



**WORSBROUGH RESERVOIR BANK
MAINTENANCE.**

OS REF: SE 34678 03400.

**BIODIVERSITY ENHANCEMENT
MANAGEMENT PLAN.**

Ref No: 211146/BEMP/2.

Date: 3rd May 2023.

Revision one: 26th May 2023.

Revision two: 10th August 2023.

TABLE OF CONTENTS.

	Page Number
1. INTRODUCTION.	3
2. SITE OVERVIEW.	4
3. LANDSCAPING PLAN.	6
4. MANAGEMENT AIMS AND MONITORING.	8
Appendix I. BIODIVERSITY MANAGEMENT PLAN.	14

1. INTRODUCTION.

1.1. There are plans to replace and repair numerous existing reservoir retaining walls due to structural failures.

1.2. A condition of the planning consent is to ensure that a Biodiversity Enhancement Management Plan (BEMP) is in place to protect the long-term wellbeing of the habitats on site.

1.3. The condition states: -

“A Biodiversity Enhancement Management Plan (BEMP), completed by a suitably qualified ecologist shall be submitted to, and approved in writing by, the Local Planning Authority prior to the commencement of works on site.”

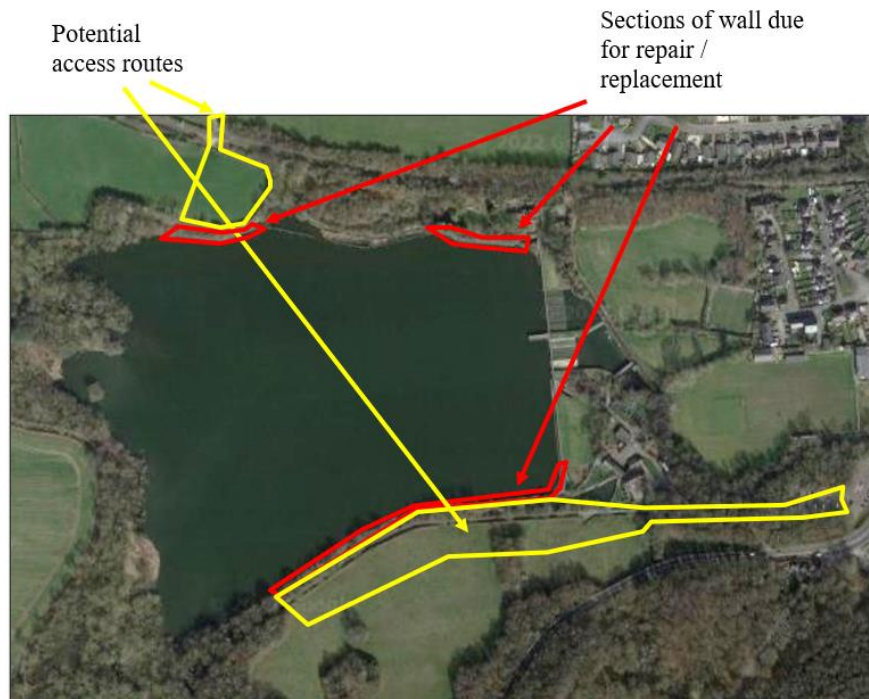
“The BEMP will include the following:

- *A recent landscape plan detailing the location of mitigation works and the size of each habitat area to be enhanced and/or created.*
- *Management aims and prescriptions detailing the methods required to create and/or enhance each habitat at the required quality for a period of 30 years*
- *A timetable of delivery for each habitat created and/or enhanced.*
- *Details on the monitoring of habitats and the provision of a report, which shall be provided to the LPA on the 1st November of each year of monitoring (years one-three after creation, years five, and ten and every ten years thereafter), which will assess the condition of all habitats created and/or enhanced and any necessary management or replacement/remediation measures required to deliver the Net Gain values set out in the BEMP for each habitat.*
- *A schedule of actions to be undertaken in case signs of failing are identified; the schedules must include details of technique(s) to be used, equipment to be used, roles and relevant expertise of personnel and organisations involved and timing of actions including submission of monitoring report to the Council.”*

1.4. This document has been prepared to address the above. This document does not cover the protection of biodiversity during construction activities, that has been documented within the CEMP undertaken by others.

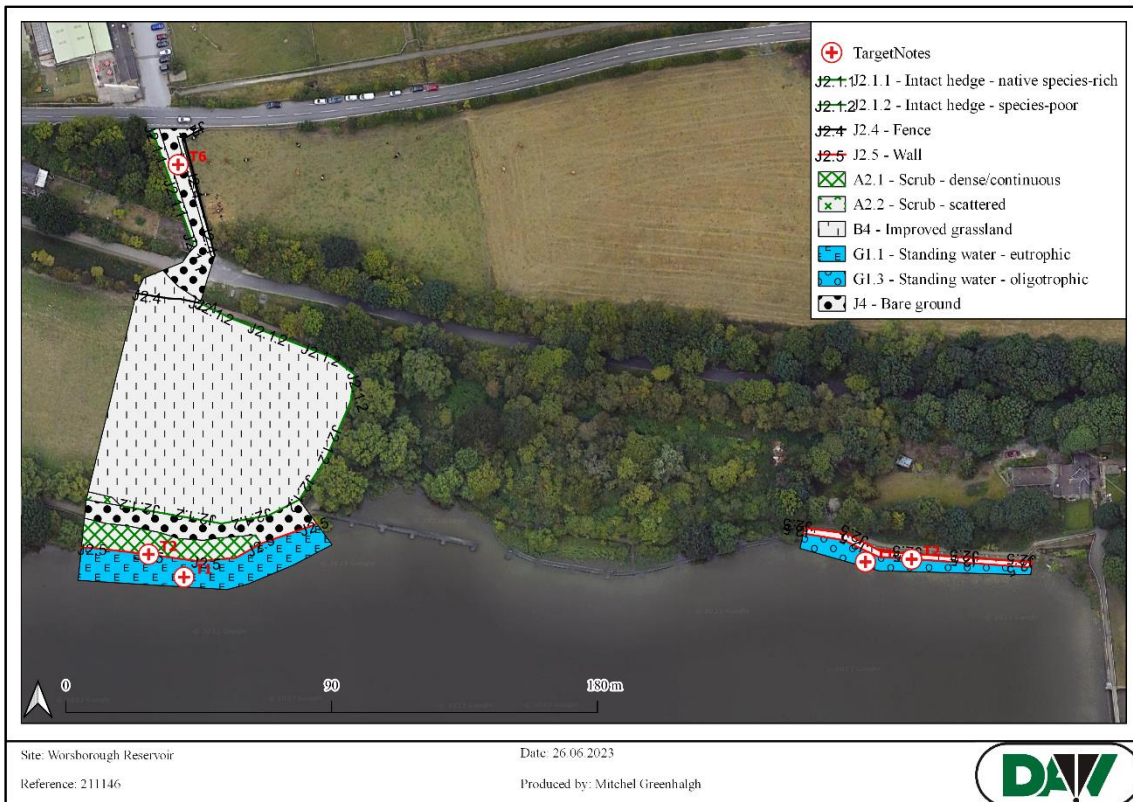
2. SITE OVERVIEW.

2.1. The aerial map below shows the location of the walls due for repair in red and the potential access route in yellow, along with the surrounding area.

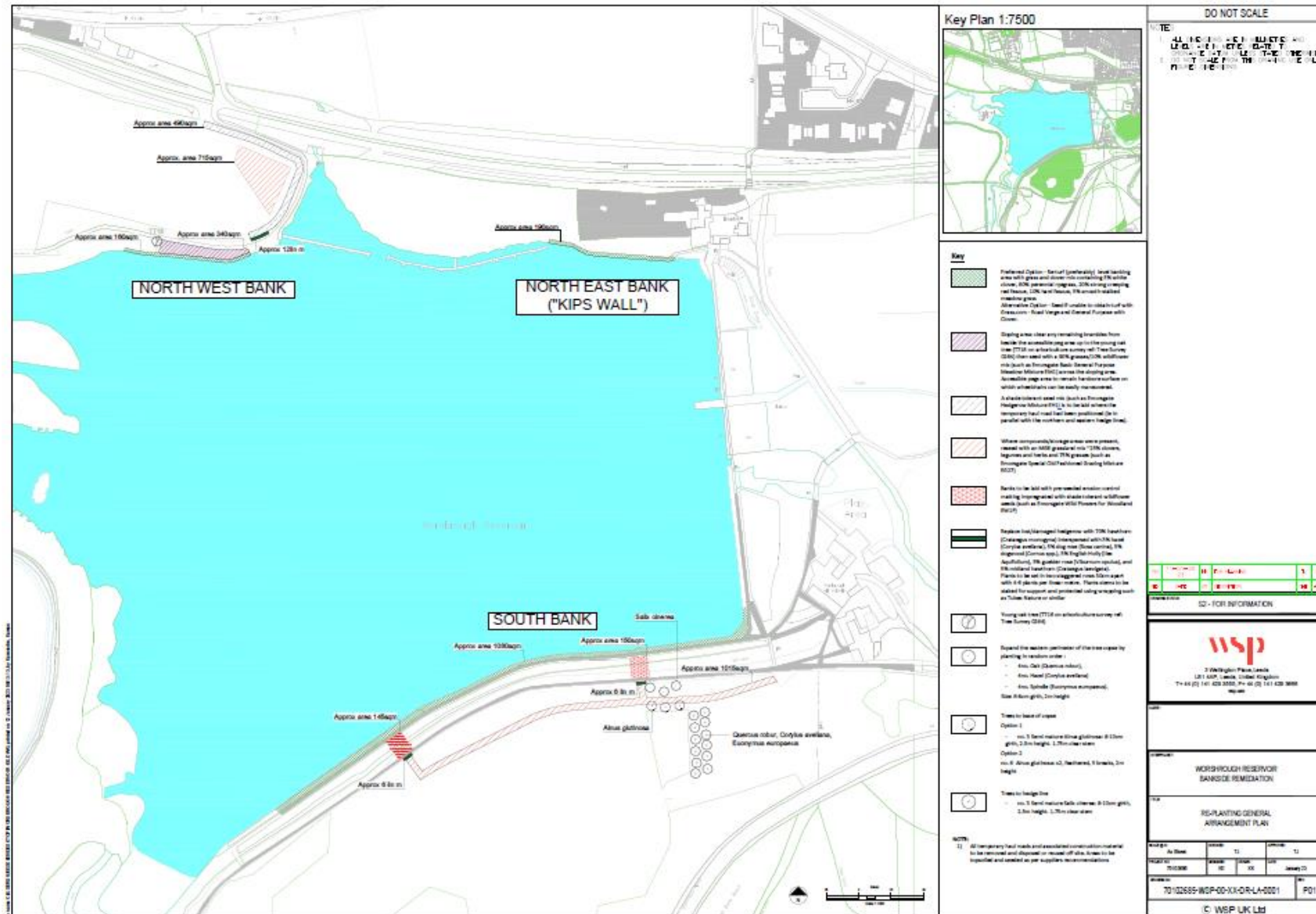


2.2. The survey area comprises a range of habitats including improved and semi-neutral grassland, scrub, running and standing water, hardstanding and hedgerows. All habitats typically associated with the wider surroundings of Worsbrough Country Park.

2.3. The following maps, shown on the next page, were produced by Whitcher Wildlife Ltd, which shows the location of each habitat within the survey area. However, biodiversity calculations have been undertaken separately by others and included within a Biodiversity Net Gain Report.



3.1. The below shows the proposed landscaping plan for the site. This will be provided to the local planning authority as an individual document to better read.



3.2. The plan to reinstate the habitat comprises the following. This is all detailed further within the replanting scheme produced by others and further details on planting are provided within section four of this document.

- The sections of scrub removed to facilitate the culverting of the river will be reinstated with a mixture of native scrub planting comprising of smaller species as to not cause issues to the anglers. Species such as hazel, dog rose, hawthorn will be planted at a low density to ensure the ground flora is not entirely shaded out.
- The areas of improved grassland above the walls will be replaced with a turf comprising typical hardy grasses. If this proves difficult then the turf will be replaced with a general road verge seed mix.
- The north-west bank area will be cleared of any remaining brambles and replaced with a general all-purpose meadow mix such as Emorsgate EM1.
- The field to the north-west will be seeded with a typical grazing mix such as Emorsgate EG27, whereas the borders of the field will be sown with a more shade-tolerant mix such as Emorsgate EF1.
- The sections of hedgerow along the south fields which have been removed will be replaced with a predominantly hawthorn mix, interspersed with other native species such as guelder rose, hazel, holly, dog rose, dogwood and midland Hawthorn.
- The south fields, which comprise the semi-neutral grasslands, will have their soils returned and then be reseeded where damaged with a meadow grassland mix intended to replicate an MG6 grassland, which reflects the higher species diversity than the other grasslands around the site. Pignut seeds will also be collected from remaining plants on site to ensure the food plant of chimney sweep moth caterpillars remains.
- Additional planting to enhance the eastern and northern boundary of the woodland will be undertaken by planting spindle, oak and hazel. Alder will be planted at the north to reflect the marshy nature of the ground.

4. MANAGEMENT AIMS AND MONITORING.

4.1. The following are the management aims for each habitat, detailing which condition assessment are to be targeted to achieve the intended condition score. These conditions are included with 3.1 Metric undertaken by others. As the 3.1 Metric was used for the calculations, its accompanying condition assessments will be used.

4.1.1. Other Neutral Grassland (South of the mill stream). – Good.

Condition Assessment Criteria	Intended (Y/N)	Justification.
1 – Matches specific grassland type	Y	Already well managed as such which will continue.
2 – Sward height	N	Periodically grazed so cannot be committed to.
3 – Bare ground	Y	Easily achieved once seed mix takes.
4 – Bracken cover	Y	No bracken present.
5 – Non-native species	Y	No invasives present.
6 – Species per m2	Y	Already achieves and proposed seed mixes will enhance.

4.1.1.1. This habitat is scheduled for annual maintenance in the Worsbrough Country Park Biodiversity Management Plan, which should allow for the achievement of these conditions.

4.1.2. Other Neutral Grassland (Area to north-west of site). – Good.

Condition Assessment Criteria	Intended (Y/N)	Justification.
1 – Matches specific grassland type	Y	Will be cleared of brambles and seeded with appropriate mix.
2 – Sward height	Y	Will be managed to have a diverse sward height.
3 – Bare ground	Y	Easily achieved once seed mix takes.
4 – Bracken cover	Y	No bracken present.
5 – Non-native species	Y	No invasives present.
6 – Species per m2	Y	Species rich seed mix will be used to ensure this is met.

4.1.2.1. The Worsbrough Country Park Biodiversity Management Plan makes no mention of managing this habitat and it is not referenced to in the report as a specific compartment. However, it will include the total clearance of bramble from the area and the sowing a species-rich grassland mix, which will be done by Balfour Beatty. The area will then be

managed by BMBC teams, volunteers or appointed contractors and will include a controlled mowing regime, allowing species to flower and set seed before being cut, and cuttings being removed. Any encroaching scrub should be removed each winter. This habitat will likely take a few years to establish.

4.1.3. Modified Grassland. – Poor.

Condition Assessment Criteria	Intended	Justification.
1 – Species per m2	N	Will not achieve this condition based on heavy use by anglers.
2 – Sward height	N	Will be regularly mown.
3 – Scattered scrub cover	Y	Scrub to be managed and removed.
4 – Physical damage	N	Will be regularly walked upon.
5 – Bare ground	N	Will be regularly walked upon.
6 – Bracken	Y	No bracken present.
7 – Non-native species	Y	No invasives present.

4.1.3.1. This habitat is acknowledged as only achieving poor condition and therefore no management regime is necessary. Regardless, the angling society will regularly mow the grassland to ensure good access for anglers.

4.1.4. Mixed Scrub (Mill Stream bank). – Fairly good.

Condition Assessment Criteria	Intended (Y/N)	Justification.
1 – Representative of UKHab description	Y	Will plant at least three woody species
2 – Age range	N	This may happen over time, but initially only same age species will be planted.
3 – Non-native species	Y	Will be kept clear of invasive species. Main threat here is Himalayan balsam which will be pulled frequently.
4 – Edge vegetation	Y	Well developed edge manageable to the north against the mill stream.
5 – Clearings, glades or rides	Y	Potentially achievable with sparse planting to ensure ground flora develops and canopy is not closed.

4.1.4.1. This habitat is scheduled for annual maintenance in the Worsbrough Country Park

Biodiversity Management Plan, which should allow for the achievement of these conditions.

4.1.5. Other Woodland; Broadleaved. – Moderate.

4.1.5.1. The planting of the woodland is supplementary and therefore the scores given are based on the entire parcel of woodland, when the new planting has reached a level of maturity such that is not distinguishable as being new. This will likely not be achieved for around twenty years.

Attributes and functional groupings	Intended score	Justification
1 – Age distribution of trees	2	Mature trees with a scrubby understory and saplings.
2 – Wild, domestic and feral herbivore damage	2	Not currently any significant browsing pressure and woodland is fenced. Only occasional rabbit grazing.
3 – Invasive plant species	3	Not currently any invasives present. Whilst laurel is present, this is Portuguese laurel and not cherry laurel. Any invasives found will be removed via the necessary methods for the species.
4 – Number of native tree species	3	Four native species already present and alder is to be added to achieve five.
5 – Cover of native tree and shrub species	2	Portuguese laurel present but native species still make up 50% - 80%.
6 – Open space within woodland	3	Woodland has dense tree and scrub cover. This should remain.
7 – Woodland regeneration	2	1-2 classes currently present and this should remain.
8 – Tree health	3	No current signs of disease and this will be monitored during the future checks. Any signs of ill health will be reported and appropriate measures taken.
9 – Vegetation and ground flora	1	No real ground flora community other than nightshade and coarse grasses.
10 – Woodland vertical structure	1	Only one storey currently present.
11 – Veteran trees	1	None present.
12 – Amount of deadwood	1	None or little present.

13 – Woodland disturbance	2	Small watercourse flows through leaving woodland vulnerable to pollution.
Total:	26	

4.1.5.2. This habitat is scheduled for future maintenance in the Worsbrough Country Park Biodiversity Management Plan, which should eventually allow for the achievement of these conditions. The planting of the new trees will be carried out by Balfour Beatty and onwards managements will be carried out by BMBC teams, volunteers or appointed contractors. This will include the protection of any new trees from grazing via fencing, and regular checks on a bi-monthly basis to ensure that the young trees are surviving. Watering should be carried out during periods of low rainfall and any failed trees should be replaced like for like in both species and size.

4.1.6. Hedgerows. – Moderate.

Attributes and functional groupings	Intended (Y/N)	Justification.
A1 – Height	Y	Height should be easily achieved, all species grow taller.
A2 – Width	Y	Width at widest point should be greater than 1.5m
B1 – Gap – hedge base	Y	Base will be lower than 0.5m across 90%.
B2 – Gap – hedge canopy	Y	Once established the canopy should be complete and unbroken.
C1 – Undisturbed ground and perennial vegetation	N	Along public footpath so whilst this may be achieved, it is not certain.
C2 – Undesirable perennial vegetation	Y	Undesirable species can be removed frequently.
D1 – Invasive neophyte species	Y	Invasives and neophytes can be removed frequently.
D2 – Current damage	N	Along public footpath so whilst this may be achieved, it is not certain.

4.1.6.1. Satisfying these conditions results in a good score, but a target of moderate allows for the unintended failing of one other criteria, not including D1 or C2.

4.1.6.2. This habitat is scheduled for annual maintenance in the Worsbrough Country Park Biodiversity Management Plan, which should allow for the achievement of these conditions.

4.1.7. All other habitats within the area will be retained and not negatively impact by the works. Therefore, no justification is needed as to their condition scores. They will be managed as stated within the Worsbrough Country Park Biodiversity Management Plan.

4.2. Any seeding will be undertaken during early autumn or spring at a ratio of 4gm/m². Due care should be paid to the management regimes advised by the manufacturer. Most seed mixes recommended are Emorsgate who provide detailed advice on their website.

4.3. Any trees or shrubs to be planted will be planted bare root during their period of dormancy, between November and March, during a period of suitable weather when the ground is neither waterlogged nor frozen or when the weather is too windy.

4.4. To ensure compliance with this document, monitoring will take place in years one, two, three, five, ten, twenty and thirty. These monitoring visits will be undertaken by suitably trained ecologists capable of scoring the created habitats on site against their target condition within this document and the metric.

4.5. After the completion of each monitoring visit and by the 1st November in each monitoring year, a report will be issued to the local planning authority. The report will run a new BNG calculation each year to determine whether the habitats are on track to achieve their intended condition. Any failings will be identified within the report along with recommendations on how these can be remedied or replaced. A suitably trained professional will be used to carry out any repairs in line with up-to-date guidance.

Prepared by:	
Mitchel Greenhalgh. BSc, ACIEEM.	Date: 3 rd May 2023.
First revision by:	
Mitchel Greenhalgh. BSc, ACIEEM.	Date: 26 th May 2023.
Second revision by:	
Mitchel Greenhalgh. BSc, ACIEEM.	Date: 10 th August 2023.

Checked by:	
Ruth Georgiou. BSc, MCIEEM.	Date: 4 th May 2023.
First revision checked by:	
Ruth Georgiou. BSc, MCIEEM.	Date: 26 th May 2023.
First revision checked by:	
Ruth Georgiou. BSc, MCIEEM.	Date: 10 th August 2023.

Appendix I. BIODIVERSITY MANAGEMENT PLAN.

The Biodiversity Management Plan is too large to be appended, but will be supplied in its entirety alongside this document.