

Coed Darcy

Green Infrastructure Statement

Rev A 25th November 2024

Overview

As part of the development process, the existing Green Infrastructure (GI) asset has been assessed through a landscape desktop survey, and the context of the site, in its wider GI network, and within the policy framework updated Chapter 6 of PPW 12. The following statement reports on the iterative GI process and how it has influenced the design, focusing on the appropriate and proportionate GI benefits that development of the site can contribute, with regard to, and taking all reasonable steps, to enhance the proposal.

Chapter 6 of PPW states *‘all reasonable steps must be taken to maintain and enhance biodiversity and promote the resilience of ecosystems and these should be balanced with the wider economic and social needs of business and local communities’*

Introduction

Definition of Green Infrastructure.

The term ‘Green Infrastructure’ first came to prominence in the early 2000’s most notably in the Landscape Institute Position Statement ‘Green Infrastructure An integrated approach to landuse’ (2009). This document defined Green Infrastructure as;

‘The network of natural and semi-natural features, green spaces, rivers and lakes that intersperse and connect villages, towns and cities. It is a natural, service-providing infrastructure that is often more cost effective, more resilient and more capable of meeting social, environmental and economic objectives than ‘grey’ infrastructure.’

GI Functions are described as the:

‘roles that assets can play if planned, designed and managed in a way that is sensitive to, and includes provision for, natural features and ecosystems services. They may have obvious primary functions, but each asset can perform different functions simultaneously – ‘multifunctionality.’

Green/Blue Infrastructure (GI) is the term adopted in this document to incorporate the now more fully developed drainage requirements for developments under SABs, (Sustainable Drainage Approval Body) in Wales, along with other GI elements including all the features of

the natural environment between and within towns and cities, including greenspace, vegetation and water. Provision of GI offers a multitude of ecosystem services (i.e. the benefits that people derive from nature) and forms part of a sustainable approach to the management of natural resources. New infrastructure should seek to strengthen and reinforce existing assets within a site and it should be planned and designed to be beneficially multi-functional.

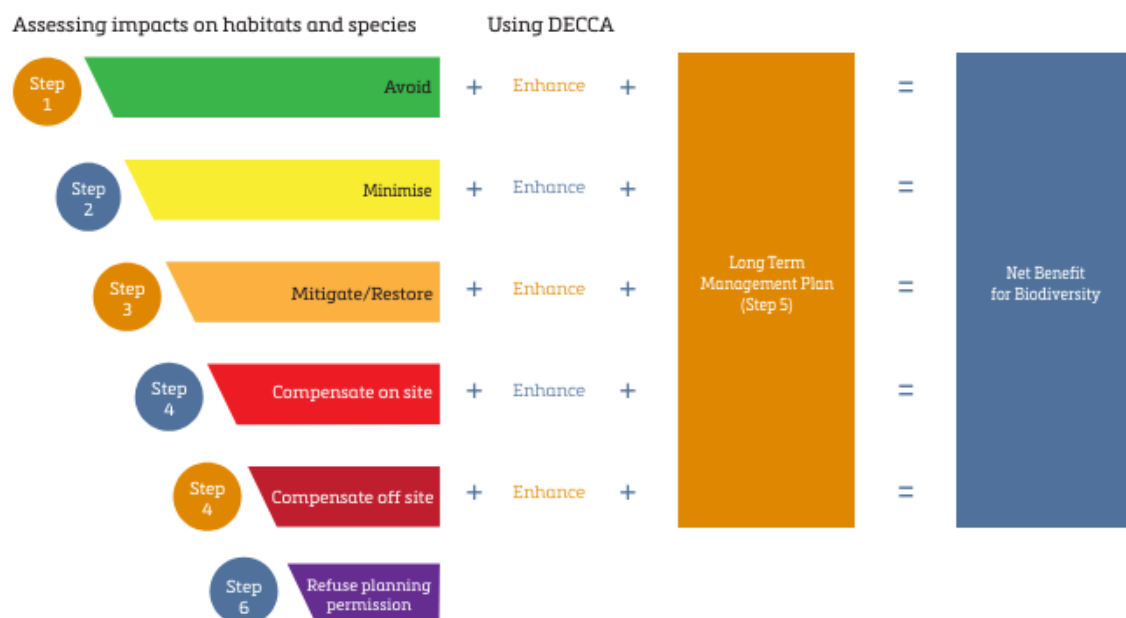
Policy & Guidance

Planning Policy Wales 12

6.2.12

A green infrastructure statement should be submitted with all planning applications. This will be proportionate to the scale and nature of the development proposed and will describe how green infrastructure has been incorporated into the proposal. In the case of minor development this will be a short description and should not be an onerous requirement for applicants. The green infrastructure statement will be an effective way of demonstrating positive multi-functional outcomes which are appropriate to the site in question and must be used for demonstrating how the step-wise approach (Paragraph 6.4.15) has been applied.

Figure 12: Summary of the Step-Wise Approach

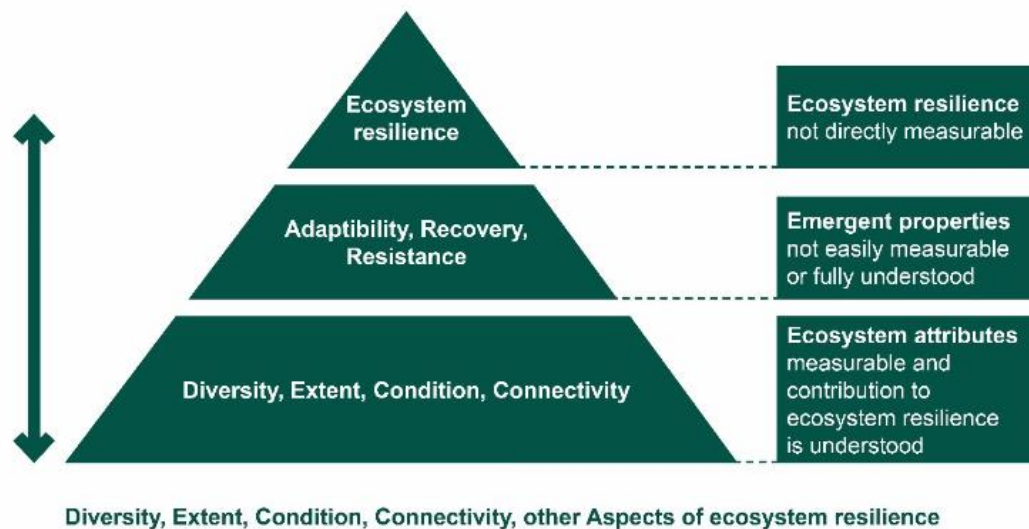


Ecosystem Resilience/ DECCA

Planning Policy Wales 12 requires the approach to biodiversity issues on a site to be guided by the larger view regarding creating resilient ecosystems across the country. This in turn needs to be taken into account when designing development sites. The resilience of an ecosystem is difficult to measure in a quantifiable manner, therefore specific ecosystem attributes and their emergent properties are being used as proxies for resilience. This has resulted in the DECCA framework approach, which sets out the following attributes to consider:

- Diversity
- Extent
- Condition
- Connectivity
- Adaptability

Adaptability, recovery and resistance are seen as emergent properties from the above.



Decca framework showing the relationship between the attributes and the emergent properties of resilience

Future Wales: The National Plan 2040

Policy 9 – Resilient Ecological Networks and Green Infrastructure

“To ensure the enhancement of biodiversity, the resilience of ecosystems and the provision of green infrastructure, the Welsh Government will work with key partners to:

- identify areas which should be safeguarded and created as ecological networks for their importance for adaptation to climate change, for habitat protection, restoration or

Creation, to protect species, or which provide key ecosystems services, to ensure they are not unduly compromised by future development; and

- identify opportunities where existing and potential green infrastructure could be maximised as part of placemaking, requiring the use of nature-based solutions as a key mechanism for securing sustainable growth, ecological connectivity, social equality and well-being.

Planning authorities should include these areas and/or opportunities in their development plan strategies and policies in order to promote and safeguard the functions and opportunities they provide. In all cases, action towards securing the maintenance and enhancement of biodiversity (to provide a net benefit), the resilience of ecosystems and green infrastructure assets must be demonstrated as part of development proposals through innovative, nature-based approaches to site planning and the design of the built environment.”

“As part of a green infrastructure assessment, broad opportunities for habitat protection, restoration or creation and the provision of green infrastructure may be specified as part of identifying areas to be safeguarded or may take the form of more specific allocations. This may be achieved, for example, through the provision of buffer areas around protected sites or stepping stones connecting habitats or through the identification of green infrastructure in and around urban areas.”

Neath Port Talbot Council, as part of their DARE Vision aims to create a cleaner, more prosperous and healthier county borough, with a mission to maximise the economic, social, health and environmental benefits of decarbonisation through a focus on renewable energy.

As part of this, one emphasis is on Green Infrastructure, ecosystem resilience and biodiversity. The council is prioritising the creation and sustainable management of Green Infrastructure (GI) and wider ecosystems to sequester carbon, address pollution and flood alleviation and provide wider benefits such as health and well-being.

Policy Principal Aims/Wider Targets of GI.

The principal multifunctional targeted benefits of GI are to:

1. Protect and enhance biodiversity and the resilience and connectivity of ecosystems;
2. Consider opportunities for habitat protection, restoration or creation;
3. Provide opportunities for improved physical and mental health and wellbeing through recreational access, community permeability, access to nature and connectivity;
4. Enhance place-making, identity and sense of community ownership;
5. Improve townscape and landscape quality and visual amenity;
6. Integrate play and recreation in GI networks;

7. Improve micro-climate (summer cooling/winter shelter);
8. Mitigate and adapt to the impacts of climate changes improving of;
 - Oxygen production and improve air and water quality.
 - Carbon sequestration (locking carbon in vegetation and soils).
 - Water sequestration (vegetation evapotranspiration and formal attenuations).
 - Provide alternative transportation opportunities (cycling/walking/public transport links).
 - Address Biosecurity and climate change resilience in habitats and species.

Development GI Process

Ecosystem Resilience/ DECCA Assessment

Diversity

Components of diversity are genetic characteristics, species and habitats. The design of the ecology at Coed Darcy takes into account the existing habitats on site, with different weightings both as to their inherent value, as well as their prevalence in the surrounding area. A number of habitats are being created and retained, including:

- woodland at a ratio of 3:1
- open mosaic habitat
- areas of bare ground
- numerous waterbodies
- areas of species-rich grassland

In addition to different types of habitats being created, the diversity aspect has also been taken into account when considering the habitats themselves. The great crested newt corridor is to include hibernacula, creating variation in topography, thereby creating diverse micro-climates within site. While habitats are also linked up as much as possible, they are being created in a manner where pockets are of varying sizes and shapes, so as to create edge effects. The above measures provide a diversity in habitat both in terms of seasonal usage, as well as species usage, the second component of this attribute. While the necessity of replacing trees 3:1 places a heavy emphasis on tree retention and planting, which would perhaps not have chosen had it not been for the requirements of PPW12, the habitats on site post development will provide a wide variety of species with habitat at all times of year.

Extent

Resilience is tied to the size of a specific ecosystem, population or habitat and this was taken into account during the design phase. Larger areas of habitat are to be created, as opposed to creating additional small amounts of habitats. Woodland will be planted in extension of existing pockets where possible. The great crested newt corridor will provide a large number of new ponds and

therefore both a network of meta-ponds, as well as ensuring resilience through there being many additional ponds, should one pond fail. Grassland areas also err on the side of larger areas. In addition, the majority of the areas put forward for biodiversity purposes are put forward for the western extent of the site and are adjacent to one another, thereby creating one large area of multiple habitats which can be traversed if needed, rather than being isolated.

Condition

Biotic and abiotic factors are used to determine condition of an ecosystem. Condition of the habitats will mostly be assessed via monitoring post-development, which by the virtue of this being a former contaminated site will include abiotic factors, as well as biotic data such as presence and abundance of species.

Connectivity

Links between and within habitats are what makes up connectivity. These can be corridors, stepping stones or patches of the same or related vegetation types. This is to be assessed in relation to relative distance species can travel, with some species being significantly more mobile than others. Most of the habitats retained or created are along the western edge of the development, adjacent to Crymlyn bog SAC, SSSI and NNR. This ensures good connectivity with this important site both in terms of habitats and also the species which utilise both sites, such as the herpetofauna and invertebrates, some of which are less mobile. In addition, the habitat corridor along the western edge also stretches along the northern boundary, thereby providing an east-west corridor. The railway line, which is outside of the redline, but cuts through the development east to west, is also such a corridor. The cycle track provides a further such corridor, as does the grassland stretch towards the southern extent of the site. These corridors ensure that the site and by extension Crymlyn bog are connected to the wider environment via terrestrial habitats, both in the form of woodland and grassland.

Adaptability, recovery and resistance

The above are seen as emergent properties of the four attributes described above. The above four properties have been taken into account on this site in a sufficient manner to ensure they are in place as functioning on site and especially the ongoing beneficial management of the habitats

and resulting prevention of successional processes is seen as a key factor in ensuring the resilience of the proposed designs.

The stepwise approach (PPW 12, page 148 figure 12) has been implemented. A summary of the stepwise approach is provided below;

1. **Avoid**
To avoid damage to biodiversity and ecosystem functioning.
2. **Minimise**
Alternative sites that would result in less harm, no harm or gain are to be fully considered to minimise any harmful environment effects.
3. **Mitigate/Restore**
‘...ensure that features and elements of biodiversity or green infrastructure value are retained on site, and enhanced or created wherever possible.’
4. **Compensate on site**
Onsite compensation must be sought when all other options have been exhausted.
5. **Compensate off site**
Offsite compensation must be sought when all other options have been exhausted.
6. **Long Term Management**
Long Term Management of retained and new GI assets to secure enhancement.

Summary of Development Effects, Mitigation & Enhancement

Step 1: **Avoid**

Ecology, Landscape and Arboricultural survey has identified the GI assets of greatest value and these have been avoided where possible, as part of the masterplan development, led by a GI masterplanning approach. This can most notably be observed in the retained woodland and habitats of greatest value within the site.

Some 46% of the redline area is set-aside for GI elements.

The retention of corridor links and dark corridor networks across the site aims to maintain the principal value and functionality of the site GI network for light sensitive species.

Step 2: **Minimise**

The masterplanning approach has been led by the minimise approach with development focusing on the disturbed brownfield site areas within the redline, focusing on the beneficial management and habitat creation opportunities in the most valuable peripheral development areas as well as possible mitigation within the development site.

Step 3/4: **Mitigate/Restore and Compensate**

Metric of Woodland pre and post proposed development.

<i>Habitats</i>	<i>Existing (Sq metres)</i>	<i>Retained (Sq metres)</i>	<i>Removed (Sq metres)</i>	<i>Newly Creates (Sq metres)</i>
Woodland	164,210	134,715	37,423	114,259 Of which (99,367 of planted woodland 14,892 of existing scrub managed into woodland)

The biggest losses of habitat as a result of development proposals would be;

- Woodland
- Scrub
- Bare Ground

Woodland loss will be mitigated at a ratio exceeding 3:1, so is compliant with PPW 12.

Other specific habitat mitigation measures have focused on where the greatest value can be delivered for the most valuable local species, notably;

- Great Crested Newts (GCN)
- Reptiles (Common Lizard & Grass Snakes)
- Lapwing

Metric of other habitats pre and post proposed development.

<i>Habitats</i>	<i>Existing (Sq metres)</i>	<i>Post Development Habitat (Sq metres)</i>
Bare Ground (Lapwing habitat)	145,967	80,276
Open Mosaic Habitat (good)	91,092	8963 (tip are only, managed to avoid succession of habitats)
Open Mosaic Habitat (poor)	133,803	
Rough Grassland	57,169	147,830 (New Species Rich Grassland)
Grassland	8443	
Ephemeral Perennial	129,044	
Ruderal grassland	23,456	
Rush Pasture	3396	
Wet Grassland	35,969	
Amenity Grassland	24,054	54,489
Ponds/Basins	47,545	71,341 (New Pond and Attenuation Basins)
Exposed Stone	4290	13,327

GCN mitigation has been set out in a specific mitigation strategy for this species, as the population is considerable in size and one of the main ecological receptors at this site. Please refer to JN00657 – D01 for further details.

GNC & Reptiles. The retention and enhancement of a habitat corridor including multiple ponds, grassland areas and woodland thinning is proposed to provide varied habitat structure to benefit these species. Species are present on the neighbouring Crymlyn bog and the habitat corridor is being created along the western edge of the site, where it adjoins the bog enhancing available habitat and providing a connecting corridor to enhance movement. The habitat corridor itself will also include hibernacula to be installed and the species-rich grassland will provide enhanced foraging opportunities.

Lapwing have previously been found to be nesting on the wider site, although usage has declined, likely owing to the successional habitat processes on the unmanaged site. The former tip area at the south-western end of the site is to be remediated, capped and covered with a crushed glass substrate originating on site that will ensure little vegetative growth occurs in this area, which in turn will provide suitable open areas for lapwing breeding purposes. Over time, as some plants pioneer, an open mosaic type habitat will be created through management (facilitated by the development), which will be suitable for invertebrates.

Habitat and target species enhancement measures are incorporated as follows:

- Woodland management to create more varied structure and enhance suitability for reptiles and great crested newts;
- Species-rich grassland to provide opportunities for invertebrates and their predators;
- Sand martin Riparia tower;
- Integrated bat boxes in at least 10% of new houses;
- 100 bat boxes to be installed on suitable retained trees;
- At least one bee brick to be included in each dwelling; and
- Beneficial management of natural habitats in perpetuity.

Loss of bare ground across the site, a transitory habitat resulting from post-industrial clearance which will naturally reduce over time if left unmanaged, would be mitigated by the creation of bare ground to be used as potential lapwing nesting habitat on the former tip areas. This will be remediated as part of the works, capped and dressed with suitable substrate with its conditioned maintained through secured management to avoid succession of this transitional habitat.

In terms of habitats of wildlife value created the following represent the largest gains with significant benefits secured via development management and habitat creation opportunities.

- Woodland
- Species Rich Grassland
- Ponds/Basins

Notably the combination of Woodland, Species Rich Grassland and Pond/Basins have significant benefits to secure wider Green Infrastructure multi-functionality across the site, with biodiversity benefits and providing enhanced climate change resilience.

Bat boxes, on at least 10% of dwellings, plus 100 others on trees are proposed and at least one bee brick is to be installed in each house. Green roofs are proposed on garages across the site as a new invertebrate habitat, although not fully quantifiable at this stage, it represents a significant habitat benefit.

An area at the western extent of retained horseshoe shaped woodland was observed as supporting numerous flying invertebrates. It is proposed to enhance this area by planting a shelter belt of Gorse with periodic scraping to ensure bare areas for burrowing remains.

Step 5: **Compensate (offsite)**

None required

Step 6: **Long Term Management**

A major benefit resulting from the development would be the mechanism to secure valuable long-term management of targeted habitats, securing transitory habitats such as the open mosaic habitats that without development would be subject to natural succession and likely erode in value over time. This would place some emphasis on managing the successional processes that would take place on site if left unmanaged, and that the management will be beneficial in providing a range of habitats, rather than one climax habitat. The combination of targeted habitat creation and management delivers a significant long-term benefit.

GI Conclusion

The current development proposals have been led by a GI masterplanning approach, following PPW 12 Stepwise approach. Within the constraints of this post-industrial site, the current development proposals protect the most valuable GI assets and create new multifunctional GI. It is considered that the proposed development will result in overall benefits to the community, protected species, important habitats and wider biodiversity value.

Development would facilitate the following major GI benefits.

- 1 Habitat protection, restoration, creation and management, enhancing biodiversity and the resilience of ecosystems, targeting the most valuable species, improving connectivity and allowing the creation and management of habitats enhanced over the short and long-term.

- 2 The creation of a new community, with a defined sense of character and place-making, identity and the opportunity for community ownership and access to recreational assets and the natural environment, allowing improved physical and mental health and wellbeing, embedded in the development proposals.
- 3 Transforming a post-industrial landscape to a new community with townscape and landscape quality, diversity and visual amenity.
- 4 The integration of play and recreation into GI networks.
- 5 Improved micro-climate (summer cooling/winter shelter) via sustainable drainage, new and enhanced green space, shelterbelts, street trees and responsive development design enhancing the site and its wider location.
- 6 Mitigate and adapt to the impacts of climate change via managed existing habitats and new green components improving:
 - Oxygen production;
 - Air and water quality;
 - Carbon sequestration (locking carbon in vegetation and soils);
 - Water sequestration (vegetation evapotranspiration and formal sustainable drainage and attenuation).
 - Provide alternative transportation opportunities (cycling/walking/public transport links).
 - Address biosecurity and climate change resilience with a broader biodiversity of targeted habitat creation and management, street trees, woodland, recreational green space, green roofs and a more multi-functional network of green assets across the development, and retained and enhanced habitats.
- 7 Development would provide the mechanism to secure long-term management of the existing and proposed GI assets across enhanced habitats and the new multifunctional GI components.