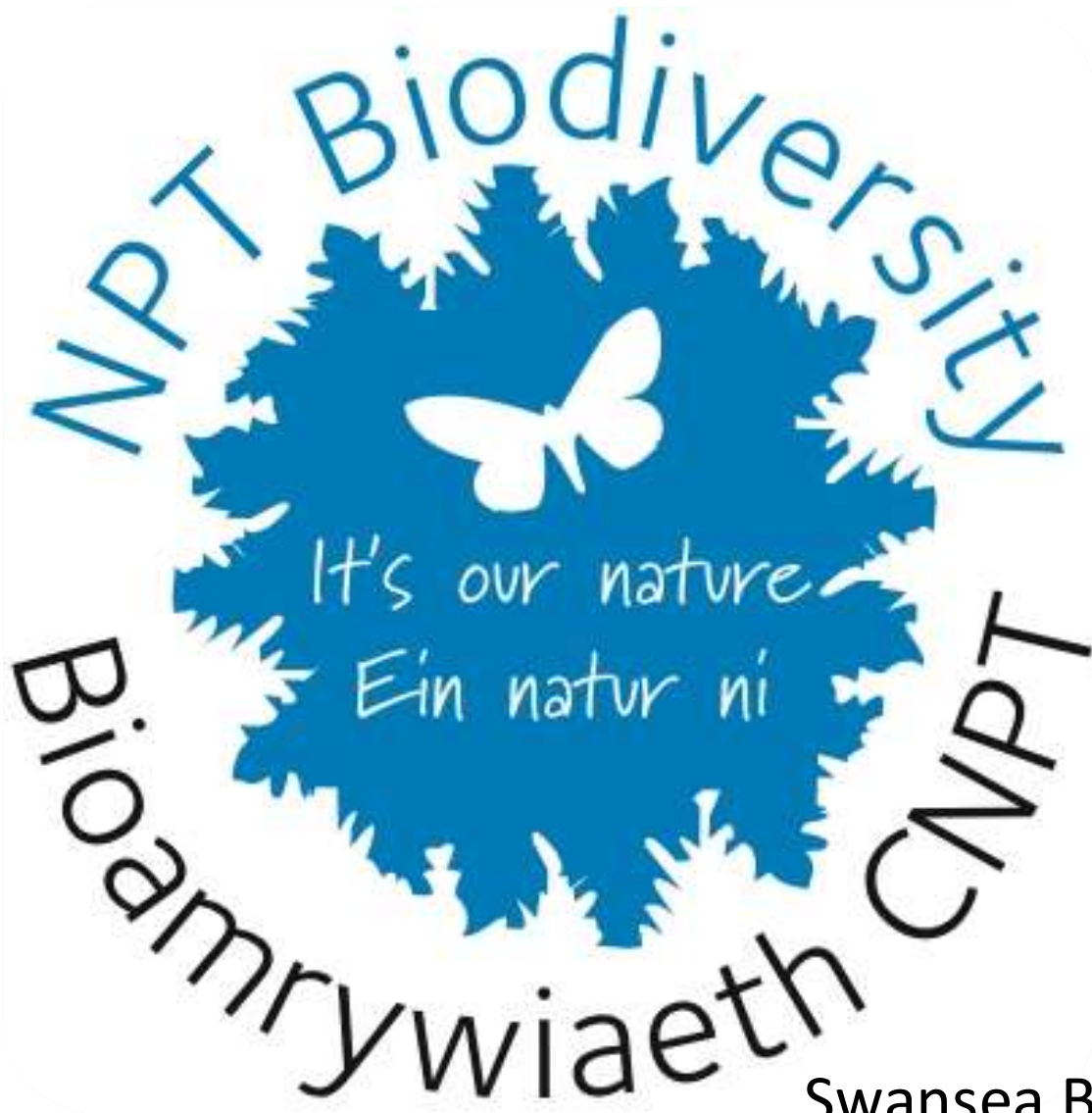




Swansea Bay Technology
Centre

Addendum to the
Preliminary Ecological
Assessment Update
June 2020

by

Megan Price – Graduate Ecologist
Countryside and Wildlife Team
Neath Port Talbot Council

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DECLARATION

The information, advice and opinions which we have prepared and provided is true, and has been prepared and provided in accordance with the CIEEM's Code of Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions.

Signed:

A handwritten signature in black ink, appearing to read 'M Price', with a stylized 'M' and 'P'.

Miss Megan Price – Graduate Ecologist, NPTC

The following report is considered a reasonable and true representation of the ecological situation on the site assessed. The report is however just a snapshot assessment therefore the authors are unable to guarantee that all biodiversity interest has been identified. In addition, if works are not undertaken as programmed re-assessment will be required. The survey information is considered applicable for one year from the date of the survey. The mitigation proposals are only applicable to works undertaken prior to the reptile hibernation season, if site clearance works are to be undertaken during winter months the mitigation proposals will need to be re-visited.

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EXECUTIVE SUMMARY

This report has been produced as an addendum to the Swansea Bay Technology Centre, Preliminary Ecological Assessment Update, February 2020. Please refer to that report for the supporting information and previous survey results.

This report contains the results of the further surveys that were recommended and the appropriate mitigation to compensate for any impacts.

The mammal survey identified no further constraints upon the scheme however the lighting plan should be designed to ensure dark corridors are maintained to allow commuting and foraging wildlife to continue to use the site.

The reptile survey identified further constraints to the scheme as up to 4 grass snake and 2 lizards were recorded during one survey. This will be mitigated for through the use of habitat manipulation and enhancement to ensure no animals are harmed/ injured during the construction phase and so that the local population of reptiles is not affected negatively. Two hibernacula will be built on the site to enhance the site for the local population of reptiles.

The bird survey identified no fully protected species known or suspected to breed on the site. The areas of scrub/ wet woodland were the most important breeding habitats on site so clearance of these areas should be undertaken outside of breeding bird season, the replacement of the wet woodland and the bird boxes that will be installed on site will mitigate for any habitat loss and ensure no nesting birds are disturbed.

The habitat survey identified that there would be a loss of calcareous grassland however this will be mitigated for by the management of mitigation areas (see page 24 for the location of these verges) by the reduction of the intensive mowing regime. The management of the transitional tall herb vegetation on the site where there is currently an abundance of a non-native invasive species (Early Golden-rod) will also ensure that the loss of the grassland is mitigated for and enhanced.

1 INTRODUCTION

1.1 SCOPE OF SURVEY

The scope of the surveys was to identify any constraints to the development as recommended in the previous report. This included:

- A mammal survey, specifically for otter, bats and a check for badger
- Reptile survey
- Bird survey
- Botanical survey

In addition, the following assessments have been carried out to inform the planning submission:

- Assessment of wild bird habitat (see Conservation of Habitats and Species Regulation 2017).
- Assessment of SINC/S7 and LBAP habitats and species.

2 SURVEY RESULTS

2.1 MAMMAL

2.1.1 BATS

Assessment

The buildings and trees on site were assessed for roosting potential on the 18th May 2020 by Megan Price.

All of the trees on site are quite young with a small diameter at breast height with negligible roosting potential for bats due to the lack of cracks and crevices. Several trees are being removed however due to the lack of roosting potential in the trees this is not considered likely to have any impact on bats.



Photo 1. A view of the typical trees present on site.

The existing building does not support bats as there are no potential access/ egress points for bats to roost in the building, the building is also not being effected in anyway by the proposed scheme.

The site does have potential to support foraging and commuting bats so the lighting scheme should be designed to minimize light spill on areas of woodland.

2.1.2 BADGER AND OTTER

A walkover of the site was carried out on the 18th May 2020 by Megan Price looking for signs of badger and otter presence on the site.

No sign of badger was recorded on site and due to the site's location and small size it is considered unlikely to be used by badgers except for the occasional badger who may cross the site looking for new territory. It is unsuitable for sett formation due to the wet nature of the woodland on site and the amenity grass areas are very open.

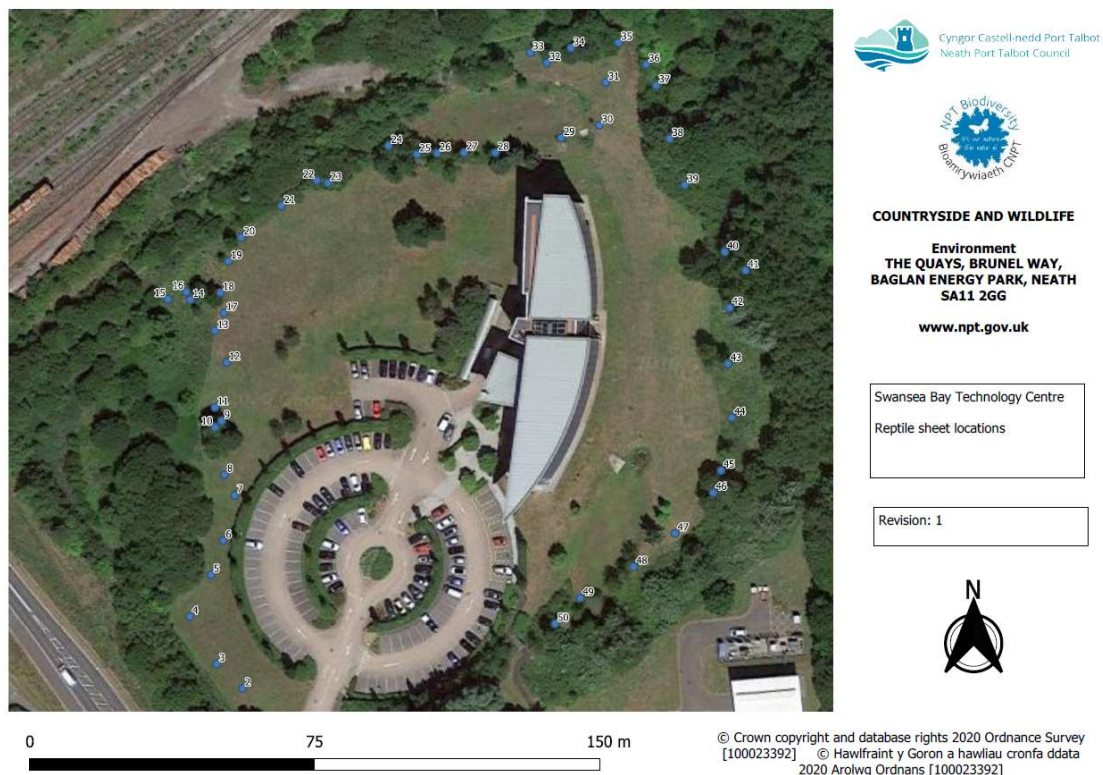
The site provides limited opportunity for Otter however they may use the site infrequently due to the reed beds and waterbodies in close proximity to the site. These features may provide suitable foraging habitat at certain times of year e.g. amphibian breeding season. The mitigation measures outlined in the recommendations should be followed to prevent a negative impact on the local otter population.

2.2 REPTILE

2.2.1 SURVEY METHODOLOGY

A reptile survey was carried out on the site by Megan Price to determine the presence or absence of reptiles.

On the 1st May 2020 50 reptile sheets were deployed across the site. See the figure below for the location of the reptile sheets.



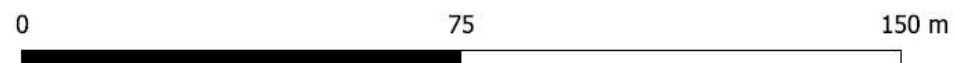
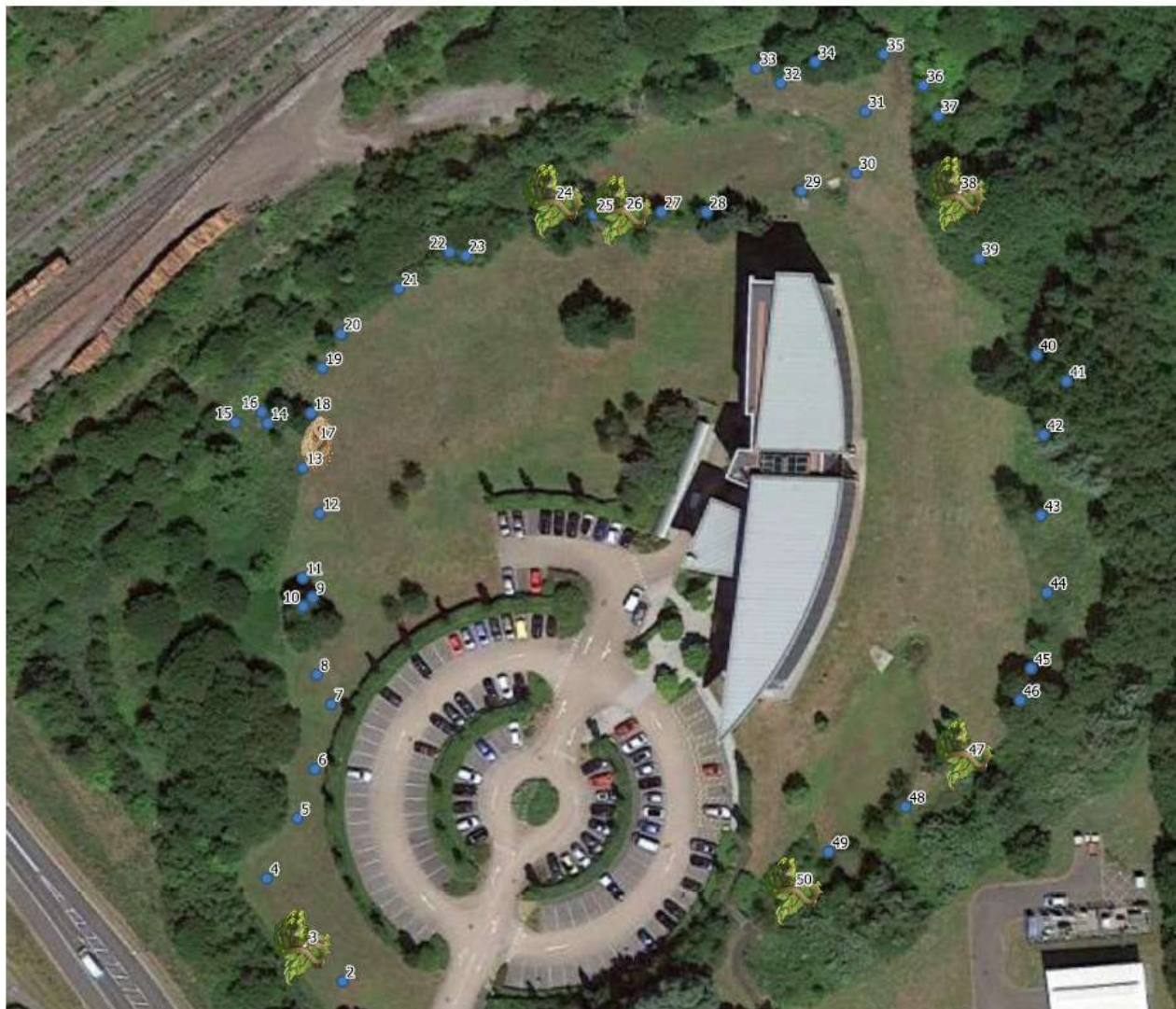
The reptile sheets were left to bed in for two weeks and then seven presence/ absence checks were carried out in suitable weather conditions.

2.2.2 RESULTS

Two species of reptile were recorded – Grass snake (*Natrix natrix*) and Common lizard (*Zootoca vivipara*).

Table 1 – Table of reptile survey results.

Date	Weather condition	Sheet number	Species	Number recorded
18/05/2020	Temp - 15°C Dry, overcast, slight breeze	26	Grass snake	1
19/05/2020	Temp - 16°C Dry, sunny, no breeze	17	Common Lizard	2
20/05/2020	Temp - 17°C Dry, sunny, no breeze	17	Common Lizard	1
		26	Grass snake	1
21/05/2020	Temp - 18°C Dry, sunny, slight breeze	26	Grass snake	1
22/05/2020	Temp - 17°C Overcast, dry, slight breeze	3	Grass snake	1
		17	Common Lizard	1
26/05/2020	Temp - 17°C Sunny, dry, no breeze	3	Grass snake	1
		17	Common Lizard	1
		24	Grass snake	1
		38	Grass snake	1
		47	Grass snake	1
27/05/2020	Temp - 16°C Sunny, dry, no breeze	17	Common Lizard	1
		24	Grass snake	1
		38	Grass snake	1
		50	Grass snake	1



COUNTRYSIDE AND WILDLIFE

Environment
THE QUAYS, BRUNEL WAY,
BAGLAN ENERGY PARK, NEATH
SA11 2GG

www.npt.gov.uk

Swansea Bay Technology Centre

Reptile survey results

Revision: 1

Legend

Reptile locations



Common Lizard



Grass snake



Sheet locations



The habitat on site is linked to other areas that are suitable for both grass snake and common lizard so it is assumed that there is a medium population of grass snake in the area and the individuals using the site also exploit the surrounding habitat. The grass snakes observed were all young, small individuals and it is thought that they are the animals that hatched during last year's breeding season. The common lizards are part of a small population.

The recommendations in the recommendation section outline suitable mitigation and compensation measures to ensure that no animals are injured or killed during the construction phase and also that the population will not be negatively affected by the scheme in the long term.

2.3 BIRD SURVEY

2.3.1 SURVEY METHODOLOGY

Three survey visits were undertaken during April and May 2020 by Barry Stewart, with a walkover, stop and look/listen method being used. Variations were made to the survey route on each visit to eliminate biases and ensure the entire site was fully covered including adjacent habitats. Additional records were made during other surveys carried during the 2019 breeding season window and are included in this assessment.

2.3.2 RESULTS

The locations of all breeding bird territories and non-breeding birds recorded within or immediately adjacent to the boundaries of the survey site during the survey are shown on figure 2 (see section 7 for figure 2) with breeding territories of species of high conservation value highlighted by orange 'heat spots'. The main survey area is shown bounded by the black-dashed line and the proposed mitigation area is bounded by the red line. The table below lists all 24 species recorded, with figures in the last column providing the number of recorded territories.

List of all species recorded during the survey, with breeding status and the total number of breeding territories recorded within or immediately adjacent to the study site. Observations of birds recorded flying over the site are shown in brackets.

BTO code	Species	Breeding Status	# Observations (#) = flying over	# Territories
----------	---------	-----------------	----------------------------------	---------------

B.	Blackbird	Confirmed	9	4
BC	Blackcap	Probable	10	5
BF	Bullfinch (S7)	Confirmed	2	1
BT	Blue Tit	Confirmed	6	4
CC	Chiffchaff	Possible	6	3
CH	Chaffinch	Probable	2	1
D.	Dunnock (S7)	Probable	7	4
GJ	Greylag Goose		(1)	0
GO	Goldfinch	Confirmed	13	8
GT	Great Tit	Probable	3	1
HM	House Martin		(2)	0
JD	Jackdaw		4(3)	0
LT	Long-tailed Tit	Probable	2	1
LW	Lesser Whitethroat	Possible	1	1
MG	Magpie	Possible	3	1
PW	Pied Wagtail	Possible	2	1
R.	Robin	Confirmed	10	5
RW	Reed Warbler	Probable	3	1
SL	Swallow		(1)	0
ST	Song Thrush (S7)	Probable	3	2
WH	Whitethroat	Probable	10	5
WP	Woodpigeon	Confirmed	3	2
WR	Wren	Probable	6	3
WW	Willow Warbler	Probable	4	1

Whilst no fully protected species (i.e. those included under Schedule 1 of the Wildlife and Countryside Act, 1981) are known or considered as likely to breed within the Site, suitable breeding habitat exists for Cetti's Warbler in areas of wet scrub. Schedule 1

species that have potential to be occasional visitors to the site during the breeding season from nearby breeding sites include Barn Owl and Kingfisher.

Section 7 *Species of Principal Importance*^a, and/or Birds of Conservation Concern Red List species^b, either recorded (in bold text) or likely to occur within or in the vicinity of the Site, include the following.

- ^a Kestrel (might occasionally hunt over areas of grassland)
- ^{ab} Starling (post-breeding aggregations could use areas of open lawn)
- ^{ab} **Song Thrush** (probable breeder in woodland/scrub)
- ^a **Dunnock** (probable breeder in heath and scrub)
- ^b Grey Wagtail (likely to be occasional visitor to attenuation basin)
- ^a **Bullfinch** (possible breeder in areas of scrub)
- ^{ab} Linnet (breeds nearby and is likely to feed in open areas on occasions)

The breeding bird assemblage is considered to be of no more than medium significance. Nevertheless, it is essential that scrub is not cleared during the breeding season without prior inspection by a suitably qualified ecologist. Ideally, any scrub/tree clearance should be undertaken during the period between September and February inclusive

2.4 BOTANICAL SURVEY

2.4.1 SURVEY METHODOLOGY

A field survey of the land at the Technium Site, located at OSGR SS74009295, upon which this assessment is based, was carried out on site visits made on 22nd April and 01st May 2020 by Barry Stewart.

The vegetation types present within the site were assessed by Barry Stewart using methodology based on that described in the Handbook for *Phase 1 habitat survey - a technique for environmental audit* (Joint Nature Conservation Committee, 2010). The results of the survey and brief descriptions of each habitat type are given in section 2.4.2 below. Species lists were compiled in the form of target notes (TN) in order to describe each of the mapping units and/or features of interest. These lists are reproduced at appendix A but key and noteworthy species are detailed in the relevant sections of the report. The text below uses vernacular names for the vascular plants recorded during the surveys, the scientific names of which are given at appendix A. It is standard practice to use italicized scientific names of lower plants, including bryophytes (mosses and liverworts), which are used preferentially in the main text, although vernacular names are also provided at appendix A.

Searches were also carried out for the presence of Invasive Non-Native Species (INNS), including those listed on Schedule 9 of the Wildlife and Countryside Act 1981, principally Japanese Knotweed *Fallopia japonica*, Indian Balsam *Impatiens glandulifera* and Giant Hogweed *Heracleum mantegazzianum*.

2.4.2 RESULTS

WOODLAND AND SCRUB

The western part of the site was largely dominated by a mixture of broad-leaved plantation woodland and deciduous scrub, as shown respectively by **TN04**, **TN05** and **TN09** on figure 1 (see section 7 for the figures). The planted section comprised a diverse mix of woody species including Austrian Pine, Dawn Redwood, Elaeagnus, Guelder-rose, Hawthorn, Hybrid Black-poplar, Italian Alder, Osier, Rowan, Silver Birch, Spindle and White Willow. The area of continuous scrub was largely dominated by Rusty Willow with occasional / rare Alder, Ash, Guelder-rose, Hybrid Crack-willow and Pedunculate Oak. Butterfly-bush was locally frequent along the railway side of the fence. The majority of trees had diameters at breast height (dbh) no greater than 30cm, with only a few of the faster growing species around 40cm.

The field layer in woodland areas was generally dominated by sprawling Bramble with other woodland indicators being generally infrequent, those noted including Atlantic Ivy, Hart's-tongue, Herb-Robert, Male-fern, Remote Sedge and Wavy Bitter-cress. Other atypical woodland species noted as frequent or locally abundant included *Brachythecium rutabulum*, Cleavers, Common Reed, Early Goldenrod, Glaucous Sedge, Hemlock Water-dropwort and Water Mint. Bryophytes (mosses and liverworts) and lichens were represented by a range of common and widespread species. The assemblage of species represented in the areas described above does not correspond well with any of the National Vegetation Classification (NVC) community descriptions, but is likely to develop into a variant of W10 *Quercus robur* - *Pteridium aquilinum* - *Rubus fruticosus* woodland.

Other areas of semi-mature mixed plantings were identified at **TN08** and in pockets within the mitigation compartments (**C2** to **C5**), the most frequent species noted being Austrian Pine, Box-leaved Honeysuckle, Hybrid Black-poplar and Silver Birch. The field layer in these areas was poorly developed with minimal woodland species other than Bramble, Common Nettle, Ground-ivy and ubiquitous bryophytes.

More formal ornamental planting areas around the car park (**TN07**) and in pockets within the mitigation compartments (**A** and **B**) included numerous trees and shrubs, these plantings being a mix of native and non-native species such as Beech, Box-leaved Honeysuckle, Cherry Laurel, Dwarf Mountain-pine, Goat Willow, New Zealand Flax and Red Dogwood. The assemblage of ruderal weeds noted in the mulch beds in which these plantings are located was moderately diverse and included American Willowherb, Annual Meadow-grass, Bilbao's Fleabane, *Oxyrrhynchium hians*, Prickly Sow-thistle and Wall Speedwell.

TALL HERB VEGETATION

Stands of vegetation with a prominent tall herb element, were noted at **TN10** and **TN14**, these areas generally being unmanaged and in an early phase of succession to scrub. The main species characterizing these heterogeneous, diverse stands included Bramble, Chalk Knapweed, Cock's-foot, Common Nettle, Creeping Thistle, Dewberry, Early Goldenrod, False Oat-grass Oxeye Daisy Hogweed and Wild Parsnip.

The non-native Early Goldenrod was invasive in large parts of TN14 extending into areas of scrub of TN05. A small stand of Japanese Knotweed was recorded on the railway side of the boundary fence and the interface of TN15 and TN16. Whilst this was the only patch recorded, vigilance should be exercised to the possibility of other living stands elsewhere within the site.

GRASSLAND

Amenity grassland areas within the core of the assessment site, shaded canary yellow on figure 1 (**TN01**), although poorly defined in terms of NVC show loose affinity to MG5 *Cynosurus cristatus-Centaurea nigra* grassland community. The main components of the sward in this community were Common Bird's-foot Trefoil, Glaucous Sedge, Red Fescue, Ribwort Plantain, Sweet Vernal-grass and Yarrow. Less frequent species reflecting the free-draining, calcareous nature of the soils included Bee Orchid, Bulbous Buttercup, Cowslip, Dove's-foot Crane's-bill, Early Forget-me-not and Lady's Bedstraw. Similar, tightly mown and rabbit-grazed lawn vegetation was present in the very north of the site at **TN13**, with additional species noted including Common Centaury, Common Stork's-bill, Ground-ivy, Squirrel-tail Fescue and Viper's Bugloss

A similar character and suite of species was recorded from the mitigation area road verge grasslands (**A1 & B1**) on the south-western side of the distributor road, additional components including Chalk Knapweed and an increase in Oxeye Daisy. Additional species noted growing around a concrete base at **A4** included a few bryophytes typically associated with sand dunes, e.g. *Homalothecium lutescens* and *Syntrichia ruralis* ssp. *ruraliformis*. The verge grassland on the north-eastern side of the road (**C1**) was significantly less diverse, with the sward largely dominated by *Rhynchospora* and Yorkshire-fog, with locally frequent Field Wood-rush, Meadow Foxtail and Oxeye Daisy.

Uncut verge banks flanking the eastern side of the bridge ramparts at **TN06** supported a rich assemblage of pollinator-friendly species. Compositionally, the sward was not markedly different to the amenity areas described above, but diverse structure enabled additional species to flourish, such as Black Medick, Common Restharrow, Creeping Cinquefoil, Hedhe Bedstraw, Lucerne, Narrow-leaved Vetch, Red Clover and Wild Parsnip.

MARGINAL & INUNDATION VEGETATION

The swale that runs around the inside of the western boundary is largely scrubbed over, but some limited sections are more open as depicted by **TN03** on figure 1. The water gradient runs from south to north to east, with the swale terminating in an attenuation basin at **TN02**, this being drained by a culvert at its eastern end. The vegetation of the flood attenuation channel is largely dominated by Rusty Willow and Common Reed, with locally frequent to occasional Bittersweet, False Fox-sedge, Remote Sedge and Yellow Iris. The attenuation basin, which was dry at the time of the survey, was dominated by *Drepanocladus aduncus*, with locally frequent Creeping Cinquefoil, Tufted Forget-me-not, Water Mint and Yellow Iris. The edge of the basin (**TN12**) were more diverse with marginal wetland species noted including Clustered Dock, False Fox-sedge, Hard Rush, Silverweed and Soft Rush.

BROWNFIELD VEGETATION

The land between the railway and the western boundary fence comprises a mosaic of scrub (**TN09**), open vegetation on basic slag (**TN16**) and a semi-shaded brownfield dune slack (**TN15**). The scrub component is described above, this partially shading the interesting strip of dune slack vegetation which includes components such as Creeping Willow, Sand Sedge and Sharp Rush. Species characterizing the drier, more open ground on basic slag a TN16 include Bilbao's Fleabane, Dewberry, Dove's-foot Crane's-bill, Evening Primrose, *Hypnum lacunosum*, Mouse-ear-hawkweed and Wild Strawberry.

SIGNIFICANT PLANT SPECIES

Bee Orchids and Cowslips were found at low density across much of the main lawned area (**TN01**) and within the sections A and B of the mitigation area. These are both axiophytes (botanical indicators of important habitats in NPT). Other localised or important plant species noted in the strip of brownfield dune slack vegetation that runs parallel to the site boundary fence (**TN15**) included Brown Sedge, Creeping Willow and Sharp Rush.

Japanese knotweed was not recorded from the study area during the survey, but a small stand was noted just outside of the western boundary at the interface of **TN15** and **TN16**. All personnel should be vigilant and must notify the site ecologist if any additional plants are encountered at any stage. A control programme would need to be implemented to eliminate the plant in its entirety from the wider site to help achieve Water Framework Directive invasive species objectives.

3 IMPACT ASSESSEMENT

The below sets out the impacts of the scheme on the species and habitats addressed in this report.

3.1 IMPACTS ON HABITATS/ PLANT SPECIES

Habitats of Principal Importance for Conservation of Biological Diversity listed under Section 7 of the Environment (Wales) Act 2016 and UK Biodiversity Action Plan Priority Habitats which may be affected by the proposals include the following:

- *Calcareous grassland*
- *Ponds*
- *Open Mosaic Habitats on Previously Developed Land*

Section 7 habitats are broadly similar to the Priority Habitats listed under the UK Biodiversity Action Plan. Section 7 habitats are material considerations to which the local planning authority is required to have due regard when determining all planning applications.

Calcareous grassland

Although mapped as amenity grassland, the extensive lawn area identified by TN01 very loosely fits into the category for calcareous grassland and supports eight qualifying species (the minimum level required for this habitat). However, as this is not a typical example of this habitat type and its inclusion here is arguably contentious, the vegetation nevertheless includes elements of local interest such as Bee Orchids, Cowslips and Lady's Bedstraw and should require a level of mitigation.

Impact Assessment: It is anticipated that >50% loss will result in an impact judged to be significantly adverse.

Mitigation: Mitigation options might include improving management transitional tall herb vegetation in and around TN14, where currently there is a high proportion of non-natives (especially the invasive Early Golden-rod) and or relaxing the intensive mowing regime across areas of the proposed mitigation verges to benefit the key species listed, as well as increasing a significantly higher level of productivity for pollinators and other grassland invertebrates.

Residual Impact: with the mitigation measures proposed implements there will be a minor short-term impact which will be offset as the created habitat in the mitigation verges matures.

Pond

The seasonally flooded pond supports a rather limited suite of wetland species, but is likely to be highly productive for invertebrates in addition to supporting a range vertebrate fauna such as amphibians, reptiles, birds and mammals.

Impact Assessment: It is not anticipated that this feature will be included within the development and the impact judged to be minor so no mitigation has been put in place

Open Mosaic Habitats on Previously Developed Land (OMHoPDL)

Most of the vegetation in this category occurs outside of the site boundary, adjacent to the western fence, but is included as it is an area that could help to deliver some ecological gain. Essentially what was formerly a diverse and open brownfield mosaic is currently in the process of being shaded out by encroaching scrub. This vegetation includes elements of brownfield dune slack vegetation (TN15) and calcareous grassland components of a former area of slag (TN16), both of which would greatly benefit from removal of adjacent scrub. These habitats, although of a secondary nature are of relatively high ecological value and are a component of wider communities that make up OMHoPDL within the Baglan area.

Impact Assessment: It is not anticipated that these feature will be included within the development and the impact judged to be negligible.

Mitigation: Opening up of these areas by carrying out scrub removal (primary Rusty Willow and the highly invasive and non-native Butterfly-bush

Residual Impact: IF the clearance is carried out there will significant ecological enhancement.

Protected Plant Species

A small number of native Bluebells was recorded in the mitigation area verges during the survey. Bluebell is protected against sale under schedule 8 of the Wildlife and Countryside Act 1981 as amended.

Impact Assessment: No work is being done on the mitigation verges that will affect the native Bluebells so no mitigation is proposed.

Plants of European Significance

No plant species of European significance were recorded or are likely to be present within the survey site.

Impact Assessment: As there will be no impact, no mitigation is proposed

Section 7 and UK BAP Plant Species

No plants within these categories were recorded or are likely to be present within the survey site.

Impact Assessment: As there will be no impact no mitigation is proposed

Non-designated Habitats and Plant Species

Amenity grassland

The loss of approximately 0.6ha species-poor grassland (amounting to approximately 90% of the site area).

Impact Assessment: As there is no ecological impact by the loss of this habitat no mitigation is proposed.

3.2 IMPACTS ON SPECIES

3.2.1 MAMMAL

Of the mammals investigated only bats and otters were considered likely to use the site. No roosting potential was noted, however it is considered possible that bats may use the site for foraging.

Of the bat species noted in the desk study previously recorded in the vicinity none were considered particularly sensitive to light. The bats are likely to use the site principally for foraging and commuting, there is a corridor of vegetation around the site linking to other habitats of value for foraging and commuting. Therefore, it is considered that any works on the site are only likely to impact upon bats by reducing their food source. Light spill will have to be controlled to ensure the commuting and foraging ability of the local bat population is not affected. The habitat replacement and enhancement that will be delivered as part of the scheme will restore the loss of food source.

It is considered that otters could potentially utilise the site, however if the light spill is controlled to allow dark commuting corridors it is considered that the impact on this species will be minimal.

During the construction phase any excavations should be covered or an escape ramp placed in any excavations over night to reduce the chances of otters becoming trapped in open excavations

Impact Assessment: Minor short-term reduction in available foraging, potential for otters to become trapped in open excavations. Destruction of foraging and commuting corridors via excessive light spill.

Mitigation: As per habitat mitigation above and reduction of light spill onto vegetation. Covering of open excavations overnight.

Residual Impact: Short-term negligible reduction in foraging suitability.

3.2.2 REPTILE

Reptiles have been found on the site (4 young grass snake and 2 common lizard). It has been established that they are present therefore without mitigation there is a significant risk of reptiles being killed/injured during the works: this would be an

offence under the Wildlife and Countryside Act 1981 (as amended). In addition the removal of vegetation is also likely to reduce the available suitable habitat, in respect of foraging, hibernacula and basking.

As mitigation, an Ecological Clerk of Works will be on site to supervise the works and will implement a method of site clearance, involving phased habitat manipulation and hand searches to encourage/ move any reptiles present into the surrounding suitable habitat during the active season for these species. Due to the numbers found and the availability of connecting suitable habitat, habitat manipulation is considered an appropriate method rather than a full capture and release programme. Two hibernacula will be created on the site during construction to enhance the site for reptiles once the work has been carried out. The habitat enhancement and mitigation verges proposed will mitigate for the small reduction in available habitat for these species.

Impact Assessment: Significant adverse impact from risk of killing/injury; minor impact from reduction of habitat availability

Mitigation: Ecological Clerk of Works to supervise and apply method to conserve amphibians and reptiles during site clearance; plus habitat mitigation including hibernacula creation will mitigate for the small loss in habitat availability

Residual Impact: Short term minor reduction in habitat availability and quality but likely to recover to an increased quality within 5 years.

3.2.3 BIRD

No fully protected species are known or suspected of breeding within the assessment site, although suitable breeding habitat exists for Cetti's Warbler in areas of marginal scrub. Approximately seven territories of three 'Section 7' *Species of Principal Importance* and Birds of Conservation Concern Red List were mapped within or immediately adjacent to the study site. In addition, moderate numbers of widespread and common species and birds of lesser conservation concern also depend upon the site, utilising all of the habitats represented. The areas of scrub are the most important breeding habitats for high priority species such as Dunnock, Song Thrush and Bullfinch, whilst lawns are important feeding areas for Song Thrush and Dunnock.

Impact Assessment: The significance of impact during the site enabling and construction phases, providing that no nesting birds are disturbed during the breeding season is predicted to be minor.

Mitigation: Reduction in habitat availability leading to displacement of territories may be offset to some degree by implementation of the habitat enhancements which would enrich adjacent feeding areas along roadside verges and marginal transitions.

Residual Impact: This could potentially reduce the significance of the residual impact on bird populations to minor/ negligible.

3.3 SUMMARY OF IMPACT ASSESSMENT

Feature	Impact	Mitigation	Residual Impact
LBAP/cSINC/S7 Habitat: Previously Developed Land of Biodiversity Interest	Moderate adverse impact if >50% of calcareous grassland is lost	Improving management of transitional tall herb vegetation especially where there is the non-native Early Golden-rod Relaxation of mowing regime in the proposed mitigation areas	Minor short-term/Ecological net gain
Bats	Minor short-term reduction in available foraging	Light spill will be controlled to create dark foraging/ commuting corridors around the site. Habitat enhancement will increase prey availability in the long term	Minor short-term reduction in habitat availability. Long-term – MINOR GAIN IN QUALITY
Otter	Minor risk of otter becoming trapped in excavations overnight Loss of corridors to commute along	Excavations will be either covered or equipped with an escape ramp. Light spill will be controlled to create dark corridors around the site.	Negligible short-term reduction in habitat Long-term - NONE
Reptiles	Significant risk of killing/injury; minor reduction in habitat availability.	Ecological Clerk of Works to supervise works and apply method to conserve reptiles during construction works; habitat mitigation and hibernacula creation as enhancement works	Minor short-term reduction in habitat availability. Long-term- MINOR GAIN IN QUALITY

Birds	Significant risk of disturbing nesting birds during the breeding season	Carry out vegetation clearance works between September-February	Minor
	Reduction in habitat availability	Manage the proposed mitigation areas to enrich the bird feeding habitat Provision of nesting boxes on site	Minor/ Negligible

RECOMMENDATIONS FOR MITIGATION

4.1 SITE CLEARANCE METHOD

The method will be followed in the order set out below:

- A suitably experienced/qualified ecologist will be engaged to act as an ecological clerk of works (ECoW) and oversee all site clearance works.
- The ECoW will provide toolbox talks to all site operatives on their biodiversity responsibilities, especially in relation to reptiles and nesting birds (if site clearance is to take place in the breeding season).
- During all works on site, if any site operative encounters a protected species (such as reptiles) works will stop immediately and further advice sought from the ECoW.

DAY 1

- The vegetation on site will be cut to a height of 300mm above ground and left for 24 hours. Cutting/strimming will be undertaken for the majority of the site in a north west to north east direction to allow any animals to move towards suitable habitat off-site. All cutting/strimming will be supervised by the ECoW. Any reptiles/other animals discovered will be carefully captured and moved to adjacent suitable habitat.

DAY 2

- Vegetation throughout the remaining area of the site will be cut/strimmed to a height of 100mm above ground and left for 24 hours. Cutting should be undertaken in the same direction as previously and towards existing suitable habitat off-site. All cutting/strimming will be under supervision of the ECoW. Any reptiles/other animals discovered will be carefully captured and moved to adjacent suitable habitat.

DAY 3

- Remaining vegetation will be reduced down to ground level and left for 24 hours. Cutting should be undertaken in the same direction as previously and towards existing suitable habitat off-site. All cutting/strimming will be under supervision of the ECoW. Any reptiles/other animals discovered will be carefully captured and moved to adjacent suitable habitat.

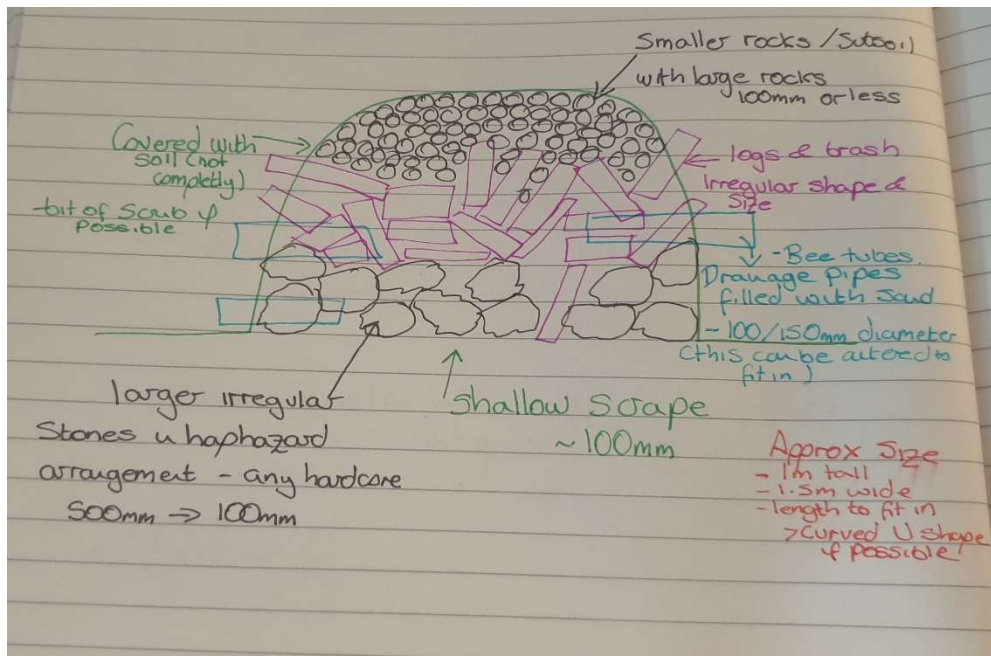
DAY 4

- The site can now be prepared for the works.
- All storage of materials, such as soils, rubble etc. will be placed within the site compound, on bare ground away from adjacent off-site habitat. This will ensure that such storage does not attract animals, such as reptiles, as refugia/hibernacula. All locations will be agreed with the ECoW

4.2 HIBERNACULA CREATION

Two hibernacula will be created on the site to enhance the site for reptiles. The locations of these hibernacula will be discussed with the ECoW and placed in suitable locations.

The below figure gives an indication of how the hibernacula will be constructed.



Drainage pipes filled with sand are being included in the hibernacula design as this will give native bee species nesting opportunities. The tubes are to be placed on the south face of the bank and 5 will be placed in each hibernacula.

4.3 MITIGATION AREAS

Due to the loss of the grassland on site it is proposed that three areas outside the site are used for mitigation (outlined in red on the figure below). These areas are currently owned by NPTC and the mowing regime is very frequent. It is proposed that a different mowing regime including cut and collect and leaving different heights of vegetation to allow different species to flourish is put in place. This will mitigate for the loss of grassland on site.



4.4 WORK TIMING RESTRICTIONS

- All vegetation clearance works will be undertaken outside of the bird nesting season (1st March – 31st July inclusive).
- All site clearance works will be undertaken during the reptile active season April- October.
- The optimum timing, to avoid conflict between birds and reptiles is therefore August – October
- If the works are not undertaken prior to October, a follow-up visit will be undertaken by an ecologist and additional advice on mitigation given and implemented to ensure all of the above elements of the ecological resource on the site are appropriately accommodated.

4.5 OTHER REQUIREMENTS

- Where necessary, appropriate Pollution Prevention Measures will be employed to prevent discharge of any silted water during excavation works.
- Any open trenches left uncovered overnight will include means of escape for any trapped animals (e.g. ramp).
- 10 bird boxes will be placed on trees (exact location to be determined by the ECoW on site during the construction phase).

- Approximately 404 square metres of wet woodland/ scrub is beign removed from site with the extension to the carpark however 407square metres of wet woodland is being created on site – the location of this habitat replacement is shown on the soft landscaping drawings.

5 MANAGEMENT AND MONITORING

Monitoring of the biodiversity mitigation measures should include the following:

- The site should be monitored for a period of 5 years and should measure both success of habitat establishment and level of functioning for reptiles. Monitoring should be carried out in years 1,3 and 5.

Management of the site will be required and should include the following:

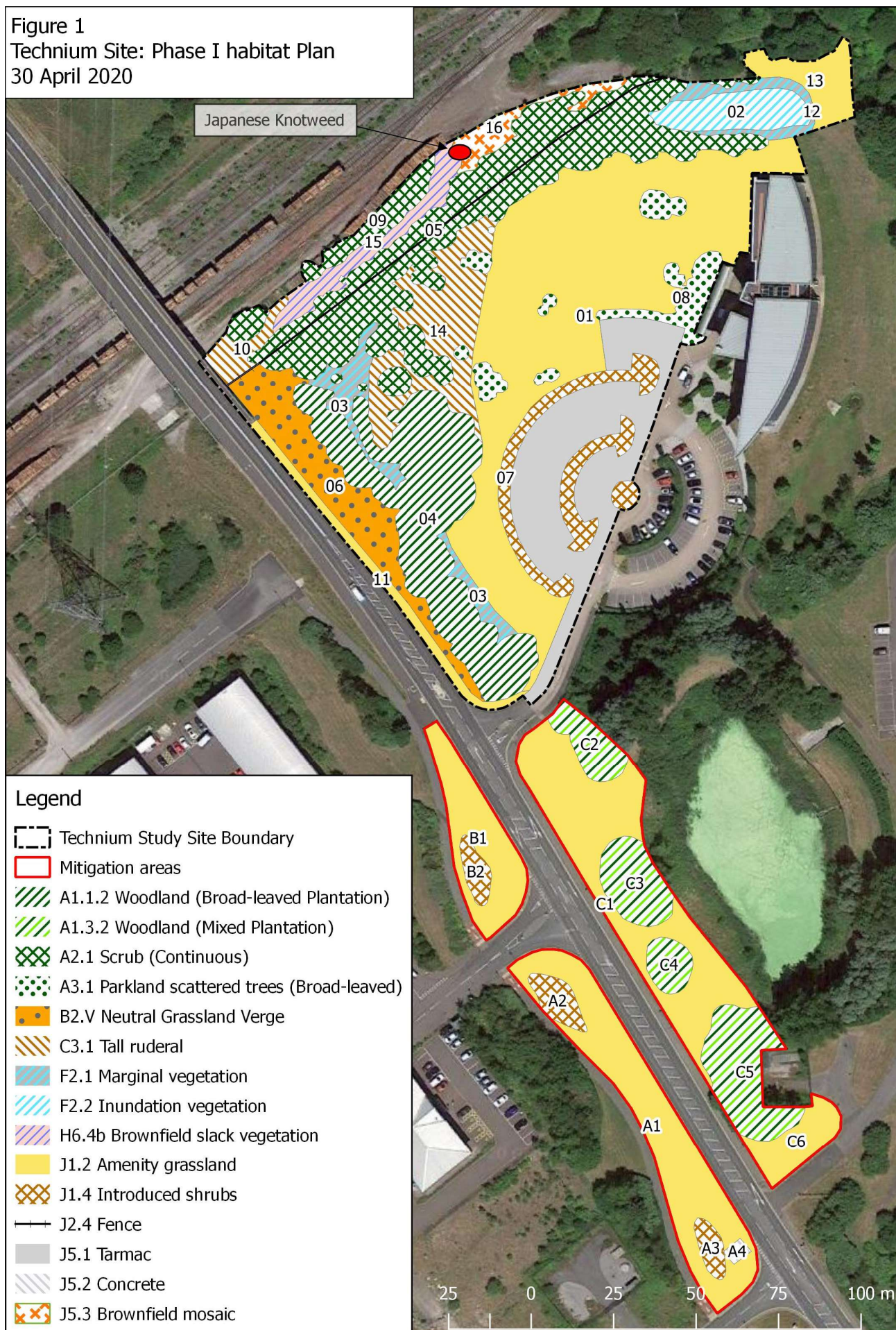
- A cutting regime should be specified and implemented once the vegetation has fully established taking into account the different habitats on site and the requirements of the different species present. This is to include the mitigation verges as well.

6 REFERENCES

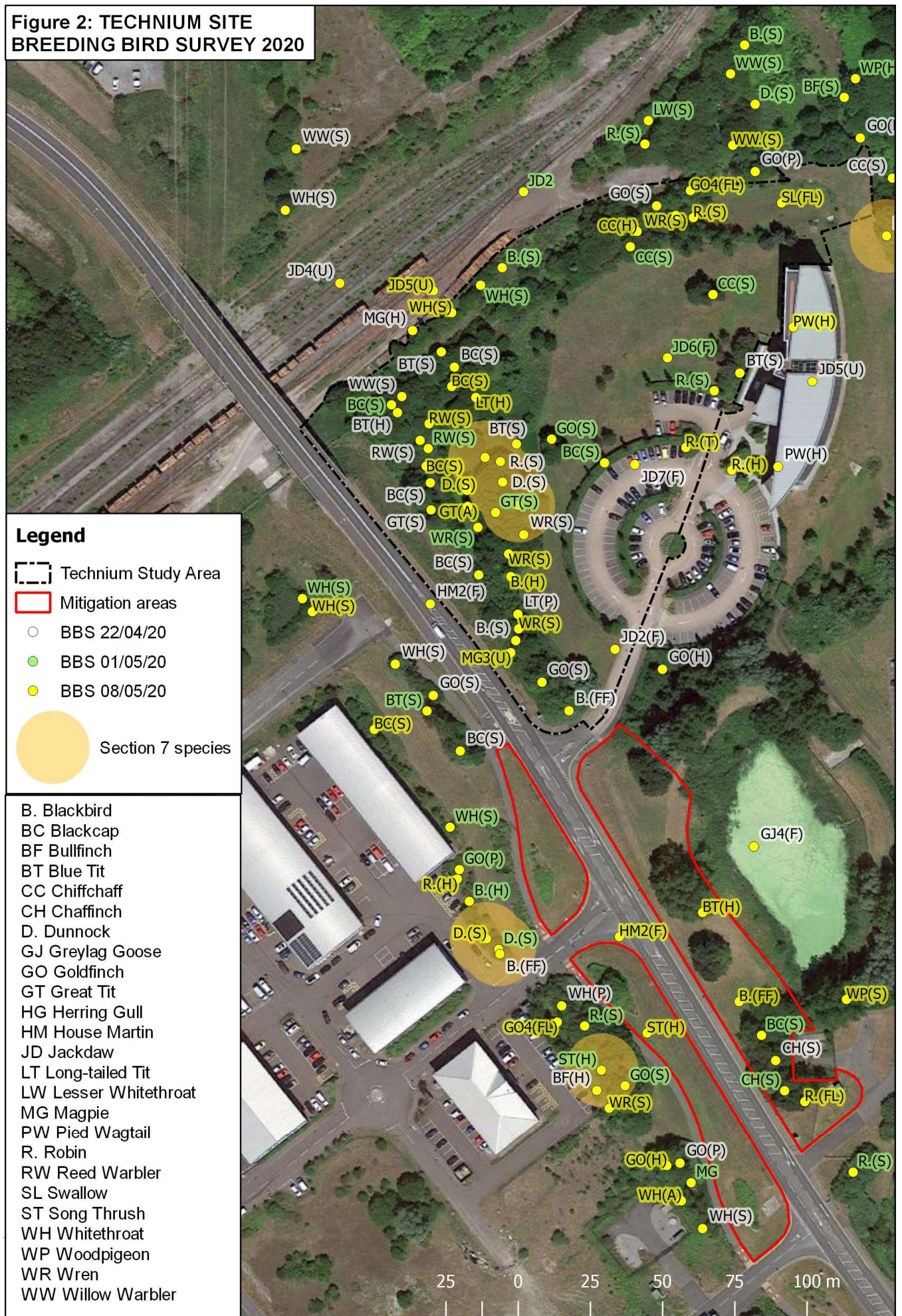
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7 FIGURES

Figure 1
Technium Site: Phase I habitat Plan
30 April 2020



**Figure 2: TECHNIUM SITE
BREEDING BIRD SURVEY 2020**



8 APPENDICES

APPENDIX A –FULL REPORT PREPARED BY BARRY STEWART

Neath Port Talbot Borough Council

**Land at the Technium Site,
Baglan**

ECOLOGICAL ASSESSMENT HABITATS & BREEDING BIRDS

Document issued: 2nd June 2020

Barry Stewart

**Barry Stewart & Associates
Consultant Ecologists**

36 Pencaeirwn Road, Penyrheol, Gorseinon, Swansea SA4 4FU
Tel 01792 539447, Mob 07730 502738, Email: moonmoths@gmail.com



Land at the Technium Site, Baglan: Phase I Vegetation & Breeding Bird Surveys

Pryce Consultant Ecologists

Trevethin, School Road, Pwll, Llanelli, Carmarthenshire, SA15 4AL.
Voicemail: 01554 775847 Mobile: 07900 241371 Email: PryceEco@aol.com

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Photographs

All photographs taken during the PEA survey visit can be viewed from the following link. The authors give permission for any of these images to be downloaded and used appropriately.

<https://photos.app.goo.gl/9F44kANpN2gEwT8s5>

Pryce Consultant Ecologists

Trevethin, School Road, Pwll, Llanelli, Carmarthenshire, SA15 4AL.
Voicemail: 01554 775847 Mobile: 07900 241371 Email: PryceEco@aol.com

Land at the Technium Site, Baglan: Phase I Vegetation & Breeding Bird Surveys

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Pryce Consultant Ecologists

Trevethin, School Road, Pwll, Llanelli, Carmarthenshire, SA15 4AL.
Voicemail: 01554 775847 Mobile: 07900 241371 Email: PryceEco@aol.com

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1. INTRODUCTION

- 1.1 This report provides a record of the ecological surveys undertaken by Barry Stewart & Associates (BSEco) and contributes to baseline-data gathered for the Technium Assessment Site and adjacent verges identified as potential mitigation options within the Baglan Industrial Area. This work is being undertaken on behalf of Neath Port Talbot in support of the proposals for a new building and the extension of car parking facilities.
- 1.2 The report provides details of an extended phase I habitat survey and a breeding bird survey and assesses the potential ecological impacts of the proposed development on the features. The report also identifies opportunities to directly contribute to the sustainable management of local natural resources in line with the objectives set out in the Environment (Wales) Act 2016 and the Well-being of Future Generations (Wales) Act 2015.

2. SCOPE OF WORK AND RELEVANT LEGISLATION

- 2.1 A field survey of the land at the Technium Site, located at OSGR SS74009295, upon which this assessment is based, was carried out on site visits made on 22nd April and 01st May 2020 by Barry Stewart. The area covered by the survey is shown on Figure 1.

Ground elevation is below 10m AOD, the Site being situated within the Baglan Bay plain 800m south-east of the Neath Estuary. The underlying geology is South Wales Middle Coal Measures Formation, overlain by tidal flat deposits of clay, silt and sand from the Quaternary Period. Industrialisation of the area has resulted in the site having been subjected to significant modification and the substrates include a high proportion of slag and other steel processing byproducts, materials favourable for the development of diverse xerophyte vegetation. The nearest residential area is Baglan, situated 350m north-east of the site on the opposite side of the M4/A48 corridor. Management of the car park beds and its plantings, together with the extensive lawn area is regularly undertaken, with peripheral areas of scrub and tall herb left to nature.

2.2 Vegetation

The vegetation types present within the site were assessed by Barry Stewart using methodology based on that described in the Handbook for *Phase 1 habitat survey - a technique for environmental audit* (Joint Nature Conservation Committee, 2010). The results of the survey are presented at figure 1 and brief descriptions of each habitat type are given in section 3, below. Species lists were compiled in the form of target notes (TN) in order to describe each of the mapping units and/or features of interest. These lists are reproduced at appendix 1 but key and noteworthy species are detailed in the relevant sections of the report. The text below uses vernacular names for the vascular plants recorded during the surveys, the scientific names of which are given at appendix 1. It is standard practice to use italicized scientific names of lower

Pryce Consultant Ecologists

Trevethin, School Road, Pwll, Llanelli, Carmarthenshire, SA15 4AL.
Voicemail: 01554 775847 Mobile: 07900 241371 Email: PryceEco@aol.com

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plants, including bryophytes (mosses and liverworts), which are used preferentially in the main text, although vernacular names are also provided at appendix 1.

Searches were also carried out for the presence of Invasive Non-Native Species (INNS), including those listed on Schedule 9 of the Wildlife and Countryside Act 1981, principally Japanese Knotweed *Fallopia japonica*, Indian Balsam *Impatiens glandulifera* and Giant Hogweed *Heracleum mantegazzianum*.

3. BASELINE INFORMATION

3.1 Designated Sites (see figure 1)

3.1.1 Protected Sites

There are no Special Protection Areas (SPA) or Special Areas of Conservation (SAC) designated within at least 2km of the survey site, the closest SAC being Crymlyn Bog, which comes to within 2.4 km of the site, to the north west, as shown on figure 3.

3.1.2 County Wildlife Sites

Figure 3 shows the series of **Sites of Importance for Nature Conservation (SINCs)** that has been adopted by Neath Port Talbot CBC in its Unitary Development Plan, several of which lie within a 2km of the site. The closest of these is **Baglan Triangular Pond**, which lies less than 50m to the east and is the site one of the most important populations of Deptford Pink (*Dianthus armeria*) in Wales. Brunel Dock grasslands lie 600m to the north of the site and support Wales main colony of Wild Liquorice (*Astragalus glycyphyllos*).

3.1.3 Designated Ancient Woodland

The assessment site does not include any ancient woodland units identified on the Forestry Commission Ancient Woodland Inventory 2011, as shown on figure 3. The nearest unit lies over 400m to the east, which is part of a mosaic of units on hillside of Daren-wen.

3.2 Vegetation Survey Results

The total numbers of species of the main plant taxonomic divisions recorded during the survey are shown at Table 3.1 and lists of all records are at appendix 1.

Table 2.1 Species totals for taxonomic groups recorded during the survey

Taxonomic group	Total species
Vascular plants (native/naturalized)	140
Vascular plants (planted)	19
Bryophytes (mosses & liverworts)	30

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3.2.1 WOODLAND AND SCRUB

The western part of the site was largely dominated by a mixture of broad-leaved plantation woodland and deciduous scrub, as shown respectively by **TN04**, **TN05** and **TN09** on figure 1. The planted section comprised a diverse mix of woody species including Austrian Pine, Dawn Redwood, Elaeagnus, Guelder-rose, Hawthorn, Hybrid Black-poplar, Italian Alder, Osier, Rowan, Silver Birch, Spindle and White Willow. The area of continuous scrub was largely dominated by Rusty Willow with occasional / rare Alder, Ash, Guelder-rose, Hybrid Crack-willow and Pedunculate Oak. Butterfly-bush was locally frequent along the railway side of the fence. The majority of trees were had diameters at breast height (dbh) no greater than 30cm, with only a few of the faster growing species around 40cm.

The field layer in woodland areas was generally dominated by sprawling Bramble with other woodland indicators being generally infrequent, those noted including Atlantic Ivy, Hart's-tongue, Herb-Robert, Male-fern, Remote Sedge and Wavy Bitter-cress. Other atypical woodland species noted as frequent or locally abundant included *Brachythecium rutabulum*, Cleavers, Common Reed, Early Goldenrod, Glaucous Sedge, Hemlock Water-dropwort and Water Mint. Bryophytes (mosses and liverworts) and lichens were represented by a range of common and widespread species. The assemblage of species represented in the areas described above does not correspond well with any of the National Vegetation Classification (NVC) community descriptions, but is likely to develop into a variant of W10 *Quercus robur* - *Pteridium aquilinum* - *Rubus fruticosus* woodland.

Other areas of semi-mature mixed plantings were identified at **TN08** and in pockets within the mitigation compartments (**C2** to **C5**), the most frequent species noted being Austrian Pine, Box-leaved Honeysuckle, Hybrid Black-poplar and Silver Birch. The field layer in these areas was poorly developed with minimal woodland species other than Bramble, Common Nettle, Ground-ivy and ubiquitous bryophytes.

More formal ornamental planting areas around the car park (**TN07**) and in pockets within the mitigation compartments (**A** and **B**) included numerous trees and shrubs, these plantings being a mix of native and non-native species such as Beech, Box-leaved Honeysuckle, Cherry Laurel, Dwarf Mountain-pine, Goat Willow, New Zealand Flax and Red Dogwood. The assemblage of ruderal weeds noted in the mulch beds in which these plantings are located was moderately diverse and included American Willowherb, Annual Meadow-grass, Bilbao's Fleabane, *Oxyrrhynchium hians*, Prickly Sow-thistle and Wall Speedwell.

3.2.2 TALL HERB VEGETATION

Stands of vegetation with a prominent tall herb element, were noted at **TN10** and **TN14**, these areas generally being unmanaged and in an early phase of succession to scrub. The main species characterizing these heterogeneous, diverse stands included Bramble, Chalk Knapweed, Cock's-foot, Common Nettle, Creeping Thistle, Dewberry, Early Goldenrod, False Oat-grass Oxeye Daisy Hogweed and Wild Parsnip.

Pryce Consultant Ecologists

Trevethin, School Road, Pwll, Llanelli, Carmarthenshire, SA15 4AL.
Voicemail: 01554 775847 Mobile: 07900 241371 Email: PryceEco@aol.com

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The non-native Early Goldenrod was invasive in large parts of TN14 extending into areas of scrub of TN05. A small stand of Japanese Knotweed was recorded on the railway side of the boundary fence and the interface of TN15 and TN16. Whilst this was the only patch recorded, vigilance should be exercised to the possibility of other living stands elsewhere within the site.

3.2.3 GRASSLAND

Amenity grassland areas within the core of the assessment site, shaded canary yellow on figure 1 (**TN01**), although poorly defined in terms of NVC show loose affinity to MG5 *Cynosurus cristaus-Centaurea nigra* grassland community. The main components of the sward in this community were Common Bird's-foot Trefoil, Glaucous Sedge, Red Fescue, Ribwort Plantain, Sweet Vernal-grass and Yarrow. Less frequent species reflecting the free-draining, calcareous nature of the soils included Bee Orchid, Bulbous Buttercup, Cowslip, Dove's-foot Crane's-bill, Early Forget-me-not and Lady's Bedstraw. Similar, tightly mown and rabbit-grazed lawn vegetation was present in the very north of the site at **TN13**, with additional species noted including Common Centaury, Common Stork's-bill, Ground-ivy, Squirrel-tail Fescue and Viper's Bugloss

A similar character and suite of species was recorded from the mitigation area road verge grasslands (**A1 & B1**) on the south-western side of the distributor road, additional components including Chalk Knapweed and an increase in Oxeye Daisy. Additional species noted growing around a concrete base at **A4** included a few bryophytes typically associated with sand dunes, e.g. *Homalothecium lutescens* and *Syntrichia ruralis* ssp. *ruraliformis*. The verge grassland on the north-eastern side of the road (**C1**) was significantly less diverse, with the sward largely dominated by *Rhytidiadelphus* and Yorkshire-fog, with locally frequent Field Wood-rush, Meadow Foxtail and Oxeye Daisy.

Uncut verge banks flanking the eastern side of the bridge ramparts at **TN06** supported a rich assemblage of pollinator-friendly species. Compositionally, the sward was not markedly different to the amenity areas described above, but diverse structure enabled additional species to flourish, such as Black Medick, Common Restharrow, Creeping Cinquefoil, Hedhe Bedstraw, Lucerne, Narrow-leaved Vetch, Red Clover and Wild Parsnip.

3.2.4 MARGINAL & INUNDATION VEGETATION

The swale that runs around the inside of the western boundary is largely scrubbed over, but some limited sections are more open as depicted by **TN03** on figure 1. The water gradient runs from south to north to east, with the swale terminating in an attenuation basin at **TN02**, this being drained by a culvert at its eastern end. The vegetation of the flood attenuation channel is largely dominated by Rusty Willow and Common Reed, with locally frequent to occasional Bittersweet, False Fox-sedge, Remote Sedge and Yellow Iris. The attenuation basin, which was dry at the time of the survey, was dominated by *Drepanocladus aduncus*, with locally frequent Creeping Cinquefoil, Tufted Forget-me-not, Water Mint and Yellow Iris. The edge of the basin (**TN12**) were more diverse with marginal wetland species noted including Clustered Dock, False Fox-sedge, Hard Rush, Silverweed and Soft Rush.

Pryce Consultant Ecologists

Trevethin, School Road, Pwll, Llanelli, Carmarthenshire, SA15 4AL.
Voicemail: 01554 775847 Mobile: 07900 241371 Email: PryceEco@aol.com

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3.2.5 BROWNFIELD VEGETATION

The land between the railway and the western boundary fence comprises a mosaic of scrub (**TN09**), open vegetation on basic slag (**TN16**) and a semi-shaded brownfield dune slack (**TN15**). The scrub component is described above, this partially shading the interesting strip of dune slack vegetation which includes components such as Creeping Willow, Sand Sedge and Sharp Rush. Species characterizing the drier, more open ground on basic slag a TN16 include Bilbao's Fleabane, Dewberry, Dove's-foot Crane's-bill, Evening Primrose, *Hypnum lacunosum*, Mouse-ear-hawkweed and Wild Strawberry.

3.2.6 SIGNIFICANT PLANT SPECIES

Bee Orchids and Cowslips were found at low density across much of the main lawned area (**TN01**) and within the sections A and B of the mitigation area. These are both axiophytes (botanical indicators of important habitats in NPT). Other localised or important plant species noted in the strip of brownfield dune slack vegetation that runs parallel to the site boundary fence (**TN15**) included Brown Sedge, Creeping Willow and Sharp Rush.

Japanese knotweed was not recorded from the study area during the survey, but a small stand was noted just outside of the western boundary at the interface of **TN15** and **TN16**. All personnel should be vigilant and must notify the site ecologist if any additional plants are encountered at any stage. A control programme would need to be implemented to eliminate the plant in its entirety from the wider site to help achieve Water Framework Directive invasive species objectives.

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4. BREEDING BIRD SURVEY

- 4.1 All nests occupied or being built by breeding birds are protected against disturbance by the Wildlife and Countryside Act (WCA) 1981. A breeding bird survey was carried out for this assessment to determine the importance of the bird. Habitat mosaics comprising woodland, scrub and emergent and tall herb vegetation were found to support no more than moderate diversity of breeding species, with only three that of high conservation value, by way of their inclusion on Section 7 of the Environment (Wales) Act 2016.
- 4.2 Three survey visits were undertaken during April and May 2020, with a walkover, stop and look/listen method being used. Variations were made to the survey route on each visit to eliminate biases and ensure the entire site was fully covered including adjacent habitats. Additional records were made during other surveys carried during the 2019 breeding season window and are included in this assessment.
- 4.3 The locations of all breeding bird territories and non-breeding birds recorded within or immediately adjacent to the boundaries of the survey site during the survey are shown on figure 2 with breeding territories of species of high conservation value highlighted by orange 'heat spots'. The main survey area is shown bounded by the black-dashed line and the proposed mitigation area is bounded by the red line. Table 3.1 lists all 24 species recorded, with figures in the last column providing the number of recorded territories.

Table 3.1

List of all species recorded during the survey, with breeding status and the total number of breeding territories recorded within or immediately adjacent to the study site. Observations of birds recorded flying over the site are shown in brackets.

BTO code	Species	Breeding Status	# Observations (#) = flying over	# Territories
B.	Blackbird	Confirmed	9	4
BC	Blackcap	Probable	10	5
BF	Bullfinch (S7)	Confirmed	2	1
BT	Blue Tit	Confirmed	6	4
CC	Chiffchaff	Possible	6	3
CH	Chaffinch	Probable	2	1
D.	Dunnock (S7)	Probable	7	4
GJ	Greylag Goose		(1)	0
GO	Goldfinch	Confirmed	13	8
GT	Great Tit	Probable	3	1
HM	House Martin		(2)	0
JD	Jackdaw		4(3)	0

Pryce Consultant Ecologists

Trevethin, School Road, Pwll, Llanelli, Carmarthenshire, SA15 4AL.
Voicemail: 01554 775847 Mobile: 07900 241371 Email: PryceEco@aol.com

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LT	Long-tailed Tit	Probable	2	1
LW	Lesser Whitethroat	Possible	1	1
MG	Magpie	Possible	3	1
PW	Pied Wagtail	Possible	2	1
R.	Robin	Confirmed	10	5
RW	Reed Warbler	Probable	3	1
SL	Swallow		(1)	0
ST	Song Thrush (S7)	Probable	3	2
WH	Whitethroat	Probable	10	5
WP	Woodpigeon	Confirmed	3	2
WR	Wren	Probable	6	3
WW	Willow Warbler	Probable	4	1

Whilst no fully protected species (i.e. those included under Schedule 1 of the Wildlife and Countryside Act, 1981) are known or considered as likely to breed within the Site, suitable breeding habitat exists for Cetti's Warbler in areas of wet scrub. Schedule 1 species that have potential to be occasional visitors to the site during the breeding season from nearby breeding sites include Barn Owl and Kingfisher.

Section 7 *Species of Principal Importance*^a, and/or Birds of Conservation Concern Red List species^b, either recorded (in bold text) or likely to occur within or in the vicinity of the Site, include the following.

- ^a Kestrel (might occasionally hunt over areas of grassland)
- ^{ab} Starling (post-breeding aggregations could use areas of open lawn)
- ^{ab} **Song Thrush** (probable breeder in woodland/scrub)
- ^a **Dunnoek** (probable breeder in heath and scrub)
- ^b Grey Wagtail (likely to be occasional visitor to attenuation basin)
- ^a **Bullfinch** (possible breeder in areas of scrub)
- ^{ab} Linnet (breeds nearby and is likely to feed in open areas on occasions)

The breeding bird assemblage is considered to be of no more than medium significance. Nevertheless, it is essential that scrub is not cleared during the breeding season without prior inspection by a suitably qualified ecologist. Ideally, any scrub/tree clearance should be undertaken during the period between September and February inclusive.

Pryce Consultant Ecologists

Trevethin, School Road, Pwll, Llanelli, Carmarthenshire, SA15 4AL.
Voicemail: 01554 775847 Mobile: 07900 241371 Email: PryceEco@aol.com

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5 ECOLOGICAL ASSESSMENT

5.1. Assessment criteria

Impact significance has been assessed for each of the features using a three-stage process: An assessment of ecological value; an assessment of the magnitude of the likely impacts of the proposals; and a determination of impact significance based on a combination of ecological value and magnitude of impact.

Ecological Value

Each feature has been classified according to its nature conservation value using the examples provided in Table 5.1.

Table 5.1. Assessment of Ecological Value

Value	Examples
International	Internationally designated or proposed sites such as Ramsar Sites, Special Protection Areas, Biosphere Reserves and Special Areas of Conservation, or otherwise meeting criteria for international designation. Sites supporting populations of internationally important species.
National	Nationally designated sites such as Sites of Special Scientific Interest (SSSIs), or non-designated sites meeting SSSI selection criteria, National Nature Reserves (NNRs), Nature Conservancy Review (NCR) Grade 1 sites, viable areas of key habitats within the UK Biodiversity Action Plan. Sites supporting viable breeding populations of Red Data Book (RDB) species (excluding scarce species), or supplying critical elements of their habitat requirements.
Regional	Sites containing viable areas of threatened habitats listed in a regional Biodiversity Action Plan, comfortably exceeding Site of Importance for Nature Conservation (SINC) criteria, but not meeting SSSI selection criteria. Sites supporting viable populations of Nationally Scarce species or those included in the Regional Biodiversity Action Plan on account of their rarity, or supplying critical elements of their habitat requirements.
County	Sites meeting the criteria for a county or metropolitan area designation (such as SINC), which may include amenity and educational criteria in urban areas. Ancient semi-natural woodland. Designated Local Nature Reserves. Sites containing viable areas of any key habitat type

Pryce Consultant Ecologists

Trevethin, School Road, Pwll, Llanelli, Carmarthenshire, SA15 4AL.
Voicemail: 01554 775847 Mobile: 07900 241371 Email: PryceEco@aol.com

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	identified in the Local Biodiversity Action Plan (LBAP). Sites supporting viable breeding populations of species known to be county/metropolitan rarities e.g. featuring in county 'red data book' or LBAP, or supplying critical elements of their habitat requirements.
District	Undesignated sites, or features considered appreciably to enrich the habitat resource within the context of the Borough or District, or included in the Borough or District LBAP. Amenity and educational functions will be recognised in urban areas. Sites with viable breeding populations of species listed as rare in the District or Borough LBAP or supplying critical elements of their habitat requirements.
Local	Undesignated sites, or features appreciably enriching the habitat resource within the context of the Parish or neighbourhood (e.g. a species-rich hedgerow).
Unimportant	Low-grade and widespread habitats

Magnitude of Impact

The magnitude of each predicted impact has been assessed on a scale of High, Medium, Low and Minimal according to the criteria provided in Table 5.2.

Table 5.2. Criteria for determining magnitude of impacts

Magnitude	Criteria
High	Loss of about 50% or more of the site area. Other effects (e.g. disturbance or damage arising from pollution) including indirect impacts having an adverse impact equivalent in nature conservation terms to a loss of >50% of the site area.
Medium	Loss affecting 20-49% of the site area. Other effects (e.g. disturbance or damage arising from pollution) including indirect impacts having an adverse impact equivalent in nature conservation terms to a loss of 20-49% of the site area.
Low	Loss affecting 4-19% of the site area. Other effects (e.g. disturbance or damage arising from pollution) including indirect impacts having an adverse impact equivalent in nature conservation terms to a loss of 4-19% of the site area.

Pryce Consultant Ecologists

Trevethin, School Road, Pwll, Llanelli, Carmarthenshire, SA15 4AL.
Voicemail: 01554 775847 Mobile: 07900 241371 Email: PryceEco@aol.com

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Minimal	Loss affecting up to 4% of the site area. Other effects (e.g. disturbance or damage arising from pollution) including indirect impacts having an adverse impact equivalent in nature conservation terms to a loss of 4% of the site area.
Potential Net Gain	Mitigation will seek to increase the extent of existing habitats or replace lost habitats with larger areas of suitable habitats. Such areas will be established and, where significant species are to be displaced, will be in a state ready for colonisation prior to any proposed habitat disturbance.

Significance of Impact

Table 5.3. illustrates how significance has been assigned to the impact, based on a combination of the value of the feature being assessed. This has been expressed on a five-point scale ranging from Severe to Negligible as shown below.

Table 5.3. Criteria for determining significance of impacts

Impact Magnitude	Ecological Value						
	Inter- national	National	Regional	County	District	Local	Un- important
High	Severe	Major	Major	Major	Moderate	Minor	Minor
Medium	Major	Major	Moderate	Moderate	Moderate	Minor	Negligible
Low	Moderate	Moderate	Minor	Minor	Minor	Negligible	Negligible
Minimal	Minor	Minor	Negligible	Negligible	Negligible	Negligible	Negligible
No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact

Assessment of significance of impact on plants and habitats**5.2 Sites and Habitats****5.2.1 Protected Sites**

There are no Special Protection Areas (SPA) or Special Areas of Conservation (SAC) designated within at least 2km of the survey site, the closest SAC being Crymlyn Bog, which comes to within 2.4 km of the site, to the north west, as shown on figure 3. The study site is

Pryce Consultant Ecologists

Trevethin, School Road, Pwll, Llanelli, Carmarthenshire, SA15 4AL.
Voicemail: 01554 775847 Mobile: 07900 241371 Email: PryceEco@aol.com

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separated hydrologically from the SAC by the Neath River. Two Sites of Special Scientific Interest (SSSI) are located within 2km buffer; Crymlyn Burrows SSSI, which lies 1.3km to the west and Earlswood Road Cutting and Ferryboat Inn Quarries SSSI. The dune and intertidal habitats for which Crymlyn Burrows is designated and geological attributes of the Earlswood SSSI lie outside the sphere of influence of the site, as they are buffered by the Neath Estuary. Provided that run-off from the site during any construction operations complies with NRW consents and does not enter any water-course that might ultimately connect to any internationally or nationally protected sites in the area, the ecological impact is assessed to be

NO IMPACT (International or National ecological value, No impact)

5.2.2 **County Wildlife Sites**

Figure 3 shows the series of **Sites of Importance for Nature Conservation (SINCs)** that has been adopted by the Neath Port Talbot County Borough Council in its Unitary Development Plan, several of which lie within a 2km of the site. The closest of these is **Baglan Triangular Pond**, which lies less than 50m to the east and is the site one of the most important populations of Deptford Pink (*Dianthus armeria*) in Wales. Brunel Dock grasslands lie 600m to the north of the site and support Wales main colony of Wild Liquorice (*Astragalus glycyphyllos*). No risks are identified that might adversely impact the habitats supporting these and other important species known to occur at local SINC sites. The only potential risk the SINC identified has a result of ongoing development of the survey site, is changes in the hydrology, which might affect the slack features of the **Baglan Bay SINC**. However, as the drainage is directed into and highly diluted by the Neath Estuary main channel, it is considered improbable that the hydrology of the SINC will be modified in any way.

NO IMPACT (County ecological value, No impact)

5.2.3 **Designated Ancient Woodland**

The assessment site does not include any ancient woodland units identified on the Forestry Commission Ancient Woodland Inventory 2011, as shown on figure 3. The nearest unit lies over 400m to the east, which is part of a mosaic of units on hillside of Daren-wen. The scrub on site is not linked to these ancient woodland units, but is well connected to other areas of scrub in Bagan Bay. Whilst scrub and planted woodland are an important component of habitat mosaics in the local landscape, open grassland habitats are more important for supporting a high level of biodiversity and scrub removal for this purpose should not be discouraged. There are no perceived areas of ancient woodland within the 2km search buffer

NO IMPACT (National ecological value, No impact)

5.2.4 Habitats of European Significance

No Annex 1 habitats as defined in the EC Habitats Directive occur within the survey site or are likely to be impacted by the proposed development.

NO IMPACT (International ecological value, No impact)

5.2.5 Section 7 Habitats of Principal Importance and UK BAP Habitats

Pryce Consultant Ecologists

Trevethin, School Road, Pwll, Llanelli, Carmarthenshire, SA15 4AL.
Voicemail: 01554 775847 Mobile: 07900 241371 Email: PryceEco@aol.com

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Habitats of Principal Importance for Conservation of Biological Diversity listed under Section 7 of the Environment (Wales) Act 2016 and UK Biodiversity Action Plan Priority Habitats which may be affected by the proposals include the following:

- *Calcareous grassland*
- *Ponds*
- *Open Mosaic Habitats on Previously Developed Land*

Section 7 habitats are broadly similar to the Priority Habitats listed under the UK Biodiversity Action Plan. Section 7 habitats are material considerations to which the local planning authority is required to have due regard when determining all planning applications.

Calcareous grassland

Although mapped as amenity grassland, the extensive lawn area identified by TN01 very loosely fits into the category for calcareous grassland and supports eight qualifying species (the minimum level required for this habitat). However, as this is not a typical example of this habitat type and its inclusion here is arguably contentious, the vegetation nevertheless includes elements of local interest such as Bee Orchids, Cowslips and Lady's Bedstraw and should require a level of mitigation. It is anticipated that >50% loss will result in an impact judged to be:

MODERATE ADVERSE (District ecological value, High magnitude)

Mitigation options might include improving management transitional tall herb vegetation in and around TN14, where currently there is a high proportion of non-natives (especially the invasive Early Golden-rod) and or relaxing the intensive mowing regime across areas of the proposed mitigation verges to benefit the key species listed, as well as increasing a significantly higher level of productivity for pollinators and other grassland invertebrates. Implementation of these measures would potentially reduce the impact of the development to:

MINOR ADVERSE (District ecological value, Low magnitude)

Pond

The seasonally flooded pond supports a rather limited suite of wetland species, but is likely to be highly productive for invertebrates in addition to supporting a range vertebrate fauna such as amphibians, reptiles, birds and mammals. It is not anticipated that this feature will be included within the development and the impact judged to be:

MINOR ADVERSE (District ecological value, Low magnitude)

Open Mosaic Habitats on Previously Developed Land (OMHoPDL)

Most of the vegetation in this category occurs outside of the site boundary, adjacent to the western fence, but is included as it is an area that could help to deliver some ecological gain. Essentially what was formerly a diverse and open brownfield mosaic is currently in the process of being shaded out by encroaching scrub. This vegetation includes elements of brownfield dune slack vegetation (TN15) and calcareous grassland components of a former area of slag (TN16), both of which would greatly benefit from removal of adjacent scrub. These habitats,

Pryce Consultant Ecologists

Trevethin, School Road, Pwll, Llanelli, Carmarthenshire, SA15 4AL.
Voicemail: 01554 775847 Mobile: 07900 241371 Email: PryceEco@aol.com

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although of a secondary nature are of relatively high ecological value and are a component of wider communities that make up OMHoPDL within the Baglan area. It is not anticipated that these feature will be included within the development and the impact judged to be:

NEGLECTIBLE ADVERSE (District ecological value, Minimal magnitude)

Opening up of these areas by carrying out scrub removal (primary Rusty Willow and the highly invasive and non-native Butterfly-bush will potentially provide:

ECOLOGICAL NET GAIN (District ecological value, Minimal magnitude)

5.3 Plants

5.3.1 Protected Plant Species

A small number of native Bluebells was recorded in the mitigation area verges during the survey. Bluebell is protected against sale under schedule 8 of the Wildlife and Countryside Act 1981 as amended.

Impact on the Bluebell population within the survey site that has already occurred during the construction phase:

NO IMPACT (County ecological value, No impact)

5.3.2 Plants of European Significance

No plant species of European significance were recorded or are likely to be present within the survey site. Impact is assessed as

NO IMPACT (International ecological value, No impact)

5.3.3 Section 7 and UK BAP Plant Species

No plants within these categories were recorded or are likely to be present within the survey site. Impact is assessed as

NO IMPACT (National ecological value, No impact)

5.3.4. Non-designated Habitats and Plant Species

Amenity ornamental plantings

The loss of approximately 0.6ha species-poor grassland (amounting to approximately 90% of the site area) is assessed as

Significance of Impact during the site enabling and construction phases

NEGLECTIBLE ADVERSE (Local ecological value, Low magnitude)

5.4 **Birds**

No fully protected species are known or suspected of breeding within the assessment site, although suitable breeding habitat exists for Cetti's Warbler in areas of marginal scrub. Approximately seven territories of three 'Section 7' *Species of Principal Importance* and Birds of Conservation Concern Red List were mapped within or immediately adjacent to the study site. In addition, moderate numbers of widespread and common species and birds of lesser conservation concern also depend upon the site, utilising all of the habitats represented. The areas of scrub are the most important breeding habitats for high priority species such as Dunnock, Song Thrush and Bullfinch, whilst lawns are important feeding areas for Song Thrush and Dunnock. The significance of impact during the site enabling and construction phases, providing that no nesting birds are disturbed during the breeding season is predicted to be:

MINOR ADVERSE (Local ecological value, Medium magnitude)

Pryce Consultant Ecologists

Trevethin, School Road, Pwll, Llanelli, Carmarthenshire, SA15 4AL.
Voicemail: 01554 775847 Mobile: 07900 241371 Email: PryceEco@aol.com

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Reduction in habitat availability leading to displacement of territories may be offset to some degree by implementation of the habitat enhancements which would enrich adjacent feeding areas along roadside verges and marginal transitions. This could potentially reduce the significance of the residual impact on bird populations to:

NEGLECTIBLE ADVERSE (Local ecological value, Low magnitude)

6. CONSTRAINTS AND OPPORTUNITIES

6.1 Grassland

It is anticipated that >50% of grassland that supports a moderately diverse calcareous flora will be lost. Mitigation options include improving management of the transitional tall herb vegetation in and around TN14, where currently there is a high proportion of non-natives (especially the invasive Early Golden-rod). Also, relaxing the intensive mowing regime across areas of the proposed mitigation verges to increase sward diversity and productivity for pollinators and other grassland invertebrates. Periodic management of the diverse and productive verge bank at TN06 will also be required to prevent succession to scrub.

The opportunity for creating a green roof would potentially provide significant mitigation for loss of grassland habitats by providing opportunities for a suite of localised species such as Deptford Pink, Wall Bedstraw, Wild Liquorice and Small Blue butterfly.

6.2 Brownfield dune slack

The vegetation adjacent to the western fence, is of moderate ecological value, but is in the process of being shaded out by encroaching scrub. This vegetation includes elements of brownfield dune slack vegetation (TN15) and calcareous grassland components of a former area of slag (TN16), both of which would greatly benefit from removal of adjacent scrub on slag.

6.3 Birds

Reduction in habitat availability is likely to result in a small number of displaced territories. These will be offset to some degree by implementation of the habitat enhancements which would enrich adjacent feeding areas along roadside verges and marginal transitions. There are further opportunities to provide nesting options for birds, both in the establishing young woodland and on the new building by way of providing nest boxes for hole-nesting birds such as Blue/Great Tits, House Sparrows and Swifts

6.4 Habitat Connectivity

The site forms part of extensive scrub, grassland and wetland mosaic with established corridors through the local landscape. These corridors are likely to be used regularly as travel routes for a wide range of mobile fauna, including Otters, birds and small mammals, herpetiles and foraging invertebrates. In addition to provisions made to ensure safe travel routes are maintained for these animals during all phases of work, opportunities exist to provide additional enhancements. Examples might include the construction of herpetile/ invertebrate banks, the development of pollinator friendly highways and habitat enrichment to support the conservation of key species.

Pryce Consultant Ecologists

Trevethin, School Road, Pwll, Llanelli, Carmarthenshire, SA15 4AL.
Voicemail: 01554 775847 Mobile: 07900 241371 Email: PryceEco@aol.com

Land at the Technium Site, Baglan: Phase I Vegetation & Breeding Bird Surveys

Pryce Consultant Ecologists

Trevethin, School Road, Pwll, Llanelli, Carmarthenshire, SA15 4AL.
Voicemail: 01554 775847 Mobile: 07900 241371 Email: PryceEco@aol.com

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Pryce Consultant Ecologists

Trevethin, School Road, Pwll, Llanelli, Carmarthenshire, SA15 4AL.
Voicemail: 01554 775847 Mobile: 07900 241371 Email: PryceEco@aol.com

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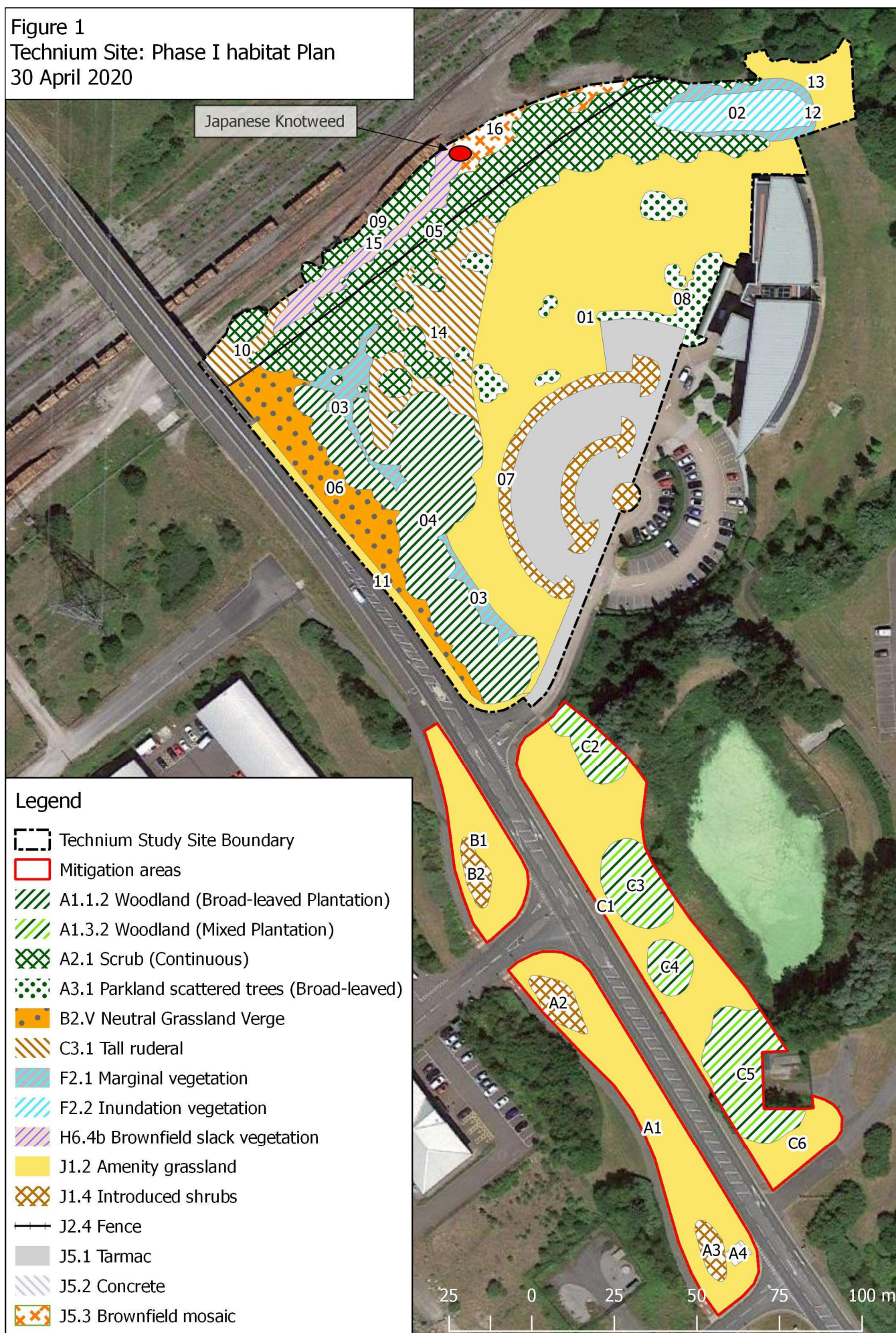
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Pryce Consultant Ecologists

Trevethin, School Road, Pwll, Llanelli, Carmarthenshire, SA15 4AL.
Voicemail: 01554 775847 Mobile: 07900 241371 Email: PryceEco@aol.com

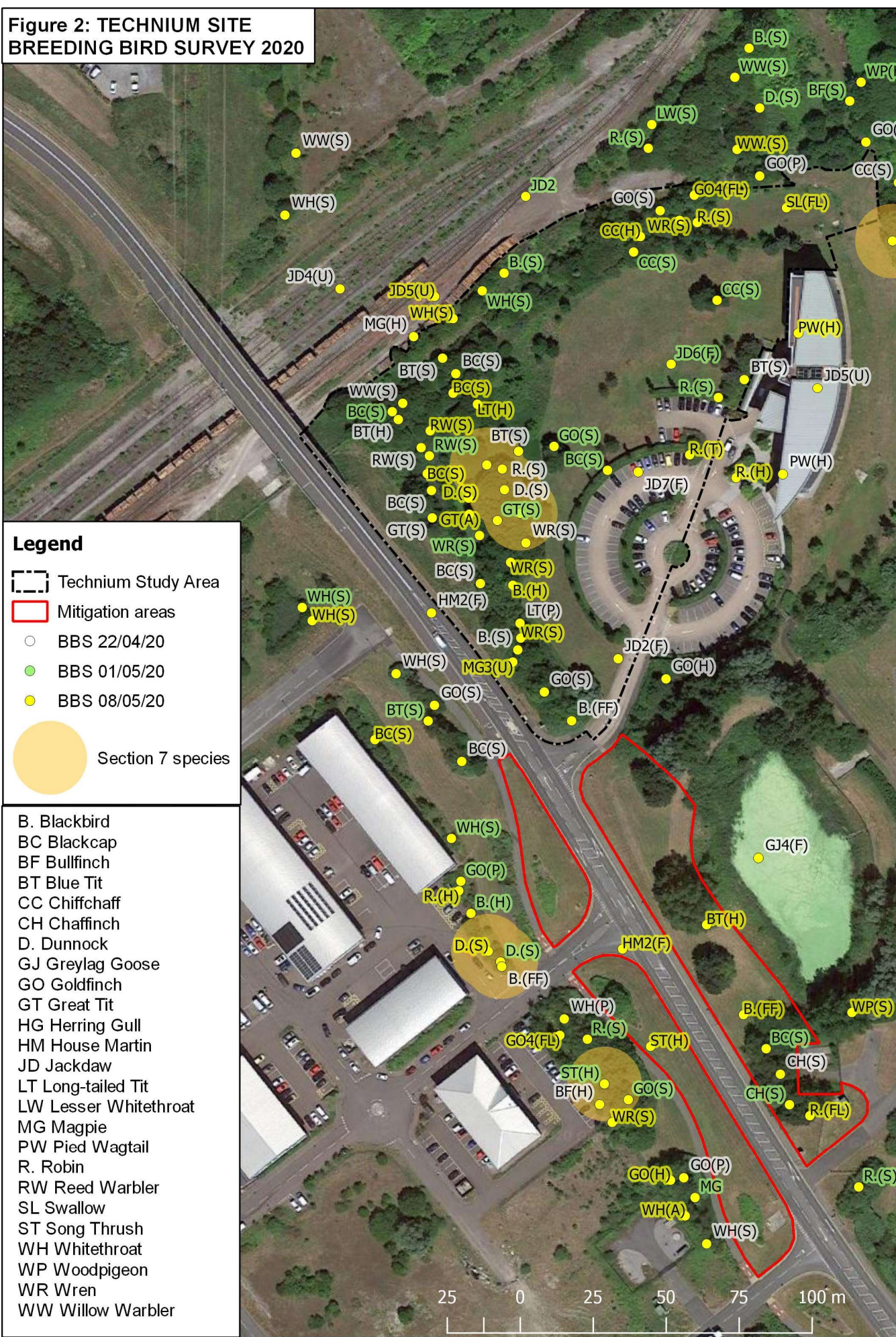
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Figure 1
Technium Site: Phase I habitat Plan
30 April 2020



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**Figure 2: TECHNIUM SITE
BREEDING BIRD SURVEY 2020**



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Figure 3: TECHNIUM SITE
Context with Ecological Designations
2km buffer shown

Legend

-  Technium Study Area
-  SAC
-  SSSI
-  NPT SINCs
-  Ancient Woodland



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APPENDIX 1

Target Notes recorded during the Phase 1 habitat Survey

The locations of the following Target Notes recorded during the ecological field survey are shown on figure 1, each being a sample of species present within a GIS mapping polygon (each outlined in grey on figure 1).

The Phase 1 Habitat Survey was undertaken by Barry Stewart on 22nd April and 1st May 2020, in sunny, calm conditions.

Target notes have been recorded using MapMate recording software which facilitates these records being incorporated into databases administered by specialist bodies including nationally to the Biological Records Centre at the Centre for Ecology and Hydrology, Wallingford, the Distributional Database maintained by the Botanical Society of the British Isles (BSBI) and to Local Record Centre databases. Such records advance the knowledge and understanding of the distribution and frequency of plants, animals and habitats and enable a more informed approach to be made to future management and conservation of the natural and semi-natural environment and potentially assist with the assessment of the impact that future development and land-use changes may have on habitats and wildlife. These records will be submitted to the various national and local databases in due course.

Key to Species Status mnemonics

Dafor scale

- d dominant
- a abundant
- la locally abundant
- f frequent
- lf locally frequent
- o occasional
- r rare
- p present (no frequency noted)
- ** Lichens
- * Bryophytes (mosses and liverworts)

Photographs

All photographs taken during the survey visit can be viewed from the following link. The authors give permission for any of these images to be downloaded and used appropriately.

INSERT LINK HERE

Pryce Consultant Ecologists

Trevethin, School Road, Pwll, Llanelli, Carmarthenshire, SA15 4AL.
Voicemail: 01554 775847 Mobile: 07900 241371 Email: PryceEco@aol.com

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TARGET NOTES

Vernacular	Taxon	Quantity
[TN01] mown lawns		
Bee Orchid	<i>Ophrys apifera</i>	r
Bulbous Buttercup	<i>Ranunculus bulbosus</i>	o
Common Bent	<i>Agrostis capillaris</i>	o
Common Bird's-foot-trefoil	<i>Lotus corniculatus</i>	f
Common Mouse-ear	<i>Cerastium fontanum</i>	o
Common Ragwort	<i>Senecio jacobaea</i>	r
Cowslip	<i>Primula veris</i>	o
Creeping Buttercup	<i>Ranunculus repens</i>	o
Cuckooflower	<i>Cardamine pratensis</i>	r
Curled Dock	<i>Rumex crispus</i>	r
Daisy	<i>Bellis perennis</i>	f
Dandelion	<i>Taraxacum agg.</i>	o
Dove's-foot Crane's-bill	<i>Geranium molle</i>	o
Early Forget-me-not	<i>Myosotis ramosissima</i>	o
Field Wood-rush	<i>Luzula campestris</i>	f
Glaucous Sedge	<i>Carex flacca</i>	lf
Ground-ivy	<i>Glechoma hederacea</i>	r
Lady's Bedstraw	<i>Galium verum</i>	o
Lesser Trefoil	<i>Trifolium dubium</i>	o
Oxeye Daisy	<i>Leucanthemum vulgare</i>	a
Perennial Rye-grass	<i>Lolium perenne</i>	o
Red Fescue	<i>Festuca rubra</i>	f
Ribwort Plantain	<i>Plantago lanceolata</i>	f
Selfheal	<i>Prunella vulgaris</i>	o
Spear Thistle	<i>Cirsium vulgare</i>	r
* Springy Turf-moss	<i>Rhytidiadelphus squarrosus</i>	a
Sweet Vernal-grass	<i>Anthoxanthum odoratum</i>	f
Thyme-leaved Speedwell	<i>Veronica serpyllifolia</i>	o
Wall Speedwell	<i>Veronica arvensis</i>	r
Wild Parsnip	<i>Pastinaca sativa subsp. sylvestris</i>	o
Yarrow	<i>Achillea millefolium</i>	f
<u>planted tree blocks</u>		
Italian Alder	<i>Alnus cordata</i>	lf
Silver Birch	<i>Betula pendula</i>	o
[TN02] basin of attenuation pond		
Common Spike-rush	<i>Eleocharis palustris</i>	o
Creeping Cinquefoil	<i>Potentilla reptans</i>	lf
* Kneiff's Hook-moss	<i>Drepanocladus aduncus</i>	d
Tufted Forget-me-not	<i>Myosotis laxa</i>	lf

Pryce Consultant Ecologists

Trevethin, School Road, Pwll, Llanelli, Carmarthenshire, SA15 4AL.
Voicemail: 01554 775847 Mobile: 07900 241371 Email: PryceEco@aol.com

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Water Mint	<i>Mentha aquatica</i>	lf
Yellow Iris	<i>Iris pseudacorus</i>	lf
[TN03a] flood attenuation channel		
Bittersweet	<i>Solanum dulcamara</i>	o
Common Reed	<i>Phragmites australis</i>	a
False Fox-sedge	<i>Carex otrubae</i>	o
Hard Rush	<i>Juncus inflexus</i>	o
Hemlock Water-dropwort	<i>Oenanthe crocata</i>	r
Honeysuckle	<i>Lonicera periclymenum</i>	r
Remote Sedge	<i>Carex remota</i>	o
Rusty Willow	<i>Salix cinerea subsp. oleifolia</i>	a
Yellow Iris	<i>Iris pseudacorus</i>	f
[TN04] woody plantings & scrub		
Austrian Pine	<i>Pinus nigra subsp. nigra</i>	o
Bramble	<i>Rubus fruticosus agg.</i>	a
Butterfly-bush	<i>Buddleja davidii</i>	r
Cleavers	<i>Galium aparine</i>	lf
* Common Feather-moss	<i>Kindbergia praelonga</i>	f
Common Nettle	<i>Urtica dioica</i>	o
* Common Pocket-moss	<i>Fissidens taxifolius var. taxifolius</i>	o
Dawn Redwood	<i>Metasequoia glyptostroboides</i>	r
Dog-rose	<i>Rosa canina agg.</i>	o
Elaeagnus	<i>Elaeagnus x submacrophylla</i>	o
Glaucous Sedge	<i>Carex flacca</i>	la
Gorse	<i>Ulex europaeus</i>	r
Guelder-rose	<i>Viburnum opulus</i>	o
Hawthorn	<i>Crataegus monogyna</i>	o
Hemlock Water-dropwort	<i>Oenanthe crocata</i>	lf
Hybrid Black-poplar	<i>Populus x canadensis</i>	o
Italian Alder	<i>Alnus cordata</i>	o
Male-fern	<i>Dryopteris filix-mas</i>	o
Osier	<i>Salix viminalis</i>	lf
Pedunculate Oak	<i>Quercus robur</i>	o
Red-osier Dogwood	<i>Cornus sericea</i>	lf
* Rough-stalked Feather-moss	<i>Brachythecium rutabulum</i>	f
Rowan	<i>Sorbus aucuparia</i>	o
Rusty Willow	<i>Salix cinerea subsp. oleifolia</i>	a
Silver Birch	<i>Betula pendula</i>	lf
Spindle	<i>Euonymus europaeus</i>	lf
Water Mint	<i>Mentha aquatica</i>	lf
Wavy Bitter-cress	<i>Cardamine flexuosa</i>	lf
White Willow	<i>Salix alba</i>	o
Wild Strawberry	<i>Fragaria vesca</i>	o

Pryce Consultant Ecologists

Trevethin, School Road, Pwll, Llanelli, Carmarthenshire, SA15 4AL.
Voicemail: 01554 775847 Mobile: 07900 241371 Email: PryceEco@aol.com

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epiphytes on Populus

Atlantic Ivy	<i>Hedera hibernica</i>	o
* Bruch's Pincushion	<i>Ulotia bruchii</i>	o
* Dilated Scalewort	<i>Frullania dilatata</i>	f
* Fairy Beads	<i>Microlejeunea ulicina</i>	o
* Forked Veilwort	<i>Metzgeria furcata</i>	o
* Frizzled Pincushion	<i>Ulotia phyllantha</i>	o
* Lateral Cryphaea	<i>Cryphaea heteromalla</i>	lf
* Mamillate Plait-moss	<i>Hypnum andoi</i>	lf
* Rough-stalked Feather-moss	<i>Brachythecium rutabulum</i>	o
* Wood Bristle-moss	<i>Orthotrichum affine</i>	f
Spanish Gorse	<i>Genista hispanica</i>	r

[TN05] scrub

Alder	<i>Alnus glutinosa</i>	o
Ash	<i>Fraxinus excelsior</i>	o
Atlantic Ivy	<i>Hedera hibernica</i>	la
Bramble	<i>Rubus fruticosus agg.</i>	la
Broom	<i>Cytisus scoparius</i>	r
Brown Sedge	<i>Carex disticha</i>	o
Butterfly-bush	<i>Buddleja davidii</i>	r
Common Reed	<i>Phragmites australis</i>	lf
* Creeping Feather-moss	<i>Amblystegium serpens var. serpens</i>	o
Dandelion	<i>Taraxacum agg.</i>	o
Early Goldenrod	<i>Solidago gigantea</i>	la
Field Horsetail	<i>Equisetum arvense</i>	o
Guelder-rose	<i>Viburnum opulus</i>	r
Hart's-tongue	<i>Asplenium scolopendrium</i>	r
Herb-Robert	<i>Geranium robertianum</i>	o
Hybrid Crack-willow	<i>Salix x fragilis sens. lat.</i>	r
Male-fern	<i>Dryopteris filix-mas</i>	o
Pedunculate Oak	<i>Quercus robur</i>	r
Remote Sedge	<i>Carex remota</i>	o
* River Feather-moss	<i>Brachythecium rivulare</i>	o
* Rough-stalked Feather-moss	<i>Brachythecium rutabulum</i>	f
Rusty Willow	<i>Salix cinerea subsp. oleifolia</i>	d
Sycamore	<i>Acer pseudoplatanus</i>	r
Wavy Bitter-cress	<i>Cardamine flexuosa</i>	o
White Willow	<i>Salix alba</i>	r
Yellow Iris	<i>Iris pseudacorus</i>	o

[TN06] verge grassland

Black Medick	<i>Medicago lupulina</i>	o
Broad-leaved Dock	<i>Rumex obtusifolius</i>	o
Bulbous Buttercup	<i>Ranunculus bulbosus</i>	o

Pryce Consultant Ecologists

Trevethin, School Road, Pwll, Llanelli, Carmarthenshire, SA15 4AL.
Voicemail: 01554 775847 Mobile: 07900 241371 Email: PryceEco@aol.com

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Chalk Knapweed	<i>Centaurea debeauxii</i>	f
Cock's-foot	<i>Dactylis glomerata</i>	f
Colt's-foot	<i>Tussilago farfara</i>	r
Common Bird's-foot-trefoil	<i>Lotus corniculatus</i>	lf
Common Bird's-foot-trefoil	<i>Lotus corniculatus</i>	f
Common Mouse-ear	<i>Cerastium fontanum</i>	o
Common Ragwort	<i>Senecio jacobaea</i>	o
Common Restharrow	<i>Ononis repens</i>	o
Creeping Cinquefoil	<i>Potentilla reptans</i>	o
Creeping Cinquefoil	<i>Potentilla reptans</i>	f
False Oat-Grass	<i>Arrhenatherum elatius</i>	f
Field Wood-rush	<i>Luzula campestris</i>	o
Glaucous Sedge	<i>Carex flacca</i>	o
Gorse	<i>Ulex europaeus</i>	r
Hedge Bedstraw	<i>Galium album</i>	lf
Hogweed	<i>Heracleum sphondylium</i>	o
Lady's Bedstraw	<i>Galium verum</i>	lf
Lucerne	<i>Medicago sativa subsp. sativa</i>	r
Meadow Buttercup	<i>Ranunculus acris</i>	o
Meadow Vetchling	<i>Lathyrus pratensis</i>	lf
Narrow-leaved Vetch	<i>Vicia sativa subsp. nigra</i>	r
Oxeye Daisy	<i>Leucanthemum vulgare</i>	a
* Pointed Spear-moss	<i>Calliergonella cuspidata</i>	la
Red Clover	<i>Trifolium pratense</i>	o
Red Clover	<i>Trifolium pratense</i>	o
Red Fescue	<i>Festuca rubra</i>	lf
* Springy Turf-moss	<i>Rhytidiadelphus squarrosus</i>	a
Timothy	<i>Phleum pratense</i>	lf
Water Figwort	<i>Scrophularia auriculata</i>	r
Wild Parsnip	<i>Pastinaca sativa subsp. sylvestris</i>	lf
Yarrow	<i>Achillea millefolium</i>	o
[TN07] car park ornamental planting beds		
Beech	<i>Fagus sylvatica</i>	a
Box-leaved Honeysuckle	<i>Lonicera pileata</i>	a
Bramble	<i>Rubus fruticosus agg.</i>	r
Chinese Silver-grass	<i>Miscanthus sinensis</i>	p
Creeping Cinquefoil	<i>Potentilla reptans</i>	o
Dwarf Mountain-pine	<i>Pinus mugo</i>	r
Heart-leaved Bergenia	<i>Bergenia cordifolia</i>	r
Lesser New Zealand Flax	<i>Phormium cookianum</i>	r
Turkish Wood Spurge	<i>Euphorbia amygdaloides subsp. robbiae</i>	r
Pedunculate Oak	<i>Quercus robur</i>	f

[TN08] ornamental plantings

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Ash	<i>Fraxinus excelsior</i>	r
Box-leaved Honeysuckle	<i>Lonicera pileata</i>	f
Chinese Silver-grass	<i>Miscanthus sinensis</i>	o
Heart-leaved Bergenia	<i>Bergenia cordifolia</i>	o
Juneberry	<i>Amelanchier lamarckii</i>	r
Red-osier Dogwood	<i>Cornus sericea</i>	o
Scots Pine	<i>Pinus sylvestris</i>	r
Cherry Laurel	<i>Prunus laurocerasus</i>	o
Bramble	<i>Rubus fruticosus</i> agg.	f
Common Nettle	<i>Urtica dioica</i>	lf
Ground-ivy	<i>Glechoma hederacea</i>	lf
Rusty Willow	<i>Salix cinerea</i> subsp. <i>oleifolia</i>	r
[TN09] scrub along railway line		
Butterfly-bush	<i>Buddleja davidii</i>	lf
Downy Birch	<i>Betula pubescens</i>	o
Rusty Willow	<i>Salix cinerea</i> subsp. <i>oleifolia</i>	a
Silver Birch	<i>Betula pendula</i>	o
[TN10] ruderal/scrub mosaic		
Alder	<i>Alnus glutinosa</i>	lf
Bramble	<i>Rubus fruticosus</i> agg.	a
Butterfly-bush	<i>Buddleja davidii</i>	o
Cock's-foot	<i>Dactylis glomerata</i>	f
Common Reed	<i>Phragmites australis</i>	lf
Creeping Thistle	<i>Cirsium arvense</i>	o
Dewberry	<i>Rubus caesius</i>	lf
Downy Birch	<i>Betula pubescens</i>	o
False Oat-Grass	<i>Arrhenatherum elatius</i>	f
Gorse	<i>Ulex europaeus</i>	o
Hogweed	<i>Heracleum sphondylium</i>	o
Red Fescue	<i>Festuca rubra</i>	f
Tufted Hair-grass	<i>Deschampsia cespitosa</i>	o
[TN11] verge curb strip		
Annual Meadow-grass	<i>Poa annua</i>	f
Beaked Hawk's-beard	<i>Crepis vesicaria</i>	o
* Bicoloured Bryum	<i>Bryum dichotomum</i>	o
* Bird's-claw Beard-moss	<i>Barbula unguiculata</i>	o
Common Bent	<i>Agrostis capillaris</i>	o
Common Restharrow	<i>Ononis repens</i>	o
Dandelion	<i>Taraxacum</i> agg.	f
Hoary Mustard	<i>Hirschfeldia incana</i>	o
* Lesser Bird's-claw Beard-moss	<i>Barbula convoluta</i> var. <i>convoluta</i>	o
Oxeye Daisy	<i>Leucanthemum vulgare</i>	f
* Red Beard-moss	<i>Bryoerythrophyllum recurvirostrum</i>	o

Pryce Consultant Ecologists

Trevethin, School Road, Pwll, Llanelli, Carmarthenshire, SA15 4AL.
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Red Fescue	<i>Festuca rubra</i>	f
* Redshank	<i>Ceratonodon purpureus</i>	o
Smooth Sow-thistle	<i>Sonchus oleraceus</i>	o
Sticky Mouse-ear	<i>Cerastium glomeratum</i>	lf
Wall Speedwell	<i>Veronica arvensis</i>	o
Wild Carrot	<i>Daucus carota subsp. carota</i>	o
[TN12] margins of attenuation pond		
Alder	<i>Alnus glutinosa</i>	o
Broom	<i>Cytisus scoparius</i>	r
Butterfly-bush	<i>Buddleja davidii</i>	r
Clustered Dock	<i>Rumex conglomeratus</i>	lf
Common Nettle	<i>Urtica dioica</i>	o
Corkscrew Willow	<i>Salix sp.</i>	r
Creeping Cinquefoil	<i>Potentilla reptans</i>	lf
Creeping Thistle	<i>Cirsium arvense</i>	o
Curled Dock	<i>Rumex crispus</i>	r
False Fox-sedge	<i>Carex otrubae</i>	r
Glaucous Sedge	<i>Carex flacca</i>	lf
Hard Rush	<i>Juncus inflexus</i>	o
Hazel	<i>Corylus avellana</i>	o
Italian Alder	<i>Alnus cordata</i>	lf
Meadow Vetchling	<i>Lathyrus pratensis</i>	o
Red-osier Dogwood	<i>Cornus sericea</i>	o
Remote Sedge	<i>Carex remota</i>	r
Rusty Willow	<i>Salix cinerea subsp. oleifolia</i>	o
Silver Birch	<i>Betula pendula</i>	o
Silverweed	<i>Potentilla anserina</i>	o
Soft-rush	<i>Juncus effusus</i>	o
Water Mint	<i>Mentha aquatica</i>	a
[TN13] lawn east of attenuation pond		
Annual Meadow-grass	<i>Poa annua</i>	o
Common Bird's-foot-trefoil	<i>Lotus corniculatus</i>	lf
Common Centaury	<i>Centaurea erythraea</i>	o
Common Ragwort	<i>Senecio jacobaea</i>	o
Common Stork's-bill	<i>Erodium cicutarium</i>	lf
Cowslip	<i>Primula veris</i>	o
Daisy	<i>Bellis perennis</i>	f
Dove's-foot Crane's-bill	<i>Geranium molle</i>	f
Early Forget-me-not	<i>Myosotis ramosissima</i>	lf
Field Wood-rush	<i>Luzula campestris</i>	f
Germander Speedwell	<i>Veronica chamaedrys</i>	o
Glaucous Sedge	<i>Carex flacca</i>	lf
Ground-ivy	<i>Glechoma hederacea</i>	lf

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Lady's Bedstraw	<i>Galium verum</i>	lf
Perforate St John's-wort	<i>Hypericum perforatum</i>	r
* Pointed Spear-moss	<i>Calliergonella cuspidata</i>	lf
Procumbent Pearlwort	<i>Sagina procumbens</i>	o
Red Fescue	<i>Festuca rubra</i>	f
Ribwort Plantain	<i>Plantago lanceolata</i>	f
Selfheal	<i>Prunella vulgaris</i>	o
* Springy Turf-moss	<i>Rhytidiadelphus squarrosus</i>	a
Squirreltail Fescue	<i>Vulpia bromoides</i>	lf
Sticky Mouse-ear	<i>Cerastium glomeratum</i>	lf
Thyme-leaved Speedwell	<i>Veronica serpyllifolia</i>	f
Viper's-bugloss	<i>Echium vulgare</i>	o
Yarrow	<i>Achillea millefolium</i>	f
[TN14] uncut open area between lawns and scrub		
Bramble	<i>Rubus fruticosus agg.</i>	la
Broad-leaved Dock	<i>Rumex obtusifolius</i>	r
Broom	<i>Cytisus scoparius</i>	r
Chalk Knapweed	<i>Centaurea debeauxii</i>	lf
Cock's-foot	<i>Dactylis glomerata</i>	f
Common Bird's-foot-trefoil	<i>Lotus corniculatus</i>	lf
Common Couch	<i>Elytrigia repens</i>	lf
Common Nettle	<i>Urtica dioica</i>	lf
Common Ragwort	<i>Senecio jacobaea</i>	o
Common Reed	<i>Phragmites australis</i>	o
Creeping Cinquefoil	<i>Potentilla reptans</i>	lf
Creeping Thistle	<i>Cirsium arvense</i>	lf
Dandelion	<i>Taraxacum agg.</i>	o
Dog-rose	<i>Rosa canina agg.</i>	o
Early Goldenrod	<i>Solidago gigantea</i>	la
False Oat-Grass	<i>Arrhenatherum elatius</i>	f
Fodder Burnet	<i>Poterium sanguisorba subsp. balearicum</i>	o
Ground-ivy	<i>Glechoma hederacea</i>	lf
Hemlock Water-dropwort	<i>Oenanthe crocata</i>	o
Oxeye Daisy	<i>Leucanthemum vulgare</i>	lf
Ribwort Plantain	<i>Plantago lanceolata</i>	lf
* Springy Turf-moss	<i>Rhytidiadelphus squarrosus</i>	a
Wavy Bitter-cress	<i>Cardamine flexuosa</i>	o
Wild Parsnip	<i>Pastinaca sativa subsp. sylvestris</i>	o
Wood Forget-me-not	<i>Myosotis sylvatica</i>	o
Yellow Iris	<i>Iris pseudacorus</i>	o
[TN15] brownfield dune slack vegetation		
Black Medick	<i>Medicago lupulina</i>	o
Common Bird's-foot-trefoil	<i>Lotus corniculatus</i>	o

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Common Reed	<i>Phragmites australis</i>	lf
Common Restharrow	<i>Ononis repens</i>	lf
Creeping Willow	<i>Salix repens</i> var. <i>argentea</i>	f
Dandelion	<i>Taraxacum</i> agg.	o
Early Goldenrod	<i>Solidago gigantea</i>	lf
Field Horsetail	<i>Equisetum arvense</i>	lf
Glaucous Sedge	<i>Carex flacca</i>	lf
Hard Rush	<i>Juncus inflexus</i>	r
Hemp-agrimony	<i>Eupatorium cannabinum</i>	r
* Neat Feather-moss	<i>Pseudoscleropodium purum</i>	a
Osier	<i>Salix viminalis</i>	r
Pedunculate Oak	<i>Quercus robur</i>	r
Red Fescue	<i>Festuca rubra</i>	lf
Sand Sedge	<i>Carex arenaria</i>	f
Sharp Rush	<i>Juncus acutus</i>	o
Wild Parsnip	<i>Pastinaca sativa</i> subsp. <i>sylvestris</i>	o
Yellow Iris	<i>Iris pseudacorus</i>	o
[TN16] brownfield mosaic along railway line		
* Bicoloured Bryum	<i>Bryum dichotomum</i>	o
Bilbao's Fleabane	<i>Conyza floribunda</i>	f
Butterfly-bush	<i>Buddleja davidii</i>	lf
Cock's-foot	<i>Dactylis glomerata</i>	lf
* Cylindric Beard-moss	<i>Didymodon insulanus</i>	lf
Dewberry	<i>Rubus caesius</i>	lf
Dove's-foot Crane's-bill	<i>Geranium molle</i>	lf
Evening Primrose	<i>Oenothera</i> agg.	o
Field Forget-me-not	<i>Myosotis arvensis</i>	o
* Great Plait-moss	<i>Hypnum cupressiforme</i> var. <i>lacunosum</i>	la
Japanese Knotweed	<i>Fallopia japonica</i>	lf
* Lesser Bird's-claw Beard-moss	<i>Barbula convoluta</i> var. <i>convoluta</i>	f
Mouse-ear-hawkweed	<i>Pilosella officinarum</i>	lf
* Pointed Spear-moss	<i>Calliergonella cuspidata</i>	f
* Red Beard-moss	<i>Bryoerythrophyllum recurvirostrum</i>	o
* Redshank	<i>Ceratodon purpureus</i>	lf
Ribwort Plantain	<i>Plantago lanceolata</i>	lf
Vervain	<i>Verbena officinalis</i>	r
Wild Strawberry	<i>Fragaria vesca</i>	o
Wild Teasel	<i>Dipsacus fullonum</i>	o
Entrance walkway		
Hornbeam	<i>Carpinus betulus</i>	o
Yew	<i>Taxus baccata</i>	lf
[Mitigation area] Verge A		
Bee Orchid	<i>Ophrys apifera</i>	r

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Bluebell	<i>Hyacinthoides non-scripta</i>	r
Chalk Knapweed	<i>Centaurea debeauxii</i>	lf
Cock's-foot	<i>Dactylis glomerata</i>	lf
Common Bird's-foot-trefoil	<i>Lotus corniculatus</i>	lf
Common Mouse-ear	<i>Cerastium fontanum</i>	o
Common Ragwort	<i>Senecio jacobaea</i>	r
Cowslip	<i>Primula veris</i>	o
Creeping Cinquefoil	<i>Potentilla reptans</i>	lf
Cuckooflower	<i>Cardamine pratensis</i>	r
Curled Dock	<i>Rumex crispus</i>	o
Daisy	<i>Bellis perennis</i>	lf
Dandelion	<i>Taraxacum agg.</i>	lf
Early Forget-me-not	<i>Myosotis ramosissima</i>	lf
Evening Primrose	<i>Oenothera agg.</i>	r
Field Wood-rush	<i>Luzula campestris</i>	lf
Glaucous Sedge	<i>Carex flacca</i>	lf
Lesser Celandine	<i>Ficaria verna</i>	o
Meadow Foxtail	<i>Alopecurus pratensis</i>	o
Oxeye Daisy	<i>Leucanthemum vulgare</i>	f
Red Clover	<i>Trifolium pratense</i>	o
Red Fescue	<i>Festuca rubra</i>	f
Rough Meadow-grass	<i>Poa trivialis</i>	o
* Springy Turf-moss	<i>Rhytidiadelphus squarrosus</i>	a
Sweet Vernal-grass	<i>Anthoxanthum odoratum</i>	lf
Thyme-leaved Speedwell	<i>Veronica serpyllifolia</i>	lf
Wild Parsnip	<i>Pastinaca sativa subsp. sylvestris</i>	o
Yorkshire-fog	<i>Holcus lanatus</i>	a
<u>area around concrete base</u>		
Annual Meadow-grass	<i>Poa annua</i>	o
* Bicoloured Bryum	<i>Bryum dichotomum</i>	o
Cat's-ear	<i>Hypochaeris radicata</i>	r
* Grey-cushioned Grimmia	<i>Grimmia pulvinata</i>	r
Groundsel	<i>Senecio vulgaris</i>	r
Hoary Mustard	<i>Hirschfeldia incana</i>	r
* Lesser Bird's-claw Beard-moss	<i>Barbula convoluta var. convoluta</i>	r
Mouse-ear-hawkweed	<i>Pilosella officinarum</i>	lf
* Neat Feather-moss	<i>Pseudoscleropodium purum</i>	o
Procumbent Pearlwort	<i>Sagina procumbens</i>	r
* Sand-hill Screw-moss	<i>Syntrichia ruralis var. ruraliformis</i>	r
* Thickpoint Grimmia	<i>Schistidium crassipilum</i>	o
* Yellow Feather-moss	<i>Homalothecium lutescens</i>	o
<u>planted beds</u>		
Goat Willow	<i>Salix caprea</i>	p

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Cherry Laurel	<i>Prunus laurocerasus</i>	la
[Mitigation area] Verge B		
Bee Orchid	<i>Ophrys apifera</i>	o
Bilbao's Fleabane	<i>Conyza floribunda</i>	r
Bluebell	<i>Hyacinthoides non-scripta</i>	r
Bristly Oxtongue	<i>Helminthotheca echioides</i>	r
Chalk Knapweed	<i>Centaurea debeauxii</i>	lf
Cock's-foot	<i>Dactylis glomerata</i>	lf
Common Bird's-foot-trefoil	<i>Lotus corniculatus</i>	f
Common Mouse-ear	<i>Cerastium fontanum</i>	o
Common Ragwort	<i>Senecio jacobaea</i>	r
Cowslip	<i>Primula veris</i>	o
Creeping Cinquefoil	<i>Potentilla reptans</i>	o
Curled Dock	<i>Rumex crispus</i>	r
Daisy	<i>Bellis perennis</i>	a
Dandelion	<i>Taraxacum agg.</i>	f
Early Forget-me-not	<i>Myosotis ramosissima</i>	lf
Field Wood-rush	<i>Luzula campestris</i>	f
Glaucous Sedge	<i>Carex flacca</i>	lf
Lesser Celandine	<i>Ficaria verna</i>	r
Lesser Trefoil	<i>Trifolium dubium</i>	o
Meadow Buttercup	<i>Ranunculus acris</i>	o
Meadow Foxtail	<i>Alopecurus pratensis</i>	f
Oxeye Daisy	<i>Leucanthemum vulgare</i>	a
Red Clover	<i>Trifolium pratense</i>	o
Red Fescue	<i>Festuca rubra</i>	f
Spear Thistle	<i>Cirsium vulgare</i>	r
Spreading Meadow-grass	<i>Poa humilis</i>	o
* Springy Turf-moss	<i>Rhytidiadelphus squarrosus</i>	a
Sticky Mouse-ear	<i>Cerastium glomeratum</i>	r
Sweet Vernal-grass	<i>Anthoxanthum odoratum</i>	f
Thyme-leaved Speedwell	<i>Veronica serpyllifolia</i>	o
Timothy	<i>Phleum pratense</i>	o
<u>planted beds</u>		
American Willowherb	<i>Epilobium ciliatum</i>	o
Annual Meadow-grass	<i>Poa annua</i>	o
* Bicoloured Bryum	<i>Bryum dichotomum</i>	o
Bilbao's Fleabane	<i>Conyza floribunda</i>	r
* Bird's-claw Beard-moss	<i>Barbula unguiculata</i>	o
Cherry Laurel	<i>Prunus laurocerasus</i>	ld
Common Centaury	<i>Centaureum erythraea</i>	r
* Common Cord-moss	<i>Funaria hygrometrica</i>	o
Common Vetch	<i>Vicia sativa subsp. segetalis</i>	r

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Cut-leaved Crane's-bill	<i>Geranium dissectum</i>	r
Dove's-foot Crane's-bill	<i>Geranium molle</i>	r
Hoary Mustard	<i>Hirschfeldia incana</i>	r
* Lesser Bird's-claw Beard-moss	<i>Barbula convoluta</i> var. <i>convoluta</i>	o
Petty Spurge	<i>Euphorbia peplus</i>	r
Prickly Sow-thistle	<i>Sonchus asper</i>	o
Red-osier Dogwood	<i>Cornus sericea</i>	o
* Rough-stalked Feather-moss	<i>Brachythecium rutabulum</i>	lf
* Swartz's Feather-moss	<i>Oxyrrhynchium hians</i>	lf
Wall Speedwell	<i>Veronica arvensis</i>	o
[Mitigation area] Verge C		
Cuckooflower	<i>Cardamine pratensis</i>	r
Field Wood-rush	<i>Luzula campestris</i>	f
Lesser Trefoil	<i>Trifolium dubium</i>	o
Meadow Foxtail	<i>Alopecurus pratensis</i>	lf
Mouse-ear-hawkweed	<i>Pilosella officinarum</i>	lf
Oxeye Daisy	<i>Leucanthemum vulgare</i>	f
Parsnip	<i>Pastinaca sativa</i>	o
* Pointed Spear-moss	<i>Calliergonella cuspidata</i>	la
* Springy Turf-moss	<i>Rhytidiadelphus squarrosus</i>	a
Yorkshire-fog	<i>Holcus lanatus</i>	a
<u>planted tree blocks</u>		
Alder	<i>Alnus glutinosa</i>	o
Austrian Pine	<i>Pinus nigra</i> subsp. <i>nigra</i>	f
Bramble	<i>Rubus fruticosus</i> agg.	lf
Chalk Knapweed	<i>Centaurea debeauxii</i>	lf
Cock's-foot	<i>Dactylis glomerata</i>	lf
Common Bird's-foot-trefoil	<i>Lotus corniculatus</i>	lf
* Common Feather-moss	<i>Kindbergia praelonga</i>	lf
Common Mouse-ear	<i>Cerastium fontanum</i>	o
* Common Pocket-moss	<i>Fissidens taxifolius</i> var. <i>taxifolius</i>	o
Common Ragwort	<i>Senecio jacobaea</i>	o
Cowslip	<i>Primula veris</i>	r
Creeping Cinquefoil	<i>Potentilla reptans</i>	o
Daisy	<i>Bellis perennis</i>	o
Dandelion	<i>Taraxacum</i> agg.	o
Downy Birch	<i>Betula pubescens</i>	r
Elder	<i>Sambucus nigra</i>	o
Hybrid Black-poplar	<i>Populus x canadensis</i>	f
Hybrid Bluebell	<i>Hyacinthoides x massartiana</i>	o
Jacquemont's Birch	<i>Betula utilis</i> var. <i>jacquemontii</i>	r
Meadow Buttercup	<i>Ranunculus acris</i>	o
Oxeye Daisy	<i>Leucanthemum vulgare</i>	f

Pryce Consultant Ecologists

Trevethin, School Road, Pwll, Llanelli, Carmarthenshire, SA15 4AL.
Voicemail: 01554 775847 Mobile: 07900 241371 Email: PryceEco@aol.com

Land at the Technium Site, Baglan: Phase I Vegetation & Breeding Bird Surveys

Red Fescue	<i>Festuca rubra</i>	f
Red-osier Dogwood	<i>Cornus sericea</i>	o
* Rough-stalked Feather-moss	<i>Brachythecium rutabulum</i>	lf
Silver Birch	<i>Betula pendula</i>	f
* Springy Turf-moss	<i>Rhytidiadelphus squarrosus</i>	a
* Swartz's Feather-moss	<i>Oxyrrhynchium hians</i>	o

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