

TATA Steel

Morfa Landfill Site, Margam Ecological Management Plan

Part B: Management Prescriptions

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Morfa Landfill Site, Maragam, Ecological Management Plan, Part B: Management Prescriptions

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1. INTRODUCTION

- 1.1 Pryce Consultant Ecologists was commissioned by Geotechnology Ltd in June 2014 to carry out a series of ecological surveys at the Morfa Landfill site at Margam, the site currently being under the ownership and management of Tata Steel. The purpose of the survey was to provide detailed baseline conditions of the site's ecological attributes together with a monitoring method to assist with satisfying the revised planning conditions, specifically Condition 26, parts a, b, d, e & f. This report provides a management plan based on the findings of desktop studies and survey data gathered during 2014-2016 (PCE, 2016), which has subsequently been updated with data collected during the interveining period (PCE, 2022).
- 1.2 The study site covers 93 hectares with Margam Moors Site of Special Scientific Interest (SSSI) to the east and Kenfig Special Area of Conservation (SAC) to the south. The dunes in the study site area have undergone dramatic changes since planning permission was granted for sand and gravel extraction and landfill operations in 1973 and a large part of the dunes have been affected by extraction and landfill derived from waste materials from the steelmaking process. For many years tipping took place without a lining system, but with the implementation of the Landfill Regulations the site was decommissioned and a replacement site constructed to modern standards. As part of the transition process the local planning authority undertook a major review of the Planning Consent and an Environmental Permit was initiated with a set of conditions. This has been prepared to assist with ecological aspects of the conditions, namely Condition 26 (reproduced below) together with aspects of conditions 37 and 41.
- 1.3 It has been accepted the impacts on the groundwater regime from the closed landfill site have been negligible (ENDS, 2016) with no risk to the water quality of the River Kenfig or the SAC. However, recharge of the ditches of the SSSI has been contaminated by groundwater flowing through the open landfill, altering water chemistry and it has been necessary to completely cap the waste mass. This has reduced groundwater levels in the SSSI but has been addressed by the establishment of a recharge trench system and by restricting sand extraction to above the water table. All current sand extraction is used solely to recreate sand dunes as part of a restoration strategy to replace habitats lost to the landfill operations.

2. PLANNING CONDITIONS

- 2.1 Planning conditions as regards biodiversity aspects state:

Condition 26 Ecological

Within 3 months of the date that these conditions come into effect an Ecological Management and Monitoring Scheme shall be submitted to the Local Planning Authority for its approval. The scheme shall include, inter alia,

- a. the provisions for the enhancement of biodiversity within the site boundary along with a programme and timescale for implementation.*
- b. the formation control and management of a buffer zone in accordance with the areas of set aside land identified on Figure 1.3 Revision 1 between the Margam Moors SSSI, the Morfa Beach and the Kenfig SAC.*

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- d. *the design and formation of dune slacks and dune pools as it applies to the restoration and aftercare of the site.*
- e. *the integration of the ecological management and monitoring scheme with the Ecological Restoration and Aftercare Report (report number 403.3/0/0906) the Working Plan for Ecological Restoration at the Morfa Closed Landfill site by LAB Coastal dated June 2006, and restoration and aftercare details as submitted under other conditions of this consent.*
- f. *the monitoring of the stability of the restored dune system and any operations and modifications required for their construction.*
- g. *details on the creation and operation of an Ecological, Restoration and Aftercare Steering Group that must include as a minimum the operator, their nominated consultants, representatives from Natural Resources Wales and the Local Planning Authority. The scheme shall be implemented as approved.*

* Note that a typographical error has meant that there is no item C.

3. **ECOLOGICAL FEATURES WITHIN THE SITE**

The Significant Ecological Features that have potential to be affected during continued site operations are listed below. These were identified during the ecological surveys and assessment carried out in 2014, and were approved during a site meeting with the NPT Ecologist Rebecca Sharp and NPT Biodiversity Forum member Charles Hipkin on 9th November 2015.

Habitats:

- Wet Woodland
- Reedbeds
- Ponds
- Coastal sand dunes
- Coastal vegetated shingle

Significant Plant Species

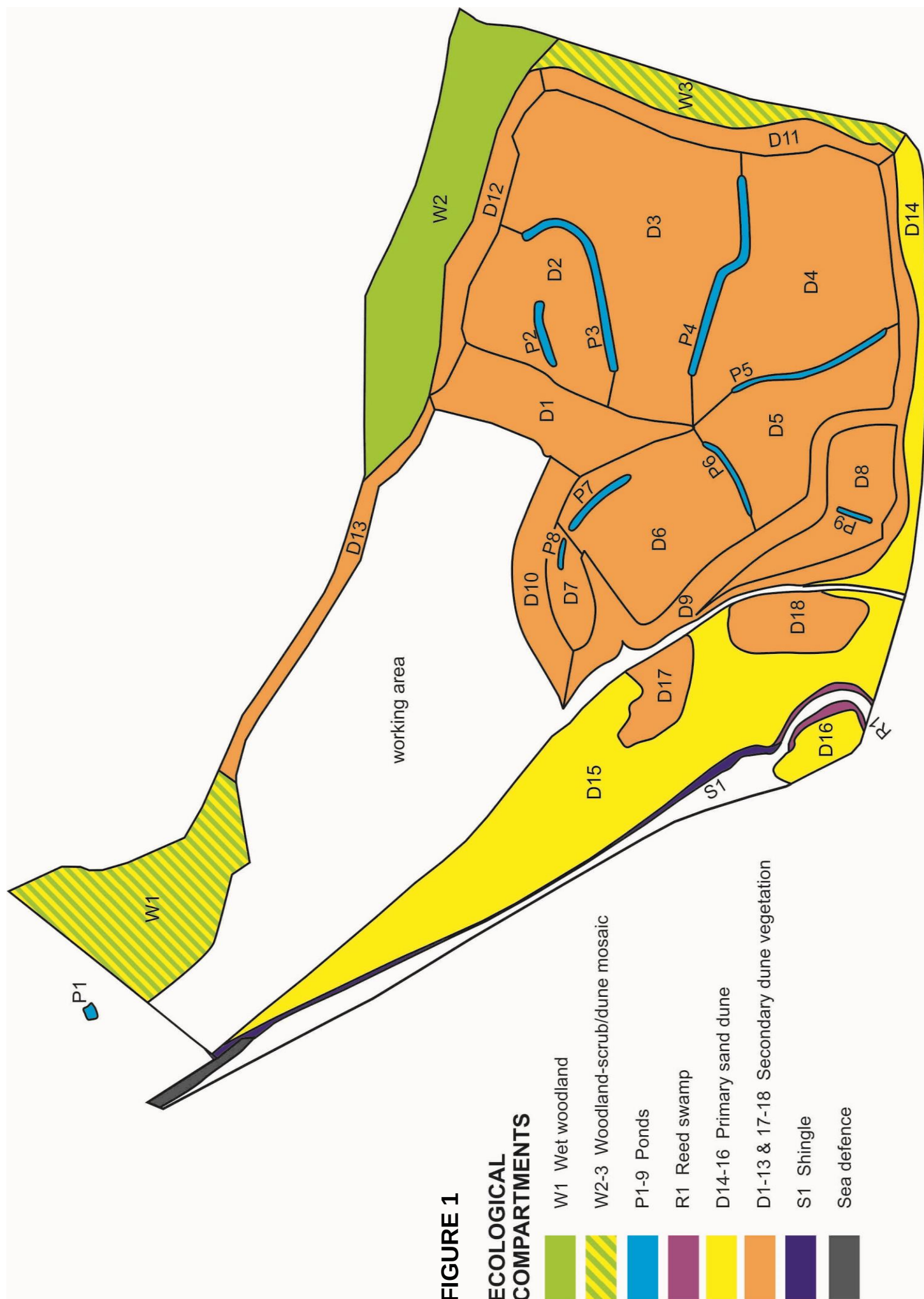
- The site supports two Section 7 Priority plant species, **Sea Stock** *Matthiola sinuata* and **Prickly Saltwort** *Salsola kali*, one of which is Nationally Rare, the other being one of seven Nationally Scarce (BSBI Red List) species, namely **Autumn lady's-tresses** *Spiranthes spiralis*, **Dune Fescue** *Vulpia fasciculata*, **Dune Pansy** *Viola tricolor ssp. curtisii*, **Eyebright** *Euphrasia tetraquetra*, **Green-winged Orchid** *Anacamptis morio*, **Heath Dog-violet** *Viola canina*, **Hutchinsia** *Hornungia petraea* and **Sharp Rush** *Juncus acutus*. An additional three Regionally Scarce plant species have been recorded with the landfill site boundary.

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- Neath Port Talbot Priority and Contributory plant assemblage: A total of **38 Priority and Contributory sand dune specialists** have been recorded to date with a further 40 species not confined to sand dunes but considered to be of local importance, as they are either important components of other valuable habitats, support scarce invertebrates or are locally scarce.
- Rare in Vice County 41 (Glamorgan) plant assemblage: Four species have been recorded in three or less Wells sites (a Wells site being a moveable 1km square).
- Sand dune plant assemblage: A total of **54 sand dune specialists** have been recorded to date with a further 37 species not confined to sand dunes but considered to be of local importance, as they are either important components of other valuable habitats, support scarce invertebrates or are locally scarce.
- Invasive plant species recorded include **Japanese Knotweed** *Fallopia japonica*, **American Skunk-cabbage** *Lysichiton americanus*, **Butterfly-bush** *Buddleja davidii*, **Japanese Rose** *Rosa rugosa*, **Sea-buckthorn** *Hippophae rhamnoides* and **Wall Cotoneaster** *Cotoneaster horizontalis*.

Significant Faunal Species

- Section 7 Priority species recorded from the site include **Brown Hare** *Lepus europaeus*, **Bittern** *Botaurus stellaris* (rare in winter), **Dunnoek** *Prunella vulgaris* (breeding), **Kestrel** *Falco tinnunculus* (non-breeding), **Lapwing** *Vanellus vanellus* (breeding), **Linnet** *Carduelis cannabina* (breeding), **Skylark** *Alauda arvensis* (breeding), **Reed Bunting** *Emberiza schoeniclus* (breeding) and **Ringed Plover** *Charadrius hiaticula* (breeding), **Shrill Carder Bee** *Bombus sylvarum*, **Brown-banded Carder Bee** *B. humilis*, **Small Blue** *Cupido minimus* and **Dingy Skipper** *Erynnis tages*.



4. STRATEGY FOR PROTECTION, RESTORATION AND ENHANCEMENT OF ECOLOGICAL FEATURES

4.1 Rationale

The primary aim of this Ecological Management Plan is to maintain and further develop the biodiversity value of the site.

The loss of habitats and species to the landfill have largely resulted from operations undertaken prior to the review of the Planning Consent and the requirement of an Environmental Permit. The main aim of the management plan is to ensure adjacent habitats and remnant habitats within the application site are not adversely impacted by the scheme and to ensure that the re-creation of dune vegetation on the capped landfill site delivers the maximum ecological benefits. The main issues in ensuring the development and maintenance of diverse dune vegetation in both primary and secondary situations are controlling natural succession and maintaining a dynamic element to the dunes. The development of scrub is a particular problem, as open, mobile dunes invariably support the most important assemblages of species. In the short term the diversity of important species will be high with a wide range of niche availability. Maintaining such diversity into the medium and longer terms will require a commitment in the form of mechanical intervention in the absence of livestock.

All existing habitats which are to be retained and all newly created habitats will be monitored by the Site Ecologist who will advise on their appropriate future management in order to maintain and maximise their benefit to wildlife.

4.2 General Ecological Recommendations

A range of general ecological recommendations are provided below for identified and potential features, in order to provide an overview of the key aims of the management plan.

4.3 Habitats overview

Scrub control is a fundamental requirement if open sand dune vegetation is to be kept in favourable condition for maintaining a high level of biodiversity. Once established, scrub should be reduced to height where regrowth can be simply managed by topping. Annual or biannual topping (as determined by monitoring evidence) of the vegetation should be sufficient to maintain an diverse sward over much of the landfill cap. As areas of bare sand are an important factor in maintaining diversity, a selection of methods to provide bare sand are given as options, whilst maintaining the integrity of the stabilising effect of the established vegetation on the landfill site.

Scrub, reed encroachment and infilling from wind-blown sand are the key management issues affecting the complex of ponds on site. Rotational clearance is to be put in place to reduce the rate of encroachment and infilling, the aim being to establish vegetation that will require only a small amount of mechanical intervention in the future.

Whilst non-intervention of the primary dunes between the landfill and the sea and the wet woodland between the landfill and Margam Moors will allow the vegetation in these areas to function naturally, so non-native invasive scrub control will be undertaken to help bring affected areas into favourable condition.

Lowering of the sand level in the borrow pits to reveal the winter water table has delivered a large conservation gain as pioneer dune slacks are a key habitat for several rare species of plant, moss and liverwort.

4.4 Bats

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No bats surveys have been carried out on Margam landfill site as there are no sites where any bat species can undertake breeding, hibernating or resting-up activities. It is likely the site is used by foraging bats at night and there is also a likelihood that regular flight lines occur along the steep edges of the landfill site and possibly along the water channels. As there are no perceived risks to breeding, hibernating or resting bats and invertebrate productivity is likely to be increased by the proposed management of the site, no actions are required. However, it would be useful to find out what and how different bat species use the site, which could be done by deploying bat recording devices in suitable locations at key periods.

4.5 Otter

It is doubtful that the constructed ponds support sufficient prey to regularly attract Otters to the site, this assumption being supported by the lack of spraints, footprints and other field signs despite regular searching. Nevertheless, given the close proximity of a known population at Kenfig NNR it is likely this species visits the site on occasions. Dense scrub and tall-herb vegetation is largely insufficiently developed to be used by Otters as resting-up sites. Other than carrying out inspections prior to the clearance of dense scrub and tall-herb vegetation, no specific recommendations are considered necessary to prevent disturbance to this species.

4.6 Badger

No evidence has been found to indicate Badgers use this site and the habitats are generally unsuitable for the species. It is likely these wide ranging animals will turn up at the site on occasions, though the substrate would appear unsuitable for the establishment of a sett. The management proposals will not impact on any Badgers that forage at the site as usage by this species is anticipated to be low.

4.7 Reptiles

The landfill site would appear to provide good habitat for species such as Slow-worm, Common Lizard and Grass Snake, though only single observations of each have been made. The paucity of records of from the landfill site is, in part, likely to be a result of a lack of survey effort and the relatively recent establishment of vegetation on the site. It is probable some colonisation has occurred and greater numbers than the few incidental records suggest occur on the landfill site. Populations are expected to increase as the area of established vegetation increases with ongoing habitat creation. The management regime is not anticipated have any adverse impact on reptiles occurring on site. More importantly, it will ensure that newly created habitats become established and maintained in favourable condition for the group. The provision of purpose-built hibernacula would prove beneficial.

4.8 Amphibians

It is uncertain how suitable the low nutrient, lime-rich ponds are for frogs, toads and newts, but the system of ponds certainly would appear to provide excellent opportunities for amphibians to establish breeding populations. Common Frog, Common Toad, Palmate Newt, Smooth Newt and Great Crested Newt all breed within close proximity of the site so the chances of natural colonisation are very high. The management proposals will not impact on any amphibians occurring on site and will ensure newly created habitats become established and are maintained in favourable condition for the group. The provision of purpose-built hibernacula would prove beneficial.

4.9 Birds

The landfill site provides suitable nesting, passage and wintering habitat for species including the following Section 7 and Red List (Stanbury et al, 2021) species: Bittern

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(wintering), Dunnock (breeding), Kestrel (non-breeding), Lapwing (breeding), Linnet (breeding), Skylark (breeding), Reed Bunting (breeding) and Ringed Plover (breeding). Linnets prefer to nest in spiny scrub such as Gorse, whereas Skylark and Reed Bunting are ground-nesting species. Other Amber List species that have been recorded breeding at the site include Meadow Pipit, Wheatear, Whitethroat and Willow warbler, along with a few pairs of more ubiquitous species such as Stonechat. Winter visitors include small numbers of Jack Snipe, Common Snipe and Teal. The open ground and patches of young scrub will continue to provide nesting opportunities for all species. The timing of management proposals will be constrained by breeding birds using the site, but their implementation will ensure newly created habitats become established and maintained in favourable condition for key species within the group, the focus being to encourage ground-nesting species, most notably Lapwing and Skylark.

4.10 Invertebrates

Incidental recording during the vegetation surveys, provided evidence to suggest the site supports a very diverse invertebrate assemblage and further surveys to help identify key species are recommended. Notable species identified at the site include the Shrill Carder Bee, Brown-banded Carder Bee, Dingy Skipper, Grayling, Small Blue, Small Heath and Wall Brown, all being section 7 species. The management proposals are aimed at maintaining a species-rich sward, with areas of bare sand and open pond edges, which will ensure conditions are optimised for this group. No species-specific management is proposed at this stage.

4.11 Invasive alien plants

Sea Buckthorn is established and is locally abundant and several stands and plants of Japanese Knotweed are present on the landfill site. American Skunk-cabbage occurs in the wet scrub of area W2. Appropriate action to control and eradicate these and other invasive species was initiated in 2020-21 and will be carried out in response to monitoring, as detailed in this MP.

4.12 Timing of Works

Site operations must only be carried out during the appropriate seasons, particularly with regard to scrub clearance which should be undertaken outside the bird nesting season.

4.13 Arisings from vegetation clearance

Any significant volume of arisings from tree and scrub-cutting or topping of dune grassland are to be removed off site if prescribed by the site ecologist, otherwise left in situ.

5. MANAGEMENT OF FEATURES

5.1 Feature – Woodland and scrub

Wet woodland is located along the eastern periphery of the site as shown by compartment W2 on figures 1 and 2. Rusty Willow *Salix cinerea* and Common Reed *Phragmites australis* are abundant with locally frequent Downy Birch *Betula pubescens*, these being key markers of the National Vegetation Classification (NVC) description for **W2** *Salix cinerea*-*Betula pubescens*-*Phragmites australis* woodland. Alder is a more abundant component of the woodland mosaic that runs alongside the River Kenfig within compartment W3 and the vegetation is referable to the NVC **W6** *Alnus glutinosa*-*Urtica dioica* woodland. There is a Corsican Pine *Pinus nigra* ssp. *laricio* plantation on sand dunes located in the northernmost part of the study site within compartment W1. The broken canopy in this compartment, on rabbit-grazed sand hills, maintains open areas of diverse vegetation with 162 recorded species. Elsewhere, there is a wide variety of woody growth across the site, most notably rapidly developing scrub within compartments D2 and D3 on the capped landfill.

Potential Impacts

Compartment W1

It is anticipated that the conifer plantation will remain undisturbed from the landfill works. There is history of disturbance from off-road bikers and fires have reduced the cover of conifer allowing modified, yet diverse sand dune flora to redevelop in these areas. There are no anticipated direct effects on the areas of coniferous plantation from the landfill scheme

Compartment W2 & W3

The wet woodland will remain undisturbed from the landfill works. This feature was formerly affected by highly basic leachate, although the capping of the landfill site has significantly improved water quality discharged from the site. There are no anticipated adverse effects on the areas of wet woodland from future operations of the landfill scheme and the improvement in water quality should improve the quality of this feature

Mitigation and Restoration

It is anticipated that compartments 1, 2 and 3 will require no management during the site operational phase other than removal of target invasive species, notably American Skunk-cabbage, Japanese Knotweed and Sea Buckthorn (see section 5.11 on invasive plants).

Areas of scrub to be removed

The removal of areas of scrub within the site will be undertaken in September or October to ensure that disturbance to breeding birds, Dormice and other fauna is minimised. Where scrub areas are associated with reptile or terrestrial-phase amphibian habitat, prior to any disturbance, these areas will be assessed by the Site Ecologist who, if necessary, will carry out a finger-tip search to locate animals and remove any found to safety. Arisings derived from scrub clearance will, where appropriate, be used in the making of ecological structures, such as rotting-wood habitat piles, as specified by the Site Ecologist and at Method Statement 2.

Management

The overall aim of woodland and scrub management will be to maintain and enhance retained areas. This, in turn, will conserve the wildlife value of the woodland by, for example,

- maintaining undisturbed faunal cover, foraging, nesting and roosting opportunities for protected species such as bats and birds,
- maintaining and increasing the diversity of species,

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- retaining mature trees and
- retaining dead wood.

Monitoring

The Site Ecologist will inspect existing woodlands and scrub in summer of each year and will instruct the site operators whether the existing management regime is to continue or amendments made.

5.2 Feature – Open water & Reedswamp

The River Kenfig passes through the south-western part of the study site, its banks being dominated by dense Common Reed. Other open water features occur within the landfill area and can be divided into two main types; i) shallow pools formed by excavations exposing the water table, both on those parts of the landfill that remain uncapped as well as the dune burrow pits, and ii) drainage channels created as part of the finished profile of the capped landfill site: the creation of new ones is ongoing.

The fluctuating water table pools located on the uncapped areas of the tip are largely vegetated by young reedswamp, these being highly calcified and consequently have limited ecological significance. The drainage channels on the capped landfill hold extremely clear and nutrient-poor water that is of high conservation value and natural colonisation has taken place over a relatively short period of time, with numerous notable species recorded. The heterogeneous nature of vegetation makes allocation of NVC communities difficult but there are elements of several communities including **A9a** *Potamogeton natans* community: Species-poor sub-community, **S4** *Phragmites australis* swamp, **S12** *Typha latifolia* reedbed, **S19** *Eleocharis palustris* swamp and **S20** *Scirpus lacustris* ssp. *tabernaemontani* swamp. Marginal vegetation is largely a linear mosaic of **SD14c** *Salix repens*-*Campyllum stellatum* dune-slack community: *Bryum pseudotriquetrum*-*Aneura pinguis* sub-community and **SD15** *Salix repens*-*Calliargon cuspidatum* dune-slack community.

Potential Impacts

Natural succession is the principal adverse impact at the landfill site; ungrazed and otherwise unmanaged wetlands invariably rapidly develop rank vegetation. Ultimately dense reed and scrub encroachment shades out the open, typically more diverse communities that can support a wealth of uncommon species.

Infilling by wind-blown sand has been a problem at the site and re-ecavation has already been undertaken to restore the open water channels. It is likely that as sand dune vegetation becomes more established, this problem will be less important, although it should be stressed that maintaining some dune mobility (in the form of a discontinuous sward) is desirable for maintaining diversity.

Mitigation and Restoration**Creation of new ponds**

New ponds are to be created as the landfill restoration scheme progresses, the design and construction process using the same methods and principles used in the creation of ponds 2 to 8. No planting is to be undertaken, colonisation being allowed to progress naturally.

Management

Following the completion of site operations all ponds within the site will continue to be managed to maintain their biodiversity value. This will require a programme of rotational clearance so that each pond unit (with each pond being split into two units) is cleared every

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5 years, or as required based on monitoring. The aim will be to maintain the ponds so they have open water of between 60% and 80% and overhanging marginal vegetation limited to no more than 20% of the total pond area.

When wind-blown sand and/or vegetation growth results in open water being less than 50% in any pond, the accumulated sand and vegetation will be cleared from one half of the pond in one year and the other half two-to-three years after, as directed by the Site Ecologist. Bulky vegetation is to be removed off site. Dredged sand and/or silt is to be dumped the maximum distance from the pond edge as the excavator will reach, levelled and left barren to enable natural recolonisation by pioneer plants.

Monitoring

The ponds will be monitored periodically including the compilation of species lists with estimates of species frequency and % of open water, as detailed at Method Statement 6.

A report will be produced detailing the survey results, an assessment of pond condition set against aims of the management objective for each pond and, if necessary, recommendations for changes in management will be made. The report will be distributed to Neath Port Talbot Council staff and any review of the management plan agreed with them.

5.3 Feature – Primary sand dunes

Remnant primary sand dunes are located on land between the active landfill site and the beach. Also there is a narrow band of remnant dune vegetation present along the eastern and north-eastern margin of the tip, although this is modified. The dunes include communities associated with mobile dunes, semi-fixed dunes, dune grassland and dune slacks. The area supports a diverse range of dune species, including a significant Nationally Scarce^{NS} (BSBI Red List) and Regionally Scarce^{RS} plant assemblage that includes ^{NS}Autumn Lady's-tresses, ^{RS}Dune Fescue, ^{NS}Dune Pansy, ^{NS}the eyebright *Euphrasia tetraquetra*, ^{NS}Green-winged Orchid, ^{NS}Heath Dog-violet, ^{RS}Hutchinsia, ^{NS}Prickly Saltwort, ^{NS}Sea Stock and ^{RS}Sharp Rush.

A further 34 species have been recorded that are listed on Neath Port Talbot's Priority^P and Contributory^C plant assemblage, examples of which include ^CBee Orchid, ^CCommon Broomrape, ^CDune Fescue, ^CKnotted Pearlwort, ^CMarsh Helleborine, ^CPale Flax, ^CPink Water-speedwell, ^CPyramidal Orchid, ^CSand Cat's-tail, ^CSea Bindweed, ^CSea Rocket, ^CSea Spurge, ^CSea-holly and ^PSticky Stork's-bill.

Potential Impacts

These largely 'yellow' dunes have been subjected to regular motorcycle activities, which has inadvertently maintained a degree of dune mobility, although disturbance has been excessive and most likely detrimental to dune flora in recent years. A more serious threat is the encroachment of dunes by the highly invasive, non-native shrub Sea-buckthorn. Lack of management on some of the older slacks has resulted in Rusty Willow dominating several areas of former high interest.

Management

Sea-buckthorn and Rusty Willow are to be subjected to an eradication programme as a matter of urgency in order to prevent further spread. Once these species have been removed, monitoring will inform the need for any further clearance works, although the dunes will generally be kept in favourable condition by natural processes, including rabbit-grazing and storm erosion and blown sand deposition.

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Monitoring

The dunes will be inspected annually for condition, with quadrat monitoring undertaken every three years, as detailed at Method Statement 6.

A report will be produced detailing the survey results, an assessment of dune condition set against aims of the management objective and, if necessary, recommendations for changes in management will be made. The report will be distributed to Neath Port Talbot Council staff and any review of the management plan agreed with them.

5.4 Feature – Secondary sand dune vegetation and bare sand

Secondary dune vegetation is made up of two broad types; i) worked areas of dunes that remain uncapped, and ii) the capped and profiled landfill plateau that has been covered with locally sourced sand. In both cases colonisation has been allowed to take place naturally and these areas all support a complex mosaic of secondary dune communities, most of which are poorly defined in NVC terms, but are nevertheless highly diverse with many scarce species.

A total of 51 sand dune specialist species have been recorded to date with a further 37 not confined to sand dunes but considered to be of local importance, as they are either key components of other valuable habitats, support scarce invertebrates or are locally scarce.

Extensive areas of bare sand were recorded on the recently capped areas of landfill. Most of these areas generally supported <5% plant cover, though diversity was high with numerous significant species recorded. The development of a stable sward is likely to take three-to-five years.

Potential Impacts

Over-stabilisation of dune grassland and the encroachment of invasive coarse grasses and shrubs such as Sea-buckthorn and Buddleia are the main adverse impacts on these secondary habitats.

Management

In the absence of grazing stock, mechanical intervention is required to arrest the development of coarse grassland and scrub. Sea-buckthorn and Rusty Willow are to be subjected to an eradication programme as a matter of urgency in order to prevent further spread. Once these species have been removed, dune grassland can be kept in favourable condition by regular topping and harrowing in order to provide a broken sward (to provide niches for annuals and invertebrates). A programme of rotational clearance is to be undertaken so that each dune grassland unit is topped and harrowed every 2 years, or as required based on monitoring. The aim will be to maintain the grasslands so they are kept open and diverse with a discontinuous sward. Monitoring will inform further clearance works.

Monitoring

The landfill dune grassland is to be inspected annually for condition, with quadrat monitoring undertaken every three years, as detailed in the baseline vegetation survey (Pryce Consultant Ecologists, 2015).

A report will be produced detailing the survey results, an assessment of dune condition set against aims of the management objective and, if necessary, recommendations for changes in management will be made. The report will be distributed to Neath Port Talbot Council staff and any review of the management plan agreed with them.

5.5 Feature - Bats

With the exception of the area of woodland and scrub in compartments W1, W2 and W3 (all features to be retained and left undisturbed) there are no roost opportunities for bats on the active working or restored areas of the landfill site. As a consequence no bat surveys have been carried out on Margam landfill site. However, it is likely the site is used by foraging bats at night and there is also a likelihood that regular flight lines occur along the steep edges of the landfill site and possibly along the water channels.

Potential Impacts

The removal of young scrub from the landfill site will modify habitats likely to be used by feeding bats, although it is not anticipated there will be a reduction in prey. As there are no perceived risks to breeding, hibernating or resting bats and invertebrate productivity is likely to be increased by the proposed management of the site, no actions are required to safeguard bats.

Mitigation

Retention and protection of features of value to bats

All peripheral trees, woodland and scrub will be retained and will require a minimum of management. Management actions proposed in the Woodland section and Method Statement will be compatible with the requirements of bats and will include the retention and preservation of any actual and potential tree-roosts at the site.

Outside lighting will be directed away from habitats of value to bats and site working practices will be designed to minimise the use of outside lighting and control times of illumination.

Removal of trees with potential bat roost features

If for any reason it should become necessary to remove or lop any trees which might have potential to harbour roosting bats, they will be examined by a licensed bat surveyor prior to the commencement of any such work. If bat-roosts are found and their disturbance cannot be avoided, a development licence may be required from NRW before work can proceed.

If any potential roost sites are removed or disturbed, bat boxes of a range of types will be positioned within the mature woodland retained along the northern and eastern peripheries of the site.

Creation of new habitats of value to bats

Bat foraging habitat will be provided by the establishment of dune grassland and ponds during progressive restoration and following the cessation of landfill operations. These habitats will provide high insect-productivity and will allow light-intolerant bat-species to move across, and exploit, the site.

The restoration scheme will provide a greater area of high quality dune and wetland habitat woodland than currently exists within the site.

Management

The management of habitats within the site will aim to create and increase their wildlife value and will provide for bats by retaining key elements of woodland and dune, plus the creation of new dune habitats over an extended area, providing good foraging potential and suitable habitat linkages throughout the site and to adjacent land.

Although woodland management is based upon the principle of non-intervention, due consideration will be given to the well-being of bats where management of woodland and trees may be required. Mature trees with trunk/branch cavities, splits and/or a covering of ivy are particularly valuable as bat roost sites and will be retained as part of the woodland management plan.. However, any trees with such features that require lopping or felling, will

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be checked for bats and roosts by a licenced bat surveyor prior to the commencement of such work. If bats are found and their disturbance cannot be avoided, a development licence may be required from NRW before work can proceed..

Monitoring

All trees having potential to support roosting bats will be surveyed prior to any anticipated disturbance resulting from site operations.

Bat activity surveys at strategic points will be undertaken in the summer of every fifth year following the adoption of this management plan to provide an indication of bat usage.

The findings of the monitoring surveys and any other bat issues will be included in the periodic reports submitted to the site operators and appropriate authorities. Survey findings will be reviewed with the Planning Authority during future liaison meetings.

5.6 Feature – Reptiles

The landfill site would appear to provide good habitat for species such as Slow-worm, Common Lizard and Grass Snake, all of which have been recorded in small numbers from adjacent habitats. That there are no records of any reptiles species from the landfill site itself is likely to be a result of a lack of survey effort and it is to be expected that the recent establishment of vegetation at the site will encourage reptile colonisation. It is probable that small numbers of these species occur on the landfill site and populations will increase as the area of established vegetation increases with ongoing habitat creation.

Potential Impacts

Existing habitats where reptiles are most likely to be located (in small numbers) are the remnant primary dunes at compartments D12-15 and the open areas in W1. These areas are to be largely left alone, except for clearance of invasive scrub. Management proposals across the remainder of the site will not adversely impact on any reptiles occurring on site and will ensure newly created habitats are established and maintained in favourable condition for the group.

Mitigation

All personnel employed in vegetation clearance will be instructed to be mindful of the likely presence of reptiles and avoid disturbing, damaging or killing them. Where it is necessary to remove or modify reptile habitat, immediately prior to the commencement of such work, a finger-tip search of the habitat will be undertaken by the Site Ecologist and initial disturbance carried out only with hand-tools prior to the use of mechanical plant. As far as possible any vegetation clearance will be undertaken during late summer and early autumn, at a time following the bird breeding season but when reptiles will still be active and more likely to be able to escape disturbance. The provision of purpose-built hibernacula would prove beneficial on the landfill site where natural refugia are largely absent.

Management

The management of habitats within the site will aim to create and increase their wildlife value and will provide for reptiles by retaining key elements of dune grassland, plus the creation of new dune habitats over an extended area, providing good foraging potential and suitable habitat linkages throughout the site and to adjacent land.

Reptile refugia will also be included, such as 1) habitat piles created from wood obtained from arisings generated from scrub removal and 2) buried rubble covered with loose sand to

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provide winter hibernacula. Ponds and wet-areas will also form part of the restoration plan and will provide additional habitat for Grass Snake.

Future management of the site will seek to maintain and enhance the range of habitats and structural diversity of vegetation and will include the retention of open areas which currently provide reptile basking habitat and the controlling of scrub encroachment where open areas need to be retained.

Monitoring

No monitoring is proposed as reptiles are not a significant feature of the site and no adverse impact is anticipated, but all incidental observations will be noted and collated. Any reptile issues will be included in the annual reports submitted to the site operators and appropriate authorities.

5.7 Feature – Amphibians

It is uncertain how suitable the low nutrient, lime-rich ponds are for frogs, toads and newts, but the pond system certainly would appear to provide excellent opportunities for amphibians to establish a significant population. Common Frog, Common Toad, Palmate Newt, Smooth Newt and Great Crested Newt all breed within close proximity of the site so the chances of natural colonisation are very high. The management proposals will not impact on any amphibians occurring on site and will ensure newly created habitats become established and are maintained in favourable condition for the group. The provision of purpose-built hibernacula would prove beneficial.

Potential Impacts

The ponds within the working area are too caustic to be used by amphibians and the only habitats where amphibians are likely to breed are the newly created ponds on the landfill site as shown by compartments P2-9, plus additional ponds programmed into the progressive restoration scheme. These areas are to be managed to keep the ponds in healthy condition for plants and invertebrates which will ensure excellent breeding opportunities for amphibians are maintained. Proposals across the remainder of the site will not adversely impact on any amphibians occurring on site and will ensure newly created terrestrial habitats are established and maintained in favourable condition for the group.

Mitigation

Site operations will avoid unnecessary habitat disturbance and personnel employed in vegetation clearance will be instructed to be mindful of the likely presence of amphibians and avoid disturbing, damaging or killing them.

As far as possible, vegetation clearance will be undertaken during late summer and early autumn, at a time following the bird breeding season but when amphibians will still be active and more likely to be able to escape disturbance. Disturbance to existing ponds resulting from programmed management, will be undertaken during early autumn when amphibians will have generally left their breeding habitat.

Management

Details of pond management are provided at 5.2

Monitoring

No monitoring is proposed as amphibians are not a significant feature of the site and no adverse impact is anticipated, but all incidental observations will be noted and collated. Any

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amphibian issues will be included in the annual reports submitted to the site operators and appropriate authorities.

5.8 **Feature – Bird assemblage**

The landfill site provides suitable nesting habitat for species including the following Section 42 species: Skylark, Linnet, and Reed Bunting. Linnets prefer to nest in spiny scrub such as Gorse, whereas Skylark and Reed Bunting are ground-nesting species. Other less significant species breeding at the site include Meadow Pipit, Wheatear and Stonechat along with a few pairs of more ubiquitous species. The open ground and patches of young scrub will continue to provide nesting opportunities for all species.

Potential Impacts

Loss of open habitat due to scrub encroachment and human/dog disturbance during the breeding season are the most significant risks to the significant nesting birds at the site.

Mitigation

The peripheral woodland and scrub habitats will not be disturbed and all retained woodland and scrub will be protected for the duration of site operations. On the landfill site, the removal of scrub or other dense vegetation will be undertaken between September and February inclusive to ensure that disturbance to nesting birds is kept to a minimum and, when possible, between mid September and mid October to minimise other faunal-disturbance issues. If it is necessary to remove any trees, scrub or other dense vegetation within the bird breeding season, such work will only be permitted after it has been certified by a qualified ornithologist from the Site Ecologist's team, that no active nests will be disturbed. If any active nests are found, clearance work will be delayed until nesting has been completed and the young birds fledged and left the nest.

Management

Woodland, dune grassland and pond management details are provided at 5.1 - 5.4. Habitat management aims to create and increase the wildlife value of the site and will provide suitable habitat for birds in general by retaining the best woodland, scrub and dune grassland, as-well-as creating additional open dune grassland and wetland habitats.

The timing of management will be constrained by breeding birds using the site, but their implementation will ensure newly created habitats become established and maintained in favourable condition for key species within the group, the focus being to encourage ground-nesting species, most notably the Skylark.

Monitoring

No monitoring is proposed as breeding birds are not a significant feature of the site and no adverse impact is anticipated, but all incidental observations will be noted and collated. Any bird issues will be included in the annual reports submitted to the site operators and appropriate authorities.

5.9 **Feature – Invertebrates**

Ad hoc recording during the vegetation surveys, provided evidence to suggest the site supports a very diverse invertebrate assemblage and further surveys to help identify key species are recommended. Management proposals for the various habitats and species

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outlined in the above paragraphs and in the following Method Statements will all be of benefit to invertebrate populations and will ensure their maintenance. The retention and enhancement of existing, and the creation of secondary dunes and ponds will receive appropriate conservation management which will include the conservation of invertebrate populations.

5.10 Feature – Invasive alien plants

Sea Buckthorn is a rhizomatous non-native that is well established and is locally abundant within several compartments. Japanese Knotweed occurs as several discrete stands and individual plants, the locations of stands of each are provided in the baseline ecological report (Pryce Consultant Ecologists, 2015). Other invasive species noted in small quantities during surveys included American Skunk-cabbage, Butterfly-bush, Japanese Rose and Wall Cotoneaster, all of which will be monitored.

Potential Impacts

Japanese Knotweed could easily be spread as a result of site operations. Failure to control Sea-buckthorn at an early stage could result in eradication becoming prohibitively expensive.

Mitigation and Control

All stands and individual plants of both species will be identified and mapped and all locations recorded.

Site operations must ensure that knotweed is not disturbed in a way that would cause its spread or export from the site or its contamination of existing uncontaminated areas. . It must be treated using approved methods prior to the commencement of any development which might cause its disturbance or spread and must comply with approved methodology for its control as prescribed in Welsh Government and Environment Agency publications.

Sea-buckthorn can be tackled using various methods including chemical treatment after cutting (eg injecting glyphosate) or, whilst standing, by spraying or injecting glyphosate, or it can be removed by mechanical pulling. Cleared areas will require regular topping to control re-establishment.

A small number of plants of American Skunk-cabbage are located in area W2 and are to be removed by hand digging.

Management

Sea-buckthorn and Knotweed stands/plants will continue to be treated using approved methods until they are eradicated. Thereafter, formerly contaminated areas will be checked at least every six months to ensure there is no regrowth. If regrowth is observed, further eradication measures will be implemented. All material entering the site will also be checked to ensure that it is not contaminated or contains knotweed propagules.

Monitoring

For the duration of site operations and the restoration phase, including the aftercare period, checks will be undertaken annually to identify any Sea-buckthorn or knotweed regrowth and control measures will be recommended and implemented if required.

The annual report produced by the Site Ecologist will include the findings of monitoring checks for Sea-buckthorn, Knotweed and other invasive species. The report will be distributed to the relevant authorities and any review of the management plan agreed.

6. CONCLUSIONS

6.1 Planning conditions relating to biodiversity are all contained within 'Condition 26 Ecological'. This report and associated appendices addresses the requirement for an *Ecological Management and Monitoring Scheme*. The methods to be undertaken in order to satisfy each condition are summarised below:

- a. *the provisions for the enhancement of biodiversity within the site boundary along with a programme and timescale for implementation.*
 - An ecological survey report detailing baseline conditions was produced in 2015 and revised in 2016 (PCE, 2016a), the results of which were used to produce a detailed management plan (PCE, 2016b), method statements (PCE, 2016d) and timesheet (PCE, 2016c) for managing and enhancing the biodiversity of the landfill site in June 2016. The management plan extends for 25 years, but can be reduced or extended and is responsive to monitoring.
 - Relevant documents:
 1. Pryce Consultant Ecologists (2016a) *Margam Landfill 2014 Vegetation Survey*, report to TATA Steel.
 2. Pryce Consultant Ecologists (2016b) *Margam Landfill Ecological Management Plan*, report to TATA Steel.
 3. Pryce Consultant Ecologists (2016c) *Margam Landfill Ecological Management Plan spread sheet*, report to TATA Steel.
 4. Pryce Consultant Ecologists (2016d) *Margam Landfill Ecological Management Plan Method Statements*, report to TATA Steel.
- b. *the formation control and management of a buffer zone in accordance with the areas of set aside land identified on Figure 1.3 Revision 1 between the Margam Moors SSSI, the Morfa Beach and the Kenfig SAC.*
 - Existing boundary features include long-established belts of both wet woodland (buffering Margam Moors SSSI), and primary sand dune vegetation (buffering Kenfig SAC and the Morfa Beach). These are to be left largely unmodified other than removing invasive non-native vegetation (PCE, 2016b & 2016c), which will increase their wildlife value. Monitoring will undertaken annually to ensure favourable condition is maintained.
- d. *the design and formation of dune slacks and dune pools as it applies to the restoration and aftercare of the site.*
 - The ongoing programme of artificial dune slack creation, as part of the restoration scheme, will continue to increase the area of this especially valuable habitat. Additional slack formation scheduled in the borrow pit zones will further extend the area of wet sand communities. Monitoring and management work detailed in the report will ensure habitats are maintained in favourable condition.

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- e. *the integration of the ecological management and monitoring scheme with the Ecological Restoration and Aftercare Report (report number 403.3/0/0906) the Working Plan for Ecological Restoration at the Morfa Closed Landfill site by LAB Coastal dated June 2006, and restoration and aftercare details as submitted under other conditions of this consent.*
- Compliance of the points above will continue be monitored by the regular committee meetings.
- f. *the monitoring of the stability of the restored dune system and any operations and modifications required for their construction.*
- Vegetation monitoring is scheduled that will provide semi-quantitative data that are to be used to report annually the diversity and community composition within representative locations across the site. Qualitative monitoring of the wider site will also be undertaken annually. The results of the monitoring will be used to report on the success or otherwise of previous management undertaken. Any modifications required for future management will be reflected by revising and updating the management plan.
- g. *details on the creation and operation of an Ecological, Restoration and Aftercare Steering Group that must include as a minimum the operator, their nominated consultants, representatives from Natural Resources Wales and the Local Planning Authority. The scheme shall be implemented as approved.*
- An annual August / early September meeting with the NPTCBC ecologist and a NRW representative will be arranged to report on the management carried out and monitoring results from the previous year. Additional discussion will be focussed on the schedule for forthcoming year and any modifications required to improve the effectiveness of the management plan.

* Note that a typographical error has meant that there is no item C.

7. REFERENCES

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APPENDIX 1

Margam Moors Site of Special Scientific Interest Citation

**CYNGOR CEFN GWLAD CYMRU
COUNTRYSIDE COUNCIL FOR WALES**

SITE OF SPECIAL SCIENTIFIC INTEREST CITATION

NEATH PORT TALBOT

MARGAM MOORS

Date of Notification: 1985

National Grid Reference: SS 783846

O.S. Maps: 1:50,000 Sheet number: 170
1:25,000 Sheet number: SS 78

Site Area: 108 ha

Description:

The last remaining example of the once extensive coastal levels in West Glamorgan. Bounded to the seaward by dunes and to landward by high ground, the meadows provide an agriculturally-managed freshwater habitat which hosts many species of plant on the edge of their geographical range, and nationally important invertebrates.

Mesotrophic marsh, fen meadow and ditch communities support Flowering-rush *Butomus umbellatus*, Frogbit *Hydrocharis morsus-ranae*, Arrowhead *Sagittaria sagittifolia*, Cyperus Sedge *Carex pseudocyperus* and Brown Sedge *C. disticha* on the edge of their range, with others such as Lesser Water-plantain *Baldellia ranunculoides*, Tubular Water-dropwort *Oenanthe fistulosa* and Marsh Helleborine *Epipactis palustris* of local interest.

The nationally rare beetle *Halipplus mucronatus*, the dragonfly *Sympetrum sanguineum* the regionally rare beetle *Anacaena bipustulata*, and the water-bug *Corixa panzeri* have all been found in the ditches.

Remarks:

In close proximity to Kenfig Local Nature Reserve.



APPENDIX 2

Best Practice Protocol for Tree Felling where trees have the potential for supporting Roosting or Hibernating Bats

Mature trees with trunk/branch cavities and/or a covering of ivy are particularly valuable bird nesting and bat roost sites, and will be retained wherever possible; compensatory planting with appropriate species will be undertaken where felling is inevitable.

Where tree felling or lopping is planned, such work will only be carried out between August and February to avoid the bird-breeding season.

All bats are protected by the Wildlife and Countryside Act 1981. Bat tree-roosts are extremely difficult to identify, and it should be assumed that any mature native-species tree is an actual roost. Every effort should be made to avoid disturbance or damage to these trees during construction work. It is an offence under the Wildlife and Countryside Act to knowingly disturb bat roosts or hibernacula. To minimise disturbance to bat populations by the removal of trees the following protocol will be followed.

- As far as possible all trees having bat roost potential will be preserved. If it is necessary for trees to be removed, all felling operations will bear due regard to this protocol.
- If bats are found during tree work, then all work will stop and the Countryside Council for Wales and the local Bat Group must be informed immediately.
- If the tree trunk is smaller than 200mm diameter and if it has no dense ivy, suitable holes, loose bark, and no holes associated with the root system, then work can be carried out on the tree between August and February (ie avoiding the bird breeding season).
- To avoid disturbing nursery roosts, work will never be carried out between June and August inclusive.
- If the tree does have any of the above or has a trunk size greater than 200mm, it will be cut only in September and October when bats, including young of the year, are still mobile and able to fly-out. If cutting must take place at other times, summer is probably best as bats can be more easily seen, can fly away and may take young with them, thus enabling a better chance of survival.
- If felling were to take place during hibernation (November to March) the bats will be torpid, difficult to see and the whole roost may be lost as they will be unable to escape.
- Any timber cut will be left lying for at least 24 hours to allow bats the opportunity to escape.
- It is also important to consider to what extent the habitat that is being removed is available elsewhere locally. For example, if only one tree in twenty of similar age or structure is to be felled, then it is likely that the impact of the loss will be less important. If the tree to be felled is solitary and in an area with few or no mature trees, then the impact would be significant.

Where the loss of mature trees is unavoidable, compensatory planting with appropriate locally native species, preferably of local provenance, should be undertaken.

APPENDIX 3

Best Practice Protocol Providing for the well-being of Badgers

If evidence of Badger activity is identified during site surveys or construction works, in order to comply with the Protection of Badgers Act, 1992, it will be necessary to protect all existing setts against disturbance and interference during site works. In general, any disturbance is prohibited within 30m of any active sett unless licensed by the Countryside Council for Wales or the National Assembly of Wales and then only between the months of July to November inclusive. Significant destruction of foraging grounds may also be judged as an infringement of the law on animal welfare grounds and, in extreme cases, prosecutions have been brought by the RSPCA.

Best practice principles advise that:

- All site personnel are made aware of the presence of setts and foraging grounds
- All site personnel are aware of the implications of the law
- If any setts are found during site works, a substantial fence will be erected, consisting of posts with three plain wires and with clearly visible bunting strung along the top, around each sett, a minimum distance of 30m from any entrance in order to prevent accidental access by any vehicle. A line of bunting supported on road pins is inadequate.
- Fragmentation of Badger territories is minimised during construction works.
- Existing Badger paths will not be obstructed during site works.
- All trenches dug on site will be provided with escape ramps, sloping boards or battered sides to allow any trapped animals to escape. As few trenches as possible will remain open on site over night.
- Fires will not be built near any sett.
- Any chemicals or other noxious substances stored on site will be in an area which is proofed against Badgers.
- If necessary, replacement foraging resources will be provided for the duration of the works.
- Landscaping proposals will bear due regard to the needs of foraging Badgers by the provision of infrequently cut grass verges and native species fruiting trees and shrubs.

APPENDIX 4 PROTECTED SPECIES & HABITATS: Permitted and Advised Times of Work												
Species	January	February	March	April	May	June	July	August	September	October	November	December
Badgers (Protection of Badgers Act 1992)							Work within 30m of a sett or annex permitted and sett closure permitted, subject to licence from NRW.					
Bats (WCA,1981, schedule 5, etc)				Limited work permitted but preferable in September & October, if possible				Felling permitted. Any felled trees of greater diameter than 20cm must be left to lie on the ground for 24hrs after felling to allow any roosting bats to escape.				
Otters: breeding and resting sites (WCA,1981, schedule 5)	Work likely to disturb such sites should only be carried out between September and January and is subject to licence from WG who will be advised by NRW.											
Water vole habitat and places of shelter (WCA,1981, schedule 5)	Early consultation with NRW should be undertaken where any planned work is likely to disturb water vole habitat. Comprehensive mitigation will be required.											
Protected Birds and nesting sites (WCA,1981, sch.1)	Work likely to disturb such sites should only be carried out between September and January and is subject to licence from WG who will be advised by NRW.											
All other Breeding Birds: nest sites (WCA,1981)	Tree and scrub clearance permitted		No scrub clearance unless site certified that no birds nests are present immediately prior to commencement of works by qualified ornithologist. In general, avoid clearing scrub during this period						Tree and scrub clearance permitted			
Great Crested Newts and their breeding & hibernation sites (WCA,1981, sch.5)	Work likely to disturb such sites should only be carried out between September and January and is subject to licence from WG who will be advised by NRW.											
Other Newts: breeding & hibernation sites (WCA,1981, sch.5)									Works likely to affect ponds should only be carried out during this period.			
Frogs & toads (not Natterjack): breeding sites (WCA,1981, sch.5)								Works likely to affect reptile habitat should only be carried out during this period.				
Reptiles except Smooth Snake: habitat (WCA,1981, sch.5)				Works likely to affect reptile habitats should only be carried out during this period.								
Marsh Fritillary butterfly (WCA,1981, sch.5)	Areas identified as supporting Marsh Fritillaries must not be disturbed except under licence from WG who will be advised by NRW											
Other Protected & Significant Invertebrates (WCA, 1981, etc)	Consult qualified ecologist before carrying out any works in areas identified as supporting these species.											
Other Invertebrates	Consult qualified ecologist before carrying out any works in areas identified as ecologically sensitive.											
Habitats of Principal Importance in Wales under Section 42 of the NERC Act 2006 and UK Biodiversity Action Plan Priority Habitats	Areas of this habitat should not be disturbed at any time of year without prior consultation with a qualified ecologist											
Important Hedgerows as defined in the Hedgerow Regulations, 1997	Important hedgerows may only be removed on the issue of a Hedgerow Removal Order from the local planning authority											

KEY TO COLOURS

Statutorily Protected Periods: No work at any time
Advisory Protected Periods: Avoid working during these periods if possible
Most suitable times for works to take place

ABBREVIATIONS

WCA,1981 Wildlife & Countryside Act, 1981 (as amended)
CCW Countryside Council for Wales
WAG Welsh Assembly Government

APPENDIX 5

Ecological Management & Monitoring Plan (EMMP) Log:

WOODLAND AND SCRUB	
The Site Ecologist will inspect existing woodlands and scrub areas in summer of each year and will instruct the site operators whether the existing management regime is to continue or amendments made.	
2017 Actions: 17 th Feb. Site inspection	Outcomes: > No change in status
2018 Actions: 26 th Jul. Site inspection	Outcomes: > No change in status
2019 Actions: 20 th Feb. Site inspection	Outcomes: > No change in status, 2 plants of American Skunk Cabbage noted in W2, removed
2020 Actions: 17 th Nov. & 21 st Dec Site inspections	Outcomes: > No change in status
2021 Actions: 18 th Feb. & 16 th Aug. Site inspections	Outcomes: > No change in status
2022 Actions: 23 rd Feb. Areas immediately S & E of W3 were inspected by BS 24 th Oct. Selected areas of wet scrub scrub were inspected for Invasive Non-Natives Species by BS.	Outcomes: > Several American Skunk Cabbage were mapped in the Kenfig River flood zone swamp. Other than stands of Sea Buckthorn, which were mapped, no evidence of Japanese Knotweed or Himalayan Balsam was recorded in any of the areas searched.

OPEN WATER & REEDSWAMP	
The ponds will be monitored periodically including the compilation of species lists with estimates of species frequency and % of open water, as detailed at Method Statement 6. A report will be produced detailing the survey results, an assessment of pond condition set against aims of the management objective for each pond and, if necessary, recommendations for changes in management will be made. The report will be distributed to Neath Port Talbot Council staff and any review of the management plan agreed with them.	
2017 Actions: 17 th Feb. Site inspection	Outcomes: > P2-to-P4 in favourable condition, P5-to-P9 with early development of pioneer humid slack vegetation
2018 Actions: 26 th Jul. Site inspection	Outcomes: > P2-to-P4 in favourable condition, P5-to-P9 with slow development of pioneer humid slack

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	vegetation
2019 Actions: 20 th Feb. Site inspection	Outcomes: > P2-to-P4 in favourable condition, though signs of scrub encroachment along margins, P5-to-P9 with good development of pioneer humid slack vegetation and increase in species diversity
2020 Actions: 17 th Nov. & 21 st Dec Site inspections	Outcomes: > P2-to-P4 starting to lose favourable condition, though succession, notably the development of scrub along margins. P5-to-P9 very good development of humid slack vegetation
2021 Actions: 18 th Feb. & 16 th Aug. Site inspections	Outcomes: > P2-to-P4 scrub cutting recommended to reverse development of scrub along margins. P5-to-P9 with excellent condition of humid slack vegetation
2022 Actions: 11 th Jan. Site inspection 23 rd Feb. Site inspection to mark out stands of Japanese Knotweed along margins of P3	Outcomes: > P2-to-P4 scrub cutting recommended to reverse development of scrub along margins. P5-to-P9 with excellent condition of humid slack vegetation, but small scale scraping of some heavily vegetated edge habitats recommended. Flailing commenced margins of P3 and P4. Ponds otherwise in generally good condition with clear water and good aquatic growth with abundant stonewort community

PRIMARY SAND DUNES

The dunes will be inspected annually for condition, with quadrat monitoring undertaken every three years, as detailed at Method Statement 6.

A report will be produced detailing the survey results, an assessment of dune condition set against aims of the management objective and, if necessary, recommendations for changes in management will be made. The report will be distributed to Neath Port Talbot Council staff and any review of the management plan agreed with them.

2017 Actions: 17 th Feb. Site inspection	Outcomes: > Off-road motorcycle activity limited to the established trackways.
2018 Actions: 26 th Jul. Site inspection	Outcomes: > No change in status
2019 Actions: 20 th Feb. Site inspection	Outcomes: > No change in status
2020 Actions: 17 th Nov. & 21 st Dec Site	Outcomes: > Evidence that there has

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inspections	been an increase in off-road motorcycle activity, which is having an adverse impact on sensitive dune slack communities, most notably in Area D18
2021 Actions: 18 th Feb. & 16 th Aug. Site inspections	Outcomes: > Further increases in off-road motorcycle activity, which is having a significant adverse impact on sensitive dune slack communities and sand hill communities, most notably in Areas D15, D17 and D18
2022 Actions: 11 th Jan. Site inspection 23 rd Feb. Site inspection 8 th Aug. Site inspection 24 th Oct. A partial search of the frontal dunes was carried out for Invasive Non-Natives Species by BS.	Outcomes: > Further increases in off-road motorcycle activity, which is having a significant adverse impact on sensitive dune slack communities and sand hill communities, most notably in Areas D15, D17 and D18 3 motor cyclists on site and degradation of dune habitats in D15, D17 & D18 significant Management overview with Chris Richards Surveys for primary colonists including searches for Invasive Non-Natives Species at the old and new burrowpits. Other than stands of Sea Buckthorn, which were mapped and three stands of Japanese Rose close to the footbridge, no other evidence of Japanese Knotweed or Himalayan Balsam was recorded in any of the areas searched.

SECONDARY SAND DUNE VEGETATION AND BARE SAND

The landfill dune grassland is to be inspected annually for condition, with quadrat monitoring undertaken every three years, as detailed in the baseline vegetation survey (Pryce Consultant Ecologists, 2015).

A report will be produced detailing the survey results, an assessment of dune condition set against aims of the management objective and, if necessary, recommendations for changes in management will be made. The report will be distributed to Neath Port Talbot Council staff and any review of the management plan agreed with them.

2017 Actions: 17 th Feb. Site inspection	Outcomes: > Consolidation of vegetation in areas D1-to-D4, D10 & D11. Areas D5-to-D9 still very open and mobile with much bare sand.
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2018 Actions: 26th Jul. Full re-survey of all monitoring quadrat points and site inspection.	Outcomes: > Very dry season when most vegetation on the tip either died back or completed life cycle early. Evidence of scrub die-back in some areas, including Sea-buckthorn.
2019 Actions: 20th Feb. Site inspection	Outcomes: > Development of scrub, notably the appearance of large stands of Sea Buckthorn, is of concern in areas D1-to-D4 and will require management to control development and spread. Areas D5-to-D9 still open with mobile sandbut Maram development steady and a notable increase in the diversity of dune species.
2020 Actions: 17th Nov. & 21st Dec Site inspections	Outcomes: > Development of scrub continues, with Sea Buckthorn stands spreading vegetatively within areas D1-to-D4. Dune grassland is diverse on site with a mix of biodiversity hot-spots and areas of coarse grasses. Areas D5-to-D9 now with well-developed yellow dune vegetation with most key species represented.
2021 Actions: 18th Feb. & 16th Aug. Site inspections	Outcomes: > First measures implemented to control Sea Buckthorn and other scrub on site with 50% of key areas in D1-to-D4 flailed, including areas of dune grassland. Areas D5-to-D9 with well-developed and diverse yellow dune vegetation established. Increased off-road motorcycle activity has had an adverse impact on some of the sand hill communities, most notably on the seaward slopes of Area D9
2022 Actions: 11th Jan. Site inspection Full re-survey of all monitoring quadrat points and site inspection. 23rd Feb. Site inspection 8th Aug. Site inspection	Outcomes: > Further increases in off-road motorcycle activity, which is having a significant adverse impact on sensitive dune slack communities and sand hill communities, most notably in Areas D8 & D9 3 motor cyclists on site and degradation of dune habitats in D8 & D9 significant Management overview with Chris Richards and preliminary surveys for primary colonists including searches for non-native invasive species at the newly

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24 th Oct. A comprehensive search of the capped landfill area was carried out for Invasive Non-Natives Species by BS.	capped Biocell, area D7 and water areas P4 & P8 Recharge trench Other than stands of Sea Buckthorn, which were mapped, no other evidence of Japanese Knotweed or Himalayan Balsam was recorded in any of the areas searched.
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MAMMALS

Casual observations of Brown Hare indicate a small breeding population probably exists on the landfill site.

As there are no perceived risks to breeding, hibernating or resting bats and invertebrate productivity is likely to be increased by the proposed management of the site, no actions are required to safeguard bats. The ecologist will advise where necessary on the use of outside lighting, which should be directed away from habitats likely to be of value to bats and site working practices will be designed to minimise the use of outside lighting and control times of illumination.

Bat activity surveys at strategic points will be undertaken in the summer of every fifth year following the adoption of this management plan to provide an indication of bat usage.

The findings of the monitoring surveys and any other bat issues will be included in the periodic reports submitted to the site operators and appropriate authorities. Survey findings will be reviewed with the Planning Authority during future liaison meetings.

2017 Actions: 17 th Feb. Site inspection	Outcomes: No incidental reports or evidence to indicate that the status of 'low' bat interest at site has changed
2018 Actions: 26 th Jul. Site inspection	Outcomes: No incidental reports or evidence to indicate that the status of 'low' bat interest at site has changed
2019 Actions: 20 th Feb. Site inspection	Outcomes: No incidental reports or evidence to indicate that the status of 'low' bat interest at site has changed
2020 Actions: 17 th Nov. & 21 st Dec Site inspections	Outcomes: > No incidental reports or evidence to indicate that the status of 'low' bat interest at site has changed
2021 Actions: 18 th Feb. & 16 th Aug. Site inspections	Outcomes: > More frequent observations of Brown Hare on the site, by site operatives. No incidental reports or evidence to indicate that the status of 'low' bat interest at site has changed.

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2022 Actions: 11 th Jan. Site inspection Bat activity survey using strategically placed bat recording devices to be undertaken in the summer 2023 to provide an indication of bat usage.	Outcomes: > Brown Hare seen on 11th
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REPTILES

No monitoring is proposed as reptiles are not a significant feature of the site and no adverse impact is anticipated, but all incidental observations will be noted and collated. Any reptile issues will be included in the annual reports submitted to the site operators and appropriate authorities.

Actions:	Outcomes:
2017 Actions: 17 th Feb. Site inspection	Outcomes: > No incidental observations or reports
2018 Actions: 26 th Jul. Site inspection	Outcomes: > No incidental observations or reports
2019 Actions: 20 th Feb. Site inspection	Outcomes: > No incidental observations or reports
2020 Actions: 21 st Dec Site inspections	Outcomes: > No incidental observations or reports
2021 Actions: 16 th Aug. Site inspections	Outcomes: > Adder was reported as seen by site operatives and a recommendation is made for a reptile survey to be undertaken
2022 Actions: Recommendation for reptile sheets to be deployed and checked during 2023.	Outcomes: >

AMPHIBIANS

No monitoring is proposed as amphibians are not a significant feature of the site and no adverse impact is anticipated, but all incidental observations will be noted and collated. Any amphibian issues will be included in the annual reports submitted to the site operators and appropriate authorities.

2017 Actions: 17 th Feb. Site inspection	Outcomes: > No incidental observations or reports
2018 Actions: 26 th Jul. Site inspection	Outcomes: > No incidental observations or reports
2019 Actions: 20 th Feb. Site inspection	Outcomes: > No incidental observations

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	or reports
2020 Actions: 21 st Dec Site inspections	Outcomes: > No incidental observations or reports
2021 Actions: 16 th Aug. Site inspections	Outcomes: > No incidental observations or reports
2022 Actions: Recommendation for herpetile sheets to be deployed and checked during the 2023	Outcomes: >

BIRD ASSEMBLAGE

The timing of management will be constrained by breeding birds using the site, which the site ecologist will advise the site managers on. No monitoring is proposed as breeding birds are not a significant feature of the site and no adverse impact is anticipated, but all incidental observations will be noted and collated. Any bird issues will be included in the annual reports submitted to the site operators and appropriate authorities.

2017 Actions: 17 th Feb. Site inspection	Outcomes: > Sch1 species breeding: Cetti's Warbler in W2-3. S7 species breeding: Skylark and Reed Bunting (population numbers not assessed)
2018 Actions: 26 th Jul. Site inspection	Outcomes: > Sch1 species breeding: Cetti's Warbler in W2-3. S7 species breeding include Skylark and Reed Bunting (population numbers not assessed). Ringed Plover possible breeder in Area D6
2019 Actions: 20 th Feb. Site inspection	Outcomes: > Sch1 species breeding: Cetti's Warbler in W2-3. S7 species breeding include Skylark and Reed Bunting (population numbers not assessed)
2020 Actions: 21 st Dec Site inspections	Outcomes: > Sch1 species breeding: Cetti's Warbler in W2-3. S7 species breeding include Skylark, Song Thrush and Reed Bunting (population numbers not assessed)
2021 Actions: 16 th Aug. Site inspections	Outcomes: > Sch1 species breeding: Cetti's Warbler in W2-3. S7 species breeding include Skylark and Reed Bunting (population numbers not assessed). Two pairs of Lapwings bred in

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	Area D4
2022 Actions: Ad hoc observations during site inspections on 11 th Jan., 8 th Aug. & 24 th Oct.	Outcomes: > Good numbers of Snipe in winter. Summer observations indicated reasonable breeding success for Linnets & Skylarks. Large gathering of 200+ Swallows on middle fence line. A movement of Fieldfares was noted in October.

INVERTEBRATES

No monitoring is proposed, but opportunities to undertake further surveys to help identify key species will be explored.

2017 Actions: 17 th Feb. Site inspection	Outcomes: >
2018 Actions: 26 th Jul. Site inspection	Outcomes: > Incidental observations of Local species noted: Dingy Skipper & Hairy Dragonfly
2019 Actions: 20 th Feb. Site inspection	Outcomes: > Incidental observations of S7 species: Brown-banded Carder Bee Local species noted: Hairy Dragonfly
2020 Actions: 21 st Dec Site inspections	Outcomes: >
2021 Actions: 16 th Aug. Site inspections	Outcomes: > Incidental observations of S7 species: Small Blue, Brown-banded Carder Bee & Shril Carder Bee. Local species noted: Yellow Belle
2022 Actions: Ad hoc observations during site inspections on 11 th Jan. & on 8 th Aug. a site visit by Buglife.	Outcomes: > Records were produced including sightings of Dune Villa, Four-banded Beegrabber, Grayling and Brown Argus. Agreement to provide managed access for Buglife to undertake invertebrate survey during 2023.

INVASIVE ALIEN PLANTS

For the duration of site operations and the restoration phase, including the aftercare period, checks will be undertaken annually to identify any Sea-buckthorn or Knotweed regrowth and control measures will be recommended and implemented if required.

The annual report produced by the Site Ecologist will include the findings of monitoring checks for Sea-buckthorn, Knotweed and other invasive species. The report will be distributed to the relevant authorities and any review of the management plan agreed.

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2017 Actions: 17 th Feb. Site inspection	Outcomes: >
2018 Actions: 26 th Jul. Site inspection	Outcomes: > Very dry season when most vegetation on the tip either died back or completed life cycle early. Evidence of scrub die-back in some areas, including Sea-buckthorn.
2019 Actions: 20 th Feb. Site inspection	Outcomes: > Development of scrub, notably the appearance of large stands of Sea Buckthorn, is of concern in areas D1-to-D4 and will require management to control development and spread. 2 plants of American Skunk Cabbage noted in W2, removed
2020 Actions: 17 th Nov. & 21 st Dec Site inspections	Outcomes: > Development of scrub continues, with Sea Buckthorn stands spreading vegetatively within areas D1-to-D4.
2021 Actions: 18 th Feb. & 16 th Aug. Site inspections	Outcomes: > First measures implemented to control Sea Buckthorn and other scrub on site with 50% of key areas in D1-to-D4 flailed, including areas of dune grassland.
2022 Actions: 11 th Jan. & 8 th Aug. Site inspections. • Check Area W2 for any additional plants of American Skunk Cabbage first noted in 2019 (but removed) • Recommendation to eradicate the few small stands of Japanese Knotweed at P3 • Implementation of the second phase of Sea Buckthorn control and other scrub on site with 50% of key areas in D1-to-D4 flailed, including areas of dune grassland. 24th Oct. A comprehensive search of the capped landfill area and targeted searches of other parts of the site was carried out for Invasive Non-Natives Species by BS.	Outcomes: > • 23-Feb-22 - Areas immediately S & E of W3 were inspected by BS and several American Skunk Cabbage were mapped in the Kenfig River flood zone swamp. • 23-Feb-22 - Stands of Japanese Knotweed were marked with cones (BS & JD) along margins of P3 prior to scrub flailing. • 23-Feb-22 - scrub flailing commenced in areas D2 & P3 All stands of Sea Buckthorn, Japanese Knotweed and Japanese Rose were mapped. Some stands of Japanese Knotweed have been killed off and will be monitored during 2023 for any signs of regrowth. Three other stands were found and will be treated during 2023. A cutting

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	programme for ongoing management of the Sea Buckthorn was drafted using the results of the survey together with high resolution aerial maps provided by Geotechnology.
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