M54 to M6 Link Road

TR010054

8.16 Review of Woodland Mapping, Impact Assessment and Compensation

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M54 to M6 Link Road

Development Consent Order 202[ ]

8.16 Review of Woodland Mapping, Impact Assessment and Compensation

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1 Introduction

1.1 Terms of Reference

1.1.1 This Technical Note ('TN') has been prepared in respect of an application ('the Application') for a Development Consent Order ('DCO') under section 37 of the Planning Act 2008 ('PA 2008') for the proposed M54 to M6 Link Road ('the Scheme') made by Highways England Company Limited ('Highways England' or 'HE') to the Secretary of State for Transport.

1.1.2 The Application for the Scheme was submitted on 30 January 2020 and accepted for Examination on 28 February 2020. Relevant Representations were received from interested parties in Spring 2020 and published on the Planning Inspectorate website on 11 June 2020.

1.1.3 This TN provides further information in response to RR-031 from Allow Ltd ('Allow'), and their statement that the extent of woodland habitat within the Scheme boundary has been inaccurately mapped and, therefore, the quantum of compensatory woodland planting proposed on Allow's land is unjustified. Whilst the statement on the accuracy of data was made by Allow in its relevant representation, the detailed information to explain the rationale behind this statement was provided by Allow on 29 September 2020, via a report by Aspect Ecology entitled '*Review of Proposed Habitat Creation on Land Owned by Allow Ltd*'.

1.1.4 The Aspect ecology report stated that only 14.03 ha of woodland would be lost as a result of the Scheme, compared to the 20.67 ha woodland loss reported by Highways England in Table 8.18 of the Environmental Statement ("ES") (Version 3) [AS-083/6.1].

1.2 Scope

1.2.1 This TN does not replace or supersede any of Highways England's issued responses to RR-031 [see REP1-043/8.9] or more detailed responses to points raised as set out in the draft Statement of Common Ground with Allow [REP1-066/8.8LIU(A)]. Instead, this TN seeks to provide information on the following:

- The original baseline mapping methodology used to map the extent of woodland within the Scheme boundary, as presented in the ES for the Scheme [APP-040 to 056/6.1, APP-057 to 153/6.2, APP-154 to 210/6.3] as amended by the ES Addendum [AS-118/6.1] and revised ES chapters.
- Methodology for the revised mapping approach to woodland extent.
- The extent of woodland loss based on the January submission Scheme design as shown in Woodland Loss figure provided to Allow on 29 July 2020 and the alternative mapping approach.
- Commentary on the proposed woodland compensation.

1.2.2 Impacts on ancient woodland and the compensation provided to offset those impacts are outside of the scope of the TN because ancient woodland is considered an irreplaceable habitat and by definition its impact cannot be mitigated. Areas of ancient woodland are therefore excluded from any of the areas of existing woodland or new woodland planting detailed in the TN. See Highways England's response to

the Examining Authority's Written Question 1.3.18 [REP1-049/8.10] for information on ancient woodland loss and compensatory planting. No ancient woodland compensation is proposed on land owned by Allow.

1.2.3 Both Allow's data on woodland extent and loss, and the revised woodland mapping and impact assessment presented in this TN, are based upon the Woodland Loss plan issued to Allow in July 2020 which reflects the January DCO submission design as reported in Version 1 of the ES. This plan was produced at Allow's request and has not been submitted as part of the application. It has now been superceeded as a result of the Scheme changes accepted on 29 October 2020 but can be provided on request. As the Allow mapping is based upon the Woodland Loss plan, this TN has also been based upon the Woodland Loss plan to allow a direct comparison between the two calculations to be made.

2 Baseline Mapping Methodology

2.1 Initial Baseline Mapping

2.1.1 Woodland extent within the Scheme boundary (and beyond where considered appropriate to do so) was mapped in accordance with Phase 1 methodology (Joint Nature Conservation Committee ("JNCC"), 2010). A Phase 1 habitat survey is a system of mapping habitats as a baseline for further survey work and assessment and is the current industry standard used by ecologists throughout England in support of development proposals of all scales.

2.1.2 JNCC methodology refers to Phase 1 habitat surveys being typically based upon 1:10,000 or 1:25,000 scale Ordnance Survey maps, with the minimum mapping units 0.1 ha or 0.5 ha respectively. To provide a greater level of accuracy for the assessment of the Scheme, habitats were mapped at a scale of 1:5,000 (as presented in Figure 8.3 of the ES [APP-113/6.2]), allowing smaller features such as ponds and individual trees to be mapped. It is not considered necessary to map at a smaller scale than this. An environmental statement is required to provide in particular a description of the likely significant effects of the project on the environment; and a description of the features of the project and/or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment. Whilst it is necessary to record the woodland and its extent in order to determine if it is of sufficient importance that any effect on it would be significant, the assessment of the impacts to the woodland and the requirements for mitigation including compensatory planting areas required to address the loss of woodland are not based on loss of woodland down to the nearest m^2.

2.1.3 The methodology uses lines and polygons to represent features like grassland, woodland or hedgerows. It does not look to accurately map habitats to a small scale, and, as such, small areas of one habitat type may be included in a polygon representing a different habitat type. This is because the transition from one habitat type to another is not obvious nor can it be defined by an accurately mapped boundary, and often the areas of habitat are too small to distinguish one from another. An example of this approach is highlighted below (for key refer to Figure 8.3 of the ES [APP-113/6.2]), where the green and white cross-shading on Plate 2 indicates plantation woodland habitat.

Plate 1: Image from Google Earth adjacent to M54

Plate 2: Image from Figure 8.3 of the ES [APP-113/6.2]

2.1.4 The dominant habitat type along the verge of the eastbound M54 in the south of the Scheme footprint is plantation woodland. However, within this woodland are areas of scrub and grassland that are too small to map as individual areas and are therefore included within the polygon denoting plantation woodland.

2.2 Revised Baseline Mapping

2.2.1 To respond to the representations made by Allow, HE has undertaken an updated desk-based mapping exercise, to compare the extent of woodland within the Scheme boundary as mapped during the Phase 1 habitat surveys with the extent of woodland shown in the same location on Google Earth aerial satellite imagery.

2.2.2 The results of this revised mapping have been used to update the assessment of woodland loss presented within this TN arising from the Scheme. Examples of the revised woodland mapping are provided in Appendix A of this TN.

3 Assessment of Woodland Loss

3.1.1 The extent of woodland loss presented in this TN is based on the revised mapping exercise referred to above, and includes the following:

- Woodland that will be felled during site clearance required for the Scheme.
- Woodland that will not be directly felled but is adjacent to woodland that will be felled. This woodland is likely to be damaged during site clearance through the compaction of soils., It is also likely to be subject to increased wind, rain, sunlight and temperature extremes due to the change in the location of the woodland edge and the protection, or lack of, that the woodland edge provides to the woodland interior. Tree roots can spread a considerable distance beyond the canopy extent, typically extending a distance at least equivalent to the height of the tree and in some cases up to 3 times the tree's height. To account for this potential damage or loss of woodland, rather than calculating the root spread for each individual tree, wherever construction works encroach within 5m of woodland, that particular area of woodland within 5 m of the construction works is assumed to be damaged or lost and therefore requires compensation. In the absence of individual root protection areas, there is no industry standard for calculating these potential impacts, other than for ancient woodland where a 15 m buffer is recommended to protect the woodland. A distance of 5 m is considered to be appropriate for the woodland within the Scheme boundary, given that it is not ancient but a mix of mature woodland and younger plantation woodland where many trees are not fully mature.
- As it is not possible to retain part of a mature tree, where such trees are situated on the boundary of a site clearance area, the tree is assumed to be lost.

3.1.2 The above approach differs to the approach that Allow have taken in mapping and reporting the extent of woodland loss as a result of the Scheme. Allow have not incorporated any impact buffer (as described above in the second bullet point) within their calculations to account for damage or loss of retained woodland adjacent to construction areas. With higher scales of mapping this is not seen as appropriate given the size of such buffer zones in comparison to the minimum mapping units (and was not part of the methodology of the original assessment of woodland loss reported in the ES). However, at smaller scales of mapping where woodland extent has been mapped more accurately, it is necessary to calculate the full extent of woodland loss by incorporating a buffer to capture potential damage or loss. As such Allow has underestimated the amount of woodland that would be lost as a result of the Scheme.

3.2 Assessment of Woodland Loss at Lower Pool

3.2.1 Lower Pool Local Wildlife Site ("LWS") and Site of Biological Importance ("SBI") is situated within the Scheme boundary and would be partially lost during construction of the Scheme.

3.2.2 The LWS/SBI consists of broadleaved woodland and a pond, as shown in Plate 3 below. The boundary of the woodland is clearly defined where it meets the historic parkland and grassland habitats adjacent to it and there is no transition area where it is difficult to assign a particular habitat type.

3.2.3 Based upon the revised woodland mapping, the woodland loss within Lower Pool would be 1.9 ha, plus an area of 0.47 ha where construction works would within 5 m of retained woodland. This is in comparison to the 1.83 ha of loss reported in the ES Version 1 (January 2020). The figure in the ES Version 1 was an underestimate due in part to the use of an early site clearance plan. No buffer was included due to scale of the mapping (as described above). The ES Chapter 8 Biodiversity Version 3 (October 2020) [AS-083/6.1] reported woodland loss at Lower Pool as 2.04 ha, however this has now been recalculated as an area of 2.11 ha due to corrections in area calculations for wider utility corridors.

3.2.4 The Scheme would result in the loss of 2.11 ha of woodland and 0.46 ha of standing water (pond) within the LWS/SBI. Construction works would take place within 5 m of a further 0.47 ha of woodland within Lower Pool, which could be lost or damaged.

Plate 3: Image of Lower Pool from Google Earth

3.3 Assessment of Woodland Loss within the rest of the Scheme

3.3.1 The revised mapping exercise has highlighted locations that were mapped as woodland during the phase 1 habitat survey, but where it is now considered possible to define the boundary between different habitats. These locations are typically along the carriageways of the A460, M54 and the M6 where a mosaic of plantation woodland, scrub and grassland is present.

3.3.2 Taking account of the revised mapping, woodland loss across the rest of the Scheme, excluding the loss within Lower Pool (2.11 ha of direct loss and 0.47 ha of woodland within the 5 m buffer) and any loss of ancient woodland (which is outside of the scope of this TN) would be:

- 12.69 ha of direct loss of woodland; and
- 6.09 ha of loss of woodland within the 5m buffer.

3.4 Assessment of Total Woodland Loss as a result of the Scheme

3.4.1 The Scheme would result in the total loss of 21.36 ha of non-ancient woodland, as follows:

- 2.11 ha of direct loss of woodland within Lower Pool LWS/SBI.
- 0.47 ha of loss of woodland within the 5m buffer within Lower Pool LWS/SBI.
- 12.69 ha of direct loss of woodland across the rest of the Scheme.
- 6.09 ha of loss of woodland within the 5m buffer across the rest of the Scheme.

3.4.2 These losses are slightly higher than the 20.67 ha woodland loss reported in Table 8.18 of Version 3 of the ES [AS-083/6.1]. This consisted of 2.04 ha loss within Lower Pool and 18.63 ha across the rest of the Scheme.

3.4.3 The difference in woodland loss arises from the revised mapping exercise altering the extent of woodland in some locations, due to the fact that woodland loss has been assessed at a greater level of detail in this instance including the 5 m buffer to assess damage or loss of woodland immediately adjacent to construction areas, and in the case of Lower Pool the Scheme design being updated after the ES was submitted in January 2020. The design changes included additional clearance of woodland around utilities at Lower Pool but a reduction in site clearance due to changes to the link road design.

3.4.4 Allow has reported a direct loss of 14.03 ha of woodland, compared with the 14.8 ha of direct loss reported by HE. Allow have under-reported woodland loss in some areas, which accounts for the difference. For example, in the plate below which shows woodland loss in part of Lower Pool, the loss equates to 1.60 ha. Allow have reported this loss as 1.27 ha, even though the habitat to be lost is all woodland, not a mosaic of woodland, scrub and grassland which can lead to differences in areas of habitats lost.

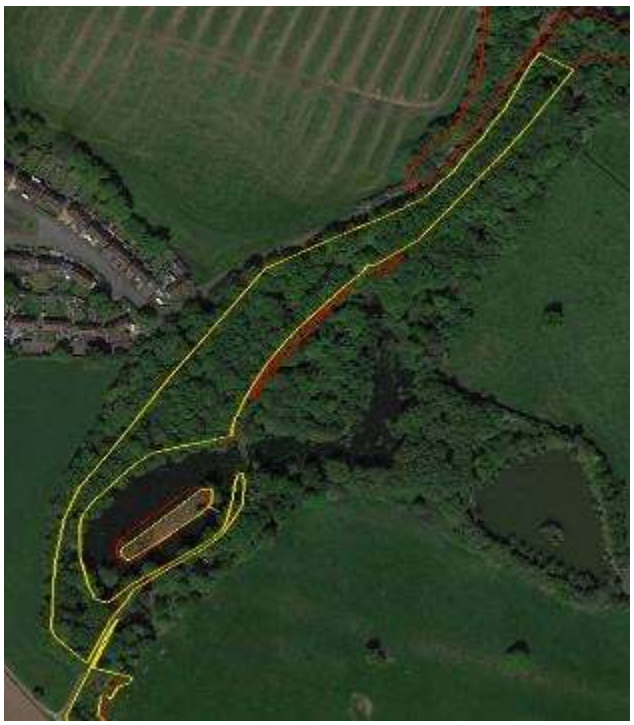


Plate 4: Image of Lower Pool from Google Earth, showing woodland loss (yellow and red polygons denoting different areas of clearance. Note that woodland has been cleared on the island since the original mapping exercise)

3.4.5 In addition Allow have not reported any loss of woodland adjacent to construction areas. The risk of impacting trees through damage or compaction of root systems when working in close proximity to the tree is detailed in "*British Standard 5837: Trees in relation to design, demolition and construction – recommendations*". It is important to account for this risk in any calculation of woodland loss, For these reasons Allow have underestimated the amount of woodland likely to be lost as a result of the Scheme.

4 Woodland Compensation

4.1.1 Compensation woodland planting has been proposed to offset the residual loss of, or permanent damage to, existing woodland after mitigation measures have been taken into account.

4.1.2 Design Manual for Roads and Bridges (DMRB) Sustainability & Environment Design LD 118 Biodiversity design states that:

- Biodiversity compensation measures shall provide replacement ecological resources or functions that are of a similar type and an equivalent or higher value than those being impacted.
- There is inherent uncertainty in the success of biodiversity compensation measures, particularly in cases which require ecological restoration, habitat creation, or translocation of species or habitats, therefore designing for higher replacement ratios can improve confidence in outcomes.

4.1.3 The Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment in the UK and Ireland (2018) gives the following guidance on compensation:

- Compensation should be focused on the same type of ecological features as those affected and equivalent levels of ecological 'functionality' sought.
- Any replacement area should be similar in terms of ecological features and ecological functions that have been lost or damaged, or with appropriate management have the ability to reproduce the functions and conditions of those ecological features.
- Compensation should be provided as close as possible to the location where effects have occurred and benefit the same habitats and species as those affected.
- Replacement ratios of compensatory habitat greater than one-to-one are frequently appropriate because of the uncertainty inherent in compensation, particularly in cases which require ecological restoration, habitat creation or translocation of species or habitats.
- The scientific basis for deriving appropriate ratios is not exact and will vary depending on the habitat or species concerned. Increased replacement ratios can also help take account of the time lag in delivering compensation

4.1.4 With regards to ratios of compensatory planting, not all areas of individual woodland blocks that will be lost have been compensated for with an equivalent area of new planting. Some woodlands, such as Lower Pool LWS/SBI, are of greater biodiversity importance than small areas of woodland planting in the Highways England soft estate and compensatory planting has been provided at a ratio of approximately 2:1 to account for their importance. Woodlands such as Lower Pool are of greater importance as they have been designated as LWS, provide habitat for protected species such as bats, and are less disturbed and fragmented than plantation woodlands alongside the existing road network.

4.1.5 Overall, HE considers that the areas of compensation to be provided are essential to compensate for the loss of woodland across the Scheme and are not excessive.

4.1.6 Allow RR-031v states that:

> "The Applicant has failed to justify the rationale behind why the Applicant has placed all of the ecological mitigation it considers necessary to alleviate the impact of its scheme on Allow's land and not any other parties land".

4.1.7 The Environmental Masterplan Figures 2.1 to 2.7 [AS-086 to AS-092/6.2] for the Scheme clearly sets out HE's approach to delivering essential mitigation across the extent of the Scheme, with features such as woodland, grassland, hedgerows and ponds proposed on several other parties' land, not just land owned by Allow.

4.1.8 The ecological mitigation to be delivered on Allow's land, in particular on Plot 5/2, is to compensate for the impacts to Lower Pool LWS/SBI. This is considered in more detail below.

4.2 Woodland Compensation at Lower Pool

4.2.1 The Scheme would result in the loss of 2.11 ha of woodland and 0.46 ha of standing water (pond) within Lower Pool LWS/SBI. Construction would take place within 5 m of an additional 0.47 ha of woodland within Lower Pool which could be damaged or lost. To compensate for this, a total of 4.84 ha of woodland, 0.57 ha of standing water and 0.78 ha of grassland is proposed to be created on Plot 5/2 (as shown in Plate 4), which is in the ownership of Allow. Although no grassland is lost within Lower Pool, the new grassland would form a buffer between the pond and the woodland, reducing the risk of significant build-up of organic material via leaf fall in the pond which can result in nutrient overload and loss of the pond ecosystem. The grassland would also reduce the negative effect of shading of the pond by the woodland and allow future safe access to the pond for management.

Plate 4: Image of Lower Pool from Environmental Masterplan [AS-086/6.2]

4.2.2 Plot 5/2 is an appropriate location for the compensatory planting for the following reasons:

- The plot is large enough to accommodate the required amount of woodland planting. Smaller plots would result in more fragmented pockets of woodland, which are of less value to biodiversity as they support smaller numbers of species and are more susceptible to disturbance.
- The plot is adjacent to the retained areas of Lower Pool. This means that the compensation is close to the location where effects have occurred and would benefit the same habitats and species as those affected.

4.2.3 Whilst the new link road represents a partial barrier between woodland on the east and west sides, the compensatory woodland planting on Allow's land will be across the link road from the retained areas of Lower Pool. The new link road between Hilton Lane and the pool within Lower Pool will be in a cutting, which will facilitate crossing by birds and bats and minimise the risk of collision for those vulnerable to road traffic deaths such as barn owl. The habitat creation next to the highway will also physically connect the compensatory and the retained woodland via the vegetated Hilton Lane immediately adjacent to retained woodland. In addition, the compensatory woodland will connect to existing woodland to the southwest. A mammal tunnel will allow safe crossing there. The potential to provide new woodland planting and replacement standing water to the east of the mainline of the Scheme was explored during the development of the landscape design at the request of Allow. However, due to the presence of the designed landscape of Hilton Park and the Shrubbery, which is a feature of the historic parkland, on the eastern side of the Scheme any additional woodland planting would result in adverse effects on these receptors. The parkland also forms the setting of the Grade I Hilton Hall and associated buildings. The potential to locate planting to the east was discussed with Historic England at a meeting on the 13 August 2019. It was agreed that the form of features within the retained historic park such as the historic boundary of Lower Pool/ The Shrubbery should be retained and that the woodland should not be extended into the remaining open parkland.

4.2.4 Plot 5/2 will compensate for the impacts to Lower Pool by providing new planting at a ratio of around 2:1 to that being lost. As stated above, there is no scientific basis for determining ratios for compensation. In this instance, the area of new planting is appropriate (i.e. twice as much as is being lost) given that the woodland being lost is within a LWS and supports protected species such as bats. There are always risks associated with creating new habitats, such as the suitability of the compensation site and the failure of new plants to establish, and these risks have been factored into the compensation proposals.

4.2.5 It should be noted that the revised mapping exercise undertaken by HE has not changed the quantum of compensation proposed on plot 5/2. The revised mapping did not alter the area of woodland lost within Lower Pool, and it is that which influences the proposals on plot 5/2. Changes to the amount of woodland lost in areas distant to Lower Pool, such as along the carriageways of the M54, do not impact on or affect the area of compensatory planting necessary at Lower Pool.

4.3 Rest of the Scheme

4.3.1 The compensatory planting across the rest of the Scheme, shown in the Environmental Masterplan Figures 2.1 to 2.7 [AS-086 to AS-092/6.2], either

addresses the impacts to another LWS, Brookfield Farm, or has a multitude of functions including landscape integration, visual screening and biodiversity. Any changes in the areas of woodland to be lost have therefore not resulted in any changes in the Environmental Masterplan. Integrating the new road layout into the wider landscape is not based on the existing areas of woodland to be lost. The scale of the impact to Brookfield Farm LWS/SBI, which influences the amount of woodland planting in the north of the Scheme distant to plot 5/2, has not changed.

5 Conclusion

5.1.1 HE has undertaken a revised woodland mapping and impact assessment for the Scheme to respond to concerns raised by Allow in RR-031 and the Aspect ecology report, as part of the DCO process. The revised mapping is not currently being used for any other purpose.

5.1.2 This exercise has shown that there are some discrepancies between the habitats mapped in the original Phase 1 habitat mapping exercise and the habitats on the ground, most notably when mapping habitat mosaics of woodland, grassland and scrub along the carriageways of the A460, M54 and M6. However, even when the loss of woodland is assessed using the revised methodology, there is no significant difference between the woodland loss reported in Table 8.18 of Version 3 of the ES [AS-083/6.1] and this TN. This is because the original woodland mapping and calculations of woodland loss were both carried out at a higher scale. With the greater level of detail of woodland mapping, the calculations of woodland loss have also been undertaken at a more detailed level through the use of the impact buffer to account for loss and damage during construction.

5.1.3 Table 1 summarises the calculations of woodland loss.

Table 1: Summary of Woodland Loss Calculations

Woodland loss reported in the ES (version 1)	Woodland loss reported in the ES (version 3)	Woodland loss reported by Allow (based on the ES version 1 submission)	Woodland loss reported in this TN
20.45 ha	20.67 ha	14.03 ha	21.36 ha

5.1.4 The discrepancy between the loss reported by HE at both stages of the assessment, and the loss reported by Allow is down to the fact that Allow have not incorporated any buffer within their calculations to account for damage or loss of retained woodland adjacent to construction areas. The risk of impacting trees through damage or compaction of root systems when working in close proximity to the tree is detailed in "*British Standard 5837: Trees in relation to design, demolition and construction – recommendations*". It is important to account for this risk in any calculation of woodland loss, therefore it is the opinion of HE that Allow have underestimated the amount of woodland likely to be lost as a result of the Scheme.

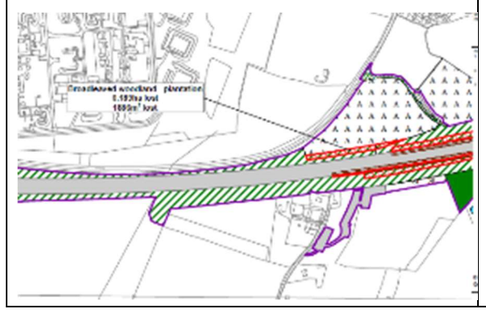
5.1.5 As such, HE concludes that the proposals for woodland planting within Plot 5/2 (owned by Allow) to compensate for impacts to Lower Pool LWS/SBI, and the proposals for woodland planting in the Masterplan as a whole to compensate for impacts of woodland loss across the Scheme are both proportionate and justified, and not excessive. The planting proposed is considered essential to mitigate the impact of the Scheme on Lower Pool.

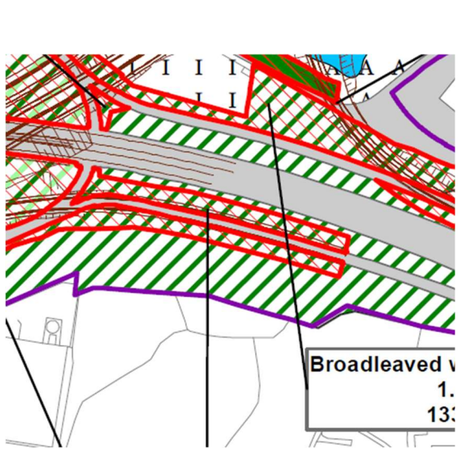
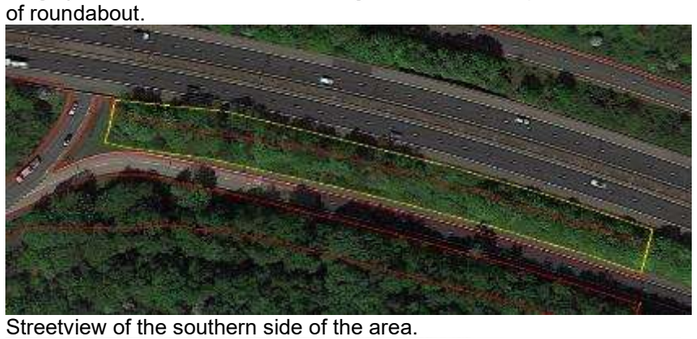
5.1.6 Although the loss of woodland reported in this TN is 0.69 ha greater than the loss reported in Table 8.18 of Version 3 of the ES [AS-083/6.1], no changes to the Environmental Masterplan or the compensatory habitat are proposed. Specific ratios have not been used to determine the quantum of ecological compensation required. Instead, the ecological importance of the feature requiring compensation, in

combination with other factors such as its difficulty to recreate have informed the compensation proposals for the Scheme in its entirety. New woodland planting across the Scheme would have several functions including biodiversity, landscape integration and visual screening and is required regardless of the total loss of woodland. The exceptions to this are blocks of woodland planting to compensate for impacts to Lower Pool LWS and Brookfield Farm LWS. Impacts to these two sites have not significantly altered, therefore the proposals for woodland planting to compensate for the impacts to these two sites have not changed following the review detailed in this TN.

Appendix A Examples of Revised Mapping Exercise

Three examples of the revised mapping exercise are shown below. The first highlights an example where the transition between woodland and grassland can be defined, therefore reducing the woodland extent. The second example highlights where at a smaller scale of mapping, areas that were mapped as woodland have been reclassified. The third example shows where the original mapping underestimated the amount of woodland loss.

Woodland Reference Red shows proposed clearance areas.	**1. Loss reported in the ES (ha)**	**2. Aspect woodland loss (ha)**	**Do points 1 and 2 Agree?**	**Narrative** Red shows proposed clearance areas. Yellow shows extent of woodland	**4. Revised woodland cover (ha)**	**5. Woodland within 5 m Impact zone (ha)**
	1.292	1.261	No	Some land around perimeter of roundabout, where vegetation of more of a scrub or grassland character.   	1.01	0.09
	0.189	0 No woodland present	No		0 – no clearance marked in this polygon on Jan clearance plans	N/A

Woodland Reference Red shows proposed clearance areas.	**1. Loss reported in the ES (ha)**	**2. Aspect woodland loss (ha)**	**Do points 1 and 2 Agree?**	**Narrative** Red shows proposed clearance areas. Yellow shows extent of woodland	**4. Revised woodland cover (ha)**	**5. Woodland within 5 m Impact zone (ha)**
						
	0.308	0.3701	No	Largely an area of woodland. Some grass and HS footpath at western edge around sightlines of roundabout.  Streetview of the southern side of the area. 	0.35	0.03