

PROPOSED ANAEROBIC DIGESTION FACILITY AT ASHTON KEYNES

Biodiversity Net Gain (BNG) Assessment
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Summary

While the provisions of the Environment Act 2021 have yet to be enacted through secondary legislation, the Act provides a useful definition and expectation of the future requirement for biodiversity gain in planning. The Act describes Biodiversity [Net] Gain objective as having been met '*...if the biodiversity value attributable to the development exceeds the pre-development biodiversity value of the onsite habitat by at least...10%*'.

This project is likely to deliver an increase in the habitat biodiversity value of the site of up to **19%** and in the linear habitat (hedgerow) an increase in biodiversity value of the site of up to **102%**. By demonstrating a level of enhancement at or greater than a 1% change the proposed development, in line with recent caselaw, is considered to satisfy the current requirement for biodiversity enhancement under the National Planning Policy Framework¹. The level of net gain also satisfies the future ambition of 10% BNG set out within the Environment Act.

The biodiversity gain identified within this report is subject to the development of landscape planting plans and site management plans to secure the predicted level of biodiversity delivery.

¹ Ministry of Housing, Communities & Local Government (2021). National Planning Policy Framework.

1.0 INTRODUCTION

SLR Consulting Ltd (SLR) was commissioned by Acorn Bioenergy Limited to undertake an evaluation of biodiversity performance and to undertake a Biodiversity Net Gain (BNG) assessment or BNG Plan for the proposed development located north of Ashton Keynes in Wiltshire (herein known as the 'Site').

The purpose of this BNG Plan is to inform the relevant planning authority of the biodiversity gain outcome.

1.1 Site Location & Description

The Site extends to approximately 7 hectares and is situated adjacent to Ashton Road on the eastern site boundary (National Grid Reference: SU 03988 96081). The Site and survey boundaries can be seen on **Drawing 1 – Habitat Plan**. The Site comprises agricultural land and encompasses two entire fields. It is bounded by further agricultural fields to the north, west and south, with the remaining eastern boundary bordering Ashton Road. The fields are bounded by hedgerows.

The nearest site designated for its ecological interest is Cotswold Water Park Site of Special Scientific Interest (SSSI), which surrounds the Site approximately 300m to the east, south and west and comprises a former gravel workings designated for its diverse assemblage of breeding birds.

1.2 Proposed Development Summary

The proposed development would import and treat in the region of 91,000 tonnes of feedstock per annum from the applicant's landholding and local farms, which would undergo a process of controlled decomposition (anaerobic digestion) within the Anaerobic Digestion (AD) facility. This anaerobic digestion generates biogas, which is upgraded on site into biomethane, before being removed by tanker to a central facility for injection into the national grid. The AD facility would have the capacity to produce approximately 9,711,888 Nm³ of biomethane per annum.

The feedstock would typically comprise the following:

- energy crops such as silage, rye, maize and grass;
- straw;
- slurry; and
- poultry litter and farmyard manure.

In addition to the biomethane, the AD process also produces a nutrient rich solid fertiliser and soil conditioner and a liquid fertiliser (digestate), which would be used on local farms in place of raw manures and artificial fertilisers.

The AD process would also result in the production of carbon dioxide (CO₂) as a natural by-product. This by-product is usually vented by AD plant operators, for whom the main goal is the production of biomethane. However, as CO₂ is a precious resource, the proposed AD plant would be fitted with equipment to upgrade the CO₂ to 99.9% purity, suitable for almost all industrial and commercial applications in the UK. Upgraded CO₂ would be liquefied and transported by road to end users within the market area. The proposed AD facility would capture approximately 14,681 tonnes of CO₂ a year.

The proposed layout can be seen at the end of this report (Drawing 2).

1.3 Purpose of this Report

This report is intended to provide the planning authority with sufficient information on the biodiversity performance of the proposed development to inform consideration of the planning application and specifically alignment of the application with the relevant planning policy.

1.4 Other supporting documents

This report is supported by a number of other documents or figures, including:

- Current Habitat Baseline Mapping (Drawing 1).
- Proposed Landscape Strategy (Drawing 2).
- Summary outputs or results from use of Natural England's Biodiversity Metric 3.1².

1.5 Relevant Policy and Legislation

1.5.1 Environment Act 2021

The Environment Act (the Act) gained Royal Assent on 9 November 2021 and is now enshrined within UK law. The Act provides a mechanism for implementing Government's ambitions for 'improving the natural environment', which were previously set out in publications including the 25 Year Environment Plan. The Act provides recognition of the 25 Year Environment Plan as the first "environmental improvement plan" which will, once the relevant regulations come into force, be used as the basis for understanding the steps Government intends to take to improve the natural environment.

The Act implements the ambitions for an improved natural environment, by setting out statutory or legal requirements which mandate action, under the oversight of the newly formed Office for Environmental Protection (OEP). The focus of the Act is the "...provision [of] targets, plans and policies for improving the natural environment..." and its requirements are structured around a number of broad themes.

Of relevance to this report Part 6 of the Act sets out provisions for 'Biodiversity gain as condition of planning permission'. Once enacted, amendments to the Town and Country Planning Act 1990 will in future (expected to be by November 2023) require planning applications to be supported with additional information on the change in the biodiversity value attributed to a project, with biodiversity metric calculations, and with biodiversity gain plans. Planning authorities will be required to consider these submissions in the exercise of their planning functions, to ensure that they are secured, approved and where relevant registered.

While the Environment Act is now part of UK law, its required actions do not commence either directly or immediately, for all parties. There remain a range of preparatory actions that need to be undertaken before further implementation of the wider legal framework (secondary legislation or regulations) will take place.

1.5.2 National Planning Policy Framework

A summary of national planning policy relevant to (onshore) biodiversity in England and Wales is provided below. Note that the summary provided here is intended for general guidance only and the original policy documents should be consulted for definitive information.

For local planning policy relevant to biodiversity the relevant local plans should be consulted.

² Natural England (2022). [The Biodiversity Metric 3.1 - JP039 \(naturalengland.org.uk\)](https://naturalengland.org.uk/biodiversity-metric-3-1-jp039)

National - The National Planning Policy Framework (NPPF), 2021

The National Planning Policy Framework (NPPF)³ sets out guidance for local planning authorities and decision makers on how to apply planning policies when drawing up plans and making decisions about planning applications. Along with Government Circular 06/05⁴, the broad policy objectives in relation to the protection of biodiversity and geological conservation in England through the planning system are set out. Specific policies relating to habitats and biodiversity are set out in paragraphs 174 and 179-182 of the NPPF.

Paragraph 174 states that:

“Planning policies and decisions should contribute to and enhance the natural and local environment by:

a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan); ...

d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures; ...”

Paragraph 180 of the NPPF states that:

“When determining planning applications, local planning authorities should apply the following principles:

a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused; ...

c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists; and

d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate.”

1.5.3 Local Planning Policy

Wiltshire Core Strategy⁵

Core Policy 50: Biodiversity and Geodiversity

“Biodiversity enhancement:

*All development should seek opportunities to enhance biodiversity. Major development in particular must include **measures to deliver biodiversity gains** through opportunities to restore, enhance and create valuable habitats, ecological networks and ecosystem services. Such enhancement measures will contribute to the objectives and targets of the Biodiversity Action Plan (BAP) or River Basin/ Catchment Management Plan, particularly through landscape scale projects, and be relevant to the local landscape character.*

North Wiltshire Local Plan⁶

NE11 Conserving Biodiversity

³ Ministry of Housing, Communities & Local Government (2021). National Planning Policy Framework.

⁴ Office of the Deputy Prime Minister (2005). ODPM Circular 06/2005. Government Circular: Biodiversity and Geological Conservation – Statutory Obligations and their Impact within the Planning System.

⁵ [untitled \(wiltshire.gov.uk\)](#)

⁶ [Microsoft Word - Written Statement Local Plan 2011- Adoptable Version.doc \(wiltshire.gov.uk\)](#)

Development proposals should ensure that species and habitats set out in the UK and local biodiversity action plans will be protected, and where possible, enhanced to help deliver BAP targets.

Development which would adversely affect, directly or indirectly, the biodiversity of the district will only be permitted when mitigating measures can be provided to retain and reinstate the level of biodiversity value. In order to achieve this, conditions and/or planning obligations will be used.

Appropriate management will also be encouraged through use of conditions, planning obligations and/or by entering into management agreements with landowners and developers, where appropriate

6.30 The UK BAP priority habitats that are found in North Wiltshire include:

- 1. Ancient and/or species rich hedgerows*
- 2. Caves and natural rock exposures*
- 3. Cereal field margins*
- 4. Eutrophic standing waters*
- 5. Lowland calcareous grassland*
- 6. Lowland meadows*
- 7. Lowland wood-pasture and parkland*
- 8. Reedbeds*
- 9. Wet woodland*

*6.31 Developers will be expected to submit an assessment of the ecological effects of their development proposal. If required, there should be a programme of avoidance, mitigation and management, that results in at least no net loss for biodiversity and **a net gain** where possible. Developers should seek opportunities for biodiversity gain; for example by the provision of land for creation of suitable habitats such as wetlands.*

2.0 Key Concepts

2.1 Overview

Natural England advise that Biodiversity Metric 3.1 *“can be used or specified by any development project, consenting body or landowner that needs to calculate biodiversity losses and gains for terrestrial and/or intertidal habitats. It will be this metric that underpins the Environment Bill’s provisions for mandatory biodiversity net gain in England...”*. It has become the standardised way of describing biodiversity change in England, noting that there are a limited number of local exceptions to its use. The biodiversity evaluation of the proposed development has been undertaken using Biodiversity Metric 3.1.

The Biodiversity Metric uses a comparison of habitats as a proxy for biodiversity and describes these habitats using standard units referred to as biodiversity units (BUs). There are 3 distinct types of BUs and these are not of equivalence or interchangeable, they are:

- Habitat BUs – which describe areas of habitat based on measurement in hectares;
- Linear BUs – which describe hedgerows and lines of trees measured in kilometres; and
- Riparian BUs – which described rivers and streams measured again in kilometres.

The overall calculation of the change in biodiversity resulting from a project or development is derived by subtracting pre-project or ‘baseline’ biodiversity units valuation of an area of land from the number of post-project units.

The results are influenced by:

- Habitat area/length;
- Distinctiveness (an indication of value);
- Condition – an indication of quality; and
- Multipliers or risk factors – that take account of the contribution to local priorities, the difficulty of habitat creation/management, the time it takes to deliver and variation in the location of habitat delivery.

2.2 Definitions

In the context of this project, we have assumed the following definitions:

- Biodiversity net gain (BNG) is an approach to development, and/or land management, that aims to leave the natural environment in a measurably better state than it was beforehand.

Under the Act the relevant percentage for Biodiversity Net Gain is a change in value attributed to a development $\geq 10\%$ the pre-development value (of onsite habitats). It should be noted that while the Act sets out the relevant percentage for Biodiversity Net Gain, the relevant parts of the Act (Section 98 and Schedule 14) are still subject to implementation through secondary legislation before they formally apply to applications.

In the interim, clarification of requirements for BNG have been set out through recent appeal decisions⁷ which have clarified that

- *“the 10% biodiversity net gain requirement set out in the Act is not yet law and is not applicable to these appeals”;*

⁷ Planning Inspectorate (2022). Appeal Decisions APP/Y3940/W/21/3278256, APP/Y3940/Q/21/3278923, APP/Y3940/W/21/3282365

- *“Paragraph 174 of the Framework [the NPPF encourages applicants to], ... seek a net gain in biodiversity without identifying a specific percentage...”*
- The relevant Core Strategy may *“...seek a net gain in biodiversity without identifying a specific percentage...”*; and
- *“A net gain of just 1% would be policy compliant in these circumstances.”*

2.3 Methodology

In supporting the assessment of biodiversity changes SLR have made reference to:

- [Biodiversity Metric 3.1 - Calculation Tool](#)
- [Biodiversity Metric 3.1 User Guide](#)
- [Biodiversity Metric 3.1 - Technical Supplement](#)

The Metric uses a unified habitat classification system known as UKHab. This system provides a number of benefits over existing systems such as Phase 1 and NVC, and allows Natural England, Scottish Natural Heritage, Natural Resources Wales, Department of the Environment Northern Ireland and JNCC to report consistently on habitats of European and national significance. UKHab information has been used where available to support the assessment of biodiversity changes.

Where habitat data has been recorded using the Phase 1 habitat classification system, these have been subject to conversion to UKHab classifications using the Metric Phase 1 translation tool.

In addition, the approach requires the condition of habitats to be assessed. Where habitat data was collected before the publication or widespread use of the Metric this is unlikely to have been collected and, in this case, an assumed condition rating has been adopted. Such variations from the Metric approach are explained in the relevant sections.

2.4 Metric 3.1 Principles and Rules

Natural England advise that the Metric is a tool that helps inform plans and decisions, by using habitats as a proxy for measuring biodiversity value, but that any assessment must be undertaken with awareness of its limitations. The metric specifically requires interpretation and ecological expertise to provide evidence of the appropriateness of proposed approaches to BNG and sets out a series of key principles and rules that help to support an understanding of whether proposals support wider considerations that a calculation output.

The Metric User Guide indicates that assessments should be conducted with regard to:

- **Principle 1:** *The metric does not change the protection afforded to biodiversity. Existing levels of protection afforded to protected species and habitats are not changed by use of this or any other metric. Statutory obligations will still need to be satisfied.*
- **Principle 2:** *Biodiversity metric calculations can inform decision-making where application of the mitigation hierarchy and good practice principles⁸ conclude that compensation for habitat losses is justified.*
- **Principle 3:** *The metric's biodiversity units are only a proxy for biodiversity and should be treated as relative values. While it is underpinned by ecological evidence the units generated by the metric are only*

⁸ CIEEM, CIRIA, IEMA (2016). Biodiversity Net Gain – Good Practice Principles for Development. https://www.cieem.net/data/files/Publications/Biodiversity_Net_Gain_Principles.pdf

a proxy for biodiversity and, to be of practical use, it has been kept deliberately simple. The numerical values generated by the metric represent relative, not absolute, values.

- **Principle 4:** *The metric focuses on typical habitats and widespread species; important or protected habitats and features should be given broader consideration.*
 - *Protected and locally important species needs are not considered through the metric, they should be addressed through existing policy and legislation.*
 - *Impacts on protected sites (e.g. SSSIs) and irreplaceable habitats are not adequately measured by this metric. They will require separate consideration which must comply with existing national and local policy and legislation. Data relating to these can be entered into the metric, so as to give an indicative picture of the biodiversity value of the habitats present on a site, but this should be supported by bespoke advice.*
- **Principle 5:** *The metric design aims to encourage enhancement, not transformation, of the natural environment. Proper consideration should be given to the habitats being lost in favour of higher-scoring habitats, and whether the retention of less distinctive but well-established habitats may sometimes be a better option for local biodiversity. Habitat created to compensate for loss of natural or semi-natural habitat should be of the same broad habitat type (e.g. new woodland to replace lost woodland) unless there is a good ecological reason to do otherwise (e.g. to restore a heathland habitat that was converted to woodland for timber in the past¹⁵).*
- **Principle 6:** *The metric is designed to inform decisions, not to override expert opinion. Management interventions should be guided by appropriate expert ecological advice and not just the biodiversity unit outputs of the metric. Ecological principles still need to be applied to ensure that what is being proposed is realistic and deliverable based on local conditions such as geology, hydrology, nutrient levels, etc. and the complexity of future management requirements.*
- **Principle 7:** *Compensation habitats should seek, where practical, to be local to the impact. They should aim to replicate the characteristics of the habitats that have been lost, taking account of the structure and species composition that give habitats their local distinctiveness. Where possible compensation habitats should contribute towards nature recovery in England by creating 'more, bigger, better and joined up' areas for biodiversity⁹.*
- **Principle 8:** *The metric does not enforce a mandatory minimum 1:1 habitat size ratio for losses and compensation but consideration should be given to maintaining habitat extent and habitat parcels of sufficient size for ecological function. A difference can occur because of a difference in quality between the habitat impacted and the compensation provided. For example, if a habitat of low distinctiveness is impacted and is compensated for by the creation of habitat of higher distinctiveness or better condition, the area needed to compensate for losses can potentially be less than the area impacted. However, consideration should be given to whether reducing the area or length of habitat provided as compensation is an appropriate outcome.*

In addition to these principles the Metric also sets out a series of rules that should be followed when undertaking a BNG calculation. These are:

- **Rule 1:** *Where the metric is used to measure change, biodiversity unit values need to be calculated prior to the intervention and post-intervention for all parcels of land / linear features affected.*

⁹ Making Space for Nature: a review of England's wildlife sites and ecological network. Report to Defra (2010).

- **Rule 2:** *Compensation for habitat losses can be provided by creating new habitats, or by restoring or enhancing existing habitats. Measures to enhance existing habitats must provide a significant and demonstrable uplift in distinctiveness and/or condition to record additional biodiversity units.*
- **Rule 3:** *'Trading down' must be avoided. Losses of habitat are to be compensated for on a "like for like" or "like for better" basis. New or restored habitats should aim to achieve a higher distinctiveness and/or condition than those lost. Losses of irreplaceable or very high distinctiveness habitat cannot adequately be accounted for through the metric.*
- **Rule 4:** *Biodiversity unit values generated by biodiversity metric 3.1 are unique to this metric and cannot be compared to unit outputs from version 2.0, the original Defra metric or any other biodiversity metric. Furthermore, the three types of biodiversity units generated by this metric (for area, hedgerow and river habitats) are unique and cannot be summed.*
- **Rule 5:** *It is not the area/length of habitat created that determines whether ecological equivalence or better has been achieved but the net change in biodiversity units. Risks associated with creating or enhancing habitats mean that it may be necessary to create or enhance a larger area of habitat than that lost, to fully compensate for impacts on biodiversity.*
- **Rule 6:** *Deviations from the published methodology of biodiversity metric 3.1 need to be ecologically justified and agreed with relevant decision makers. While the methodology is expected to be suitable in the majority of circumstances it is recognised that there may be exceptions. Any local or project-specific adaptations of the metric must be transparent and fully justified.*

The Metric guidance also confirms:

- **Irreplaceable habitats** – the Metric does not adequately measure impacts on irreplaceable habitats and separate consideration should be given to relevant policy and legislation. These habitats can be entered into the calculator to give an indication of value or to support an understanding of enhancement or restoration actions and a guide to minimum areas of replacement habitats (compensation) but that *"bespoke compensation should be agreed with the relevant decision maker for any losses or impacts to these habitats"*.
- **Ancient woodland** – "Ancient woodland is a finite and irreplaceable resource and is protected by existing policy and legislation. However, ancient woodland is not a discrete habitat type and, as such, is not listed in biodiversity metric 3.1;
- **Woodland cover** – *"In England there is a presumption against the loss of woodland and a need to increase overall woodland cover. The metric trading rules support the delivery of this policy through requiring 'like for like' habitat replacement for all high distinctiveness woodland types."* With limited exceptions;
- **Hedgerows** – *"Lost double hedgerows should be compensated with a double hedge, typically a path or track width apart."*

2.5 Evidence of Technical Competent and Experience

Giselle Hynes, a Senior Field Ecologist at SLR, who wrote this report and completed the field survey, holds an MSc in Wildlife Management and Conservation from the University of Reading. She is a qualified member of the Chartered Institute of Ecology and Environmental Management (CIEEM). Giselle has been a consultant ecologist for more than 3 years and has prepared reports for a range of different projects and plans.

Olivia Guindon, a Senior Ecologist at SLR Consulting, who reviewed this report has a Bachelor's degree in Ecology and Wildlife Conservation (BSc Hons) and a Master's degree in Species Identification and Survey Skills and is a Qualifying member of CIEEM. Olivia has over four years' professional experience within ecological consultancy and has undertaken numerous ecological assessments of this type.

Ruth Holland ACIEEM, who reviewed this report, is an Associate Ecologist, with a BSc in Ecology and Conservation Management and a MSc in Biological Recording. She has over nine years of experience as a professional ecological consultant, during which time she has worked on many development projects.

2.6 Limitations

For areas of habitat creation 'Moderate' condition has been set, as habitat objectives in all cases except for those habitats which have default condition scores in the Metric e.g. 'Poor' condition.

No significant limitations were encountered during completion of the Biodiversity Net Gain assessment. Natural England note that Biodiversity Metric 3.1 has been extensively tested, but that they continue to listen to feedback to support correction of any errors or problems. No such errors were encountered.

3.0 Baseline Habitats

3.1 Pre-development Habitats (On-site)

Full description of the baseline habitats within the Site are provided within the Preliminary Ecological Appraisal report (ref: 20230331 404.11923.00002 Ashton Keynes PEA fv1.pdf). This habitat survey was undertaken in accordance with UKHab methodology and using the associated classification system. The survey was undertaken in September 2022 and a summary of the habitats is given in Table 3-1 and presented at Drawing 1.

Table 3-1 On Site Baseline Habitats within the Proposed Development Site

Broad Habitat	Habitat Type	Size	Description
Cropland	Cereals crops	6.99 ha	Two parcels of cultivated land
H2a	Hedgerow	0.83 km	Native hedgerows with scattered trees around boundary of fields
Grassland	Modified grassland	0.01 ha	Narrow field margins comprise of strips of actively managed grassland

3.2 Pre-development Habitats (Off-site)

Just to the northwest of the site is a section of native species rich hedgerow shown at **Drawing 1**. It measures 0.83 km in length.

Consideration of principles and rules

This report has recognised the ‘trading down’ rule (rule 3), the need to avoid such situations and specifically any losses of irreplaceable or very high distinctiveness habitat. In considering any proposed works to the Site, existing linear features including hedgerows will be retained, and consideration has been given to their enhancement. If required, such habitats will need to be replaced on a “like for like” or “like for better” basis.

3.3 Baseline Habitat Value (On-site)

The total area of the site is approximately 7.00 ha. This includes areas of cropland (6.99 ha), grassland habitat (0.01 ha). Of these the areas of cropland have the highest biodiversity value (13.97 BU) and the grassland habitat (0.06 BU). The total overall ecological baseline (habitat) is around 14.03 BU (habitats).

The baseline also contains a linear habitat, specifically a length of native hedgerow with trees. This hedgerow surrounds and bisects the centre of the Site and measures 0.83 km in length, having a baseline value of 6.66 BU (linear).

3.4 Baseline Habitat Value (Off-site)

The length of hedgerow offsite measures 0.83 km and delivers 1.14 BU.

3.5 Overall Baseline Habitat Value

A summary of the current baseline biodiversity value to two decimal place is given in Table 3-2.

Table 3-2 Summary of Baseline Habitat Value

BIODIVERSITY UNIT TYPE	AREA/LENGTH		BASELINE UNITS		TOTAL UNITS
	On site	Off site	On site	Off site	
Area habitat (On Site)	7.00 ha	0	14.03 BU	N/A	14.03
Linear habitat – Hedgerows	0.83 km	0.12 km	6.66	1.14	6.66
Linear habitat – Rivers and streams	N/A	N/A	N/A	N/A	N/A

4.0 Post Development Habitats

4.1 Habitat Units

Biodiversity calculations have been completed for:

- Comparison of the current site baseline with the proposed plans.

This comparison supports an understanding of the differences in biodiversity performance of proposed development between the current on-site habitats with the proposed plans.

The proposed plans are illustrated at Drawing 2 at the end of this report.

4.2 Current Baseline to Proposed Plans (onsite)

In line with Metric 3.1 a comparison has been made between the current site baseline and the proposed post-intervention habitats on site.

4.2.1 Habitats Units

Once the proposed plans have been delivered, the total area of habitats within the development site is estimated to be approximately 7.00 ha, comprising 2.37 ha of habitat creation and 4.63 ha of developed land. No existing habitats are being retained.

The proposed onsite change would lead to an increase in the area of developed land; sealed surface (+4.63 ha) and the creation of other neutral grassland (+1.55 ha), mixed scrub (+0.82 ha) and urban trees (+0.26 ha). There would be a reduction in the area of cropland (-6.99 ha) and modified grassland (-0.01 ha). Increases in the area of other neutral grassland, mixed scrub and urban trees will support improved biodiversity performance.

Overall, the project is expected to lead to an increase of 2.62 Habitat BU on site, which corresponds to an increase of **18.69%** in biodiversity value.

4.2.2 Hedgerow Units

Once the proposed plans are delivered, the total length of hedgerow within the development site is estimated to be approximately 0.88 km. This includes retention of 0.57km of hedgerow surrounding the site and creation 0.31 km of new hedgerow and also includes the loss of hedgerow in poor condition, located in the centre of the site (-0.26 km).

The created hedgerow will be of moderate condition, and as such supports an increase of 6.77 BU. The project would deliver an increase in the hedgerow biodiversity value of the site of **101.65%**.

4.3 Current Baseline to Proposed Plans (off-site)

Once the proposed management plans are delivered, the total length of off-site hedgerow is still estimated to be 0.12 km. The proposed management of this habitat would lead to an increase in biodiversity units of 0.93 units.

4.4 Current Baseline to Proposed Plans (Overall)

Overall, the proposed plans are expected to support changes in habitat area and hedgerow length of **18.69%** and **101.65%**, respectively, which satisfies the current requirement for biodiversity enhancement under the National Planning Policy Framework. An overall summary of the proposed biodiversity gain is given in Table 4-1.

The biodiversity gain identified within this report requires planting plans and management plans to secure the predicted level of gain.

Table 4-1 Summary of biodiversity net gain

BIODIVERSITY UNIT TYPE	BASELINE UNITS		POST INTERVENTION UNITS		TOTAL NET UNIT CHANGE	% NET GAIN
	On site (dev. Site)	Off site	On site (dev. site)	Off site		
Area habitat	14.03 BU	0	16.65 BU	0	+ 2.62 BU	18.69 %
Linear habitat – Hedgerows	6.66 BU	1.14	12.51 BU	2.07	+ 6.77 BU	101.65 %
Linear habitat - Rivers/streams	N/A	N/A	N/A	N/A	N/A	N/A

5.0 Recommendations for Achieving Biodiversity Net Gain

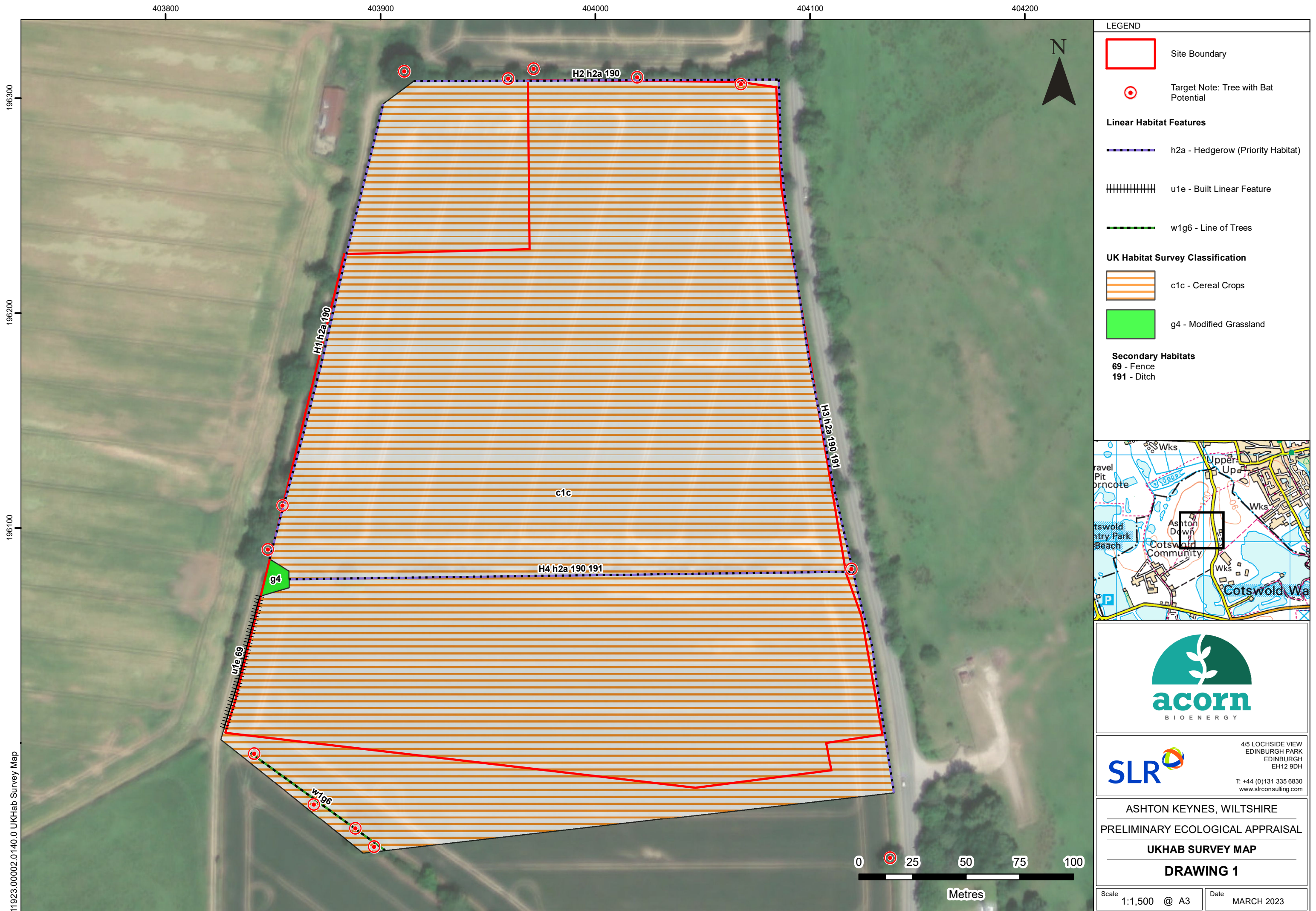
The assessment of the proposed development against the current baseline indicates that an increase in biodiversity performance of the Site of approximately **19%** in habitat and **102%** in hedgerow can be achieved. This is subject to appropriate planting plans and management plans being developed to optimise the delivery of biodiversity performance on the Site and to realise its intended out-turn condition.

This is considered to satisfy the current requirement for biodiversity enhancement under the National Planning Policy Framework¹².

There remain further opportunities for refinement and improvement of the biodiversity performance of the proposed development which will be considered as part of detailed design of this project.

DRAWING 1

Baseline Habitat Map



DRAWING 2

Proposed Landscape Strategy



NOTES

- SITE LAYOUT DETAILS TAKEN FROM DRAWING: 'GGP-29419-P-101-E-Ashton Keynes-Site Layout'
- PAVING DETAILS TAKEN FROM DRAWING: 'GGP-29419-P-120-A-Ashton Keynes-Paving.'

LEGEND

	SITE BOUNDARY
	EXISTING TREES AND HEDGEROW RETAINED
	EXISTING TREES AND HEDGEROW REMOVED
	PROPOSED NATIVE TREES AND SHRUBS
	PROPOSED NATIVE HEDGEROW
	PROPOSED NATIVE HEDGEROW INFILLING
	PROPOSED INDIVIDUAL TREES
	SHADE TOLERANT SPECIES RICH GRASSLAND
	SPECIES RICH WET GRASSLAND
	BUILDINGS
	GRAVEL AREA
	BREEDON AGRICULTURAL HOT ROLLED ASPHALT (HRA)
	CONCRETE
	TANK BUND BUILD UP
	TANK
	EQUIPMENT/FEEDER HOPPER SLAB
	COVERED LAAGOON
	RAINWATER LAAGOON
	DEER PROOF FENCING
	VISIBILITY SPLAY

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ASHTON KEYNES

LANDSCAPE STRATEGY

FIGURE 6

Scale 1:1000 @ A2	Date APRIL 2023
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APPENDIX 1

Habitat Condition Assessment Sheets

Condition sheet: HEDGEROW Habitat Types				
UKHab Habitat Type				
Native hedgerow Native hedgerow - associated with bank or ditch Native hedgerow with trees Native hedgerow with trees - associated with bank or ditch Native species rich hedgerow Native species rich hedgerow - associated with bank or ditch Native species rich hedgerow with trees Native species rich hedgerow with trees - associated with bank or ditch				
Site name/Location	Native hedgerow with trees - associated with bank or ditch		Onsite/offsite	Onsite
Habitat's central grid reference	SU 03976 96081		Unique polygon reference(s)	
Limitations (if applicable)			Metric 3.1 survey reference (if condition assessment of this polygon relates to a wider habitat survey)	
Habitat Description				
The centre of the site was bisected by a hedgerow with trees, associated with a ditch, which was dry at time of survey. The hedgerow had large gaps in both the base and in the hedge canopy and comprised predominantly hawthorn. Other species present included crab apple (<i>Malus sylvestris</i>), bramble, field maple, blackthorn, dog rose and ivy. The hedgerow also contained a semi-mature ash (<i>Fraxinus excelsior</i>) at the westernmost end.				
See Table TS1-3 of the Technical Supplement.				
Condition Assessment Criteria				
A series of ten attributes, representing key physical characteristics, are used for this assessment. The attributes, and the minimum criteria for achieving a favourable condition in each, are defined. The attributes use similar favourable condition criteria to the Hedgerow Survey Handbook and the handbook is the recommended source of reference for assessing individual hedgerow attributes.				
Hedgerow favourable condition attributes				
Attributes and functional groupings (A, B, C, D & E)	Criteria (the minimum requirements for 'favourable condition'	Description	Condition Achieved (Y/N)	Notes/Justification
Core groups - applicable to all hedgerow types				
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).	Y	>1.5 m in 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).	Y	>1.5m in width
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 the Hedgerow Survey Handbook).	N	Many vertical gaps
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).	N	Many horizontal gaps
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 level of disturbance (excluding wildlife disturbance) at the base of the hedge. Undisturbed ground should be present for at least 90% of the hedgerow length, greater than 1m in width and must be present along at least one side of the hedge. This criterion recognises the value of the hedge base as a boundary habitat with the capacity to support a wide range of species. Cultivation, heavily trodden footpaths, poached ground etc. can limit available habitat niches.	N	Arable immediately either side.
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.	Y	Not recorded during survey.

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.	Y	No invasive species recorded during survey.
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 (e.g. excessive hedge cutting).	N	Evidence of cutting.
Additional group - applicable to hedgerows with trees only					
E1.	Tree age	At least one mature tree per 30m stretch of hedgerow. A mature tree is one that is at least 2/3 expected fully mature height for the species.	This criterion addresses if there are sufficient mature trees (within the scope of planning timescales) which are of higher value to biodiversity.	N	Only one semi-mature tree
E2.	Tree health	At least 95% of hedgerow trees are in a healthy condition (excluding veteran features valuable for wildlife). There is little or no evidence of an adverse impact on tree health by damage from livestock or wild animals, pests or diseases, or human activity.	This criterion identifies if the trees are subject to damage which compromises the survival and health of the individual specimens.	Y	No evidence of damage
Each attribute is assigned to one of five functional groups (A – E), as indicated in Table TS1-2 and the condition of a hedgerow is assessed according to the number of attributes from these functional groups which pass or fail the ‘favourable condition’ criteria according to the approach set out in Table TS1-3.					
The hedgerow condition assessment generates a weighting (score) ranging from 1-3, which is used within the biodiversity metric 3.1. The scores for each are set out in tables TS1-3 and TS1-4 below.					
TABLE TS1-3: Hedgerow condition assessment and weighting					
Condition categories for hedgerows without trees					
Category	Maximum number of attributes that can fail to meet ‘favourable condition’ criteria in Table TS1-2	Weighting (score)			
Good	No more than 2 failures in total; AND No more than 1 in any functional group.	3			
Moderate	No more than 4 failures in total; AND <u>Does not fail both attributes</u> in more than one functional group (e.g. fails attributes A1, A2, B1 & C2 = Moderate condition).	2			
Poor	Fails a total of more than 4 attributes; OR <u>Fails both attributes</u> in more than one functional group (e.g. fails attributes A1, A2, B1 & B2 = Poor condition).	1			
Score achieved:					
Condition categories for hedgerows with trees					
Category	Maximum number of attributes that can fail to meet ‘favourable condition’ criteria in Table TS1-2	Weighting (score)			
Good	No more than 2 failures in total; AND No more than 1 failure in any functional group.	3			
Moderate	No more than 5 failures in total; AND <u>Does not fail both attributes</u> in more than one functional group (e.g. fails attributes A1, A2, B1, C2 & E1 = Moderate condition).	2			
Poor	Fails a total of more than 5 attributes; OR <u>Fails both attributes</u> in more than one functional group (e.g. fails attributes A1, A2, B1 & B2 = Poor condition).	1			
Score achieved:	Poor, fails B1 and B2 functional group				
Suggested enhancement interventions to improve condition score					

Condition Sheet: GRASSLAND Habitat Type (low distinctiveness)			
UKHab Habitat Type(s)			
Grassland - Modified grassland			
Site name/location	Ashton Keynes	Onsite/offsite	Onsite
Central grid reference of habitat	SU 03854 96078	Unique polygon reference	
Limitations (if applicable)		Metric 3.0 survey reference (if condition assessment of this polygon relates to a wider habitat survey)	
Habitat Description Small area of modified grassland in gateway between arable and adjacent field. Very damaged with track marks due to frequent vehicular use. Species in this area comprised common nettle, cow parsley (<i>Anthriscus sylvestris</i>), hedge mustard (<i>Sisymbrium officinale</i>), false oat-grass (<i>Arrhenatherum elatius</i>), red dead nettle (<i>Lamium purpureum</i>), cleavers (<i>Galium aparine</i>), shepherd's purse (<i>Capsella bursa-pastoris</i>) and creeping thistle (<i>Cirsium arvense</i>).			
See UKHab			
Condition Assessment Criteria		Condition Achieved (Y/N)	Notes/Justification
1	There must be 6-8 species per m2. If a grassland has 9 or more species per m2 it should be classified as a medium distinctiveness grassland habitat type. NB - this criterion is essential for achieving moderate condition.	N	Species poor predominantly false oat grass with sporadic common nettle, cow parsley, hedge mustard, red dead nettle, cleavers, shepherd's purse and creeping
2	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.	Y	Tussocky in nature
3	Some scattered scrub (including bramble) may be present, but scrub accounts for less than 20% of total grassland area. Note - patches of shrubs with continuous (more than 90%) cover should be classified as the relevant scrub habitat type.	Y	No scrub.
4	Physical damage is evident in less than 5% of total grassland area. Examples of physical damage include excessive poaching, damage from machinery use or storage, erosion caused by high levels of access, or any other damaging management activities.	N	High levels of access causing extensive patches of bare ground.
5	Cover of bare ground is between 1% and 10%, including localised areas (for example, a concentration of rabbit warrens).	N	As above
6	Cover of bracken less than 20%.	Y	No bracken.
7	There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981).	Y	No invasive species recorded during surveys.
		Essential criterion 1 achieved (Y/N)	N
		Number of criteria passed	4
Condition Assessment Result	Condition Assessment Score	Score Achieved x/✓	
Passes 6 or 7 of 7 criteria including passing essential criterion 1	Good (3)		
Passes 4 or 5 of 7 criteria including passing essential criterion 1	Moderate (2)		
Passes 0, 1, 2 or 3 of 7 criteria; OR 4, 5 or 6 of criteria but failing criterion 1	Poor (1)	Y	
Suggested enhancement interventions to improve condition score			

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