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Morlais, Nefyn
Landscape Management Plan

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This document is to be read in conjunction with the following drawings:

- 223_MOR_0700_GA

1.0 INTRODUCTION AND DEVELOPMENT PROPOSAL

1.1 Introduction

Land Studio have been instructed to produce a Landscape Management Plan to accompany the residential development at Morlais, Nefyn.

1.2 Site Location and Description

The proposed development at Morlais is situated in Nefyn, located along the coast to the north of Lon Penrallt. The site at the bottom of the cliff and access joins the public footpath to the south of the site. The site is bounded by neighbouring residential properties to the west, the beach to the north and the cliff to the south and east. Part of the site lies within the Pen Llyn A'r Sarnau SAC which encompasses much of the coast to the north west of Nefyn.

The site currently comprises a residential building and a portion of the cliff that lies between the building and the Llyn Coastal Path at the top of the cliff. The cliff face is densely planted with large shrubs and trees, however Himalayan balsam and Montbretia crocosmia, which are both invasive species, have been found and will be removed. The site boundaries consist of a mix of timber post and rail fencing alongside concrete and timber retaining walls.

1.3 Development Proposal

The landscape scheme involves stabilisation works to 80% of the available cliff face due to recent landslides in the surrounding area along the coast. As the site is located within the SSSI and the SAC the proposal looks to retain much of the existing planting species and, once stabilisation works have been completed, re-colonisation of any cleared areas will be enabled to allow the natural character and biodiversity of the cliff to re-establish.

In addition to stabilising the cliff, an area to the south of the site adjacent to the public footpath and representing 20% of the available cliff is proposed to be left unstabilised and unmanaged as the ecosystem of the cliff benefits from the occasional landslide allowing for its natural re-colonisation. Pioneer habitats have been proposed within the landscape to allow natural cliff processes to occur and allow invertebrates to nest and tunnel into the unstabilised cliff after landslides.

It is also intended to actively manage a further 35% of the stabilised cliff whilst the remaining 45% of the unstabilised cliff will be totally unmanaged after stabilisation works have been carried out.

2.0 AIMS AND OBJECTIVES OF THE LANDSCAPE MANAGEMENT PLAN

2.1 Landscape Management Plan Aim

The Landscape Management Plan sets out the aims and objectives of the proposed scheme along with a ten-year and beyond management prescription programme.

2.2 Plan Objectives

- Proposing stabilisation of areas of cliff.
- To actively manage stabilised areas of the cliff ensuring successful establishment and growth.
- To ensure planting in stabilised areas is native/ self-seeded and successful in their establishment.
- Retaining areas of cliff as unstabilised.
- No / minimal intervention to areas of unstabilised cliff to allow for the ecosystem to continue to grow.
- To supplement and support bee habitats to allow them to thrive
- Planned / controlled removal of Himalayan balsam and Montbretia crocosmia (invasive species).

3.0 LANDSCAPE COMPARTMENTS AND MANAGEMENT PRINCIPLES

3.1 Existing Landscape Compartments

The existing landscape comprises two distinct habitats. The first lies to the upper section of the cliff and is predominantly dense scrub containing Blackberry (*Rubus fruticosus*), Ulex Europaeus (Gorse), Prunus spinosa (Blackthorn) and Salix caprea (Goat Willow). The second habitat area lies to the lower section of the cliff and comprises a diverse range of scrub and woodland ground flora with some biodiversity value. Species in the lower section include but are not limited to Primrose (*Primula vulgaris*), Red campion (*silene dioica*), Herb Robert (*Geranium robertianum*), Hart's Tongue Fern (*Asplenium scolopendrium*). Two invasive non-native species include Himalayan Balsam and Montbretia which dominate areas within the lower section of the cliff face.

3.2 Proposed Landscape Compartments

(Refer to 223_MOR_0700_GA for details.)

The proposed landscape scheme consists of the following compartments:

3.4 Unstabilised Area:

In the area of landscape adjacent to the public footpath, where there are no stabilisation works, the planting will remain as existing. Being unstabilised, small scale, naturally occurring, landslides will occur allowing for the re-colonisation of the bare ground by native ground flora species. This process is one of very high ecological importance as bare substrate areas are part of a rare successional stage of the soft cliff habitat. Any natural landslips that occur will be retained and allowed to function naturally as part of the soft cliffs habitat.

Himalayan balsam and Montbretia crocosmia may also be present in the unstabilised area and will therefore need removing in line with the agreed management method.

Management Aim: Remove any growth of Himalayan balsam and Montbretia crocosmia.

Management Prescription: Ensure Himalayan balsam and Montbretia crocosmia are disposed of correctly and do not return.

3.5 Stabilised Area:

An area, measuring 1516m² of the cliff within the site, will be stabilised and as part of the stabilisation process, much of the existing vegetation will be reduced to allow for the installation of rock anchors and netting. Once the structure has been built, the cleared areas will be allowed to re-establish from the local seedbed forming areas of ground flora, scrub and, over time, areas of tree planting.

Himalayan balsam and Montbretia crocosmia may also be present in the stabilised area and will therefore need removing.

The stabilised area will be split into two sections; a managed area of rotational coppice on the lower section of the cliff to allow ground flora to flourish and an unmanaged area to the upper parts of the cliff where scrub and tree planting will be allowed to establish. The lower section of cliff will consist of ground flora typical of broadleaved woodland transitioning up to more dense scrub to the upper section of the cliff.

Managed Stabilised Area:

(Refer to 223_MOR_0700_GA for details of location)

Once the cliff has been stabilised with rock anchors and rockfall netting, this section of stabilised cliff which is nearest to the proposed house, will be managed in the form of coppicing to allow both larger existing and self seeded planting and also ground flora to regenerate naturally and rejuvenate and flourish in this area. Management will be in the form of rotational coppicing where existing and self seeded planting will be cut back annually. Management will also take into consideration allowing regeneration of species such as Bird's Foot Trefoil (*Lotus corniculatus*) which are beneficial to important species like solitary bees.

Management Aim: Ensure successful establishment of existing and self seeded planting

Remove any growth of Himalayan balsam and Montbretia crocosmia.

Rotational coppicing of planting in managed stabilised area annually to ensure both larger plants and ground flora are established.

Management Prescription:

Ensure Himalayan balsam and Montbretia crocosmia are disposed of correctly and do not return.

Unmanaged Stabilised Area:

(Refer to 223_MOR_0700_GA for details of location)

This section of stabilised cliff will be toward the upper area of the site and will be left unmanaged. The purpose of leaving this area of cliff unmanaged is to allow for scrub and tree planting to re-establish itself and reach maturity.

Management Aim:

Remove any growth of Himalayan balsam and Montbretia crocosmia.

Management Prescription:

Ensure Himalayan balsam and Montbretia crocosmia are disposed of correctly and do not return.

3.6 Native Hedgerow Planting:

Two areas of native hedgerow planting have been proposed adjacent to the western side of the existing public footpath. This will supplement existing planting while also creating a deterrent for people wanting to access the cliff. Species include: Crataegus monogyna, Prunus spinosa and Ulex europaeus.

Management Aim: Ensure successful establishment.

Management Prescription: Ensure growing areas are kept litter and weed free.

3.7 Flower Rich Grassland Planting:

Swathes of flower rich grassland have been proposed throughout the site along the cliffside. This planting will supplement existing planting and will contain species that are dominant throughout this area of Nefyn. The Wales Wildflower Meadow Seed Mix by Habitat Aid contains species that are prevalent within grasslands that dominate the coast which includes (but isn't limited to): Festuca rubra, Lotus corniculatus, Plantago lanceolata, Centaurea nigra, Rumex acetosa and Cerastium fontanum all of which are highly useful to local biodiversity. Minimum area of flower rich grassland planting: 100m². Areas are to be checked on the ground by the ecologist, against a vegetation map to ensure that habitat creation is achievable and to suggest alternative locations if not.

Management Aim: Ensure successful establishment.

Management Prescription: Ensure growing areas are kept litter and weed free.

3.8 Pioneer Habitat:

Areas of bare earth forming the basis of the pioneer habitat will be proposed to areas of the cliff nearby seepages. It is also important to note that seepages will be left to occur naturally. These areas of bare earth will also be allowed to slip naturally as they would on the soft cliff, allowing for the creation of pioneer habitats in conjunction with the flower rich grassland. Pioneer habitats will support a wide range of invertebrates including bees. Minimum area of Pioneer Habitat: 20m². Areas will be checked on the ground by the ecologist, against a vegetation map to ensure that habitat creation is achievable and to suggest alternative locations if not. Bare areas will be created a year apart from each other to allow for rotational management. Some management in the form of cutting back will also be required on planting that overshadows Pioneer habitat areas and areas directly adjacent will need to be kept open.

Management Aim: Ensure successful establishment.

Management Prescription: Ensure areas are kept litter and weed free.

3.9 Structures:

Structures include cliff stabilisation rock anchors and rockfall netting.

Management Aim: To maintain all structures in a safe and serviceable condition, ensuring they are fit for purpose.

Management Prescription: Carry out regular checks of all structures (suggested once annually and for more than 5 years). Check for and make good any damage where possible and where there is irreparable damage, items to be replaced with identical specification or similar if not available.

4.0 MANAGEMENT PRESCRIPTIONS

Table 1 – Pre-Construction (part of site clearance works)

Compartments	Actions	Frequency and Timing	Comments
Landscape Compartments			
Stabilised Area	Vegetation to be cleared to allow for cliff stabilisation structure to be installed.	During November – February (outside of bird nesting periods)	Works must not take place between 1 st of March and 30 th of September, to avoid nesting birds
	Rotational coppicing of Managed Stabilised Area.	During February – March before planting comes into active growth (outside of bird nesting period).	
	Removal of Himalayan balsam (invasive species).	During April – June (remove before Himalayan balsam has started to seed)	A report detailing annual monitoring of INNS including work undertaken and maps showing location and extent of INNS to be produced every year and passed to the Local Planning Authority.
	Removal of Montbretia crocosmia (invasive species).	During November – February (remove before Montbretia crocosmia flowers)	
Unstabilised Area	Removal of Himalayan balsam (invasive species) before it has produced seeds.	During April – June (remove before Himalayan balsam has started to seed)	A report detailing annual monitoring of INNS including work undertaken and maps showing location and extent of INNS to be produced every year and passed to the Local Planning Authority.
	Removal of Montbretia crocosmia (invasive species) before it has flowered.	During November – February (remove before Montbretia crocosmia flowers)	

Table 2 – Year One

Landscape Compartments			
Stabilised Area	Rotational coppicing of Managed Stabilised Area.	During February - before planting comes into active growth (outside of bird nesting period).	Works must not take place between 1 st of March and 30 th of September, to avoid nesting birds
	Check for resurgence of Himalayan balsam growth (invasive species) and remove accordingly.	During April – June (remove before Himalayan balsam has started to seed)	A report detailing annual monitoring of INNS including work undertaken and maps showing location and extent of INNS to be produced every year and passed to the Local Planning Authority.
	Check for resurgence of Montbretia crocosmia growth (invasive species) and remove accordingly.	During November – February (remove before Montbretia crocosmia flowers)	
Unstabilised Area	Check for resurgence of Himalayan balsam growth (invasive species) and remove accordingly.	During April – June (remove before Himalayan balsam has started to seed)	A report detailing annual monitoring of INNS including work undertaken and maps showing location and extent of INNS to be produced every year and passed to the Local Planning Authority.
	Check for resurgence of Montbretia crocosmia growth (invasive species) and remove accordingly.	During November – February (remove before Montbretia crocosmia flowers)	
Native Hedgerow Planting	During times of prolonged drought, plants are to be watered to field saturation using clean fresh water.	May-September, weekly during dry weather.	
	Litter picking to be carried out by hand and disposed of off-site.	During every visit	
Flower Rich Grassland	Ensure INNS are not growing within growing area.	During every visit	Clearance of INNS may be required before planting of flower rich grassland.
	During times of prolonged drought, plants are to be watered to field saturation using clean fresh water.	May-September, weekly during dry weather.	

	Litter picking to be carried out by hand and disposed of off-site.	During every visit	
	Annual cutting of vegetation to 50mm in height and clearance of clippings	During September – February, annually.	
	Should flower rich grassland fail to develop into a species rich grassland, locally sourced green hay from the Llyn peninsula should be spread to allow for restoration of grassland.	Areas to be cleared between June and July before spreading green hay. Green hay to be spread between July and August.	
Pioneer Habitat	To be rotationally managed by clearing vegetation that has developed in bare areas.	During September – February, annually.	To be cleared without the use of herbicides.
	Litter picking to be carried out by hand and disposed of off-site.	During every visit	
	Cut back tall vegetation that overshadow Pioneer habitat areas in non-intervention zone. Ensure area immediately adjacent to pioneer habitat is kept open.	During February - before planting comes into active growth (outside of bird nesting period).	

Table 3 – Year Two - Five

Compartments	Actions	Frequency and Timing	Comments
Landscape Compartments			
Any trees or shrubs that fail should be replaced to match original specification.			
Stabilised Area	Rotational coppicing of Managed Stabilised Area.	During February – before planting comes into active growth (outside of bird nesting period).	Works must not take place between 1 st of March and 30 th of September, to avoid nesting birds
	Check for resurgence of Himalayan balsam growth (invasive species) and remove accordingly.	During April – June (remove before Himalayan	A report detailing annual monitoring of INNS including work undertaken

		balsam has started to seed)	and maps showing location and extent of INNS to be produced every year and passed to the Local Planning Authority.
	Check for resurgence of Montbretia crocosmia growth (invasive species) and remove accordingly.	During November – February (remove before Montbretia crocosmia flowers)	
Unstabilised Area	Check for resurgence of Himalayan balsam growth (invasive species) and remove accordingly.	During April – June (remove before Himalayan balsam has started to seed)	A report detailing annual monitoring of INNS including work undertaken and maps showing location and extent of INNS to be produced every year and passed to the Local Planning Authority.
	Check for resurgence of Montbretia crocosmia growth (invasive species) and remove accordingly.	During November – February (remove before Montbretia crocosmia flowers)	
Native Hedgerow Planting	During times of prolonged drought, plants are to be watered to field saturation using clean fresh water.	May-September, weekly during dry weather.	
	Litter picking to be carried out by hand and disposed of off-site.	During every visit	
Flower Rich Grassland	Ensure INNS are not growing within growing area.	During every visit	
	During times of prolonged drought, plants are to be watered to field saturation using clean fresh water.	May-September, weekly during dry weather.	
	Litter picking to be carried out by hand and disposed of off-site.	During every visit	
	Annual cutting of vegetation to 50mm in height and clearance of clippings	During September – February, annually.	
	Should flower rich grassland fail to develop into a species rich grassland, locally sourced green hay from the Llyn peninsula should be spread to allow for restoration of grassland.	Areas to be cleared between June and July before spreading green hay. Green hay to be spread between July and august.	

Pioneer Habitat	To be rotationally managed by clearing vegetation that has developed in bare areas.	During September – February, annually.	To be cleared without the use of herbicides.
	Litter picking to be carried out by hand and disposed of off-site.	During every visit	
	Cut back tall vegetation that overshadow Pioneer habitat areas in non-intervention zone. Ensure area immediately adjacent to pioneer habitat is kept open.	During February - before planting comes into active growth (outside of bird nesting period).	

Table 4 – Year Five to Ten

Compartments	Actions	Frequency and Timing	Comments
Landscape Compartments			
Any trees or shrubs that fail should be replaced to match original specification.			
Stabilised Area	Rotational coppicing of Managed Stabilised Area.	During February – before planting comes into active growth (outside of bird nesting period).	Works must not take place between 1 st of March and 30 th of September, to avoid nesting birds
	Check for resurgence of Himalayan balsam growth (invasive species) and remove accordingly.	During April – June (remove before Himalayan balsam has started to seed)	A report detailing annual monitoring of INNS including work undertaken and maps showing location and extent of INNS to be produced every year and passed to the Local Planning Authority.
	Check for resurgence of Montbretia crocosmia growth (invasive species) and remove accordingly.	During November – February (remove before Montbretia crocosmia flowers)	

Unstabilised Area	Check for resurgence of Himalayan balsam growth (invasive species) and remove accordingly.	During April – June (remove before Himalayan balsam has started to seed)	A report detailing annual monitoring of INNS including work undertaken and maps showing location and extent of INNS to be produced every year and passed to the Local Planning Authority.
	Check for resurgence of Montbretia crocosmia growth (invasive species) and remove accordingly.	During November – February (remove before Montbretia crocosmia flowers)	
Native Hedgerow Planting	During times of prolonged drought, plants are to be watered to field saturation using clean fresh water.	May-September, weekly during dry weather.	
	Litter picking to be carried out by hand and disposed of off-site.	During every visit	
Flower Rich Grassland	Ensure INNS are not growing within growing area.	During every visit	
	During times of prolonged drought, plants are to be watered to field saturation using clean fresh water.	May-September, weekly during dry weather.	
	Litter picking to be carried out by hand and disposed of off-site.	During every visit	
	Annual cutting of vegetation to 50mm in height and clearance of clippings	During September – February, annually.	
	Should flower rich grassland fail to develop into a species rich grassland, locally sourced green hay from the Llyn peninsula should be spread to allow for restoration of grassland.	Areas to be cleared between June and July before spreading green hay. Green hay to be spread between July and august.	

Pioneer Habitat	To be rotationally managed by clearing vegetation that has developed in bare areas.	During September – February, annually.	To be cleared without the use of herbicides.
	Litter picking to be carried out by hand and disposed of off-site.	During every visit	
	Cut back tall vegetation that overshadow Pioneer habitat areas in non-intervention zone. Ensure area immediately adjacent to pioneer habitat is kept open.	During February - before planting comes into active growth (outside of bird nesting period).	

Table 4 – Year Five to Ten

Compartments	Actions	Frequency and Timing	Comments
Landscape Compartments			
Any trees or shrubs that fail should be replaced to match original specification.			
Stabilised Area	Rotational coppicing of Managed Stabilised Area.	During February – before planting comes into active growth (outside of bird nesting period).	Works must not take place between 1 st of March and 30 th of September, to avoid nesting birds
	Check for resurgence of Himalayan balsam growth (invasive species) and remove accordingly.	During April – June (remove before Himalayan	A report detailing annual monitoring of INNS including work undertaken

		balsam has started to seed)	and maps showing location and extent of INNS to be produced every year and passed to the Local Planning Authority.
	Check for resurgence of Montbretia crocosmia growth (invasive species) and remove accordingly.	During November – February (remove before Montbretia crocosmia flowers)	
Unstabilised Area	Check for resurgence of Himalayan balsam growth (invasive species) and remove accordingly.	During April – June (remove before Himalayan balsam has started to seed)	A report detailing annual monitoring of INNS including work undertaken and maps showing location and extent of INNS to be produced every year and passed to the Local Planning Authority.
	Check for resurgence of Montbretia crocosmia growth (invasive species) and remove accordingly.	During November – February (remove before Montbretia crocosmia flowers)	
Native Hedgerow Planting	During times of prolonged drought, plants are to be watered to field saturation using clean fresh water.	May-September, weekly during dry weather.	
	Litter picking to be carried out by hand and disposed of off-site.	During every visit	
Flower Rich Grassland	Ensure INNS are not growing within growing area.	During every visit	
	During times of prolonged drought, plants are to be watered to field saturation using clean fresh water.	May-September, weekly during dry weather.	
	Litter picking to be carried out by hand and disposed of off-site.	During every visit	
	Annual cutting of vegetation to 50mm in height and clearance of clippings	During September – February, annually.	
	Should flower rich grassland fail to develop into a species rich grassland, locally sourced green hay from the Llyn peninsula should be spread to allow for restoration of grassland.	Areas to be cleared between June and July before spreading green hay.	

		Green hay to be spread between July and August.	
Pioneer Habitat	To be rotationally managed by clearing vegetation that has developed in bare areas.	During September – February, annually.	To be cleared without the use of herbicides.
	Litter picking to be carried out by hand and disposed of off-site.	During every visit	
	Cut back tall vegetation that overshadow Pioneer habitat areas in non-intervention zone. Ensure area immediately adjacent to pioneer habitat is kept open.	During February - before planting comes into active growth (outside of bird nesting period).	

Table 5 – Year Ten and Beyond

Compartments	Actions	Frequency and Timing	Comments
Landscape Compartments			
Any trees or shrubs that fail should be replaced to match original specification.			
Stabilised Area	Rotational coppicing of Managed Stabilised Area.	During February – before planting comes into active growth (outside of bird nesting period).	Works must not take place between 1 st of March and 30 th of September, to avoid nesting birds
	Check for resurgence of Himalayan balsam growth (invasive species) and remove accordingly.	During April – June (remove before Himalayan balsam has started to seed)	A report detailing annual monitoring of INNS including work undertaken and maps showing location and extent of INNS to be produced every year and passed to the Local Planning Authority.
	Check for resurgence of Montbretia crocosmia growth (invasive species) and remove accordingly.	During November – February (remove before Montbretia crocosmia flowers)	
Unstabilised Area	Check for resurgence of Himalayan balsam growth (invasive species) and remove accordingly.	During April – June (remove before Himalayan balsam has started to seed)	A report detailing annual monitoring of INNS including work undertaken and maps showing location and extent of INNS to be produced every year and passed to the Local Planning Authority.
	Check for resurgence of Montbretia crocosmia growth (invasive species) and remove accordingly.	During November – February (remove before Montbretia crocosmia flowers)	
Flower Rich Grassland	Ensure INNS are not growing within growing area.	During every visit	
	During times of prolonged drought, plants are to be watered to field saturation using clean fresh water.	May-September, weekly during dry weather.	
	Litter picking to be carried out by hand and disposed of off-site.	During every visit	

	Annual cutting of vegetation to 50mm in height and clearance of clippings	During September – February, annually.	
	Should flower rich grassland fail to develop into a species rich grassland, locally sourced green hay from the Llyn peninsula should be spread to allow for restoration of grassland.	Areas to be cleared between June and July before spreading green hay. Green hay to be spread between July and august.	
Pioneer Habitat	To be rotationally managed by clearing vegetation that has developed in bare areas.	During September – February, annually.	To be cleared without the use of herbicides.
	Litter picking to be carried out by hand and disposed of off-site.	During every visit	
	Cut back tall vegetation that overshadow Pioneer habitat areas in non-intervention zone. Ensure area immediately adjacent to pioneer habitat is kept open.	During February - before planting comes into active growth (outside of bird nesting period).	

5.0 MONITORING AND REVIEW

5.1 Monitoring

It is assumed that a local landscape contractor is employed to undertake the maintenance and management programme set out.

5.2 Plan Review

A formal review of the Plan should take place every two years for the lifetime of the proposal which should provide revised objectives and prescriptions for future years and also amended for any additions to the landscape. The formal review should include but not be limited to the following actions:

- Assessing the resurgence and re-establishment of any Invasive Non-Native Species within the site and arranging appropriate management and removal of said species.
- Ensure there are areas of bare earth within the site and that they are managed appropriately.

- Ensure maintenance and management of all areas of species-rich grassland.
- A brief report with photos highlighting the aforementioned formal review actions, that will need to be submitted to the local planning authority.

Monitoring and plan reviews should be undertaken by a qualified Landscape Manager or Ecologist. The purpose of monitoring and reviews will be to ensure that objectives in terms of INNS resurgence and management of landscape compartments are having the desired effect and if required, make adjustments to those prescriptions in order to ensure that the objectives are adequately met.

6.0 INVASIVE NON-NATIVE SPECIES BIOSECURITY RISK ASSESSMENT

6.1 Introduction

A survey was undertaken by Cambrian Ecology Limited on the site in relation to the planning application for the proposed development of Morlais in Nefyn. The survey recorded the presence of certain invasive garden species which include Montbretia (*Crococsmia x crocosmiflora*) and Himalayan Balsam (*Impatiens glandulifera*). These species are listed as 'Invasive Non-Native Species' (INNS) under the Wildlife and Countryside Act which is accompanied by legal implications with regards to the potential spread of these species. Invasive non-native plant species are an increasing problem throughout the UK and in some cases pose a significant threat to the native ecosystem.

The purpose of this biosecurity risk assessment is to achieve the following:

- Ensure current legislation is adhered to with regards to the off-site spreading of the invasive non-native species and within the site during any clearance or other work phases.
- Provide a strategy for the effective control/ eradication of existing invasive non-native species.
- Reducing/ minimising the risk of introducing new species during construction.

6.2 Transmission of Species

Montbretia - usually spread by human activity when the corms or rhizomes of the plant are discarded. The plant then rapidly colonises potentially large areas and out-competes most native plants. Very occasionally Montbretia produces viable seeds but this is not usually considered to pose a risk. On a busy construction site, there is always the potential for new INNS to be inadvertently introduced. Precautionary measures are suggested later in the assessment.

Himalayan Balsam – Main distribution is through human means, but also transported through water routes with seeds remaining viable for 2 years. Himalayan Balsam seedpods can shoot their seeds up to 7m and can produce up to 800 seeds which means distribution of seeds could cover large areas.

Table 6 – Biosecurity Risk Assessment

Risk	Transmission Method	Level of Risk	Consequences	Control Measures
Further introduction of INNS	Material brought onto the site as part of the construction phase.	Low - if precautionary measures are taken.	Further infestation of the site, eventually leading to the potential spread of additional invasive species into surrounding habitats.	Where possible avoid the import of top soil or other material that could be contaminated. Topsoil and other material must come from a reputable source.
	Plant parts and/or seeds introduced via mud on tools, boots, tyres, plant and machinery.	Low - if precautionary measures are taken.	The spread of INNS throughout the site and potentially into the wider landscape.	All boots, tools, tyres, plant and machinery or any other possible means of transmission must be thoroughly cleaned. Facilities for cleaning boots etc should be provided on site and site hygiene should be strictly enforced.
	Plant parts and/or seeds introduced via new planting stock brought onto site.	Low - if precautionary measures are taken.	The spread of INNS throughout the site and potentially into the wider landscape.	Confirmation from the supplier that all new planting stock has been grown in an environment free from contamination by INNS. Careful selection of plant species to avoid any now classed as INNS
Spread of INNS throughout site	Plant parts and/or seeds spread throughout the site via mud on tools, boots, tyres, plant and machinery.	High - unless precautionary measures are taken.	The spread of INNS throughout the site and potentially into the wider landscape.	Measures must be introduced to eliminate Montbretia. Prior to works commencing all areas containing this species must be clearly defined.
Off-site spreading of INNS	Plant parts and/or seeds carried off site via mud on tools, boots, tyres, plant and machinery or in material removed from the site.	High - unless precautionary measures are taken.	The spread of INN plants onto other sites. There is the additional risk of prosecution due to the legal implications of causing or allowing the spread of this species.	All boots, tools, tyres, plant and machinery or any other possible means of transmission must be thoroughly cleaned. Facilities for wheel washing and the cleaning boots etc must be provided at the site office where site hygiene should be strictly enforced.
Spread of Montbretia to surrounding areas/habitats	Corms/rhizomes deposited intentionally/accidentally over the site during any works that involve soil excavations.	High - unless precautionary measures are taken.	Infestation of the surrounding habitats to the detriment of native ground-flora. There is the additional risk of prosecution due to the legal	Avoid excavating in areas where the plant is present. Keep all excavated material on site. Initiate an eradication programme.

			implications of causing or allowing the spread of this species.	Removing this plant from site is not usually an option as there are then problems with the disposal of the material. Treating the plant in-situ with herbicide is the most realistic course of action.
Spread of Himalayan Balsam into surrounding areas/ habitats	Plant parts and/or seeds introduced via mud on tools, boots, tyres, plant and machinery. Seeds spread by animals consuming seeds.	High – unless precautionary measures are taken.	Infestation of habitats outside the proposed development site.	Implement clearly defined working areas avoiding the species and implement a control programme. The only way of preventing the spread of Himalayan Balsam via animal-dispersed seeds is to eradicate the plants.

6.3 Montbretia Eradication

Pre-Construction Eradication – Prior to any construction, all Montbretia on site will be clearly marked and an excavation zone, measuring a 75cm radius around the plant and a 75cm depth, will be set up to ensure all corms have been removed. Ensure all excavation takes place before the Montbretia has flowered, during the period of November to February. All excavation material will be transported to a licensed landfill site to be deposited as controlled waste or dealt with on site in a waste management area.

6.4 Future Monitoring

Montbretia, being very persistent, can regenerate from small root particles and re-infest the site post-development. To combat this, it is important that the landscape management plan is adhered to and is adopted for a minimum of 10 years to ensure that the plant is completely eradicated. Any reappearances must be dealt with immediately and appropriately.

6.5 Himalayan Balsam Eradication

Pre-Construction Eradication – Prior to any construction all Himalayan Balsam on site should be removed before seeding commences, during the period of April to June. Removal will be undertaken by pulling the species up by hand ensuring all of the plant is removed.

6.6 Future Monitoring

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Himalayan Balsam seeds can remain viable for up to 2 years therefore it is important that the landscape management plan is adhered to and is adopted for a minimum of 10 years to ensure that the plant is completely eradicated. Any reappearances must be dealt with immediately and appropriately.