

EASTLEIGH BOROUGH COUNCIL

One Horton Heath

Appendix 10.13 – Habitat Change

1 NON-TECHNICAL SUMMARY

1.1.1 Summary Conclusions

This assessment of Habitat Change (in lieu of the release and intended subsequent re-assessment using the DEFRA Biodiversity Offsetting Metric 3.0) has been informed by a suite of detailed Phase 1 Habitat Survey carried out by Johns Associates in July/August 2018 with additional areas surveyed and revisited as required through 2019 and 2020 as described in detailed in Chapter 10 Appendix 10.2 – Phase 1 Habitat Survey.

This assessment concludes that the site will deliver the following net increase in UK priority habitats within a priority area identified within the Eastleigh Biodiversity Action Plan:

- Broadleaved Semi-Natural Woodland – 5.63 ha (a total of 11.27 ha of woodland is incorporated into the development area)
- Parkland – 0.7 ha
- Ponds (standing water) – 0.11 ha (4 ponds)

These habitats have been designed to complement and effectively extend the priority habitats on site and the designated sites adjacent to the site, whilst delivering significant benefit for other key ecological receptors such as bats, dormice and great crested newts and wider biodiversity benefits.

The calculations for the OPA & Link Road phase shown within this appendix are inclusive of the Phase 1 areas, with the phase 1 areas also shown separately.

The master planning process has been ecology and landscape led from the outset and, as such, the key priority habitat areas have been avoided, with area of low value habitats identified as appropriate areas for potential development (predominantly intensively grazed improved grassland and arable fields). This approach is reflected in this assessment which demonstrates the minimal loss of high value habitats. Where the loss of small areas of these habitats has been unavoidable, measures have been included within the ES chapter to minimise and compensate for these effects as required.

This approach has resulted in net gain for all priority habitats on site in terms of both the extent of these habitats and the improved condition of new and retained habitats as a result of the proposed development.

The application of this assessment and the principles of the delivery and allocation of BNG throughout the phases of this development has been subject to regular consultation with the project Ecological Steering Group (comprised of Natural England, and is the subject of a Memorandum of Understanding that has been accepted by all parties with the exception of Eastleigh Borough Council Ecology in lieu of receiving this detailed assessment.

This approach allows for the delivery of new and enhanced habitats in advance of construction phases, in accordance with ecological best practice, to minimise the time between habitat loss and the provision of functional replacement and enhanced habitats within the wider site. This document also acknowledges that each development phase may not be able to deliver a net biodiversity gain within the phase boundary and allows flexibility to deliver the required measures for any given phase within the wider 'site' to create larger and more diverse areas of habitats in more appropriate locations.

However, each phase will still deliver biodiversity net gain through an appropriate allocation of the biodiversity units but this will be subject to a full assessment using the DEFRA 3.0 calculator when released in early 2021.

1.1.2 Precautionary Approach for OHH Outline Application

This assessment has quantified the key areas of habitat gain and loss that result from the development as shown in the site masterplan.

The assessment contained herein outlines the broad approach taken to maximise the delivery of biodiversity gain through the creation and enhancement of habitats within the allocated and protected ecological areas across the site. These areas have been identified as having strong connectivity to the wider ecological network and complement existing habitat areas to increase the size, and thereby resilience, of existing high value habitats on and adjacent to the site.

This assessment excludes the following on a precautionary basis and to provide additional confidence in the delivery of new habitats for the development:

- SuDS have been excluded at this point despite the delivery of ecologically valuable features within the SuDS chain. Wetland features have also been excluded at this stage, pending detailed design.
- The area to the north west of the site (indicated on figure XX in purple) has been designed to deliver significant biodiversity net gain and the requirement for GCN habitat as a component of the GCN mitigation licence for the extant permission to construct the initial road access. This area has been excluded from this habitat change assessment despite contributing a large area of priority habitat and recreational open space on site due to its function as delivering the mitigation for great crested newts in this area. This area covers 5.5ha and includes semi-natural broadleaved woodland, poor, semi-improved grassland, hedgerows, 6 wildlife ponds and areas of adjacent species rich grassland habitats. This area has effectively increased the extent of Quobleigh Wood SINC by 1.7ha.
- Domestic gardens and areas within private ownership
- The delivery of specific measures within the development areas such as street trees, amenity grassland, formal landscaping, rain gardens, green roofs etc.) have been excluded at this stage. These elements have positive contribution towards biodiversity but have not been included in the outline masterplan assessment as they are currently undefined, and their value is dependent on the location and implementation. Likewise, the assessment does not include for very small, discrete areas of habitat delivery within the development parcels as these are subject to detailed design and will be assessed as each phase is designed in detail.
- River habitats have been excluded at this point as all watercourses are expected to be retained. Enhancement measures are intended but will be assessed in detail as these are finalised through the detailed design process. These will be included in the DEFRA 3.0 assessment.

2 METHODOLOGY

2.1 ASSESSMENT OF BASELINE HABITATS

2.1.1 Habitat Classification

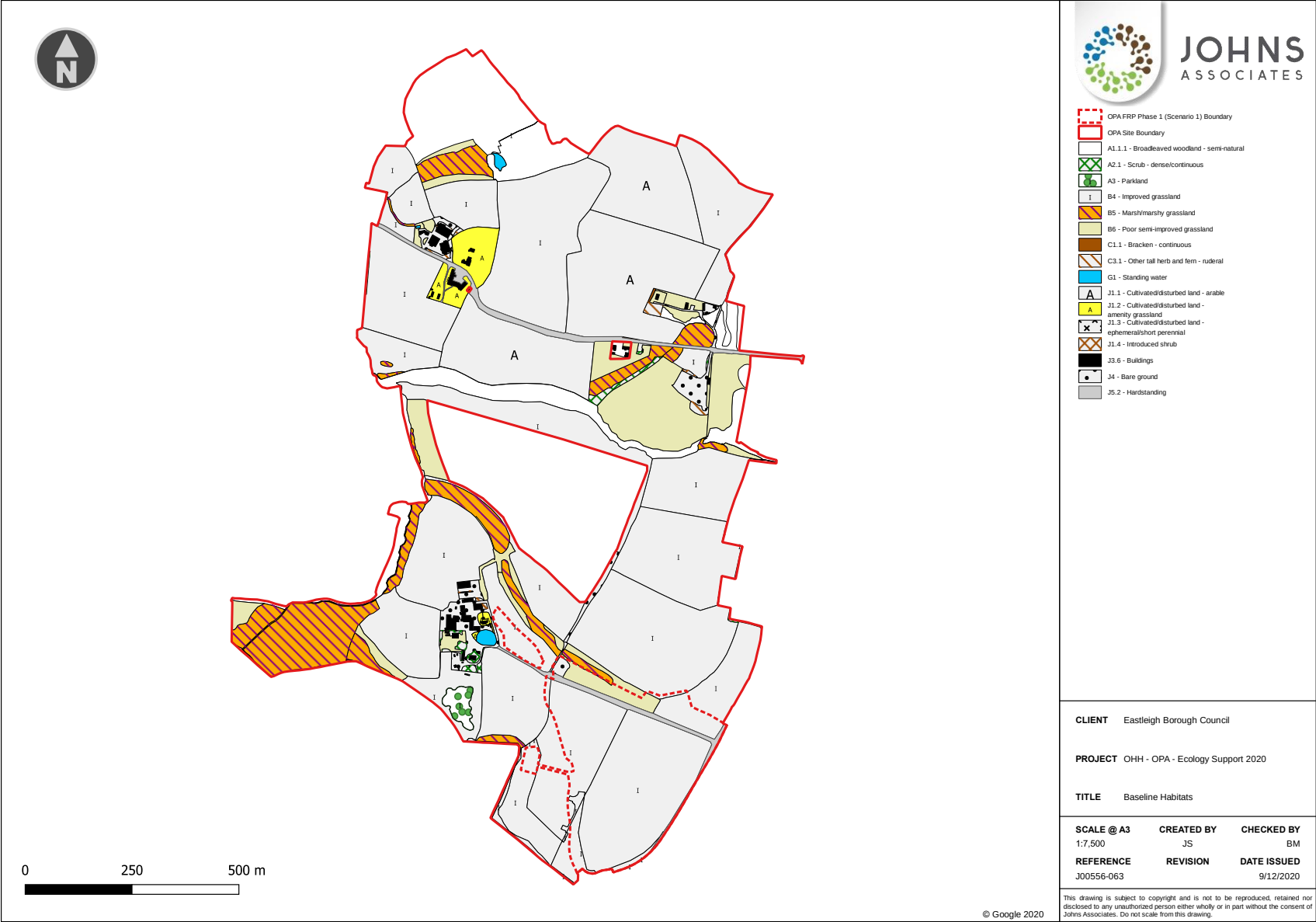
The habitats present on sites were recorded using the standardised system for classifying and mapping British Habitats Handbook for Phase 1 Habitat survey – a technique for environmental audit¹. See Appendix 10.2 Phase 1 Habitat Survey for detailed results of this assessment and the habitat descriptions. The extents of existing habitats area detailed in Table 2.1.

Table 2.1 OPA Baseline (Existing) Habitats

Habitat Type • UK BAP Priority habitats in dark green/white, • habitats of moderate value in light green/white, • low/negligible value habitats in grey	Existing Habitat Area (ha)
A1.1.1 - Broadleaved woodland - semi-natural	6.47
A2.1 - Scrub - dense/continuous	0.50
A3 - Parkland	0.47
B4 - Improved grassland	69.38
B5 - Marsh/ marshy grassland	8.85
B6 - Poor semi-improved grassland	9.79
C1.1 - Bracken - continuous	0.03
C3.1 - Other tall herb and fern - ruderal	0.29
G1 - Standing water	0.22
J1.1 - Cultivated/disturbed land - arable	16.62
J1.2 - Cultivated/disturbed land - amenity grassland	1.62
J1.3 - Cultivated/disturbed land - ephemeral/short perennial	0.07
J1.4 - Introduced shrub	0.02
J3.6 - Buildings	0.77
J4 - Bare ground	2.29
J5.2 - Hardstanding	1.87
Total UKBAP Priority Habitats	7.15
Total Moderate Value habitats	18.64
Total Low/Negligible Value Habitats	93.47

¹ British Habitats Handbook for Phase 1 Habitat survey – a technique for environmental audit (Joint Nature Conservancy Council, 2010)

Figure 1 OPA and Link Road - Baseline Habitats



3 ASSESSMENT OF HABITAT CHANGE

3.1 PHASE 1

The following assessment analyses the post construction habitat plan (see Figure 2) against the Phase 1 (Baseline) Habitat Plan (Figure 1) to quantify the changes in habitat types delivered by the proposed development.

3.1.1 Habitat Areas

Habitat Type (UK BAP Priority habitats in dark green/white, habitats of moderate value in light green/white, low value habitats in grey)	Existing	Retained	Lost (including habitats lost due to transformation to other more valuable habitat)	% lost	Created	Post Construction	Net Change In Area (Ha)	% Net Change In Area (Ha)	Notes
B4 - Improved grassland	15.21	0.46	14.75	97%	0	0.46	-14.75	-97%	Habitat of very low ecological value - scoped out of EIA. Identified as low impact habitat for potential development.
B5 - Marsh/ marshy grassland	0.18	0.03	0.15	81%	0	0.03	-0.15	-81%	Very small area of habitat of existing low ecological value due to poor condition - scoped out of EIA - see appendix 10.2 Phase 1 Habitat Survey for justification. Retained habitat areas to be enhanced to increase species diversity
B6 - Poor semi-improved grassland	0.76	0.53	0.23	30%	1.92	2.45	+1.70	224%	Existing habitat of very low ecological value due to poor condition - scoped out of EIA - see appendix 10.2 Phase 1 Habitat Survey for justification.
J4 - Bare ground	0.13	0.05	0.08	61%	0	0.05	-0.08	-61%	Habitat of very low ecological value - scoped out of EIA. Identified as low impact habitat for potential development.
J5.2 - Hardstanding	0.63	0.63	0	0.0%	0	0.63	+0.00	0%	Habitat of very low ecological value - scoped out of EIA. Identified as low impact habitat for potential development.
A1.1.1 - Broadleaved woodland - semi-natural	0.099	0.099	0	0.0%	0.87	0.97	0.87	881%	Also feature of high benefit to GCN, reptiles, breeding birds and foraging bats
A3 - Parkland	0.469	0.452	0.000	0.0%	0.72	1.17	0.70	149%	Also feature of high benefit to GCN, reptiles, breeding birds and foraging bats
Total UKBAP Priority Habitats	0.568	0.551	0	0	1.59	2.14	1.572	376%	
Total Moderate Value habitats	0.94	0.56	0.38	40.4%	1.92	2.48	1.54	163%	
Total Low/Negligible Value Habitats	15.97	1.14	14.83	93%	0	1.14	-14.83	-92%	

Figure 2 Phase 1 - Post Construction Habitat Plan

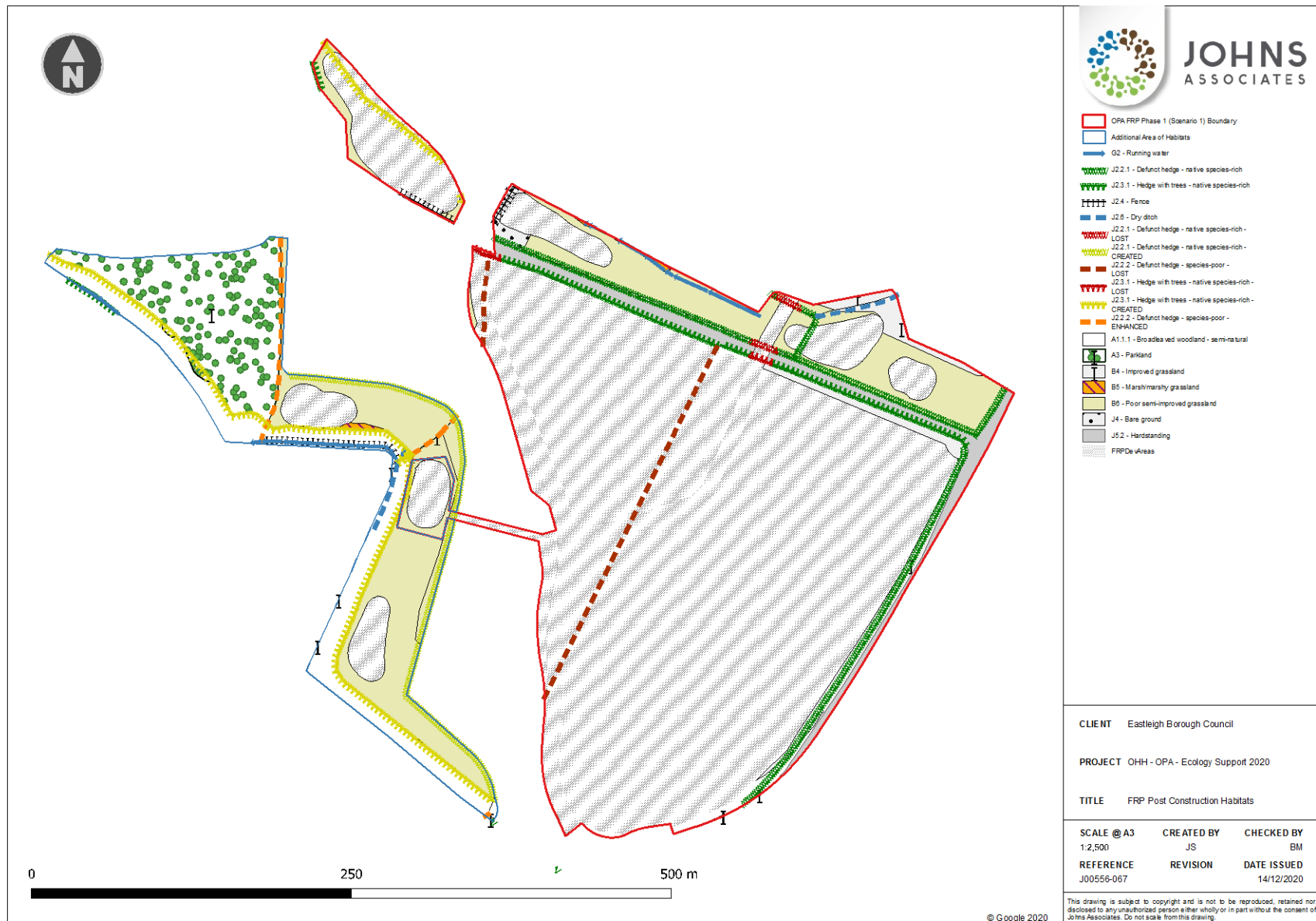


Table 3.1 Phase 1 - Detailed Habitat Transformation Assessment

		Post Construction Habitats (ha)						
		A1.1.1 - Broadleaved woodland - semi-natural	A3 - Parkland	B4 - Improved grassland	B5 - Marsh/marshy grassland	B6 - Poor semi-improved grassland	J4 - Bare ground	J5.2 - Hard standing
		Increase in biodiversity value Negligible change in biodiversity value Decrease in biodiversity value						
Existing Habitats	A1.1.1 - Broadleaved woodland - semi-natural	0.10	0.00	0.00	0.00	0.00	0.00	0.00
	A3 - Parkland	0.00	0.45	0.00	0.00	0.00	0.00	0.00
	B4 - Improved grassland	0.72	0.72	0.47	0.00	1.92	0.00	0.00
	B5 - Marsh/marshy grassland	0.13	0.00	0.00	0.03	0.00	0.00	0.00
	B6 - Poor semi-improved grassland	0.00	0.00	0.00	0.00	0.53	0.00	0.00
	J4 - Bare ground	0.00	0.00	0.00	0.00	0.00	0.05	0.00
	J5.2 - Hardstanding	0.00	0.00	0.00	0.00	0.00	0.00	0.63
	Grand Total	0.95	1.17	0.47	0.03	2.45	0.05	0.63

3.1.2 Linear habitats

The change in linear habitats is shown in Table 3.2. This demonstrates the development will result in the net gain of 2.79km of new hedgerow, an 868% net gain in this priority habitat. In addition, 0.216 km of existing species poor hedgerows will be enhanced to species rich hedgerows.

Table 3.2 Phase 1 - Linear Habitat Change

Habitat Type (UK BAP Priority habitats in dark green/white, habitats of moderate value in light green/white, low value habitats in grey)	Existing	Retained	Enhanced (to species rich form of existing habitat)	Lost (including habitats lost due to transformation to other more valuable habitat)	% lost	Created	Post Construction	Net Change Length (m)	% Net Change In Length (Ha)
J2.2.1 - Defunct hedge - native species-rich	857.72	816.63	n/a	816.63	41.09	5%	470.72	1,287.35	+429.63
J2.2.2 - Defunct hedge - species-poor	591.68	216.74	216.74	216.74	374.94	63%	0.00	216.74	-374.94
J2.3.1 - Hedge with trees - native species-rich	480.73	441.38	n/a	441.38	39.35	8%	852.82	1,294.20	+813.47
Grand Total	1930.13	1474.75	216.74	1474.75	455.38	24%	1323.54	2798.29	+868.16

3.2 OPA & LINK ROAD

3.2.1 Habitat Areas

The following assessment analyses the post construction habitat plan (see Figure 4) against the Phase 1 (Baseline) Habitat Plan (Figure 1) to quantify the changes in habitat types delivered by the proposed development.

Table 3.3 Assessment of Habitat Change

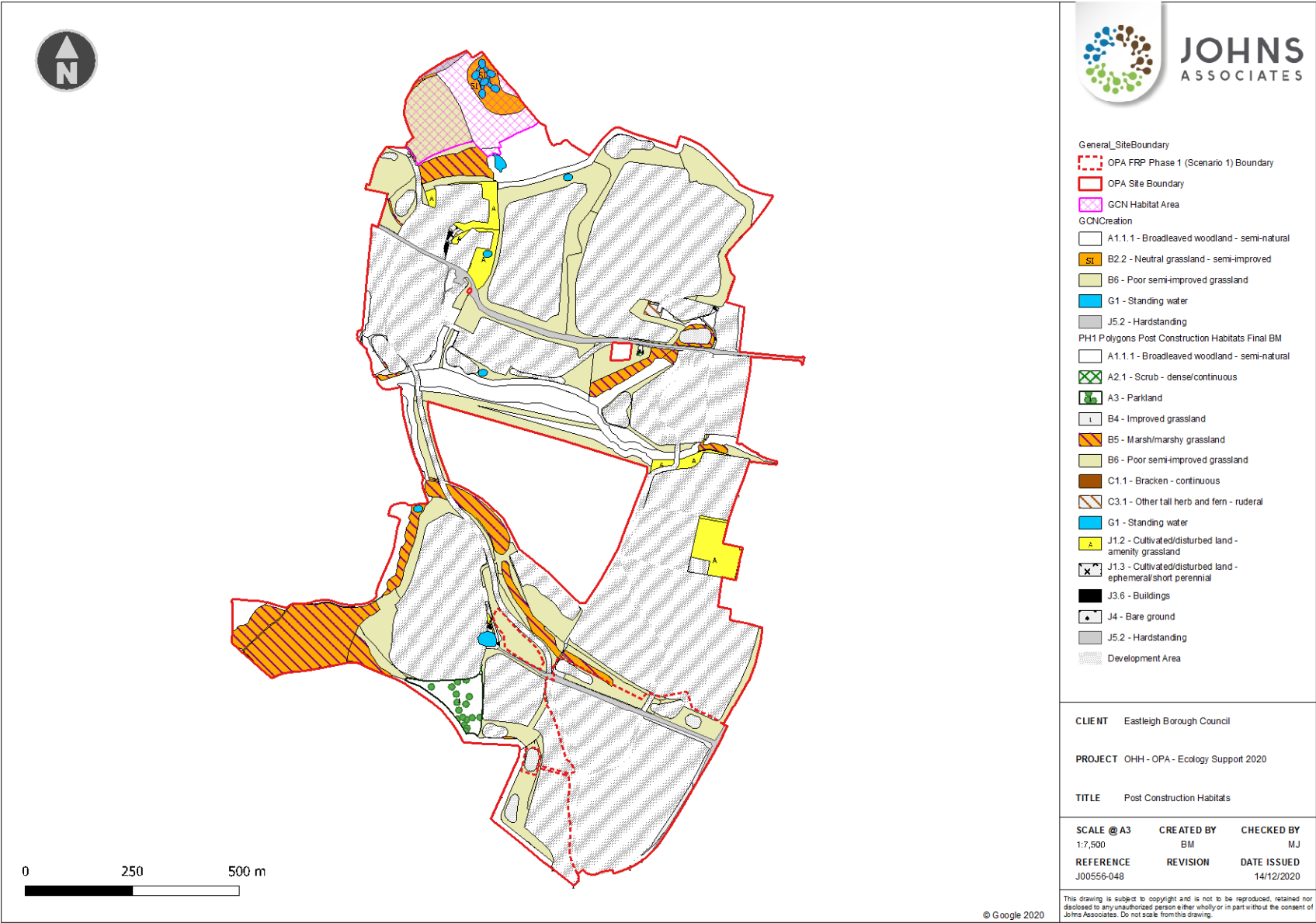
Habitat Type • UK BAP Priority habitats in dark green/white • habitats of moderate value in light green/white • low/negligible value habitats in grey	Existing	Retained	Lost (including habitats lost due to transformation to other more valuable habitat)	% lost	Create d	Post Constructio n Total	Net Chang e In Area (Ha)	% Net Chang e In Area (Ha)	Notes
A1.1.1 - Broadleaved woodland - semi-natural	6.47	5.64	0.83	- 13%	5.63	11.27	+4.80	74%	Also feature of high benefit to GCN, reptiles, dormice, breeding birds and foraging bats
A2.1 - Scrub - dense/continuous	0.50	0.02	0.49	- 96%	0.00	0.02	-0.49	-96%	Habitat of very low ecological value - scoped out of EIA. Identified as low impact habitat for potential development.
A3 - Parkland	0.47	0.47	0.00	0%	0.70	1.17	+0.70	149%	Also feature of high value to breeding birds and foraging bats
B4 - Improved grassland	69.38	0.00	69.38	- 100 %	0.47	0.47	-68.92	-99%	Habitat of very low ecological value - scoped out of EIA. Identified as low impact habitat for potential development.
B5 - Marsh/ marshy grassland	8.85	8.20	0.65	-7%	0.00	8.22	-0.63	-7%	Condition of this habitat is very variable across the site. No areas have been identified as BAP habitat. Areas of this habitat to be lost are of poor quality - see appendix 10.2 Phase 1 Habitat Survey for detailed description. Retained habitat areas to be enhanced to increase species diversity.
B6 - Poor semi-improved grassland	9.79	3.63	6.16	- 63%	16.24	19.87	+10.08	103%	Habitat of very low ecological value due to poor condition - scoped out of EIA - see appendix 10.2 Phase 1 Habitat Survey for justification. Retained habitat areas to be enhanced to increase species diversity
C1.1 - Bracken - continuous	0.03	0.00	0.03	- 91%	0.00	0.00	-0.03	-91%	Habitat of very low ecological value - scoped out of EIA. Identified as low impact habitat for potential development.
C3.1 - Other tall herb and fern - ruderal	0.29	0.11	0.17	- 60%	0.00	0.11	-0.17	-60%	Habitat of very low ecological value - scoped out of EIA. Identified as low impact habitat for potential development.
G1 - Standing water	0.22	0.20	0.02	-9%	0.11	0.31	+0.09	41%	These are standalone wildlife ponds created to achieve UKBAP habitat criteria and good condition score (not SuDS features). Feature of benefit to GCN, grass snake and foraging bats
J1.1 - Cultivated/disturbed land - arable	16.62	0.00	16.62	- 100 %	0.00	0.00	-16.62	-100%	Habitat of very low ecological value - scoped out of EIA. Identified as low impact habitat for potential development.
J1.2 - Cultivated/disturbed land - amenity grassland	1.62	0.55	1.07	- 66%	1.99	2.55	+0.92	57%	Habitat of very low ecological value - scoped out of EIA. Identified as low impact habitat for potential development.
J1.3 - Cultivated/disturbed land - ephemeral/short perennial	0.07	0.04	0.03	- 49%	0.00	0.04	-0.03	-49%	Habitat of very low ecological value - scoped out of EIA. Identified as low impact habitat for potential development.

J1.4 - Introduced shrub	0.02	0.00	0.02	- 100 %	0.00	0.00	-0.02	-100%	Habitat of very low ecological value - scoped out of EIA. Identified as low impact habitat for potential development.
J3.6 - Buildings	0.77	0.05	0.72	- 93%	0.00	0.05	-0.72	-93%	Habitat of very low ecological value - scoped out of EIA. Identified as low impact habitat for potential development.
J4 - Bare ground	2.29	0.25	2.04	- 89%	0.00	0.25	-2.04	-89%	Habitat of very low ecological value - scoped out of EIA. Identified as low impact habitat for potential development.
J5.2 - Hardstanding	1.87	1.87	0.00	0%	0.00	1.87	+0.00	0%	Habitat of very low ecological value - scoped out of EIA. Identified as low impact habitat for potential development.
Total UKBAP Priority Habitats	7.15	6.31	0.85	- 12%	6.44	12.74	+5.59	78%	
Total Moderate Value habitats	18.64	11.83	6.81	- 37%	16.24	28.09	9.45	51%	
Total Low/Negligible Value Habitats	93.47	2.90	90.57	- 97%	2.46	5.36	-88.11	-94%	

Table 3.4 OPA & Link Road - Detailed Habitat Transformation Analysis (Habitats outside the development footprint)

Increase in biodiversity value Negligible change in biodiversity value Decrease in biodiversity value		Post Construction Habitats (ha)															
		A1.1.1 - Broadleaved woodland - semi-natural	A2.1 - Scrub - dense/continuous	A3 - Parkland	B4 - Improved grassland	B5 - Marsh/marshy grassland	B6 - Poor semi-improved grassland	C1.1 - Bracken - continuous	C3.1 - Other tall herb and fern - ruderal	G1 - Standing water	J1.1 - Cultivated/disturbed land - arable	J1.2 - Cultivated/disturbed land - amenity grassland	J1.3 - Cultivated/disturbed land - ephemeral / short perennial	J1.4 - Introduced shrub	J3.6 - Buildings	J4 - Bare ground	J5.2 - Hard standing
Existing Habitats	A1.1.1 - Broadleaved woodland - semi-natural	5.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	A2.1 - Scrub - dense/continuous	0.22	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	A3 - Parkland	0.00	0.00	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	B4 - Improved grassland	3.33	0.00	0.72	0.47	0.02	12.93	0.00	0.00	0.03	0.00	1.99	0.00	0.00	0.00	0.00	0.00
	B5 - Marsh/marshy grassland	0.19	0.00	0.00	0.00	8.20	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	B6 - Poor semi-improved grassland	1.03	0.00	0.00	0.00	0.00	3.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	C1.1 - Bracken - continuous	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	C3.1 - Other tall herb and fern - ruderal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	G1 - Standing water	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	J1.1 - Cultivated/disturbed land - arable	0.86	0.00	0.00	0.00	0.00	3.19	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	J1.2 - Cultivated/disturbed land - amenity grassland	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.03	0.00	0.55	0.00	0.00	0.00	0.00	0.00
	J1.3 - Cultivated/disturbed land - ephemeral/short perennial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00
	J1.4 - Introduced shrub	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	J3.6 - Buildings	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00
	J4 - Bare ground	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00
	J5.2 - Hardstanding	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.87
	Grand Total	11.27	0.02	1.17	0.47	8.22	19.87	0.00	0.11	0.31	0.00	2.55	0.04	0.00	0.05	0.25	1.87

Figure 3 OPA and Link Road - Post Construction Habitat Plan



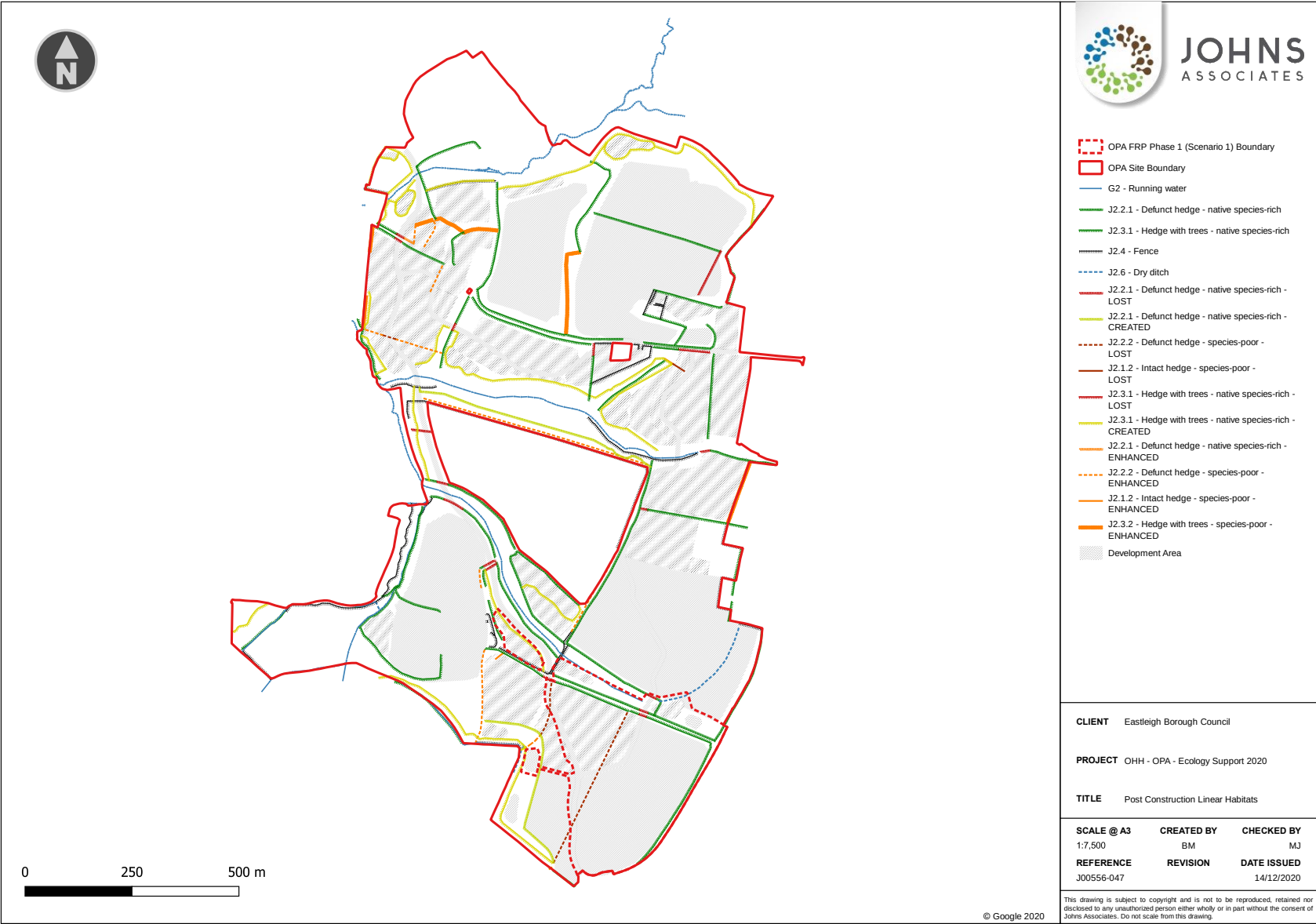
3.2.2 OPA and Link Road - Linear Habitats

The change in linear habitats is shown in Table 3.5. This demonstrates the development will result in the net gain of 4.672km of new hedgerow, a 37% net gain in this priority habitat. In addition, 2.1km of existing species poor hedgerows will be enhanced to species rich hedgerows.

Table 3.5 OPA & Link Road - Linear Habitat Change

Habitat Type (UK BAP Priority habitats in dark green/white, habitats of moderate value in light green/white, low value habitats in grey)	Existing	Retained	Enhanced (to species rich form of existing habitat)	Lost (including habitats lost due to transformation to other more valuable habitat)	% lost	Created	Post Construction	Net Change Length (m)	% Net Change In Length (Ha)
J2.1.2 - Intact hedge - species-poor	75.49	45.07	45.07	30.42	40%	0.00	45.07	-30.42	-40%
J2.2.1 - Defunct hedge - native species-rich	4701.09	4301.91	n/a	399.18	8%	1060.90	5,362.81	+661.72	14%
J2.2.2 - Defunct hedge - species-poor	1969.64	1416.15	1416.15	553.49	28%	0.00	1,416.15	-553.49	-28%
J2.3.1 - Hedge with trees - native species-rich	5124.14	4934.51	n/a	189.63	4%	4783.84	9,718.35	+4,594.21	90%
J2.3.2 - Hedge with trees - species-poor	708.58	708.58	708.58	0.00	0%	0.00	708.58	+0.00	0%
Grand Total	12578.94	11406.22	2169.8	1172.72	9%	5844.74	17,250.96	+4,672.02	37%

Figure 4 OPA and Link Road - Post Construction Linear Habitats Only for clarity



4 KEY HABITAT CONDITION CRITERIA

4.1.1 Lowland Mixed Deciduous Woodland & Parkland

The criteria for the delivery of this habitat type have been reproduced from the DEFRA Metric 2.0 Technical Supplement² in **Error! Reference source not found.** and Table 4.2. The following principles will guide the delivery of this habitat on site:

- This habitat will be delivered through the planting of new woodland in the areas indicated in Figure 3 designed to extend the existing woodland habitats providing multi species benefits.
- This woodland planting will retain the existing grassland habitats where the grassland is of value or, in areas where the grassland has been removed, a diverse species mix will be sown.
- A specific native woodland species mix will be developed using the existing high value woodland community as a basis.
- These areas of woodland will be segregated from the main green infrastructure (GI) corridors by a species rich hedgerow, ditch and/or bank and fence to restrict public access.
- The associated GI corridors will act as a further complimentary habitat and buffer between the developed areas and the new woodland habitats.
- A detailed management and monitoring plan will be implemented to ensure target condition and structure are achieved.

² Biodiversity Metric 2.0 Technical Supplement – Beta Test Final (DEFRA JP029, 29.07.20)

Table 4.1 Woodland Broad Habitat Type Condition Table

Condition Table	Woodland Broad Habitat Type
Habitat Description Woodland is defined as vegetation dominated by trees more than 5 m high when mature, which forms a distinct, although sometimes open, canopy [areas of trees with a canopy greater than 20%]. This includes felled, young or newly planted woodland. There is no minimum size for areas of trees that have the definite characteristics and feel of a woodland and are managed as woodland. Two broad woodland types are considered here: Broadleaved, mixed and yew woodland. Coniferous woodland. It does not include scrub (see separate scrub condition assessment). In England, native woodland is defined as woodland that is composed of at least 80% native tree species including 'naturalised species'. It is based on the England Woodland Biodiversity Group condition assessment for none SSSI woodlands. See https://woodlandwildlifetoolkit.sylva.org.uk/assess for more background and detailed information. Wood Pasture and Parkland (see notes below on how to record) Wood pasture is a vegetation structure rather than a particular plant community. Typically, this structure consists of large, open-grown or high forest trees (often pollards) at various densities, in a matrix of grazed grassland, heathland and/or woodland floras. This feature includes: Wood pasture and parkland derived from medieval forests and embankments, wooded commons, parks and pastures with trees; and where the land use has been converted to arable, forestry or amenity, but where ancient trees are still present. For wood pasture and parkland assessment established by PTES see https://ptes.org/campaigns/wood-pasture-parkland/wood-pasture-parkland-survey/.	
Condition Assessment Criteria 1. This should be an area of trees with complete canopy cover. 2. Native species are dominant. Non-native and invasive species account for less than 10% of the vegetation cover. 3. A diverse age and height structure of the trees. 4. Free from damage [Bark stripping; Browse line; Damage shoot tips] (in the last five years) from stock or wild mammals with less than 20% of vegetation being browsed. 5. There should be evidence of successful (i.e. not browsed off before it gets well established) tree regeneration such as seedlings, saplings and young trees. 6. Standing and fallen dead wood of over 20 cm diameter are present including fallen large dead branches/stems and stumps. 7. Wetland habitat if they exist within the wood has little sign of drainage or channel straightening. 8. The area is protected from damage by agricultural and other adjacent operations. 9. There should be no evidence of inappropriate management (e.g. deep ruts, animal poaching or compaction). 10. Invasive non-native plants are below 5% (see list below). 11. No signs of significant nutrient enrichment present. 12. More than 3 different native trees and 3 shrub species in an average 10 m radius.	

Table 4.2 Woodland - Key Habitat Criteria

Condition	Assessment Criteria	Score
Good	Meets at least 10 of the criteria with only minor variation No more than 1 of the indicators of poor condition are present Stands of native trees that do not obviously originate from planting should be classified as native semi-natural woodland. Stands of native trees that do not obviously originate from planting should be classified as native semi-natural woodland.	3
Moderate	Clearly fails at least 2 of the above criteria OR invasive non-native plants are 5-20%. OR where non-native species comprise more than 20% of the canopy, the woodland should be recorded as either non-native plantation or mixed woodland. A mixed woodland is woodland with native and non-native species. (This includes woodlands established by planting and by natural regeneration.) Trees of similar age and height structure throughout the woodland. Little or no standing deadwood is present.	2
Poor	The following characteristics can help to identify plantations: (note: BAP woodlands can be plantation woodlands) Non-native trees often of a single species or the same age are the dominant component; OR invasive non-native plants are greater than 20%. Mixed species show a consistent planting pattern across the site. Original planting lines or remains of planting lines can be seen Drainage features and channel straightening of watercourses	1
Undesirable species: - American skunk cabbage <i>Lysichiton americanus</i> - Himalayan balsam <i>Impatiens glandulifera</i> - Japanese knotweed <i>Fallopia japonica</i> - Cherry Laurel <i>Prunus laurocerasus</i> - Shallon <i>Gaultheria shallon</i> - Snowberry <i>Symphoricarpos albus</i> - Variegated yellow archangel <i>Lamiastrum galeobdolon</i> subsp. <i>argentatum</i> - Rhododendron <i>Rhododendron ponticum</i> Factsheets of these invasive non-native plant species can be found on the GB non-native species secretariat website. http://www.nonnativespecies.org/home/index.cfm		

Notes

The following information should be recorded:

- Dominant tree species
- Regenerating tree or shrub species
- Ground flora species – any specialist woodland plants present.
- The average age class throughout the wood – establishment (E), semi-mature (S/M), mature (M) or ancient (A).
- Whether the woodland is accessed by livestock and amount of deer pressure.
- Past management – whether any trees are coppiced or pollarded;
- Threats – damage by pests, invasion by undesirable.

Additional information relevant to data collection:

Woodland - Felled woodland

The condition assessment of this habitat type needs to be based – so far as possible - on the trees that stood on the site prior to felling. It should be possible to determine what these were from the stumps, bark and leaf litter. It should then be recorded as the original woodland type, the age of the trees and note that it has been felled. Condition assessment will be harder in these situation, but should be considered good unless good ecological justification can be given preferably with accompanying photographic evidence.

If it is not possible to record the woodland type, record any tree recovery or seedlings present between the stumps. Where felling occurred a considerable time previously (4-5 year +) with no obvious replanting progressing it may be appropriate in some circumstances to classify as the predominant habitat that is now replacing the felled trees (with stumps still present), particularly when they have high biodiversity value such as heathland or grassland development. Notes of what other species are present on the site will need to be recorded, such as ground flora; felled brash predominates; heather present; grass species; scrub and tree species regenerating etc.

Woodland - Planted young trees

This is recently planted trees (often in tree tubes) within grassland. Where the tree species planted match another woodland description they should be recorded under this description (with a note to state the tree age and that recently planted). If none match then they can be recorded under this catch all category. The grassland sward species and herbs present should also be recorded and described in field notes. Particular note should be made of habitat enhancement practices, such as where native flowers and herbs are created surrounding the planting, to give a wildlife boost until full tree canopy has developed.

Woodland and forest - Wood-pasture and parkland

These are mosaic habitats valued for their trees, especially veteran and ancient trees, with a grazed grassland below. They have open grown trees, sometimes in clumps, but with space between them. They may contain patches of scrub in some circumstances. If it is clearly this habitat then it needs to be recorded under this habitat type for all the area being surveyed. But for condition it may well be preferable to condition assess and map different components separately using different sheets. Please record how this was done, along with recording area amounts for each split section. So below the tree canopy use the woodland condition table; in open grassland use the grassland condition; on mappable areas of scrub use the scrub condition etc. This is relatively complex on the different components of the mosaic, but will be useful for large areas of parkland being surveyed. To make an accurate assessment of the biodiversity value we need to know if the grassland is made of poor or good quality species composition, is the scrub of high quality, the age of the trees and key feature etc. This is likely to involve quite extensive field notes and ecological report to capture this information accurately.

Wood pasture and parkland that has been converted to other land uses such as arable fields, forestry and amenity land but where veteran trees survive are still of high nature conservation interest. They offer great opportunities for restoration to increase biodiversity habitat and should still

4.1.2 Other Neutral Grassland

4.1.3 The criteria for the delivery of this habitat type have been reproduced from the DEFRA Metric 2.0 Technical Supplement in Grassland Habitats

Areas of grassland habitats, predominantly poor semi improved or neutral grassland, will be delivered across the site to the specification outline below (see Table 4.4, Figure 2 and Figure 3). These areas form key components of the green infrastructure corridors and connective habitats that will facilitate continued use of the site for wildlife and ensure landscape connectivity to the habitat areas beyond. The extent and location of these habitats, in combination with the requirements for accessible open space, will constrain the ultimate condition that can be achieved. However, all reasonable measures will be taken throughout the detailed design, delivery and ongoing management of these habitats to deliver the maximum possible value for wildlife.

Table 4.4 Grassland Habitat Types - Condition Table

. The following principles will guide the delivery of this habitat on site:

- This habitat will be delivered through the sensitive management of grassland habitats in the areas indicated as "Poor Semi-Improved" designed to complement and buffer retained habitats whilst providing multi-species benefits.
- Existing grassland habitats where the grassland is of value or, in areas where the grassland has been removed, a diverse species mix will be sown.
- A specific native grassland species mix will be developed using the existing high value semi-improved communities on site as a basis.
- These areas of grassland will form the main green infrastructure (GI) corridors and will therefore be subject to a measure of recreational pressure, thereby limiting the potential condition of areas in close proximity to the development or in areas where recreational activities (in particular dog walking) is unrestricted.
- It is considered likely that in some areas the grassland condition will achieve moderate condition where the effects of the proximity to the development can be adequately managed.
- A detailed management and monitoring plan will be implemented to ensure target condition and structure are achieved.

4.1.4 Ponds

Four new wildlife ponds will be created during the last phases of construction to add diversity to the site. These have also been positioned to facilitate the natural recolonization of the western habitat areas by great crested newts post construction.

Table 4.3 Pond Habitat Type - Condition Table

Condition Table		Pond Habitat Type
Habitat Description		
This covers all water bodies up to 1 ha in area. Expert judgement should be used to decide if a water body between 1 and 2 ha area is assessed as a pond or as a lake. It includes sunny or shaded and temporary or permanent ponds at any stage of succession, from newly created ponds to ones that are completely overgrown. It also includes scrapes, and other temporary ponds which may be dry certain times of the year.		
Condition Assessment Criteria		
1. Are of good water quality, with clear water (substrate can be seen) and no obvious sign of pollution in the water body. 2. The water body should have semi natural riparian land for at least 10 m from the pond edge. 3. Non-woodland ponds should be dominated by plants, be they submerged or floating (note dominance of duckweed is a sign of eutrophication). 4. Non-woodland ponds [i.e. that have always been open] should not be shaded more than 50% 5. Many ponds will be fishless, those which naturally contain fish should not be stocked and should contain a native fish assemblage. 6. Ponds should not be artificially connected to other water bodies, e.g. ditches. 7. Pond water levels should be able to fluctuate naturally throughout the year. 8. Non-native species should be absent. 9. Less than 10% of the pond should be covered with duckweed or filamentous algae.		
Condition	Assessment Criteria	Score
Good	Meets the majority of the criteria with only minor variation Few of the indicators of poor condition are present.	3
Moderate	Fails a number of the criteria above There is only moderate water quality Where non-native species comprise more than 10% of the vegetation. There is insufficient extent of semi natural riparian land Water levels are subject to some control. There are some artificial connections to other water bodies, but they are not delivering water of poor water quality or preventing water level fluctuations. Fish have been stocked at a low density, but they are native species and there is sufficient aquatic plants and habitat heterogeneity to reduce the effects of predation. Moderate shading of non-woodland ponds. Submerged and floating plants are limited but still present	2
Poor	Poor water quality present Ponds in poor health Fails the majority of criteria. Extensive filamentous algae or duckweed Absence of semi-natural riparian land. No natural fluctuations in water levels Extensive non-native species High density of stocked fish Absence of submerged and floating plants (unless naturally a shaded woodland pond). Non-woodland ponds completely over-grown with trees and scrub.	1
Undesirable species: Any non-native species. Frequently observed non-native plant species include water fern, Australian swamp stonecrop, parrot's feather, floating pennywort and Japanese knotweed and giant hogweed (on the banks). Frequently occurring non-native animals include signal crayfish, zebra mussels, killer and demon shrimp and carp. Cover of more than 10% of duckweeds or filamentous algae are signs of eutrophication.		

4.1.5 Grassland Habitats

Areas of grassland habitats, predominantly poor semi improved or neutral grassland, will be delivered across the site to the specification outline below (see Table 4.4, Figure 2 and Figure 3). These areas form key components of the green infrastructure corridors and connective habitats that will facilitate continued use of the site for wildlife and ensure landscape connectivity to the habitat areas beyond. The extent and location of these habitats, in combination with the requirements for accessible open space, will constrain the ultimate condition that can be achieved. However, all reasonable measures will be taken throughout the detailed design, delivery and ongoing management of these habitats to deliver the maximum possible value for wildlife.

Table 4.4 Grassland Habitat Types - Condition Table

Condition Table		Grassland Habitat Types
Habitat Description		
Includes both agricultural, recreational, amenity, road verges and semi-natural grassland types including Priority Habitat Grasslands on all soil types. Will be dominated by grassland species with very little (if any) dwarf shrub, wetland or wooded species within the sward. Will exist above and below the level of enclosure at all altitudes		
Condition Assessment Criteria		
1. The area is clearly and easily recognisable as a good example of this type of habitat and there is little difference between what is described in the relevant habitat classifications and what is visible on site. 2. The appearance and composition of the vegetation on site should very closely match the characteristics for the specific Priority Habitat [i.e as described by either the Phase 1 Habitat Classification or the UK Habitat Classification], with species typical of the habitat representing a significant majority of the vegetation. 3. Wildflowers, sedges and indicator species for the specific Priority grassland habitat are very clearly and easily visible throughout the sward and occur at high densities in high frequency. See relevant Habitat Classification for details of indicator species for specific habitat. 4. Undesirable species and physical damage is below 5% cover. 5. Cover of bare ground greater than 10% (including localised areas, for example, rabbit warrens). 6. Cover of bracken less than 20% and cover of scrub and bramble less than 5%.		
Condition	Assessment Criteria	Score
Good	- Species-rich Grassland of all Priority Habitat Types. Of high to moderate quality. - Wildflower and sedges above 30% excluding white clover <i>Trifolium repens</i>, creeping buttercup <i>Ranunculus repens</i> and injurious weeds. - Meets all of the condition criteria with only minor variation - None of the indicators of poor condition are present (4, 5 & 6).	3
Moderate	- Semi-improved grassland occurs on a wide range of soils and may be derived from higher quality Priority Habitat grassland habitats in poor condition. Often as they deteriorate following nutrient inputs. Typical grasses include: cock's-foot, common bent, creeping bent, crested dog's-tail, false oat-grass, meadow fescue, meadow foxtail, red fescue, sweet vernal grass, Timothy, tufted hair-grass and Yorkshire-fog. - Total cover of wildflowers and sedges less than 30%, excluding white clover, creeping buttercup and injurious weeds. - Rye-grass cover is less than 25% including amenity grasslands. - OR - Clearly fails at least 1 of the condition criteria - OR - The grassland type has some differences between what is described in the relevant habitat classifications and what is visible on site. It is a Lower Quality Priority Habitat, but clearly recognisable as such. - Potentially restorable to grassland Priority Habitat with improved management. - Cover of undesirable species at 5- 15%.	2
Poor	- Agricultural grasslands is characterised by vegetation dominated by a few fast-growing grasses on fertile, neutral soils. It is frequently characterised by an abundance of rye-grass <i>Lolium</i> spp. (above 25% cover) and white clover <i>Trifolium repens</i>. These grasslands are typically either managed as pasture or mown regularly for silage production or in non-agricultural contexts for recreation and amenity purposes; they are often periodically re-sown and are maintained by fertiliser treatment and weed control. They may also be temporary and sown as part of the rotation of arable crops but they are only included in this broad habitat type if they are more than one year old. - Amenity and Road verge grasslands with similar species to description for agriculture grasslands. - OR Most of the condition criteria are being failed. - Cover of undesirable species above 15% usually resulting in a dense scrub or tree cover, or high cover of exotic species.	

Undesirable species: creeping thistle <i>Cirsium arvense</i>, spear thistle <i>Cirsium vulgare</i>, curled dock <i>Rumex crispus</i>, broad-leaved dock <i>Rumex obtusifolius</i>, common ragwort <i>Senecio jacobaea</i>, common nettle <i>Urtica dioica</i>, creeping buttercup <i>Ranunculus repens</i>, white clover <i>Trifolium repens</i>, cow parsley <i>Anthriscus sylvestris</i>, marsh thistle <i>Cirsium palustre</i> and marsh ragwort <i>Senecio aquaticus</i>.		
Notes Physical damage to the vegetation from: excessive poaching, damage from machinery use or storage, or any other damaging management activities.		

4.1.6 Hedgerows

All new and enhanced hedgerows will be created in order to comply with the maximum possible number of condition criteria (see Table 4.5 and Table 4.6 and Figure 4) to achieve the highest biodiversity benefit. This will also guide management prescriptions for these habitats.

Table 4.5 Hedgerow - Favourable Condition Attributes

Hedgerow favourable condition attributes			
Attributes and functional groupings (A, B, C & D)	Criteria (the minimum requirements for 'favourable condition')		Description
A1.	Height	>1.5 m average along length	The average height of woody growth estimated from base of stem to the top of shoots, excluding any bank beneath the hedgerow, any gaps or isolated trees. Newly laid or coppiced hedgerows are indicative of good management and pass this criterion for up to a maximum of four years (if undertaken according to good practice) A newly planted hedgerow does not pass this criterion (unless it is > 1.5 m height)
A2.	Width	>1.5 m average along length	The average width of woody growth estimated at the widest point of the canopy, excluding gaps and isolated trees. Outgrowths (e.g. blackthorn suckers) are only included in the width estimate when they >0.5 m in height. Laid, coppiced, cut and newly planted hedgerows are indicative of good management and pass this criterion for up to a maximum of four years (if undertaken according to good practice ⁴)
B1.	Gap – hedge base	Gap between ground and base of canopy <0.5 m for >90% of length (unless 'line of trees')	This is the vertical gappiness of the woody component of the hedgerow, and its distance from the ground to the lowest leafy growth. Certain exceptions to this criterion are acceptable (see page 65 of
B2.	Gap - hedge canopy continuity	Gaps make up <10% of total length and No canopy gaps >5 m	This is the horizontal gappiness of the woody component of the hedgerow. Gaps are complete breaks in the woody canopy (no matter how small). Access points and gates contribute to the overall gappiness, but are not subject to the >5 m criterion (as this is the typical size of a gate)
C1.	Undisturbed ground and perennial vegetation	>1 m width of undisturbed ground with perennial herbaceous vegetation for >90% of length measured from outer edge of hedgerow, and is present on one side of the hedge (at least)	This is the horizontal gappiness of the woody component of the hedgerow. Gaps are complete breaks in the woody canopy (no matter how small). Access points and gates contribute to the overall gappiness, but are not subject to the >5 m criterion (as this is the typical size of a gate)

C2.	Undesirable perennial vegetation	Plant species indicative of nutrient enrichment of soils dominate <20% cover of the area of undisturbed ground	The indicator species used are nettles (<i>Urtica</i> spp.), cleavers (<i>Galium aparine</i>) and docks (<i>Rumex</i> spp.). Their presence, either singly or together, should not exceed the 20% cover threshold.
D1.	Invasive and neophyte species	>90% of the hedgerow and undisturbed ground is free of invasive non-native and neophyte species	Neophytes are plants that have naturalised in the UK since AD 1500. For information on neophytes see the JNCC website and for information on invasive non-native species see the GB Non-Native Secretariat website.
D2.	Current damage	>90% of the hedgerow or undisturbed ground is free of damage caused by human activities	This criterion addresses damaging activities that may have led to or lead to deterioration in other attributes. This could include evidence of pollution, piles of manure or rubble, or inappropriate management practices (

Table 4.6 Condition Categories for Hedgerows

Condition categories for hedgerows	
Category	Maximum number of attributes that can fail to meet 'favourable condition' criteria in Table TS1-.2
Good	No more than 2 failures in total and no more than 1 in any functional group.
Moderate	No more than 4 failures in total and fails both attributes in a maximum of one functional group e.g. fails attribute 1 & 2, 5 & 7 = Moderate condition.
Poor	Fails a total of more than 4 attributes or both attributes

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