



Llyn Tegid Reservoir Safety Project

Phase 1 Habitat Survey Report for additional site areas and validation

September 2019

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PHASE 1 HABITAT SURVEY REPORT FOR ADDITIONAL SITE AREAS**CONTENTS**

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1. INTRODUCTION

1.1 Background

Natural Resources Wales (NRW) are proposing to undertake safety modifications to the impounding structures at Llyn Tegid, Gwynedd, North Wales. Llyn Tegid is a natural lake with approximately 2,950m of embankment at its northern end. The outflow is controlled by Bala Sluices, which is a gated control structure that controls the combined outflow from Llyn Tegid and the Afon Tryweryn. This allows Llyn Tegid to be used for flood control and to regulate the River Dee downstream.

The proposed modifications to the existing water impounding structures comprise of reinforcement of landward / downstream embankment faces with buried 3D geotextile mat (Enkamat or similar) and upgrading of existing rip rap upstream slope protection on the lake embankment with additional imported stone material.

1.2 Scope of Survey

A Preliminary Ecological Appraisal (PEA) for the Project area was carried out by Enfys Ecology (2017) which included a Phase 1 habitat plan of the Project area. Since then the Project has developed and additional areas were added to the Project that are to be used for site compounds, construction access routes and potential habitat enhancement areas (referred to as the 'survey area' within this report). This Phase 1 habitat report only covers the additional areas and does not cover all the Project area as this has already been completed in 2017 (Yardley 2017) and by a more recent Phase 1 habitat report completed by Exegesis in 2018 (Lush 2018). During this survey, however, habitats were validated from the 2017 survey to see if any habitats have changed significantly.

This report is to be used as an addendum to the existing PEA, which can both be used to support the Project planning application.

2. METHODS

The survey was carried out by Black & Veatch's Ecologist, Gary Noble on the 17th July 2019. The additional areas for the Project were walked by the ecologist and the habitats mapped and classified using the standard Phase 1 habitat survey methodology (JNCC 2010). Notes were taken on the habitats present and target notes were used to record any habitats and features of note, including the dominant plants that were present. The survey area can be found in the Phase 1 habitat survey drawing in Appendix 2 and the target notes can be found in Appendix 1.

During the survey, habitats were also assessed for their suitability to support protected and notable species, and field signs indicating their presence or absence were recorded. The distribution and extent of widespread, visible invasive non-native species (INNS) were also noted where found. A systematic survey for INNS was not conducted as part of this survey.

3. LIMITATIONS

The survey undertaken for this report does not comprise a full list of plants and animals that may be present within the survey area. The protected species appraisal provides a

preliminary view of the likelihood of protected species occurring at the survey area. It should not be taken as providing a full and definitive survey of any protected species group.

4. RESULTS

4.1 Habitats Recorded

Improved/poor semi improved neutral grasslands

The majority of the fields in the survey area were classed as improved neutral grasslands that at the time of survey had been recently managed through mowing (Target notes 2 and 9). Other improved fields in the survey area at the time of survey were currently being used to graze sheep and cattle (Target notes 12, 14 and 15). Species diversity and composition within improved fields is generally low only containing species that are indicative of improved neutral grasslands. Other areas of grassland within the survey area contained unmanaged grassland habitat that were classed as poor semi improved grassland (Target notes 13 and 18) as species diversity within these grasslands was generally more diverse. The area of grassland on the island (Target note 22) has been classed as semi improved grassland due to more species of flowering plants present.

Hedgerows

Hedgerows within the survey area were classed as species poor hedgerows containing five or less woody species (Target notes 1, 4, and 16). Hedgerows were usually intact with minimal gaps with some hedgerows containing standard broadleaved trees within the hedgerow line (Target note 11).

Scattered broadleaved trees

The majority of the field boundaries within the survey area contained a mixture of mature broadleaved trees (Target notes 5, 6, 7, 8, 10 and 17). Trees generally in good condition with some trees clad with thick ivy.

Ditch

Only one ditch recorded within the survey area. At the time of survey, the ditch contained running shallow water (Target note 4).

Invasive and non-native plants

Invasive plants such as Indian balsam *Impatiens glandulifera* and Japanese knotweed *Fallopia japonica* are known to be within the area. Indian balsam is present and managed along the foreshore of the lake and within the riparian habitats along the rivers within the survey area. Monkeyflower *Mimulus guttatus* is present along a ditch (Target Note 4).

Validation of habitats from previous phase 1 habitat surveys

The majority of the habitats recorded from the 2017 and 2018 phase 1 habitat surveys have not changed significantly since this survey in 2019. Differences occur in classifying the neutral grasslands. The Enfys 2017 survey has classed some areas as poor semi improved grassland, whereas the Exegesis report has classed them as semi improved grassland around the meadow areas adjacent to the rivers. This is likely that the 2017 survey was carried out in October and some of the flowering species recorded in the 2019

survey were not visible in the autumn. This survey from 2019 has classified some of the meadow areas on the island as semi improved neutral grassland due to presence of more flowering plant species.

4.2 Potential for Protected Species

Bats

From biological records and recent surveys, bats are known to be using the survey area for foraging and commuting. The mature trees along the various field boundaries have potential to support roosting bats as they contain potential roosting features (PRFs) such as holes, cracks and broken limbs. Some large mature trees also are covered in ivy which are likely to obscure further PRFs.

Badgers

No badger setts or signs were observed within the survey area. The habitats within the survey area are generally suitable to support badgers given the presence of suitable foraging areas and areas where setts could be newly created, particularly along field boundaries.

Breeding birds

The habitats within the survey area, such as trees and hedgerows have good potential to support breeding birds.

Great crested newts (GCN)

The Enfys 2017 PEA report stated that there are no records of GCN within the area. The pond within the survey area (Target note 19), at the time of survey was mostly dry and contained no water. Given the lack of records and no suitable waterbodies within the general area, GCN are unlikely to be affected by the proposed works.

Otters

Otters are known to be present within the area and are known to use the lake foreshore and the rivers close to the proposed construction areas. Within the survey area there were no suitable rivers that could support otter, but adjacent terrestrial habitat could be used for otter holts and resting areas.

Reptiles

The Enfys 2017 PEA report stated there are no records of reptiles within the survey area. Suitable habitat for reptiles exists along some field boundaries within the survey area, such as rough unmanaged grassland strips and the meadow areas that are adjacent to the river (Target notes 3, 4, 13, 18, 21 and 22). Slow worms have also been reported to be present within the Rip Rap areas along the foreshore of the lake. No slow worms were observed during the site investigations works that took place in June 2019.

5. RECOMMENDATIONS

The recommendations in this report are for the survey area only. Reference should also be made to the Enfys 2017 PEA report which details the recommendations for the entire Project.

- Field boundaries and buffer zones – the boundaries of the fields should be protected from any compound construction by creating buffer zones around the field boundaries to protect tree protection zones (informed by an arboricultural survey), ditches and any unmanaged grass strips that are present along some of the field boundaries. Encroachment should be prohibited into the buffer zones at all times;
- Bats – if any mature trees are affected by construction compounds or access routes then further detailed assessments will be required to assess the tree/s suitability to support bat roosts. If suitable and the tree will be impacted by proposed works, then further surveys will be required either through or in combination with tree climbing surveys to inspect PRFs followed by dawn/dusk emergent/re-entry surveys;. Any works that effects bat roosts should be undertaken under license from NRW;
- Breeding birds - Any vegetation removal required for a site compound or access routes to be removed outside the breeding bird season. The main breeding bird season is considered to be between March and September;
- Reptiles – areas of rough unmanaged grassland located on the borders of some field boundaries to be protected. If these are to be disturbed for a site compound and/or any construction access routes, then sensitive habitat removal should be completed prior to works to discourage reptiles from the working area. This type of method should only be used for small areas and includes removing the grassland habitat in a two stage sensitive cut under ecological watching briefs;
- Badgers – a pre-construction check should be made before construction of the site compound to ensure no new setts have been created close to proposed works;
- Otters – a pre-construction check for otters along rivers and in areas along field boundaries close to the lake foreshore; and
- Invasive species – any invasive species should be dealt with in line with the Projects invasive species management plan.

6. REFERENCES





JNCC (2010) Handbook for Phase 1 Habitat Survey: A Technique for Environmental Audit. First published 1990; reprinted in 1993; reprinted in 2003 with limited revisions & additions; reprinted in 2004; reprinted in 2007 with minor additions; reprinted in 2010





Lush M J (2018) Aerial, Phase 1 and NVC Survey Report – Llyn Tegid Reservoir Safety Project, Exegesis. Version 4.





Yardley T (2017) Preliminary Ecological Appraisal Survey Report – Llyn Tegid Embankments, Enfys Ecology.





APPENDIX 1 – Phase 1 habitat target notes





<p>TN 1</p>		<p>Unmanaged species poor intact hedgerow on perimeter of field and adjacent leisure centre. Woody species included ash <i>Fraxinus excelsior</i>, hawthorn <i>Crataegus monogyna</i>, blackthorn <i>Prunus spinosa</i> and dog rose <i>Rosa canina</i>. Hedgerow understorey included abundant common nettle <i>Urtica dioica</i> and common bent grass <i>Agrostis capillaris</i> with occasional red campion <i>Silene dioica</i>, common cleavers <i>Galium aparine</i> and bramble <i>Rubus fruticosus</i>.</p>
<p>TN 2</p>		<p>Grassland habitat that had been recently mown. Improved neutral grassland habitat containing common species such as perennial rye grass <i>Lolium perenne</i>, meadow foxtail <i>Alopecurus pratensis</i> and flowering species such as meadow buttercup <i>Ranunculus acris</i>, daisy <i>Bellis perennis</i>, white clover <i>Trifolium repens</i>, ribwort plantain <i>Plantago lanceolata</i> and scattered common dock <i>Rumex acetosa</i>.</p>
<p>TN 3</p>		<p>Hedgerow bank located on the field boundary adjacent to the A494. Good mixture of grasses and flowering plants such as false oat grass <i>Arrhenatherum elatius</i>, cocksfoot <i>Dactylis glomerata</i>, common bent and Yorkshire fog <i>Holcus lanatus</i>, meadow vetchling <i>Lathyrus pratensis</i>, black knapweed <i>Centaurea nigra</i> and meadow sweet <i>Filipendula ulmaria</i>.</p>

<p>TN 4</p>		<p>Shallow running ditch along the field boundary with adjacent rough unmanaged buffer. Species included hemlock water dropwort <i>Oenanthe crocata</i>, water mint <i>Mentha citrata</i>, monkeyflower <i>Mimulus guttatus</i> and meadow sweet. Adjacent young hazel <i>Corylus avellana</i> hedge located on the field boundary next to the ditch.</p>
<p>TN 5</p>		<p>Row of mature trees on field boundary. Most of the trees were ash with the occasional beech <i>Fagus sylvatica</i> tree. Some trees have suitability for roosting bats which contained potential roosting features (PRFs) such as cracks, knots and hollows within trees that could be used as bat roosts. Some trees covered in ivy, which may obscure any further PRFs.</p>
<p>TN 6</p>		<p>Row of mature ash and beech trees with PRFs on field boundary.</p>
<p>TN 7</p>		<p>Row of mature ash and beech trees with PRFs on field boundary.</p>

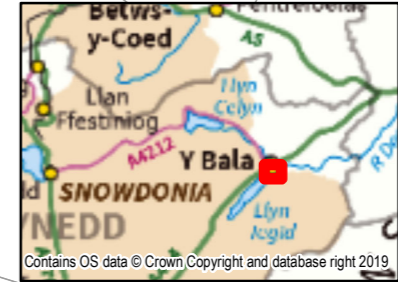
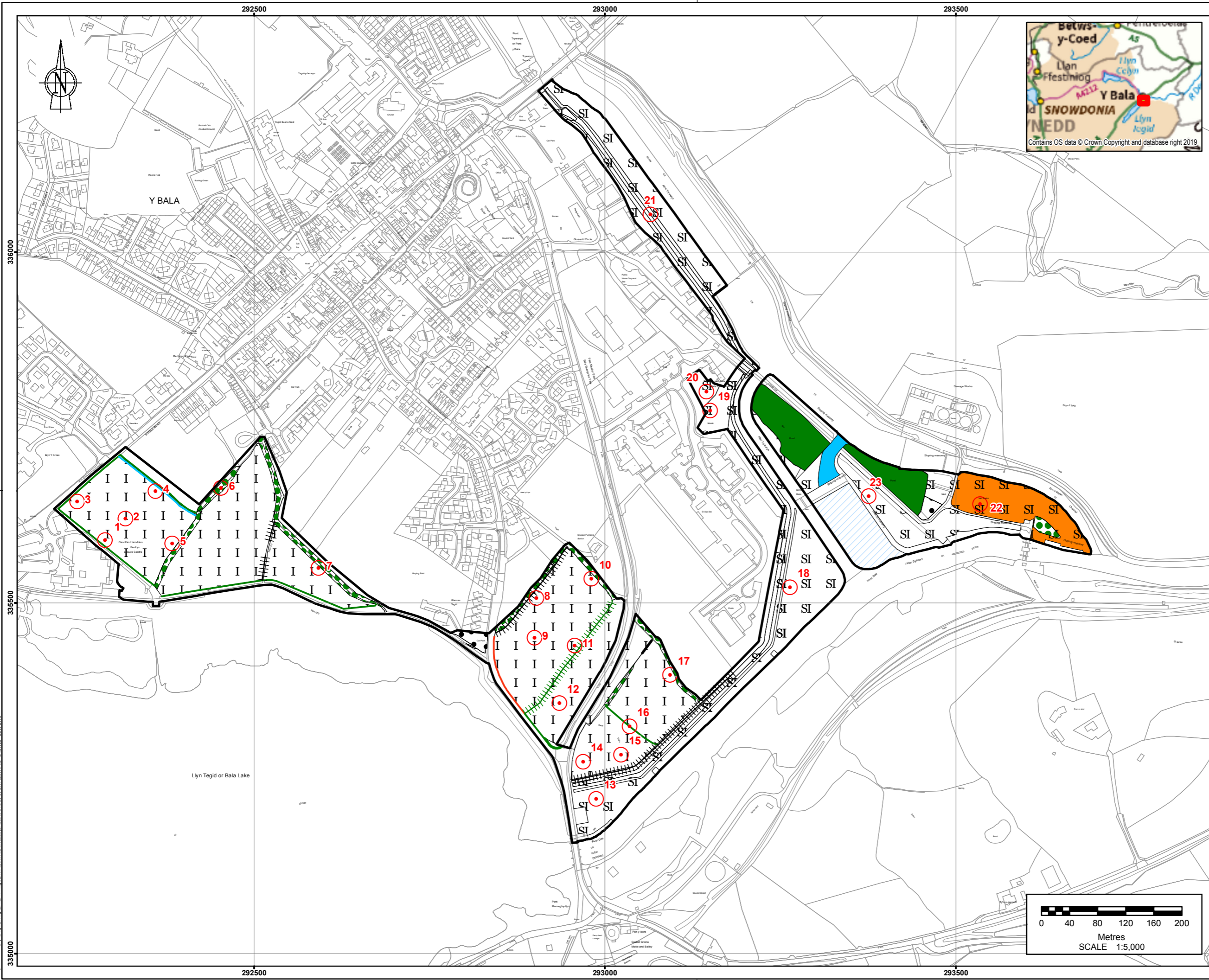
<p>TN 8</p>		<p>Row of mature, ash, oak <i>Quercus sp</i>, beech and sycamore <i>Acer pseudoplatanus</i> trees with PRFs on field boundary.</p>
<p>TN 9</p>		<p>Improved neutral grassland habitat that had been recently mown. Species diversity of grassland low, containing species such as perennial rye grass, white clover and occasional meadow buttercup.</p>
<p>TN 10</p>		<p>Row of mature ash and oak trees on the northern boundary of the field with PRFs.</p>
<p>TN 11</p>		<p>Intact species poor hedgerow with trees on the boundary of the field. Good mixture of woody species such as hawthorn, hazel, blackthorn, elder <i>Sambucus nigra</i> and dog rose. Within hedgerow are semi mature ash trees. Understorey of hedgerow containing abundant nettle and common cleavers with red campion.</p>

TN 12		<p>Improved neutral grassland habitat that at time of survey was being grazed by cattle. Scattered throughout field was frequent creeping thistle <i>Cirsium arvense</i>.</p>
TN 13		<p>Grassland area currently being used as meadow habitat. Grassland dominated by Yorkshire fog and common bent grasses. Mixed within the grassland was occasional greater birdsfoot trefoil <i>Lotus pedunculatus</i>.</p>
TN 14		<p>Improved neutral grassland habitat that is currently being grazed by sheep. More diversity of grasses in these fields compared to others, including species such as common bent, Yorkshire fog, sweet vernal grass <i>Anthoxanthum odoratum</i>, crested dogstail <i>Cynosurus cristatus</i> and scattered creeping buttercup.</p>
TN 15		<p>Wet flush within field containing dominant soft rush <i>Juncus effusus</i>. Area surrounded by improved neutral grassland currently being grazed by sheep.</p>

<p>TN 16</p>		<p>Species poor intact hedgerow separating field. Hedgerow dominated by hawthorn.</p>
<p>TN 17</p>		<p>Row of mature ash and oak trees on the northern boundary of field with PRFs.</p>
<p>TN 18</p>		<p>Large area of meadow habitat adjacent to the river. Grasses such as Yorkshire fog and common bent dominate the sward with occasional greater birdsfoot trefoil.</p>
<p>TN 19</p>		<p>Small pond at time of survey was dry. Vegetation dominated by common reed <i>Phragmites australis</i> and reedmace <i>Typha latifolia</i>. The remainder of the vegetation contained bramble and dominant common nettles.</p>

<p>TN 20</p>		<p>Recently mown grassland area adjacent to the Natural Resources Wales office proposed for a small satellite compound.</p>
<p>TN21</p>		<p>Area of grassland habitat adjacent to the river. Grasses such as Yorkshire fog and common bent dominate the sward with occasional greater birdsfoot trefoil and scattered meadow buttercup. Scattered in the area was osier willow <i>Salix viminalis</i>.</p>
<p>TN22</p>		<p>Area of grassland habitat on island adjacent to the river. Sward dominated by Yorkshire fog and common bent grasses with occasional birdsfoot trefoil, back knapweed and selfheal <i>Prunella vulgaris</i>.</p>
<p>TN23</p>		<p>Large open area of managed grassland habitat. Sward dominated by Yorkshire fog and common bent grasses.</p>

APPENDIX 2 – Phase 1 habitat plan



Note: The limits, including the height and depths of the Works, shown in this drawing are not to be taken as limiting the obligations of the contractor under Contract.
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- LEGEND:**
- SURVEY AREA
 - TARGET NOTE
 - G2 RUNNING WATER
 - J2.1.2 INTACT HEDGE - SPECIES-POOR
 - J2.3.2 HEDGE WITH TREES - SPECIES-POOR
 - J2.4 FENCE
 - J2.5 WALL
 - A1.1.1 BROADLEAVED WOODLAND - SEMI-NATURAL
 - A3.1 BROADLEAVED PARKLAND/SCATTERED TREES
 - B2.2 NEUTRAL GRASSLAND - SEMI-IMPROVED
 - B4 IMPROVED GRASSLAND
 - B6 POOR SEMI-IMPROVED GRASSLAND
 - F2.2 MARGINAL AND INUNDATION - INUNDATION VEGETATION
 - G1 STANDING WATER
 - J4 BARE GROUND

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
 IN ADDITION TO THE HAZARDS OR RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, THE FOLLOWING SIGNIFICANT RESIDUAL RISKS SHOULD BE NOTED. FURTHER DETAILS ARE INCLUDED IN THE CDM DESIGN RISK MANAGEMENT REGISTER

CONSTRUCTION:
 NOT APPLICABLE

MAINTENANCE, CLEANING AND OPERATION:
 NOT APPLICABLE

DECOMMISSIONING OR DEMOLITION:
 NOT APPLICABLE

Rev	Drawn	Chkd	Rvwd	Apprvd	Date	Description
P01	ZO	GN	ES	SC	30/07/2019	SUITABLE FOR INFORMATION

Designed by: ZO Date: JULY 2019

Client: Cyfoeth Naturiol Cymru Natural Resources Wales

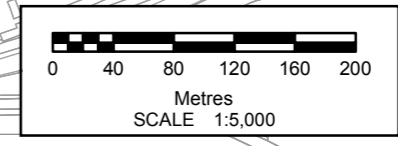
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