soils. Patches of bare ground are frequent. However in some areas Bramble <i>Rubus fruticosus</i> or Ivy <i>Hedera helix</i> can form dense patches. Other associated ground flora species include Dog's Mercury <i>Mercurialis perennis</i> , Bluebell <i>Hyacinthoides non-scripta</i> , Wood Anemone <i>Anemone nemorosa</i> , Ramsons <i>Allium ursinum</i> , Sancile <i>Sanicula europaea</i> , and Male Fern <i>Dryopteris filix-mas</i>
Canopy forming tree	Any tree that contributes to the canopy
Native species	Any species native to the area, including Sycamore <i>Acer pseudoplatanus</i>
Mature tree	Canopy forming tree with a girth of >150cm at chest height.
Viable beech sapling	Beech sapling >1.5m in height and with a maximum stem diameter of 10cm.
Dead wood	Fallen trees, fallen branches, dead branches on living trees or standing dead trees (all > 20cm in diameter and longer than 2m)
Patch of dense viable beech regeneration	Areas of regeneration >10m x 10m with a minimum density of 50 viable beech saplings per 100m ² . Each area of advance regeneration needs to be separated by a minimum of 10m

The rationale behind the selection of the performance indicators is provided below.

Map 1. A map of the core areas of beech woodland (see 10.2, below for explanation of Areas).



10.2 Rationale behind the performance indicators.

10.2.1 Extent

The NVC surveys undertaken in 1990 by R. Cooke (as part of the internal programme of woodland survey by the Nature Conservancy Council) and in 1997 by Ecotech were used to set the limits for the extent of this feature. No upper limit was included; however the extent is limited by the requirements of the *Tilio-Acerion* performance indicators that have been agreed for this site. There is the potential for some degree of transition between these two features, although it is unlikely that the beech will replace the *Tilio-Acerion* on the steep ground, where the latter currently pre-dominates.

As the beech woodland has been identified as the feature of primary interest, we want to maintain as a minimum the current extent and the target has been set to reflect this.

10.2.2 Quality

Assessment of the quality of the beech woodland can be broken down into sections:

10.2.2.1 Quality within A, B and C.

Three key areas of beech woodland have been identified within this SAC. These contain the largest blocks of beech woodland habitat. Also although the majority of the beech woodland within this SAC is within these areas, small patches occur elsewhere in the SAC but they are too small to be considered fully functioning beech woodland.

The following attributes have been identified as being of crucial important in assessing the condition of the beech woodland in these areas: native canopy, proportion of beech in the canopy, number of mature trees, regeneration, deadwood and disturbance of the ground flora.

10.2.2.1.1 Native canopy

The target set requires 95% of trees that contribute to the canopy to be native. This is based on the Common Standards Monitoring target (JNCC, 2004) but rather than applying the target to the canopy cover we have attempted to make the target more measurable by assessing the number of non-native trees that contribute to the canopy. How this is measured is discussed below in the method section. The proportion of non-natives trees in the beech woodland is at present very low and we want to ensure this continues to be the case. In this instance sycamore is considered to be a native species. Over the years there have been lots of discussions as to whether sycamore should be accepted as a component of our UK woodlands. The current NRW position seems to be that where mature sycamore is already widespread on conservation sites it should be tolerated, partly as sycamore removal appears to be largely un-successful. Conversely where it is absent or present at low frequencies then it should be removed/managed against (Jim Latham pers. comm.) Sycamore is present in all the SSSI that make up this SAC, so currently we are tolerating its occurrence. Additional field notes were made of the

cover of sycamore in the canopy, sub-canopy and field layer so this discussion can be reviewed in the future.

10.2.2.1.2 Proportion of beech in the canopy

Areas A, B and C are considered to be 'core' areas of habitat with a high beech cover. A high beech cover tends to result in a deep leaf litter and a heavy shading, which in turn generates the spare field and ground layers that are typical of the habitat. These conditions provide suitable habitat for the more unusual woodland ground flora species found at Cardiff Beech Woods such as yellow bird's nest orchid and common bird's nest orchid. The target in the PIs requires 50% of the canopy forming trees overall in each block to be beech, meeting this target should help ensure that the habitats characteristic structure and ground flora are being maintained, providing suitable conditions for the rarer plants in the field layer.

10.2.2.1.3 Number of mature trees

The overall aim is to have a canopy that is not completely closed. Rather than concentrate on trying to work out how much of the canopy is open or how many gaps there are, the target is aimed at ensuring that there are a minimum number of mature trees throughout the blocks that are considered large enough to fall if conditions arise. The definition of a mature tree is based on visual assessments of the size of trees that have already fallen over. As these trees fall they will open up the canopy and allow opportunities for regeneration.

10.2.2.1.4 Regeneration

The target for regeneration is set in two ways; one requires that small amounts of beech regeneration are found throughout the core areas of beech woodland. As beech can grow under a closed canopy the saplings do not need to be associated with a canopy gap. This ensures that should gaps appear the woodland is capable of regenerating. The second method of assessment is discussed below in section 10.2.2.5.

10.2.2.1.5 Dead wood

No particularly rare species which rely on dead wood have been recorded from Cardiff Beech Woods SAC. However it is generally accepted that dead wood is an important component of any woodland. A target has been included for a minimum amount.

10.2.2.2 Disturbance and condition of ground flora

The ground flora under the beech woodland is variable. Some areas are dominated by species such as Bluebell *Hyacinthoides non-scripta*, Ramsons *Allium ursinum*, Wood anemone *Anemone nemorosa* and Dog's Mercury *Mercurialis perennis*. In other areas forb cover is very low and the ground is covered in deep leaf litter. Beech seedlings c.20cm are often frequent. One of the main sources of aesthetic,

as well as ecological interest in these woodlands is provided by the large stands of bluebells and ransoms found under both beech and ash canopies, and we don't want to see this reduced. Areas with a sparser ground flora often provide suitable conditions for 'beech woodland specialists' including yellow bird's nest orchid. We don't want to see a decrease in the extent of ground flora nor increased levels of disturbance to areas which do support either general woodland species or specialist beech woodland plants. As this SAC is within close proximity to Cardiff the woodlands come under a high recreational pressure, particularly from mountain bikers and scramblers. The use of this site for these activities appears to have increased in recent years. The number of trails throughout certain sections seems to have increased. A target has been included to ensure that disturbance to the ground flora is minimal.

10.2.2.3 Continued presence in area D

The beech woodland in this area comprises small scattered stands, many of which are transitional in character to other woodland types, principally W8. We don't expect to see a fully functioning beech woodland here. As a result we simply want to see a continued presence of beech woodland in this area, to maintain the distribution of beech throughout the SAC.

10.2.2.4 Continued presence of beech throughout area E

Area E contains part of Fforestganol a Chwm Nofydd SSSI. During the NVC survey the woodland here was predominantly recorded as W8 b/d, with small pockets of W12. However beech trees are scattered at low levels throughout this block and it is felt that these make an important contribution to the condition of the true beech woodland within the SAC, linking and supporting the other stands. As a consequence a target has been included in the performance indicators requiring that beech continues to be present throughout the area if the feature is to be considered in favourable condition.

10.2.2.5 Advanced regeneration

Beech is able to produce viable saplings under a closed canopy, often resulting in the presence of dense stands of so called 'advanced regeneration'. In Cardiff Beech Woods this generally occurs at the bottom of sloping ground, possibly as a result of seeds being washed down slope, and is particularly noticeable in Castell Coch and Area B in Garth Wood. It is likely that the majority of these saplings will fail to reach the canopy, however should conditions become suitable and a gap is created, beech saplings are already at an advantage over other species by being 1m plus tall. These patches of dense regeneration are also a valuable sub-habitat in their own right, notably providing cover for breeding birds in otherwise very open woodland. As such a target requiring that at least five patches of dense beech regeneration are present in the whole of the core beech woodland (areas A-C only) has been included in the performance indicators.

The following table shows how the JNCC Common Standards Monitoring woodland guidance (JNCC, 2004) has been used to develop the performance indicators. The guidance requires that at least one target is set for each attribute.

10.3 Appendix 1.2: Performance indicators for Feature 2:
Tilio-Acerion forest of slopes, screes and ravines (EU Habitat Code 9180)

Performance indicators for maintenance management		To maintain the <i>Tilio-Acerion</i> woodland of the Cardiff Beech Woods SAC in favourable condition where:
Extent	Upper limit	None set (However, it will be limited by the targets set in the conservation objective for the beech woodland feature)
	Lower limit	As mapped (Garth Wood and Fforestganol a Chwm Nofydd mapped in 1997 by Ecotech, with additional survey work undertaken by Westwood and Wilkinson in 2010)
Quality	Lower limit	<p>Within mapped areas of <i>Tilio-Acerion</i> within Garth Wood and Cwm Nofydd:</p> <ul style="list-style-type: none"> • At least 95% of the canopy forming trees are native. • There are, on average, at least 5 mature trees per 50 x 50m area. • There are, on average, at least 5 viable ash saplings per 50 x 50m area. • There are, on average, at least 2 pieces of dead wood per 50 x 50m area. • <5% of the ground flora is disturbed and the species composition is typical
Site specific habitat definitions		
<i>Tilio-Acerion</i> woodland		Woodland on steep, rocky limestone slopes or sloping, 'undulating' ground. Ash <i>Fraxinus excelsior</i> is at least present in the canopy and is generally associated with a wide variety of other canopy forming species e.g. Beech <i>Fagus sylvatica</i> and Sycamore <i>Acer pseudoplatanus</i> . Harts-tongue Fern <i>Asplenium scolopendrium</i> is at least present in the ground flora within a 10m radius. In addition <i>Dryopteris</i> species are often present.
Canopy forming tree		Any tree that contributes to the canopy.
Native species		Any species native to the area, including Sycamore <i>Acer pseudoplatanus</i> .
Mature tree		Canopy forming tree with a girth of >150cm at chest height.
Viable ash sapling		Ash sapling >1.5m in height and with a maximum stem diameter of 10cm.
Dead wood		Fallen trees, fallen branches, dead branches on living trees or standing dead trees (all > 20cm in diameter and longer than 2m).

The rationale behind the selection of the performance indicators is provided below.

Rationale behind the performance indicators.

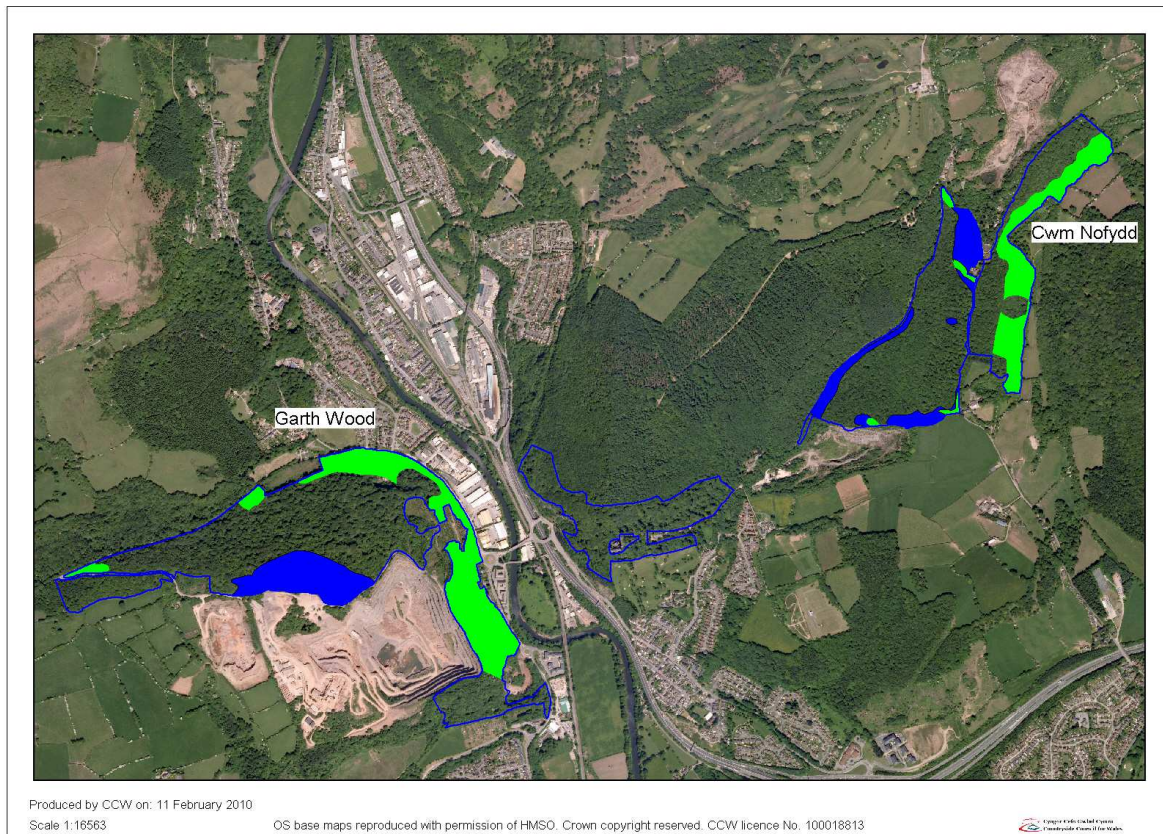
10.3.1 Extent

The NVC surveys undertaken by Ecotech in 1997 plus additional survey work by S. Westwood and K. Wilkinson in 2010 were used to set the limits for the extent of this feature. The current extent of the *Tilio-Acerion* woodland is shown in green on Map 1 and is thought to be 20.7 ha. This is the extent of the so called 'true' *Tilio-Acerion* and it does not include areas of ash woodland on flatter ground, which are also referable to W8 sub-communities.

Within NRW, where these sub-communities occur on flat or gently sloping ground there has been a tendency to consider these areas as 'supporting habitat'. However, contrary to the approach taken on other SACs, within Cardiff Beech Woods these areas are *not* considered to be part of the feature and they have not been monitored as part of the 2009/10 assessment. Within the Gower Ash Woods SAC for example, large areas of *Tilio-Acerion* are linked together by areas of so called supporting habitat. 'True' habitat runs into 'supporting' habitat; the two are difficult to separate and ecologically it makes sense to consider them together. Here in the Cardiff Beech Woods SAC areas of supporting habitat are found as fragments, isolated from true *Tilio-Acerion* and as a result their role as ecologically supporting habitat begins to break down. As such they have been excluded from this assessment, although they still are an important part of the semi-natural broadleaf woodland SSSI feature and will be assessed under that heading.

No upper limit was included for the extent of Tilio-Acerion, however the extent is limited by the requirements of the performance indicators for the beech woodland feature and the natural topography. There is the potential for some degree of transition between these two features, although it is unlikely that the beech will replace the Tilio-Acerion on the steep ground, where the latter currently predominates.

Map 1. Current extent of the *Tilio-Acerion* woodland within Cardiff Beech Woods SAC. 'True' *Tilio-Acerion* is shown in green, habitat supporting *Tilio-Acerion* is shown in blue.



10.3.2 Quality

Garth Wood and Cwm Nofydd contain the majority of the *Tilio-Acerion* within this SAC, so monitoring is targeted at these two areas. Both woodland blocks have to meet the criteria laid out in the performance indicators for the *Tilio-Acerion* overall to be considered favourable. The following attributes have been selected to assess the quality of the *Tilio-Acerion* woodland:

10.3.2.1 Native canopy

The target set requires 95% of trees that contribute to the canopy to be native. This is based on the Common Standards Monitoring target (JNCC, 2004) but rather than applying the target to the canopy cover we have attempted to make the target more measurable by assessing the number of non-native trees that contribute to the canopy. Measurement of this attribute is discussed below in the method section. The proportion of non-natives trees in the *Tilio-Acerion* woodland is very low and we want to ensure this continues to be the case. In this instance sycamore is considered to be a native species. Over the years there have been lots of discussions as to whether sycamore should be accepted as a component of our UK woodlands. The current NRW position seems to be that if sycamore is present to any great extent it should be tolerated, partly as sycamore removal appears to be largely un-successful. If it is absent or present at low frequencies then it should be removed/managed against (Jim Latham pers. comm.). Sycamore is present in all the SSSI that make up this SAC, so currently we are tolerating its occurrence. Additional field notes were made of the cover of sycamore in the canopy, sub-canopy and field layer so this discussion can be reviewed in the future.

10.3.2.2 Number of mature trees

The overall aim is to have a canopy that is not completely closed. Rather than concentrate on trying to work out how much of the canopy is open or how many gaps there are the target is aimed at ensuring that there are a minimum number of mature trees throughout the *Tilio-Acerion* woodland that are considered large enough to fall if conditions arise. The definition of a mature tree is based on visual assessments of trees that have already fallen over. As trees fall they will open up the canopy and allow opportunities for regeneration.

10.3.2.3 Regeneration

The target for regeneration is set to ensure that small amounts of viable native regeneration are found throughout these areas of *Tilio-Acerion* woodland. As ash can grow under a closed canopy the saplings do not need to be associated with a canopy gap. This ensures that should gaps appear the woodland is capable of regenerating.

10.3.2.4 Dead wood

There are no known species of particular conservation concern found with Cardiff Beech Woods SAC that rely on dead wood. However it is generally accepted that dead wood is an important component of any woodland. A target has been included for a minimum amount.

10.3.2.5 Disturbance and condition of ground flora

The ground flora in areas mapped as *Tilio-Acerion* is variable. Some areas are dominated by species such as Bluebell *Hyacinthoides non-scripta*, Ramsons *Allium ursinum*, Wood anemone *Anemone nemorosa* and Dog's Mercury *Mercurialis perennis*. On steeper, rockier Hart's-tongue Fern and other *Dryopteris spp.* are frequent. There should be no decrease in the extent of ground flora nor increased levels of disturbance to areas which support either general woodland species or specialist woodland plants. As this SAC is within close proximity to Cardiff the woodlands come under a high recreational pressure, particularly from mountain bikers and scramblers. The use of this site for these activities appears to have increased in recent years and the number of trails throughout certain sections seems to have increased. A target has been included to ensure that disturbance to the ground flora is minimal.



**Cyfoeth
Naturiol**
Cymru
**Natural
Resources**
Wales

Published by:
Natural Resources Wales
Cambria House
29 Newport Road
Cardiff
CF24 0TP

0300 065 3000 (Mon-Fri, 8am - 6pm)

enquiries@naturalresourceswales.gov.uk
www.naturalresourceswales.gov.uk

© Natural Resources Wales

All rights reserved. This document may be reproduced with prior permission of
Natural Resources Wales