

Botanical Walkover File Note

Ecological Walkover Addendum

Site Address	Borde Hill House & Garden, Borde Hill Lane, Haywards Heath, West Sussex RH16 1XP
Client	Borde Hill
LPA	Mid Sussex District Council
Project Description	Updated ecological walkover to inform amendments to granted planning application DM/24/0433 involving relocation of play equipment to a new area.
National Grid Reference	TQ 32125 26021
Site size	~0.1ha
Visit Date	15 th August 2025

Summary

The proposed development zone contains a species poor, semi-improved Wealden variant on **g3c other neutral grassland**, which in the usual Wealden fashion is typified by poor drainage. This is related to semi-improved, ill drained subtype **MG10**. This has high restoration potential, although what can be achieved may be limited by high nutrient status¹. The obvious direction for restoration is **MG5 Centaurea nigra-Cynosurus cristatus grassland** with a little seasoning from wet grassland subtypes **MG4/8** to capture the Wealden grassland ethos, possibly bringing it towards the **MG5c Filipendula ulmaria subtype** (further exploration of possibilities and suitable species lists will form part of any updated EMEP).

The development area also falls within an area of Ghyll leading from a spring fed pond within a pocket of woodland and feeding the main Ghyll complex within Dinosaur (Spring) Wood. In this section, it has been heavily modified via the creation of a culvert allowing a track and the apparent rationalisation of the banks. The vegetation in this region is no longer representative of a ghyll as it contains terrestrial vegetation such as bracken, brambles and nitrophilic ruderals, amongst members of the wider grassland assemblage. This represents an opportunity for restoration by de-culverting and creating the steep sided earth banks proper to ghylls that are at present absent. In the Ghylls current form, the play interventions would be unlikely to cause any particular harm on account of the features generally depleted ecological status. The only minor issue may be increased sedimentation from erosion (under a scenario of high use), but this can be mitigated via strategic planting to both channel children along desired pathways and act as sediment traps. By integrating the area with existing woodland and using ecologically sensitive blending principles

¹ Should the estate wish to understand nutrient status and the enhancement potential of different areas in depth, soil testing across the estate is recommended to learn which areas are nutrient rich and poor. Phosphorus tends to be the key limitation as this depletes from soil very slowly (over many decades). Alternatively they could experiment by reading the plants. The areas with the highest densities of “nitrophilic” species, like thistles, nettles and docks are likely to indicate areas of higher nutrient status.

the proposal offers an opportunity to install a creative and ecologically beneficial addition to the park.

The site remains unchanged from previous visits and conclusions regarding protected and otherwise important flora and fauna remain unchanged. No further survey work is necessary and precautionary measures as outlined in previous work will be sufficient to reduce the already minor risks to wildlife to negligible.

1.0 Introduction

1.1 Background

Arbtech Consulting Limited was instructed by Borde Hill Gardens to undertake a Botanical Walkover Survey to inform amendments to the above-named planning application.

This File Note is intended to act as an addendum to previous work and is to be read in conjunction with previous work completed on the site, which included;

Ecological Impact Assessment (Arbtech, 2024)

Botanical Walkover of Dinosaur Wood (Arbtech, 2023)

GCN eDNA survey (Arbtech, 2023)

Breeding Bird Survey (Arbtech, 2023)

Non Licenced Water Vole Construction Method Statement (Arbtech, 2024).

Reinventing Borde Hill CEMP/EMEP (Arbtech, 2024)

Statutory BNG Metric (Arbtech, 2024).

1.2 Project

The updated play intervention plan aims to create an area inspired in its planting and topography by principles of Triassic/Jurassic/Cretaceous ecology and proposes the following concepts;

- A wooded landscape containing the likes of ginkgos, conifers, ferns and lush plants.
- Evolution of flowering plants in the Cretaceous
- offers opportunity to mix gymnosperms with angiosperms.
- Using mounding and stone in some areas to replicate the textures of dinosaur scales or bones
- Using adventurous play structures of timber to replicate the skeleton of the dinosaur
- Rocky areas with archaeological digs for footprints and bones

All features will provide elements of structural and habitat interest of benefit to biodiversity.

1.2 Aims

The survey aimed to assess the suitability of a chosen location for new play equipment and provide an updated addendum to the previously submitted suite of ecological works informing the application;

Task	Aim
1 Collect a full species list	List all species in and around the proposed development area (visible at the time of visit), noting Important Plants and axiophytes ² to Determine the presence or likely absence of Important Species. These are defined as any plant species, subspecies or hybrid which is: • Red-listed in England or Great Britain³ • Occurring at fewer than 100 hectad⁴ localities at country or GB

² Axiophytes = "worthy plants". Indicators of habitat considered important for conservation, such as ancient woodlands, clear water and species-rich meadows.

³ Following Stroh et al, 2014 A Vascular Plant Red-list for England. Available at: https://bsbi.org/wp-content/uploads/dlm_uploads/England_Red_List_1.pdf

⁴ Hectad records include records within 10x10km squares. Also see www.bsbi.org/maps

		level (country-scarce / nationally scarce) • Occurring at fewer than 15 hectad localities at country or GB level (country-rare/nationally rare) • Endemic • Scarce or rare at regional, county or local level⁵ • Listed under s.41 National Environment and Rural Communities Act 2006⁶; and/or • Listed under Schedule 5 Conservation of Habitats and Species Regulations 2017 (as amended); and/or • Listed under Schedule 8 Wildlife & Countryside Act 1981 (as amended).
2	Classify the Habitat	Fully (insofar as possible) classify the target habitat/s assisted by both UKHabs and National Vegetation Classification coding. The specific habitats selected for further in-depth classification are; Grassland
3	Assess Importance	Identify the presence of any Important Habitats and their importance at a geographical level (LOCAL, REGIONAL, NATIONAL, INTERNATIONAL), those being. • Listed on local Biodiversity Local Biodiversity Action Plan/list • Habitats-Habitats of Principal Importance (e.g. those under S.41 NERC Act) • Annex 1 Habitats Directive habitats (International importance) • Irreplaceable habitats, which once lost cannot be recreated (Technical note T3 of CIEEM et al, 2019, National Planning Policy Framework 2023, Irreplaceable Habitat Regulations 2024) (International Importance) • Other important (and potentially irreplaceable) habitats such as waxcap grasslands (Local to international importance) • Meets local/county wildlife site criteria.
5	Perform a Baseline Habitat Condition Assessment	Collect data to inform the habitat condition assessment required for BNG calculations.
6	Assess impacts and make recommendations	Assess the risks of the development upon protected and otherwise important species and habitats and make recommendations accordingly.

1.3 Methodology

A walkover of the proposed development area and a 50m radius was carried out to search for evidence/examples of protected or otherwise important flora and fauna. The grassland habitat was sampled as per National Vegetation Classification (NVC) methodology. Five targeted quadrat samples were deployed wherever possible within the grassland. This included samples which were 2x2m, as per standing guidance provided by Rodwell (2006)⁷. Quadrat survey was not extended for stands which are either not suited to the methodology, or easily recognisable, such as the flora of the ghyll feature. This was

⁵ This was ascertained through review of BSBI and British Bryological Society mapped plant distributions.

⁶ Including species which are a conservation priority within England.

⁷ Rodwell, J.S., 2006. *National Vegetation Classification: User's handbook*. Available at: <https://data.jncc.gov.uk/data/a407ebfc-2859-49cf-9710-1bde9c8e28c7/JNCC-NVC-UsersHandbook-2006.pdf>

simply described, and surveyed with reference to a) the UKHabs user manual (UKHabs Working Group, 2018). All plants within the quadrat were recorded alongside an estimation of percentage cover, using the DOMIN scale as illustrated in the table below, or percentage scores (later related back to DOMIN). Percentage totals are permitted to add up to over 100% to factor in the tendency for plants to layer themselves above one another. Measures for frequency during quadrat survey of habitats were calculated using the Domin scale, dependent upon abundance within any given sample. A constancy value of I-V was calculated for all species across all x5 quadrats. The community on site was classified via methodologies and habitat descriptions set out in the National Vegetation Classification (Rodwell, 1998; Rodwell 2006), and the relevant British Plant Communities Volume (Rodwell, various dates). It was then further classified using UKHabs methodology (UKHabs Working Group, 2018) using UK Habitat Classification Version 2.01 (UKHab Ltd, 2023. Remaining habitats (e.g scrub) were assessed via descriptive means alone.

1.4 Limitations

The survey was carried out within a period of extended high temperatures and drought. It is therefore possible that some species may have gone into early dormancy/senescence and been missed, however the Surrey microclimate is such that the landscape in this locale was in much better condition than that elsewhere around the southeast. In addition, grazing had been relaxed for the year and as such the results gained by the surveyor are deemed representative.

2.0 Desk Study

2.1 Site History & Description

A full description and history for the whole site is provided in the EciA and Botanical Walkover Surveys from 2023/4 and for the interests of brevity are not recounted here. The proposed new play location is sited at the northwest corner of Dinosaur Wood/Spring Copse, encompassing semi-improved grassland of only limited botanical value and the sloping banks to a ghyll watercourse feature rising from a spring fed pond ~86m to the northwest which is set within woodland. The ghyll feature has been modified by the culverting of the watercourse underneath trackway between the two sides of the field, installed at sometime since the 1900's. This means flow is restricted to a very minor channel/moves underneath the ghyll in this region, and its unique ecological features have been replaced with bracken and ruderal vegetation. The woodland adjacent to which the play equipment is to be sited was marked as present on 1800's Ordnance Survey as a narrower strip than that present today but is not ancient. The ancient part of the woodland lies ~52m to the east.

2.2 Geology and Soils

The park as a whole hosts a complex geology, with the carpark to the north and the eastern part of the site underlain by mudstone. Sandstone and sand underlie the parkland between the carpark and lake, which itself is underlain by sands, silts and mudstones up to the northern pond around Dinosaur Wood, which is underlain by clays and mudstones to the east, sandstone to the west and a calcareous sandstone strip along the plateau to the far eastern edge. The overlying soils are slightly acid, loamy, and clayey ones with impeded drainage and moderate fertility, suited to a wide range of woodland and pasture types.

The proposed new play location is situated within a relatively complex zone of transition (Illustrated in **Figure 1**) shifting in the south west through the mudstone of the Lower Grinstead Clay, through the calcareous sandstone of the Cuckfield stone bed at the Ghyll crossing and back through to the Lower Grinstead Clay, beyond which (and away from the proposed play area is a small lens of upper Tunbridge Wells sand, before on ascending the slope back to the plateau beyond the Ghyll a return to the Ardingly Sandstone Member which occupies much of the site. This point marks a geological change from a predominantly acid geological northern scene to a predominantly calcareous one south of the ghyll feature. However, the soils overlying all pictured areas as according to Soilscales a homogeneous scene of slightly acid loamy and clayey soils with slightly impeded drainage.

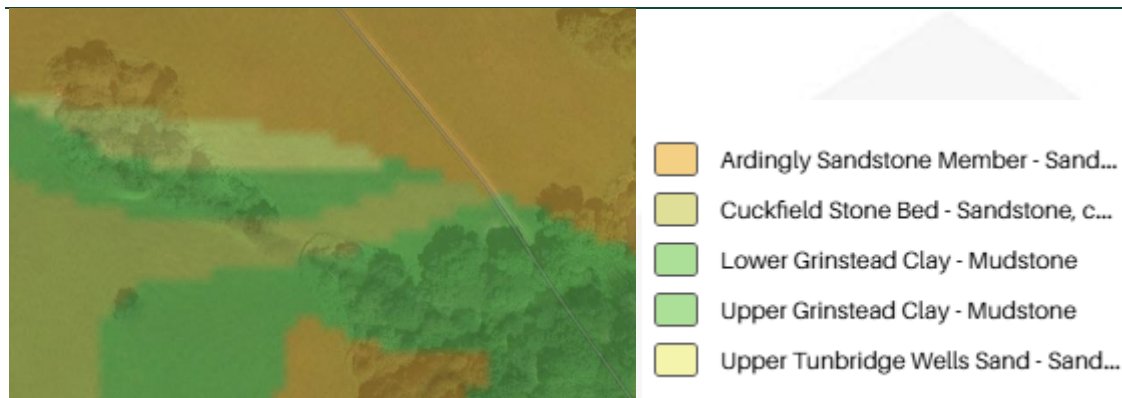


Figure 1 - Site Geology, BGS (2025).

3.0 Field Survey Results

The site has undergone no particular material changes since the author's last visits and the conclusions within their previous work still stand. However, the grassland around the site was not studied in particular depth in previous work, as no visits took place in the optimal period for surveying grassland and the repeat visit provided an opportunity to address this, at least in the location of the proposed works. As part of previous recommendations, the author recommended the estate take a "wait and see" approach before applying any major enhancement interventions to the grassland, so they could properly understand their communities. When the author visited in August 2025, the park had followed this advice and left all grass to grow long and a botanist is to investigate the site in the coming weeks. This allowed a much more detailed assessment (to include assessment via distant views) than was previously possible under its grazed status and the grassland in and around the proposed development area is described and analysed below.

3.1 Habitat Description & Condition Assessment Grassland

The grassland comprises a **pasture**. It is usually maintained at a **homogenous** sward height of **around 10 50cm** via moderate **intensity grazing by sheep** but is at present being left unmown as part of an experiment in seeing what comes up. This was a recommendation made by the author in the 2023/2024 round of works to ensure any decisions to overseed or create new habitat are ecologically appropriate.

The sward is **dense and in general structurally homogenous**. There was **no thatch**, and the sward was only partially closed, providing some opportunities for smaller species, poor competitors. and the setting of seed. There is **very little (~1%) bare ground** created by **mole hills**. Physical damage from **vehicular rutting/livestock poaching/erosion/compaction/dumping** and/or impacts of mismanagement is **not present**. No ant hills present.

The community visible at the time of survey comprised a **species poor (<15sp per/m²)** assemblage of **18 species** distributed at **6-9sp/m² (Average 7.4)**. The sward was very much a grass dominated one with a ratio of grass to **herbs** of approximately **95:5**. It contained **x4 indicators of Lowland Meadow**. Negative indicator species occupied **<10%** and there were **no invasive species**. Bracken is not **problematic (<20%)**, with encroachment restructured to the ghyll feature. Scrub is **not an issue**.

As an aside, it is noted that away from the proposed development area the negative indicator status changes profoundly, with creeping thistle occupying ~30% of the field to the south of the Ghyll, which is a situation which can be improved with appropriate management.

The below community description takes from both the quadrat data and the community members observed elsewhere.

Community Description

Constant/Dominant (NVC Constancy Class IV/V)

Grasses – Yorkshire fog *Holcus lanatus*, common bent *Agrostis capillaris*, rough meadow grass *Poa trivialis*
Forbs curled dock *Rumex crispus*, white clover *Trifolium repens*, creeping buttercup *Ranunculus repens*

Frequent (NVC Constancy Class III)

Grasses – Perennial ryegrass *Lolium perenne*

Occasional (NVC Constancy Class II)

Grasses – sweet vernal grass *Anthoxanthum odoratum*, creeping thistle *Cirsium arvense* **Forbs** tufted vetch *Vicia cracca*.

Rare (NVC Constancy Class I)

Grasses – Timothy grass *Phleum pratense*

Forbs – Common agrimony *Agrimonia eupatoria*.

The sampled area, encompassing around 50m from the ghyll was exceptionally species poor. Elsewhere across the wider field, other forbs were present and relatively widespread, although nowhere did they occur at a relative abundance of more than occasional. These included wild carrot *Daucus carota*, birds foot trefoil *Lotus corniculatus*, greater birds foot trefoil *Lotus pedunculatus*, common fleabane *Pulicaria dysenterica*, meadow vetchling *Lathyrus pratensis*, red clover *Trifolium pratense*, common agrimony *Agrimonia eupatoria*

The survey took place in the optimal period for surveying the habitat type and there are no caveats to the above relating to visibility of species and reliability of the data thus collected.

Using the field key in Rodwell,

The results were ran through MAVIS 2016 twice. First accounting for solely the surveyed area and the second accounting for the additional species found elsewhere, set at a frequency of 2 or 3, to best account for their observed relative abundance around the site. Both data sets returned high confidence (>50) returns for **g4 modified grassland community MG7b *Lilium perenne* leys and related grasslands *Lolium perenne*-*Poa trivialis* leys.**

MAVIS run 1	MAVIS run 2
NVC: MG7B 55.36	NVC: MG7B 55.36
NVC: MG10b 49.54	NVC: MG10b 49.54
NVC: MG10a 49.14	NVC: MG10a 49.14
NVC: MG7 48.50	NVC: MG7 48.50
NVC: MG7A 48.12	NVC: MG7A 48.12
NVC: MG10 47.23	NVC: MG10 47.23
NVC: MG7C 46.29	NVC: MG7C 46.29
NVC: MG7D 45.50	NVC: MG7D 45.50
NVC: MG15 44.17	NVC: MG15 44.17
NVC: MG15b 43.17	NVC: MG15b 43.17

MG7b is a slightly more species rich sward than MG7a (the most recently/intensively improved of grazing leys) and it bears a general resemblance to the semi-improved ***Lolio-cynosuretum* (MG6)** to which it can be converted under a permanent pasture regime. Here it is clear the pasture is permanent and whilst species poor, it is clear that inputs probably ceased at least 20 years ago as *Lolium perenne* occurred at a frequency of just 2 and a cover of only 1-3, rendering it only a minor part of the sward.

The author considers it likely that these results were biased by the fact this corner of the site was exceptionally species poor and were a full field NVC survey carried out, the results would likely indicate a “going back” scenario to a poor semi-improved (**g3c other neutral grassland**) scenario. Interestingly, MG6 is entirely absent from the results and this is likely to be the result of a lack of crested dogs tail *Cynosurus cristatus*. But what does appear at high confidence is MG10 *Holcus-Juncus* neutral grassland. This tallies with the edaphic situation of impeded drainage and hints at a Wealden local variant characterised by wet grassland indicators such as *Lotus pedunculatus*. However, whilst there is some creeping bent *Agrostis stolonifera* which typifies this community, overall, the community is not a good fit for MG10.

Using UKHabs coding and habitat descriptions (UK Habs Ltd, 2023), the following assesses the parcels conformation or lack thereof with higher distinctiveness/ **Section 41 Habitat of Principle Importance** acid, neutral and calcareous grasslands and lowland meadow classifications. If the parcel/s do not conform it is then tested against moderate and low distinctiveness grassland subtypes.

To qualify under level 4 high distinctiveness grassland classifications **g1a lowland dry acid grassland g2a Lowland calcareous grassland or g3a/b lowland meadow**, the community would need to adhere to the following criteria;

Meet at least two of the following;

1. >15 sp/m² (>12 for acid grassland) (including grasses and excluding bryophytes). **FAIL**
2. >30% cover of broadleaved herbs and sedges, excluding *Trifolium repens*, *Ranunculus repens* and injurious weeds. **FAIL**
3. <10% cover of rye grasses and *Trifolium repens*. **PASS**

AND EITHER 4 OR MORE (2 OR MORE FOR g2A) of listed indicators at least 'present' on the DAFOR scale
Lotus pedunculatus, *Lotus corniculatus*, *Lathyrus pratensis*, *Agrimonia eupatoria*

OR THREE OR MORE (1 OR MORE FOR g1A) of these indicators at least 'occasional' on the DAFOR scale (but not limited to field corners or edges).
Lotus pedunculatus, *Lotus corniculatus*, *Lathyrus pratensis*, *Agrimonia eupatoria*

The grassland habitats on site fail two of the criteria based on being species poor and being rather grass dominated but do pass on cover of rye grass and white clover. The grassland as a whole passes on indicator species (although not in the surveyed area).

Whilst P2 meets the criteria for indicator species, it and the remaining parcels fail the core criteria by passing only one and therefore the site does **NOT** qualify as **Lowland meadow**.

To qualify under the next option, level 4 moderate distinctiveness grassland classifications **g3a neutral grassland**, the community would need to be; a neutral grassland that does not meet the definition of either g3a or g3b AND that meets at least **THREE** of these **FOUR** criteria;

1. >20% cover of broadleaved herbs and sedges **FAIL**
2. >8sp/m² (including forbs, grasses, sedges and rushes and excluding byophytes) **FAIL**
3. 1 or more grass species not generally sown for intensive agricultural production (i.e *Lolium perenne*, *Phleum pratense*, *Dactylis glomerata*, *Lolium pratensis* is at least abundant. **FAIL**
4. Cover of rye grasses *Lolium spp.* and white clover *Trifolium repens* where present is <30%. **PASS**

Separately from the above criteria, a neutral grassland that meets the criteria for waxcap grassland (Secondary code 130).

The grassland across the site meets **ONE** of the **FOUR** criteria and therefore using it strictly **DOES NOT** qualify as **g3c other neutral grassland**.

However, when one applies the **Low distinctiveness grassland condition assessment criteria**, this specifically states that "where the vascular plant species present are characteristic of medium, high or very high distinctiveness grassland, OR there are 9 or more of these characteristic species per m2 please review the full UKHab description to assess whether the grassland should instead be classified as a higher distinctiveness grassland.

In this case the grassland as a whole contains a number of indicator species of Lowland Meadow and neutral grasslands, plus the *Lolium* percentage is low. So also fitting closely neither to MG6 or MG10, it can be asserted that this grassland in this part of the site fits into a Wealden specific variant on a species poor, ill drained semi-improved grassland that conforms to **g3c other neutral grassland**.

Medium Distinctiveness Grasslands Condition Assessment Sheet

- A. "The parcel represents a good example of its habitat type, with a consistently high proportion of characteristic indicator species present relevant to the specific habitat type (and relative to Footnote

3 suboptimal species which may be listed in the UKHab description). Note - this criterion is essential for achieving Moderate or Good condition for non-acid grassland types only."

FAIL – Indicator species few and at low abundance (None in and around development zone, x4 elsewhere occurring as occasionals).

- B. Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20% is more than 7 cm) creating microclimates which provide opportunities for insects, birds and small mammals to live and breed.

FAIL – homogenously long at present but homogenously short when grazed

- C. Cover of bare ground is between 1% and 5%, including localised areas, for example, rabbit warrens².
PASS

- D. Cover of bracken *Pteridium aquilinum* is less than 20% and cover of scrub (including bramble *Rubus fruticosus* agg.) is less than 5%.
PASS

- E. "Combined cover of species indicative of suboptimal condition³ and physical damage (such as excessive poaching, damage from machinery use or storage, damaging levels of access, or any other damaging management activities) accounts for less than 5% of total area. If any invasive non-native plant species⁴ (as listed on Schedule 9 of WCA5) are present, this criterion is automatically failed."

PASS

Additional Criterion - must be assessed for all non-acid grassland types

- F. "There are 10 or more vascular plant species per m² present, including forbs that are characteristic of the habitat type (species referenced in Footnote 3 and 5 cannot contribute towards this count). Note - this criterion is essential for achieving Good condition for non-acid grassland types only."

FAIL

For non acid grassland types

Passes 5 or 6 criteria, including essential criterion A and additional criterion F.

Good (3)

Passes 3 - 5 criteria, including essential criterion A.

Moderate

(2)

"Passes 2 or fewer criteria;

OR

Passes 3 or 4 criteria excluding criterion A and F."

Poor (1)

The site passes 3 criteria but fails essential criterion A and additional criterion F and is therefore assessed as being in **POOR** condition

3.2 Habitat Description & Condition Indication - Ghyll

The Ghyll area is dominated to the east by a dense and impenetrable cover of bramble *Rubus fruticosus* agg and bracken *Pteridium aquilinum*, and in the understory creeping buttercup *Ranunculus repens*, whilst the western part, associated with the trackway contains rank grassland dominated by creeping thistle *Cirsium arvense arvense* with frequent cocksfoot *Dactylis glomerata*, ragwort *Jacobaea vulgaris*, common hogweed *Heracleum sphondylium* and silverweed *Argentina anserina*. The remaining forbs are ones typical of the grassland elsewhere, with representation mainly coming from scrambling legumes such as birds foot trefoil, tufted vetch *Vicia cracca*, meadow vetchling *Lathyrus pratensis*, greater birds foot trefoil and scattered herbs such as cats ear, self-heal *Prunella vulgaris*, dandelion and agrimony *Agrimonia eupatoria*, dandelion *Taraxacum* agg. Together, this assemblage paints a picture of a nutrient enriched substrate which may have impeded drainage but only rarely holds water. This is the exact botanical scenario one would expect of the course of a culverted/heavily modified stretch of former watercourse. It was not possible to inspect the remaining watercourse at the bottom due to the density of vegetation. Trees within the ghyll include oak *Quercus robur*, rowan *Sorbus aucuparia*, hawthorn *Crataegus monogyna*

3.3 Important Species

No important species or evidence of them were found in or around the proposed development area. Conclusions re protected and otherwise important species of flora and fauna are not markedly different from those drawn last time and the specific location of the interventions is not considered high risk.

4.0 Conclusions, Impacts and Recommendations

4.1 Habitats

The grassland likely has high restoration potential, however, there are clearly issues with nutrient enrichment in places, hence the proliferation of thistles in parts of the site. High Phosphorous levels may limit what can be achieved on site without high intervention strategies such as topsoil stripping. Soil testing would be beneficial should the estate decide they would like to better understand what is achievable across the site using both high and low intervention strategies.

However plants often provide good clues themselves, and it can be reasonably asserted that the areas containing the most thistles are likely to be the poorest performing parts of the site in terms of enhancements. Such areas could be appropriate sites for topsoil stripping experiments. In any case, unless the estate were willing to commit to a re-wilding experiment similar to that of Knepp⁸, permitting the thistles to proliferate is likely to cause issues.

The ghyll feature is currently not functioning as it should be due to the modifications it has received in converting it to a navigable track. As such, the proposals would likely have a beneficial impact by clearing the ruderal vegetation, bramble and scrub. The proposals will also be designed to replace this with a more “ghyll appropriate” planting scheme. Of even greater benefit would be for the estate to restore this feature by reconnecting its hydrological functionality if deemed practical to do so.

As the proposal involves use of the slope into the ghyll feature for play, this does invite a risk of erosion and mobilisation of suspended solids. The risk to the watercourse is mitigated by the fact this section is not currently functioning as a water course due to the culverting, however planting in a way that channels children along desired paths across it and away from any functioning watercourse either side will further mitigate risk, with strategic planting also aiding in capturing any sediment thus generated.

BNG

It is possible the BNG calculations will need to be amended to account for the new play intervention, but this depends if it counts as a real world loss of habitat. If installation could be as low intervention as possible it may be possible to argue that this is not required.

It should be noted that works within 10m of a watercourse generally require a River Condition Assessment to inform the watercourse element of the BNG. This would represent an additional site visit cost. However conducting an accurate RCA here will be very difficult due to how densely vegetated the ghyll feature is. Accessing it for proper inspection of a reach (~5x 10m) would require vegetation clearance and that seems disproportionate just to allow a survey to be conducted.

⁸ At Knepp, in converting their arable farm to grazed, unenclosed pastures and semi-natural habitats, an explosion of creeping thistles was the initial outcome across the whole estate. This being a “noxious weed” this caused an initial panic, but in spite of complaints from their farming neighbours, they held their nerve and commitment to allowing natural processes to happen. They were eventually treated to a phenomenon rarely seen in the UK. From time to time we receive mass migrations of painted ladies, whose favoured caterpillar food plant is creeping thistle. One year, such an event happened at Knepp and the caterpillars cleared the entire estate of creeping thistle, which from that moment on ceased to be an issue. This provided a valuable insight into a natural “boom and bust” population dynamic of creeping thistle we simply never get to experience in an agricultural landscape where on arable land in particular, it is generally controlled to avoid neighbour complaints and subsequent control orders under the 1954 Weeds Act.

See <https://the-past.com/comment/sherds-ca-414/> Also, the book Wilding by Isabella Tree would be a valuable read as it will provide inspiration for concepts that may be achievable at Borde Hill.

As such, in terms of BNG, considering an in depth assessment has already taken place and a good plan for enhancements is already in place, it seems to the author to be overkill to tweak this for one alteration. Before committing to BNG changes, the author advises Borde Park to discuss the possibility of dealing with this via bespoke LPA agreement.

4.2 Flora and Fauna

Realistically, the play interventions within both the field and ghyll are low intervention and whilst there is a risk that herptiles (common amphibians and reptiles) and larger mammals like badgers may be present on site and pass through the development area (at risk of injury), any such risk can be easily mitigated via the measures already outlined in the CEMP (Arbtech, 2023). Water vole are unlikely to be of particular issue here considering the broken nature of the watercourse in this location and its general lack of water. Dormice, evidence of which has been recently found nearby represent the only risk, but the affected habitat (predominantly bracken and some bramble) is fragmented from the ghyll vegetation along the path, limiting this sections value to them for commuting purposes. The loss of cover in this area will not have material impacts on use of the site by this species and realistically, supervision of the removal of bramble/bracken should be sufficient to mitigate any risk.

4.3 Enhancements

Since the author's last visit to the site, they have visited many more similar sites across Surrey and the UK, including the Atlantic Rainforests of Wales and Scotland. The Weald shares with these places a (geographically errant) Atlantic microclimate and it is the authors opinion that the ghyll feature could be enhanced using species characteristic of these places, many of which will contribute positively to the "Jurassic ethos" the team aim to achieve.

In addition some morphological changes could be explored within the ghyll feature. It is difficult to assess its morphology properly considering the dense vegetation but this appears to have been modified into a gentler slope. If this is the case it could be beneficial to alter the banks into something more reminiscent of a true ghyll, which due to the actions of water cutting through mudstone tend to have steep, bare clay banks over which ferns and liverworts find a suitably humid substrate. It would also be beneficial to re-tree the feature and reconnect the fragmented sections of woodland around it as this will raise local humidity. Elsewhere along the Ghyll feature, some thinning of trees may be beneficial to allow in a little more light (and better access).

In this location, helping vegetation of banks along would be rendered easy by the clay. Some examples of moss and liverworts from within Dinosaur Wood could very easily be translocated to the site by simply sticking them to the bank. Whilst the Wildlife Trust were historically very clear on their objection to any form of translocation regarding woodland indicator species, it is the authors belief that spreading some of the more common and widespread bryophytes to different locations would not cause harm to existing populations, nor come with an unacceptably high risk of failure.

Were the estate to choose to restore the Ghyll in this location, it would be a welcome addition to add a stone bridge so an access track could be retained. If constructed out of a sandrock (the locally appropriate stone, and one which characterises parts of the Weald), this could be encouraged to vegetate naturally with locally appropriate wall ferns and bryophytes.

A series of photographs on the next page are taken from a Ghyll running through Stumblewood common as inspiration for what the ghyll feature could be made to look like. There are also some photos taken from Atlantic rainforest sites in Scotland for further planting inspiration.



Figure 1: A typical steep sided ghyll bank

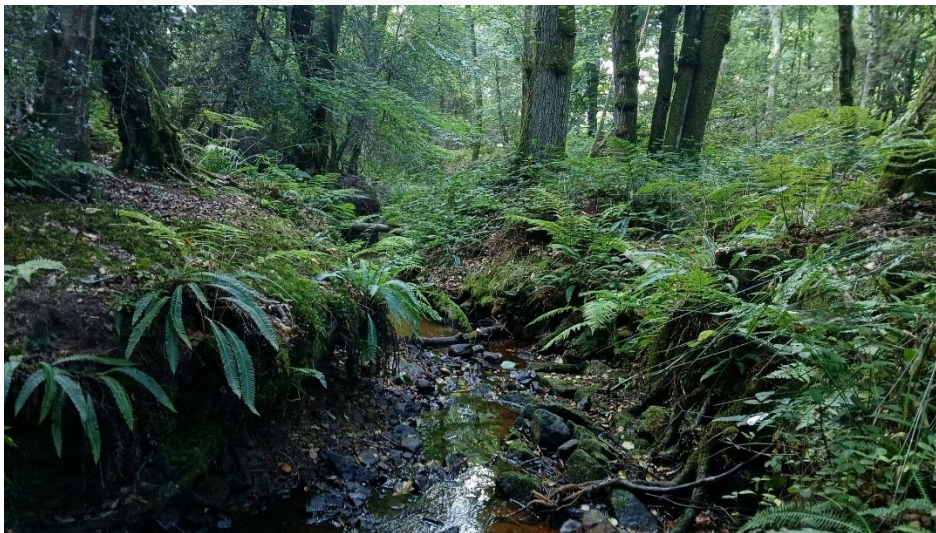


Figure 2: An in channel view, demonstrating how ferns tend to cling to the clay edges allowing their fronds to overhang and benefit from the raised humidity within this microclimate. Hard fern *Blechnum spicant* is a key feature.



Figure 3: An illustration of how liverworts (and towards the top mosses) tend to extensively colonise the vertical clay banks. Iron hued water and muds may arise depending on the nature of the geology.

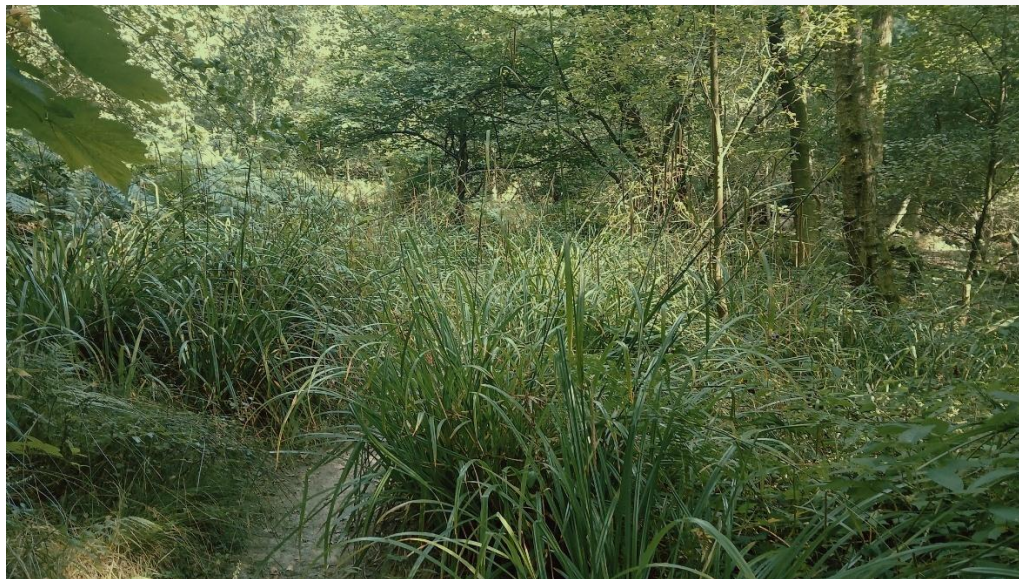


Figure 4: A stand of pendulous sedge *Carex pendula*. This robust and vigorous species is ideal for creating a Jurassic theme. It would be perfect for children to play amongst and would also be ideal for creating pathways and boundaries as it is large and not easily destroyed by trampling. It is however a vigorous species and its spread may need to be controlled.

Other species fulfilling the joint aims of biodiversity enhancement and a Jurassic aesthetic.



Harts tongue fern *Asplenium scolopendrium* on a Ghyll in Surrey.



Hay scented buckler fern *Dryopteris aemula* A species with usually a northern distribution with errant populations in The Weald.



Male/golden scaly male/Borrer's fern *Dryopteris filis-mas/affinis* look excellent hanging over banks as here in Taynish NNR, South West Highlands, Scotland (Here the ferns reach impressive size due to the high humidity).



Alternatively it looks good in its upright shuttlecock form. A robust species that could likely withstand some trampling, although not excessively.

Another native species which would create the desired vibe could be great horsetail *Equisetum telmateia*, which growing up to 6foot high, and with its striking zebra stripe stem patterning cuts a striking visual paired with pendulous sedge and ferns.



Regarding non-native choices it will be prudent to exercise caution and avoid introducing anything that may spread into the woods, however some tree choices will be in keeping as is already recommended. Australian

Tree ferns e.g *Dicksonia antartica* would cut an imposing and impressive figure in the parkland, particularly once mature.



Species of Fern recorded in Surrey

The following species have all been recorded within the Surrey Weald;

Tunbridge Filmy-fern: *Hymenophyllum tunbridgense* - First discovered at the High Rocks in the High Weald in 1686.

Hart's-tongue Fern: *Asplenium scolopendrium* - Walls and calcareous earth

Black Spleenwort: *Asplenium adiantum-nigrum* - Walls.

Maidenhair Spleenwort: *Asplenium trichomanes* - Walls.

Wall-rue: *Asplenium ruta-muraria* - Walls.

Polypody: *Polypodium vulgare* agg. – Walls

Maidenhair Fern: *Adiantum capillus-veneris* -

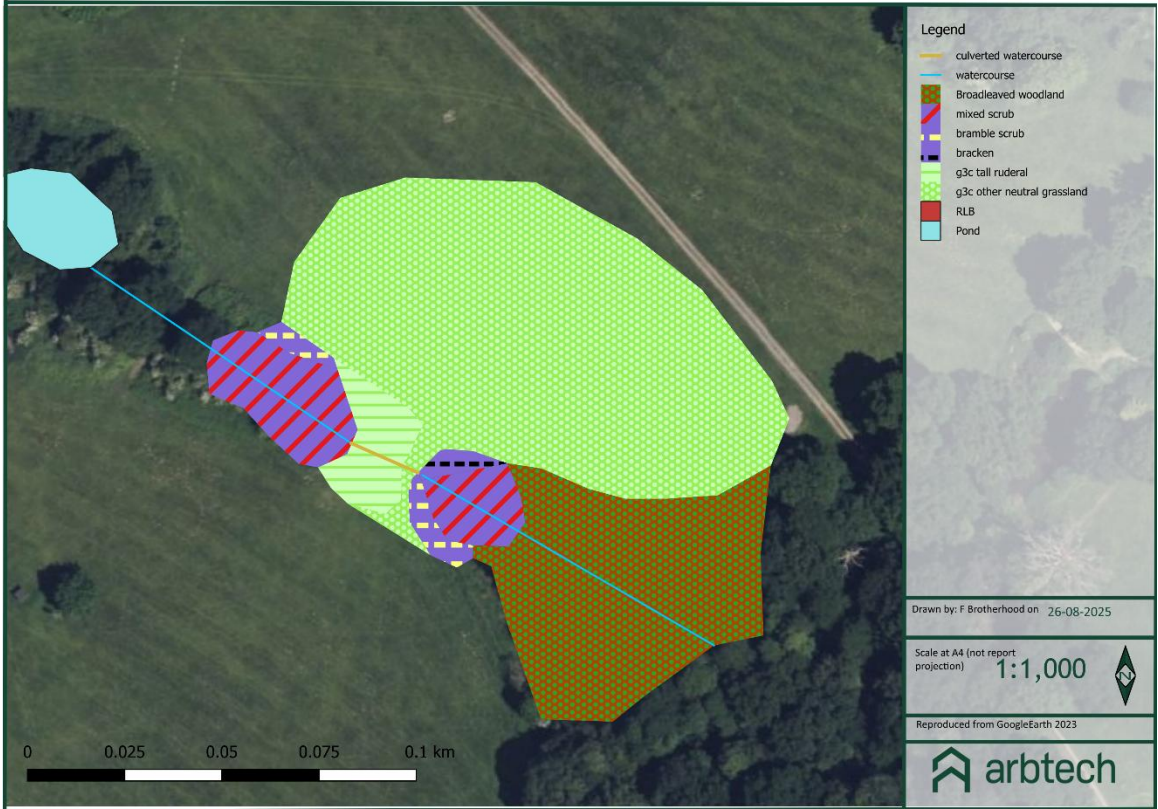
Borrer's male fern: *Dryopteris borrieri*

Hay scented buckler fern *Dryopteris aemula*

Broad buckler fern *Dryopteris dilatata*

Lady fern *Athyrium filix-femina*

Appendix 1: Habitat Map



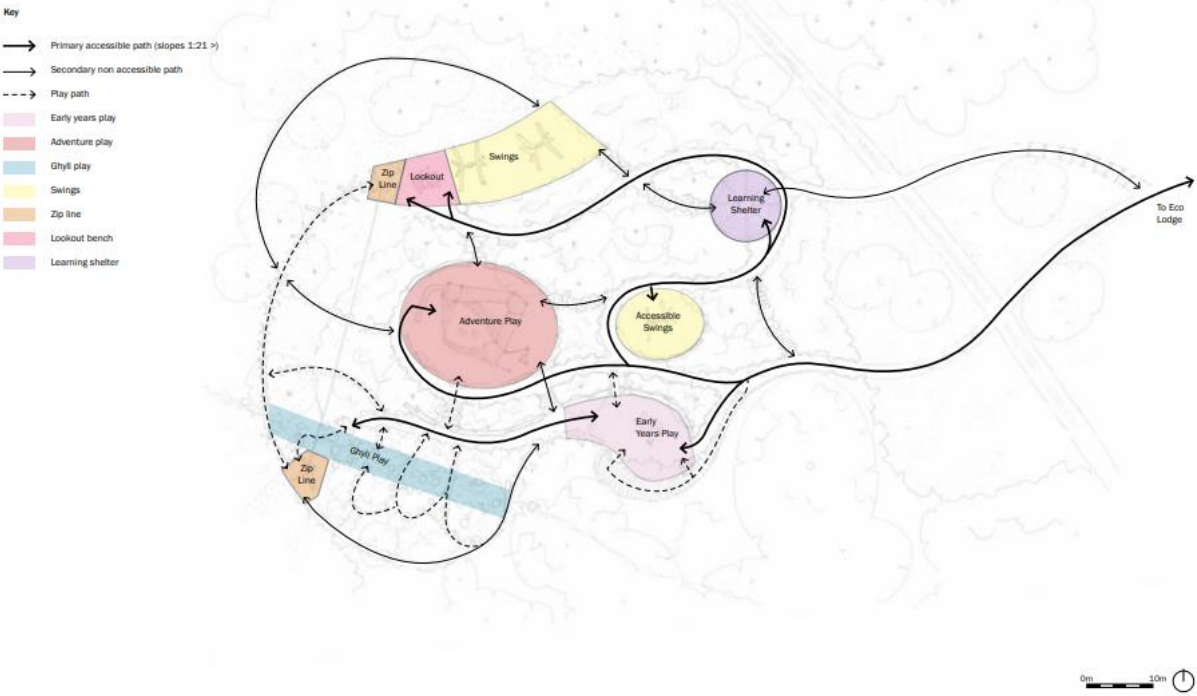
Appendix 2: Site Location





Appendix 3: Plans

Concept Design
Zoning and Circulation Layout



Concept Design
Play Concept Plan

- Notes
- 1. Primary accessible path from Eco Lodge.
 - 2. Secondary non accessible path forming loops.
 - 3. New specimen parkland trees in pasture.
 - 4. New parkland tree belt/grove to screen views looking south from the Borde Hill House.
 - 5. New biodiverse plant community to either reflect the Cretaceous period or blend in with the parkland pasture using wildflower meadow.
 - 6. Proposed Ginkgos or conifer tree planting to reflect the Cretaceous forests.
 - 7. Tall swings which swing over planting below.
 - 8. Lookout bench.
 - 9. Integrated zip wire deck.
 - 10. Dinosaur tail traverse.
 - 11. Natural Ghyll play, with stones and boulders.
 - 12. Existing scrub retained and enhanced with new coppice trees and fern understorey.
 - 13. Balance log beams across Ghyll.
 - 14. Play paths weaving through coppice.
 - 15. Scramble play up slope between Ghyll and Adventure play.
 - 16. Long slide.
 - 17. Rope play.
 - 18. Adventure play tree forms.
 - 19. Beam benches forming informal seats and holding back levels.
 - 20. Early years slide and route up.
 - 21. Woven dinosaur tail play den.
 - 22. Accessible swing.
 - 23. Learning shelter for school groups.



Appendix 4: Site Photographs.

Site Photos



Parcel 1: Development area viewed from north



Parcel 2: development area



Parcel 3: South side of the Ghyll



Parcel 4: Culverted/modified part of ghyll dominated by ruderals

	
Parcel 5: Modifications associated with ghyll	Parcel 6: Dense bracken in ghyll (to be cleared for development area).
	
Parcel 1: ruderal dominated banks of ghyll	

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