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Kenson River Restoration

National Vegetation Classification Survey

Final

P02

January 2026

Prepared for
National Resources Wales

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| Prepared by | Hannah Webster BSc MSc Ecologist |
| Reviewed by | Jonathan Harrison BSc MSc CEcol MCIEEM Principal Ecologist |
| Authorised by | Rachel Drabble BSc (Hons) CEnv MISEP Project Manager |

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| | |
|---------------------|---|
| JBA Project Manager | Rachel Drabble |
| Address | JBA Consulting, Kings Chambers, 8 High St, Newport NP20 1FQ |
| JBA Project Code | 2025s0023 |

This report describes work commissioned by Natural Resources Wales. Jonathan Harrison and Hannah Webster of JBA Consulting carried out this work.

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Abbreviations

| | |
|-------|---|
| BNG | Biodiversity Net Gain |
| CIEEM | Chartered Institute of Ecology and Environmental Management |
| GIS | Geographic Information System |
| INNS | Invasive Non-Native Species |
| JNCC | Joint Nature Conservation Committee |
| MAGIC | Multi-Agency Geographic Information for the Countryside |
| NVC | National Vegetation Classification |
| NRW | Natural Resources Wales |
| PEA | Preliminary Ecological Appraisal |
| UKHab | UK Habitat Classification |
| WCA | Wildlife and Countryside Act |

1 Introduction

1.1 Project background

JBA Consulting was commissioned by Natural Resources Wales (NRW) to carry out a vegetation survey of the saltmarsh and brackish communities associated with the adjacent Land South of Llancadle SINC to help inform the Outline and Detailed Design of restoration opportunities for the Kenson River at Fonmon Estate, in the Vale of Glamorgan. The survey was completed in September 2025 in order to capture suitable time of year for botanical identification.

1.2 Site location

The site is situated on a stretch of the River Kenson between Kenson Hill (NE) to the location where the Kenson River passes under the B4265. The river flows southwest through grassland and riparian habitats until its confluence with the River Thaw 500m southwest of the study area (site) boundary (red line). The area of interest is a 2.3km long reach from Kenson Hill 250m north of Kenson to the B4265 2km to the west of Kenson and is centralised on national grid reference NGR ST 04343 68371 which largely corresponds to the existing SINC boundary. The site is irregular in shape and occupies an area of 33.3 hectares. The site location is shown below in Figure 1-1.

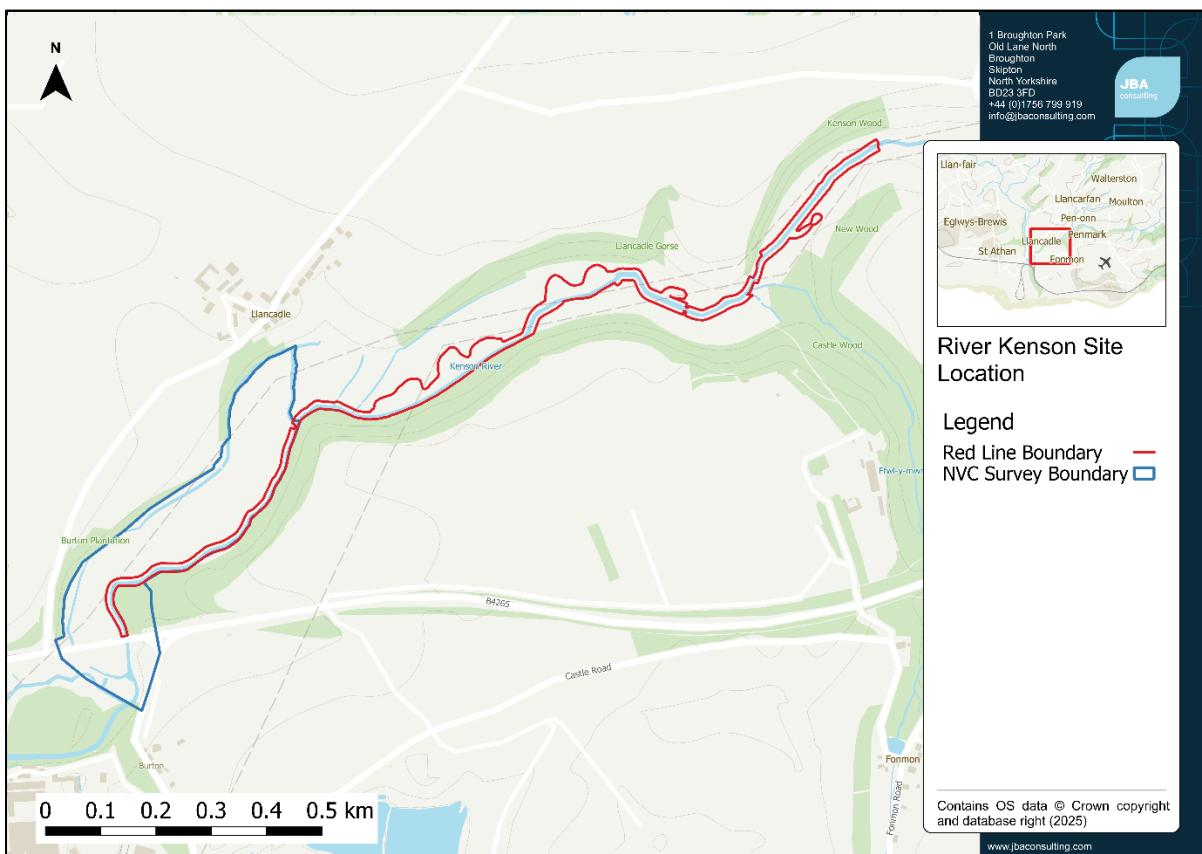


Figure 1-1: Site location

1.3 Previous surveys

A previous site survey was undertaken on the 23 January 2025 by ecologist Hannah Webster as part of a Preliminary Ecological Appraisal (PEA). The survey area included the site boundary as outlined in Figure 1-1 above. The PEA was based upon a UKHab Survey and habitats within and adjacent to the site boundary were surveyed using the UKHab classification system. The survey was conducted in January, a suboptimal time of year for botanical identification and therefore a further survey in the form of an NVC survey has been completed in September 2025, a more suitable time of year for botanical identification.

2 Methods

2.1 Field survey

2.1.1 Dates and survey team

The field survey was completed on the 26 September 2025 by experienced ecologist from JBA, Jonathan Harrison.

2.1.2 Field mapping

All homogeneous stands of vegetation were identified and described to NVC sub-community level whenever possible. These stands were mapped onto ortho-rectified aerial photographs and OS Master Map base maps to a scale of 1:5000. Vegetation was primarily mapped using up-to-date satellite imagery, such as ESRI satellite. Vegetation was assigned to the published NVC communities, and intermediate communities were only used in exceptional circumstances, with the communities mapped using the codes set out in Section B.1. However, vegetation within the site displayed complex and gradual transitions between communities reflecting subtle variations in environmental parameters and mapping should be viewed as a simplification of this complexity.

Mosaics of communities were mapped where different communities or sub-communities occurred in intimate association, or within complex, ill-defined boundaries. Vegetation mosaics were mapped as discrete parcels and an estimate of the relative proportions of the component sub-communities of mosaics were included on the map or in a target note.

2.1.3 Quadrat samples

Quadrat samples were recorded for each sub-community and further samples were collected wherever difficulties with the NVC placement were encountered or for large or variable stands. A quadrat size of 2m x 2m (or equivalent area on restricted, e.g., narrow, vegetation stands) was used.

Within quadrats the cover of every taxon of vascular plant, bryophyte and lichen were recorded using the Domin scale, with cover assessed by eye as a vertical projection on the ground of the live, above ground parts of the plants in the quadrat.

The Domin scale is the standard measure of cover used in NVC surveys (Rodwell 2006). The cover is based on projected cover, separated by layer where vegetation has a complex structure. The projected cover range and corresponding Domin value are shown in Table 2-1.

Table 2-1. The Domin scale

| Cover | Domin |
|--------------------------|-------|
| <4%, few individuals | 1 |
| <4%, several individuals | 2 |
| <4%, many individuals | 3 |
| 4-10% | 4 |
| 11-25% | 5 |
| 26-33% | 6 |
| 34-50% | 7 |
| 51-75% | 8 |
| 76-90% | 9 |
| 91-100% | 10 |

A record was made of the total cover and mean height excluding flowering stems of the layers together with the cover of any bare sand, soil, litter, rock or open water. A record was also made of grazing levels and any grazing animals, as well as other obvious management interventions.

2.2 Data analysis

2.2.1 Mapping

The field maps were digitised in QGIS 3.22 (QGIS.org 2022) and aligned to the Ordnance Survey Master map, with features identified from NRW and ESRI aerial images.

2.2.2 Mosaics and Habitat Areas

The area of each habitat presented in the report includes both 'pure' stands and stands which occur in a mosaic. The area of each vegetation type from a mosaic is based on the percentage cover in each mosaic assigned to each vegetation type from the field survey. The total area of the mapped polygon is measured from the GIS and divided into the relative proportion of each component. This figure should be treated with some caution and mosaics were typically complex and assigning proportions to the relevant components is one of the most subjective elements of the survey.

2.3 Nomenclature

The vegetation communities follow the names given in the published volumes (Rodwell, 1991a; 1991b; 1992; 1995; 2000), in a few instances supplemented with communities in Mountford (2011). Sub-communities are noted with the letters assigned in the published volume.

Botanical nomenclature follows Stace (2019) except where a species name is part of the NVC title where the original names have been preserved so they are directly traceable to

the vegetation types in the published volumes. Where the NVC title should otherwise be updated, the corresponding names are shown in Table 2-2. Vascular plants referred to by their scientific name throughout. Bryophyte nomenclature follows Blockeel et al. (2021) and lichens follow the British Lichen Society's Lichen Taxon Dictionary (BLS 2021).

Table 2-2. Synonyms preserved in the NVC community titles used in this report

| Names preserved from Rodwell | Name in Stace (2019) |
|--|--|
| <i>Aster tripolium</i> | <i>Tripolium pannonicum</i> |
| <i>Aster tripolium</i> var. <i>discoideus</i> | <i>Tripolium pannonicum</i> var. <i>discoideus</i> |
| <i>Elymus pycnanthus</i> | <i>Elymus athericus</i> |
| <i>Epilobium angustifolium</i> | <i>Chamaenerion angustifolium</i> |
| <i>Glaux maritima</i> | <i>Lysimachia maritima</i> |
| <i>Halimione portulacoides</i> | <i>Atriplex portulacoides</i> |
| <i>Scirpus lacustris</i> ssp. <i>tabernaemontani</i> | <i>Schoenoplectus tabernaemontani</i> |
| <i>Scirpus maritimus</i> | <i>Bolboschoenus maritimus</i> |

2.4 Limitations

The interpretation of the NVC is known to be somewhat subjective (Hearn et al. 2011) and therefore the analysis is to some degree based on the experience of the surveyors. Jonathan has carried out a wide range of NVC surveys of coastal, grassland and woodland habitats throughout the UK. The way vegetation has been assigned to communities is explained below, and to some extent supported by the floristic tables compiled for each stand type.

3 Results

3.1 Overview

A total of 23 NVC communities and sub-communities (or equivalent) were recorded. Most areas of vegetation could be assigned to existing NVC categories, although some show site-specific differences to typical forms of each community. The NVC communities are described in the following sections in the order of how frequently their NVC Categories were encountered, specifically: saltmarsh (SM), swamp (S), mesotrophic grassland (MG), woodland and scrub (W), and open vegetation (OV). A detailed breakdown of the NVC communities and sub-communities is given in the tables below. The NVC communities are mapped in Appendix A.

Table 3-1. Area of saltmarsh NVC communities

| Saltmarsh NVC Communities plus flashes and pans | | | |
|--|---------------------------------|-----------|-----------------|
| Community Type | NVC community and sub-community | Area (ha) | Total area (ha) |
| SM24 <i>Elymus pycnanthus</i> salt-marsh community | N/A | 0.52 | 0.52 |

Table 3-2. Area of swamp and mire NVC communities

| Swamp and Mire NVC Communities | | | |
|--|---|-----------|-----------------|
| Community Type | NVC community and sub-community | Area (ha) | Total area (ha) |
| S4 <i>Phragmites australis</i> swamp and reed-beds | S4a <i>Phragmites australis</i> sub-community | 0.46 | 0.84 |
| | S4d <i>Atriplex prostrata</i> sub-community | 0.34 | |
| | S4di <i>Atriplex prostrata</i> variant | 0.01 | |
| | S4diii <i>Agrostis stolonifera</i> variant | 0.03 | |
| S6 <i>Carex riparia</i> swamp | N/A | 0.57 | 0.57 |
| S7 <i>Carex acutiformis</i> swamp | N/A | 2.77 | 2.77 |
| S21 <i>Scirpus maritimus</i> swamp | S21a <i>Scirpus maritimus</i> sub-community | 0.01 | 0.05 |
| | S21b <i>Atriplex prostrata</i> sub-community | 0.03 | |
| | S21c <i>Agrostis stolonifera</i> sub-community | 0.01 | |
| S26 <i>Phragmites australis</i> - <i>Urtica dioica</i> tall-herb fen | S26b <i>Arrhenatherum elatius</i> sub-community | 0.01 | 1.41 |

Swamp and Mire NVC Communities

| | | | |
|--|--|------|--|
| | S26c <i>Oenanthe crocata</i> sub-community | 0.27 | |
| | S26d <i>Epilobium hirsutum</i> sub-community | 1.13 | |

Table 3-3. Area of grassland NVC communities

| Grassland NVC Communities | | | |
|--|--|------------------|------------------------|
| Community Type | NVC community and sub-community | Area (ha) | Total area (ha) |
| MG1 <i>Arrhenatherum elatius</i> grassland | MG1b <i>Urtica dioica</i> sub-community | 0.54 | 0.61 |
| | MG1c <i>Filipendula ulmaria</i> sub-community | 0.07 | |
| MG6 <i>Lolium perenne</i> - <i>Cynosurus cristatus</i> grassland | MG6 damp | 0.12 | 0.17 |
| | MG6a typical sub-community | 0.05 | |
| MG10 <i>Holcus lanatus</i> - <i>Juncus effusus</i> rush-pasture | MG10b <i>Holcus lanatus</i> - <i>Juncus effusus</i> rush-pasture, <i>Juncus inflexus</i> sub-community | 0.32 | 0.32 |
| MG11 <i>Festuca rubra</i> - <i>Agrostis stolonifera</i> - <i>Potentilla anserina</i> grassland | MG11b <i>Atriplex prostrata</i> sub-community | 0.65 | 0.65 |

Table 3-4. Area of open vegetation NVC communities and other vegetation

| Other Open Vegetation NVC Communities plus unclassified single species vegetation stands | | | |
|---|--|------------------|------------------------|
| Community Type | NVC community and sub-community | Area (ha) | Total area (ha) |
| OV23 <i>Lolium perenne</i> - <i>Dactylis glomerata</i> community | OV23d <i>Lolium perenne</i> - <i>Dactylis glomerata</i> community, <i>Arrhenatherum elatius</i> - <i>Medicago lupulina</i> sub-community | 0.01 | 0.01 |

3.2 Saltmarsh communities

Saltmarsh is present in the lower reaches of the River Kenson where it remains tidal despite the modified outfall through the power station. Saltmarsh communities are present south of the B4265 and the Kenson River valley is brackish in the lower reaches just north of the B4265 but quickly loses the saline influence thereafter. Some of this saltmarsh is grazed, but it also features large areas of brackish reedbeds (discussed in Section 3.3) on small parcels of land isolated by the river.

3.2.1 SM24 *Elymus pycnanthus* salt-marsh community

Constant species: *Elymus athericus*. In this survey *Atriplex prostrata* and *Puccinellia maritima* were also constant.

Description: The SM24 *Elymus pycnanthus* salt-marsh community is an upper saltmarsh community and can also often be found on raised banks and along creeks in the middle saltmarsh. The community is characterised by constant and abundant *Elymus athericus*, a coarse grass able to create dense swards and develop a thick leaf litter.

This community was recorded in lowest reach (Reach 6) of the survey area. The Stands of SM24 were rather variable, featuring some that are amongst grazed vegetation which keeps the dominant of *Elymus athericus* down with both of *Festuca rubra* and *Agrostis stolonifera* becoming prominent in the sward.

3.3 Swamp and mire Communities

The swamp vegetation recorded in this survey are present over much of the survey area. Some swamp, most often *Phragmites australis* reedbed, is present in the saltmarsh, although stands of *Phragmites australis* are found throughout the survey area and, in drier places, form a more grassy vegetation (S26). Other swamps are present on the lower-lying parts of floodplain and include swamps dominated by *Carex riparia* (S6) and *Carex acutiformis* (S7).

3.3.1 S4 *Phragmites australis* swamp and reed-beds

Constant species: *Phragmites australis*

Description: Stands of S4 *Phragmites australis* swamp and reed-beds are typical of upper saltmarsh and characterised by dense stands of *Phragmites australis*, often with a deep layer of wet leaf litter underneath and a few scattered associates that can persist amongst the tall vegetation.

The S4a *Phragmites australis* sub-community, which is the most species-poor sub-community of freshwater situations, was recorded north of the B4265 with a large stand present on the left bank. The S4d *Atriplex prostrata* sub-community was recorded south of the B4265 where there is still salinity and a supply of drift material that allows the persistence of halophytic associates. S4d includes a range of variants, and the more strongly tidal stands are placed in S4di *Atriplex prostrata* variant with a small area present in front of the tidal outfall at the lowest end of the survey area. The S4diii *Agrostis*

stolonifera variant is more of a grassy vegetation type with a layer of *Agrostis stolonifera* under the canopy of *Phragmites australis*. Stands of S4diii occur on the wetter parts of the floodplain, helped by the combination of animal grazing and trampling which prevents the *Phragmites australis* from becoming dominant.

3.3.2 S6 *Carex riparia* swamp

Constant species: *Carex riparia*

Description: Stands of *Carex riparia* in S6 *Carex riparia* swamp were recorded on the floodplain upstream of any brackish influence. The stands were typically species-poor, with the sedge forming a dense cover with a thick leaf litter, presumably avoided by the grazing animals. Where stands were slightly more open, a grassy layer was present with *Agrostis stolonifera*, *Festuca rubra*, *Holcus lanatus*, and *Phalaris arundinacea* all noted within the S6 community.

3.3.3 S7 *Carex acutiformis* swamp

Constant species: *Carex acutiformis*

Description: Stands of S7 *Carex acutiformis* swamp are discussed in the NVC as occurring in two situations. They are most common as tall swamp vegetation in open water transitions at the edges of still or slow-flowing lakes, rivers, and ditches however it is also listed as occurring in hollows on floodplains, and it is this type of stand which occurs within a single large area on the floodplain. The stand is grazed and in dryer areas beneath the dominant layer of *Carex acutiformis*, there are typical floodplain grassland species from the adjacent MG6 and MG10 swards, with a relatively low diversity of herb species. These stands are much drier and grassier than the Rodwell indicates, with constant species such as *Agrostis stolonifera* and *Ranunculus repens* along with *Glyceria maxima* and *Phalaris arundinacea* being recorded. Where the ground is wetter there is an increase in tall herbs such as *Angelica sylvestris*, *Filipendula ulmaria* and *Cirsium palustre*, and there is a greater affinity with the typical S7 composition.

3.3.4 S21 *Scirpus maritimus* swamp

Constant species: *Bolboschoenus maritimus*

Description: Stands of S21 *Scirpus maritimus* swamp were scattered across the saltmarsh and brackish areas of the floodplain. The saltmarsh stands were largely confined to ditches but on the brackish floodplain some extensive stands of S21c *Scirpus maritimus* swamp, *Agrostis stolonifera* sub-community were present. They are characterised by the dominance of the tall *Bolboschoenus maritimus* which, even where grazed, form dense stands with few associates, although the associates that are present are important for distinguishing the sub-communities. The saltmarsh and brackish ditches were occupied by the species-poor and wettest S21a *Scirpus maritimus* sub-community. These stands had relatively few associates, although *Mentha aquatica* was frequent. In the S21c *Agrostis stolonifera* was a constant presence forming a low mat under the *Bolboschoenus maritimus*.

3.3.5 S26 *Phragmites australis-Urtica dioica* tall-herb fen

Constant species: *Phragmites australis*, *Urtica dioica*.

Description: Stands of S26 *Phragmites australis-Urtica dioica* tall-herb fen were typically found at the edge of S4 reedbeds where the *Phragmites australis* is able to invade drier ground. The Kenson Valley floodplain supports extensive areas with *Phragmites australis* in a grassy swamp which is rather variable and patchy in composition, but overall most of the stands fit best with S26d *Phragmites australis-Urtica dioica* tall-herb fen, *Epilobium hirsutum* sub-community. There is a large stand of species-poor *Phragmites australis* with constant *Oenanthe crocata* and only a little *Urtica dioica*, which fits well with the S26c *Oenanthe crocata* sub-community.

3.4 Mesotrophic grassland and open vegetation communities

3.4.1 MG1 *Arrhenatherum elatius* grassland

Constant species: *Arrhenatherum elatius*, *Dactylis glomerata*.

Description: Stands of MG1 *Arrhenatherum elatius* grassland are coarse grasslands distinguished by the constant and abundant presence of *Arrhenatherum elatius*. They were the most common vegetation on areas of higher high ground where the tree cover is low. Most stands were assigned to MG1b *Urtica dioica* sub-community due to the constant and locally abundant presence of tall ruderal species in the sward. A small amount of the damper MG1c *Filipendula ulmaria* sub-community was also recorded in the lower section of the survey area.

3.4.2 MG6 *Lolium perenne-Cynosurus cristatus* grassland

Constant species: *Cerastium fontanum*, *Cynosurus cristatus*, *Festuca rubra*, *Holcus lanatus*, *Lolium perenne*, *Trifolium repens*

Description: The MG6 *Lolium perenne-Cynosurus cristatus* grassland is typically semi-improved grassland and occupies much of the grazed floodplain away from any brackish influence. Most of the MG6 was classified as the dry and species-poor MG6a *Lolium perenne-Cynosurus cristatus* grassland, typical sub-community but the MG6 present below the B4265 is a bit damper and this created some difficulty in placing the vegetation. The damper sward features constant *Carex hirta* and *Ranunculus repens* but not *Filipendula ulmaria*, so does not come close to the MG6d *Lolium perenne-Cynosurus cristatus* grassland, *Filipendula ulmaria* sub-community community (Wallace & Prosser 2016), and instead seem to be a distinct local variant of MG6, and was mapped as MG6 'damp' to distinguish from the other forms of MG6.

3.4.3 MG10 *Holcus lanatus*-*Juncus effusus* rush-pasture

Constant species: *Agrostis stolonifera*, *Holcus lanatus*, *Juncus effusus*, *Ranunculus repens*

Description: The form of MG10 recorded within the survey was the MG10b *Holcus lanatus*-*Juncus effusus* rush-pasture, *Juncus inflexus* sub-community. This sub-community was common on the main floodplain of the Thaw and was characterised by the constant and abundant presence of *Juncus inflexus*. It features less *Holcus lanatus* than expected, with *Agrostis stolonifera* appearing to take its place as the constant grass under the rush tussocks; *Carex hirta* is also a common component of the sward. The prominent presence of *Filipendula ulmaria* and *Mentha aquatica* suggest stands are a little wetter than the typical vegetation discussed in typical stands of this community.

3.4.4 MG11 *Festuca rubra*-*Agrostis stolonifera*-*Potentilla anserina* grassland

Constant species: *Agrostis stolonifera*, *Festuca rubra*, *Potentilla anserina*

Description: MG11 *Festuca rubra*-*Agrostis stolonifera*-*Potentilla anserina* grassland is grassy vegetation associated with the upper saltmarsh, often around transitions to non-saltmarsh vegetation with the constant presence of *Potentilla anserina* with *Festuca rubra* and *Agrostis stolonifera*. A large area of the MG11b *Atriplex prostrata* sub-community was recorded north of the B4265.

3.5 Miscellaneous vegetation and other

Open water is a common feature throughout the survey area in the form of the Kenson River itself and associated ditches as well recent artificial scrapes that have formed ponds.

Pylons are a constant feature of the floodplain and are mapped on top of the existing vegetation, as they are sufficiently open to allow vegetation growth underneath.

3.6 Notable species

A systematic survey for notable species was not carried out, but notable species were recorded where encountered and are discussed below.

3.6.1 Rare and protected species

No rare or notable species were recorded in the survey.

3.6.2 Invasive Non-Native Species

Large stands of Himalayan Balsam *Impatiens glandulifera* were recorded throughout the survey area and is present on both banks of the River Kenson.

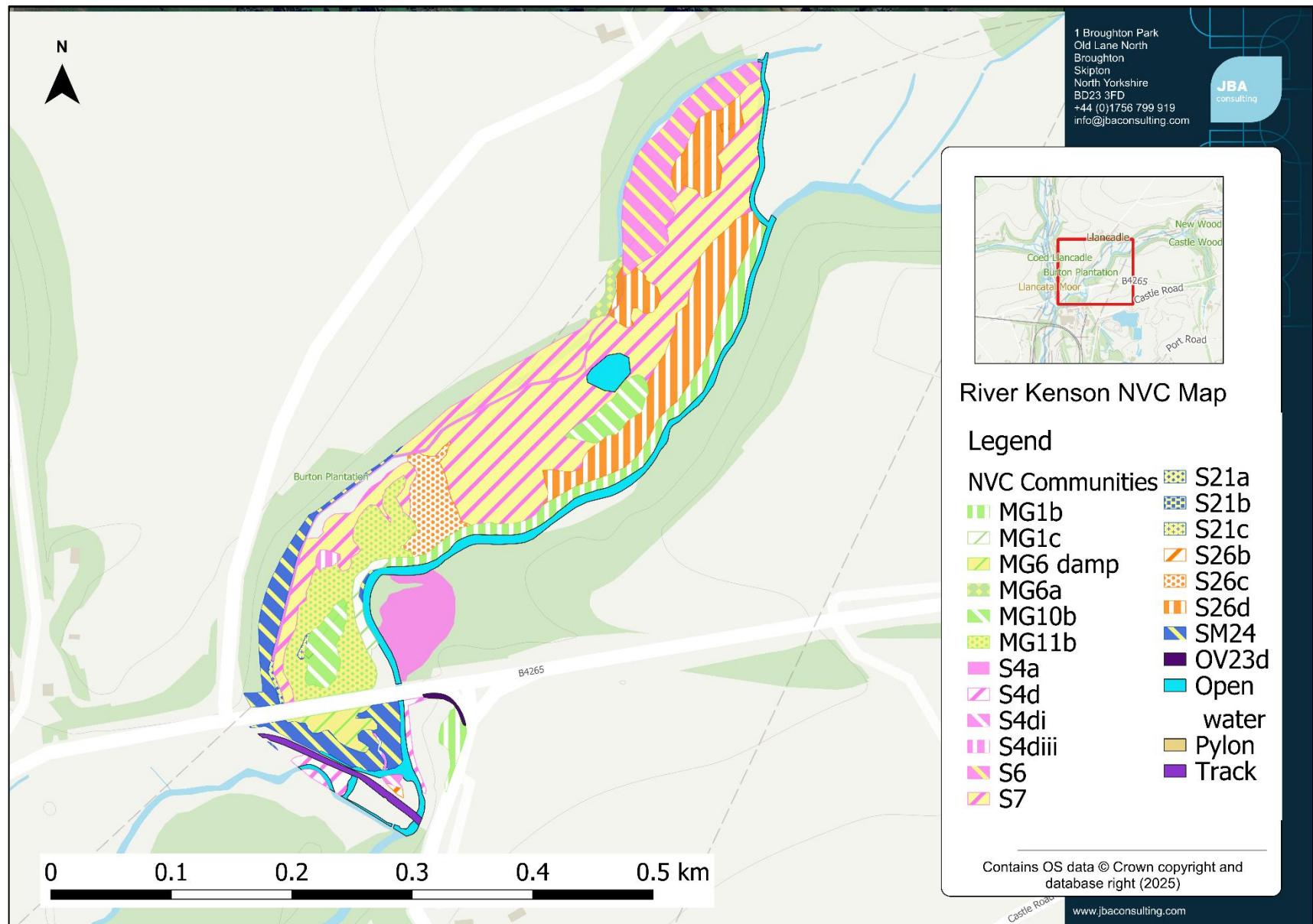
4 Conclusions

4.1 General vegetation characteristics

The area of vegetation included in this survey is the semi-natural floodplain of the Kenson River north of the severely modified outfall past the old Aberthaw Power Station. The floodplain is confined within a low wooded valley and it features a natural transition from the saltmarsh at the southern end through brackish swamp vegetation to freshwater floodplain grazing marsh in the north. The valley is grazed throughout, predominantly as permanent pasture, although some areas of saltmarsh in the south are ungrazed or left ungrazed seasonally. There is relatively little lower saltmarsh, which is limited to a few pans and pools and most of the saltmarsh is grassy middle and upper saltmarsh. The transition through brackish grasslands and swamps is fairly abrupt. The presence of the B4265 and its bridges limit the amount of water that can flood upstream on high tides and, combined with a deepened and embanked main channel of the Thaw, the total inundation with saline water is fairly low north of the road. Most of the floodplain is therefore typical semi-improved grassland and rush pasture, with some of the sedge-dominated vegetation forming an interesting variation. The vegetation types of the floodplain are typical for this kind of habitat, but interesting in the large extent that remains semi-natural.

None of the vegetation types recorded in the survey are rare or unusual, but the area surveyed represents a good example of semi-natural floodplain vegetation with a brackish to freshwater transition, surrounded by wooded slopes. There is potential to increase the value of the site using river restoration to increase the connectivity of the river to the floodplain and maybe through connecting the marshes and the woodland to allow more continuous grazing at the right intensity.

A Appendix - NVC Map



B National Vegetation Classification

The NVC is a phytosociological scheme developed to provide a comprehensive system to classify vegetation throughout Wales, Scotland and England. The final scheme was published in the five British Plant Communities volumes (Rodwell 1991a; 1991b; 1992; 1995; 2000). The system has been in widespread use since it was developed in the late 1980s. Since the publication of the original volumes much has been written to develop the classification further, including the Users' Handbook (Rodwell 2006) and a review of proposed additions (Mountford 2011).

The NVC is not designed as a hierarchical scheme, unlike much European phytosociology. However, the vegetation communities were split into groups based on the broad habitat type, with open vegetation being used as a catch-all for a diverse group of vegetation types at the end. The group codes are shown in Table B-1.

Table B-1. NVC Categories

| NVC Prefix | Category | No. comms | Notes for saltmarsh survey |
|------------|-------------------------|-----------|---|
| A | Aquatic | 24 | Sometimes found in coastal water bodies but generally not mapped in this survey |
| CG | Calcicolous grassland | 14 | Not generally found on saltmarsh. |
| H | Heaths | 22 | Not generally found on saltmarsh. |
| M | Mire | 38 | Includes some of the mires that develop from saltmarsh cut off from tidal inundation but that retain a freshwater supply. |
| MC | Maritime cliff | 12 | Coastal grassland influenced by salt, most commonly on coastal cliffs, and includes some vegetation occasionally found on strand lines and shingle. |
| MG | Mesotrophic grassland | 13 | Often found on damper or more enriched soils in upper saltmarsh and the transitions beyond the tidal limit. |
| OV | Open vegetation | 42 | Includes communities of disturbed ground and tall herb vegetation that are sometimes found on saltmarsh. |
| S | Swamp and tall-herb fen | 28 | Includes vegetation that develops from saltmarsh cut off from tidal inundation but which retain a freshwater supply. |
| SD | Sand dune | 19 | The main vegetation of sand dunes; often found in close association with saltmarsh. |
| SM | Saltmarsh | 28 | The main group of saltmarsh communities |
| U | Calcifugous grassland | 21 | Not generally found on saltmarsh. |

| NVC Prefix | Category | No. comms | Notes for saltmarsh survey |
|------------|----------|-----------|--|
| W | Woodland | 25 | Woodland and scrub communities including many found around the margins of saltmarshes. |

B.1 NVC codes and naming conventions

The NVC volumes introduced a specific way of naming each community, a convention which is followed throughout this report. The community is assigned a letter (Table B-1) with a sequential number, following which are listed one to three prominent species from the community, then a word or two describing the vegetation type for example as follows:

- SM24 *Elymus pycnanthus* salt-marsh community
- S21 *Scirpus maritimus* swamp

Where these communities include sub-communities, these are described in the NVC volumes by a number (typically two) of their characteristic species, or rarely another defining features (e.g., typical sub-community, or species-poor sub-community). Examples for SM16, which includes six sub-communities, are:

- *Puccinellia maritima* sub-community
- *Juncus gerardii* sub-community
- *Festuca rubra-Glaux maritima* sub-community
- *Festuca rubra* sub-community
- *Leontodon autumnalis* sub-community
- *Carex flacca* sub-community

When using shorthand codes these communities are assigned a letter based on the order in which they are described in the volumes (a, b, c...). The same applies where these sub-communities are split further, referred to as 'variants' in the NVC volumes. These are similarly named using prominent species and assigned a roman numeral for the purposes of mapping (i, ii, iii...). The full name of a community (given at least at the first mention in each report) would then look something like this: SM16b *Festuca rubra* salt-marsh community, *Juncus gerardii* sub-community. This is subsequently referred to in the text as simply SM16b.

B.2 Frequency, abundance and constant species

Frequency and abundance are the two main variables used to interpret the vegetation data in the NVC volumes, and they are fundamental to the presentation of data in the published volumes. The floristic tables in the NVC combine all data assigned to that community from the whole of the British Isles.

Frequency class is assigned on a scale of 1 to 5, displayed using Roman numerals I-V, and used in the published NVC. It is a measure of the percentage of samples in which each species is recorded. Those that occur in >60% of samples (frequency class IV and V) are considered to be 'constant' in that community as shown in Table B-2.

Table B-2. Frequency Scale

| % Samples | Frequency noted in Roman numerals |
|-----------|-----------------------------------|
| 80-100 | V |
| 60-79 | IV |
| 40-59 | III |
| 20-39 | II |
| 0-19 | I |

The species in frequency classes IV and V are termed 'constant' species. This is an important note for interpreting floristic data, with constant species being present in 60% or more of samples e.g., a 'constant' species may be absent in 40% of stands nationwide. The abundance values used are simply the range of Domin values recorded for each species in all quadrats, in particular species where the Domin is 8 or over (Table 2-1) can give the impression of overwhelming dominance in a stand.

B.3 Preferential and differential species and the key

Preferential and differential species are used extensively in the published NVC volumes to help distinguish between different communities and sub-communities. Preferential species are those which tend to have a higher-than-average frequency or constancy within a certain sub-community and differential species have a lower than average frequency. These species form the basis of the dichotomous, or occasionally polytomous keys given in the published volumes to help identify vegetation communities. The keys rely on the overall floristics of stands of vegetation, drawing on both the frequency and abundance of species.

B.4 Philosophy for assigning NVC communities in this survey

The NVC user's handbook (Rodwell 2006) provides a pragmatic approach to implementing the NVC, accepting the continuous variation in vegetation and the difficulty of defining precise units. The implementation of the NVC on a wide range of field surveys by NRW has led to the development of a specific approach to application and interpretation of the NVC. This approach was specified for these surveys and followed as closely as possible. In particular, the approach is based on assigning vegetation to an NVC community in the field, and not relying on post hoc computer assisted analysis. The approach used also favours taking a wider view of the vegetation, using published communities wherever possible, even for stands of vegetation that are some way from the 'typical' community description. This approach was dutifully implemented in the field survey, allowing much of the vegetation to be placed into the existing NVC communities, even where the vegetation represents a significant local variation. There was also an active decision to avoid mapping transitional stands of vegetation unless there was no clear alternative; vegetation that was intermediate between two communities was assigned to the community to which it had the strongest affinities, with a note added to state its transitional nature. In many cases, such stands were mapped as mosaics, as they typically incorporated small areas of both ends of the transition as well as areas of mixed communities.

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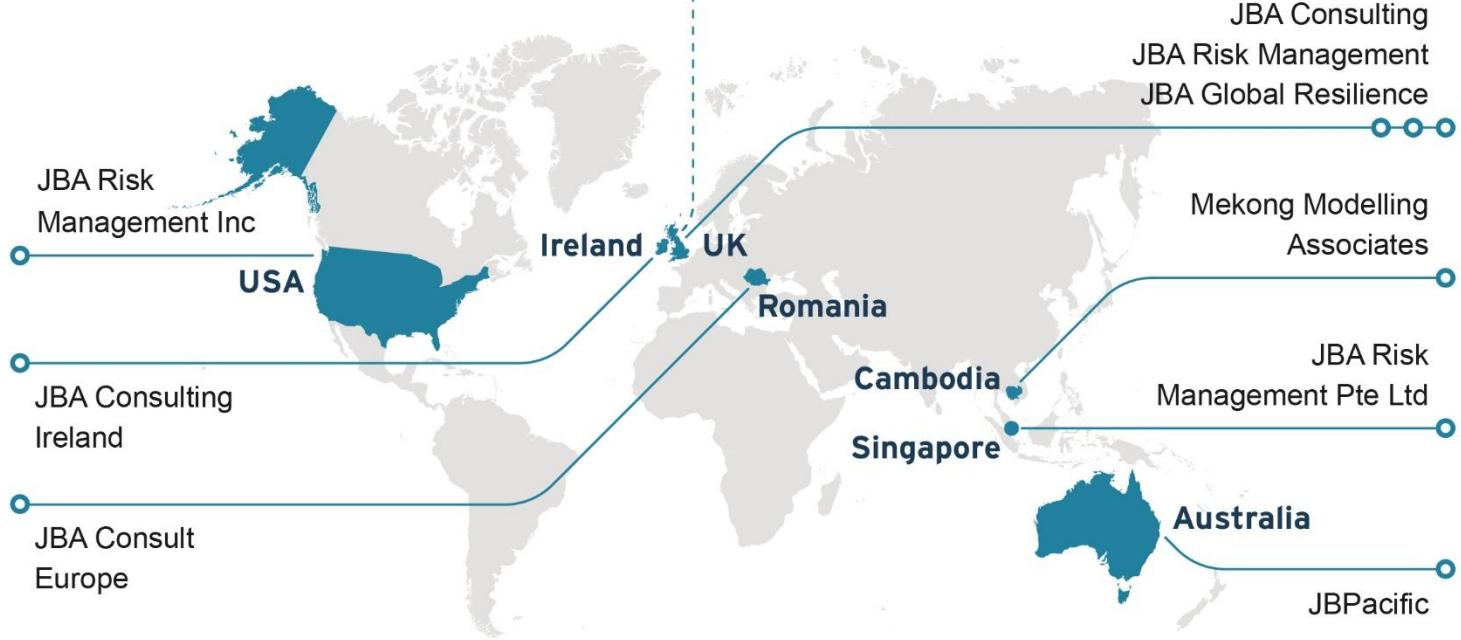
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