



TUNLEY
ENVIRONMENTAL

BIODIVERSITY NET GAIN ASSESSMENT REPORT

TRUSTED SUSTAINABILITY SCIENTISTS

BIODIVERSITY ASSESSMENT REPORT

FOR

**Land adjacent to 916 Halifax Road,
Cleckheaton, BD19 6LR**



BARNES
homes

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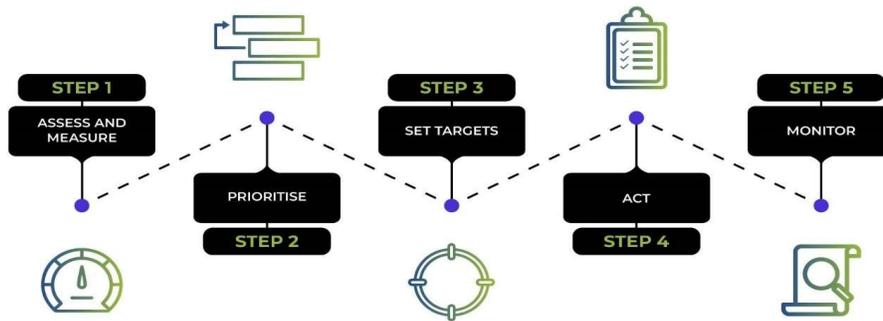
Nomenclature

Nomenclature	Description
Baseline Assessment	Before a development project begins, a baseline assessment is conducted to determine the existing biodiversity of the project site. This assessment establishes the current state of habitats, species, and ecosystem functions.
Biodiversity	The variety of life within a defined area for example, globally or in a specific habitat which can be described by a variety of metrics including species abundance or the living plant index and which we are dependent on to provide us with food, clean water and many more essentials.
Biodiversity Loss	The reduction in the variety and abundance of species in a particular ecosystem or across the entire planet. It can result from factors such as habitat destruction, pollution, climate change, and invasive species.
Biodiversity Net Gain	A concept that aims to ensure that development projects have a positive impact on biodiversity by enhancing or creating habitats.
Biodiversity Net Gain (BNG) Assessment	The quantification of the overall positive impact on biodiversity resulting from a specific activity or project. While biodiversity gain refers to the increase in the numbers, genetic variability, and species variety in a given area, BNG goes a step further by assessing whether the difference between biodiversity losses and gains leads to a net positive impact.
Biodiversity Units	A measure to describe the level of biodiversity present on a given site.
DEFRA Statutory (Official) Biodiversity Metric	Is a tool developed by the UK Government that provides a standardised approach to quantifying changes in biodiversity resulting from development activities. It assigns values to different habitats and species based on their ecological importance, and it allows for the calculation of a numerical score that reflects the overall biodiversity impact of a development.
Habitat	The specific environment or type of ecosystem in which a particular species of organism lives. Habitats can range from forests and wetlands to grasslands and urban areas.
Habitat Condition	The state or quality of a habitat, taking into consideration factors such as biodiversity, ecological processes, and overall health. Habitat condition assessment is essential in determining the effectiveness of conservation or restoration efforts.
Habitat Distinctiveness	The unique characteristics and features that differentiate one habitat from another. Distinctiveness is often assessed based on the diversity of species, ecological functions, and physical attributes of a habitat.
Habitat Strategic Significance	The local importance of a habitat determined by assessing both its geographic location and the specific type of habitat it represents. This evaluation helps in understanding the unique value and contribution of the habitat in its surrounding ecosystem.
Local Planning Authority (LPA)	The local government body that is empowered by law to exercise urban planning functions for a particular area/council. They are the government body whom approve and validate planning permissions and Biodiversity Net Gain compliance
On-Site	Refers to activities, impacts, or features that occur within the boundaries of a specific development or project site. In the context of Biodiversity Net Gain, on-site measures may include habitat creation, enhancement, or protection within the project area.
Off-Site	Relates to actions or effects that occur outside the boundaries of the development or project site. Off-site measures in Biodiversity Net Gain may involve compensatory actions, such as creating or enhancing habitats in a different location to offset any biodiversity loss caused by the development.
Small Site	A small residential site is a development which is less than 1 hectare with less than 9 dwellings, or where the number of dwellings is unknown an area of less than 0.5 hectares. A small commercial site is a development which has created floor space of less than 1,000 m ² or with a total site area of less than 1 hectare.

Nomenclature	Description
Major Development	A major development is any development, either residential or non-residential, which falls out of the requirements of a small site. This means more than 9 dwellings or greater than 0.5 hectares for residential developments or greater than 1,000 m ² floor space, or over a hectare for non-residential developments.

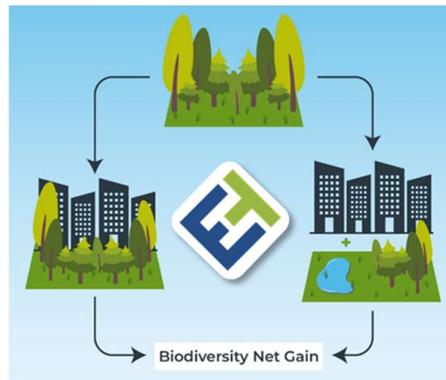
Methodology and Quantification Standards

This Biodiversity Net Gain (BNG) report has been completed using methodology consistent with the Science Based Targets for Nature (SBTN), Nature Positive Initiatives, and DEFRA Regulations.



Science-Based Targets for Nature Steps which Tunley Environmental's Biodiversity Net Gain (BNG) services aligns with to achieve reduced impact on Nature.

Biodiversity was quantified using the DEFRA (Department for Environment, Food & Rural Affairs) statutory (official) biodiversity metric as a tool to assess and measure biodiversity in the context of development projects. This metric is specifically designed to assist in quantification of the impact that development activities have on biodiversity and determine whether Biodiversity Net Gain (BNG) is achieved. Where BNG refers to the idea that the biodiversity value of a site should be enhanced due to development, ensuring a "net gain" in ecological terms. Tunley have completed all calculations within small site metric along with any required documents such as habitat condition. These additional documents will be submitted alongside this form in the excel format for LPA approval.



Tunley Environmental's conceptualisation of Biodiversity Net Gain.

Where applicable, the equivalent small site biodiversity metric was utilised for developments under the requirements for the statutory (official) biodiversity metric. The BNG assessment was further completed using methodology consistent with the international standard BS 8683:2021 (Process for designing and implementing BNG). Information on data sources and assumptions made to support this analysis are provided in Appendix A.

Executive Summary

Biodiversity is the foundation of the global economy. The World Economic Forum (WEF) estimates that over 50% of the world's GDP, equivalent to 33 trillion pounds, significantly depends on nature and the services it provides. However, biodiversity is amid a severe global crisis. Human-induced changes in land and sea use, overexploitation, invasive species, pollution, and climate change are the primary drivers of rapid biodiversity decline. Human activity threatens approximately a million species with extinction, some within decades, and species are disappearing at a rate of tens to hundreds of times faster than the natural pace.

Biodiversity net gain is a concept implemented into the *Town and Country Planning Act 1990* that aims to ensure that development projects in the UK, specifically England, have a positive impact on biodiversity by enhancing or creating habitats either on-site or off-site.

The site at land adjacent to 916 Halifax Road, Cleckheaton, BD19 6LR is predominantly a vegetated garden with 8 areas of Deciduous Woodland, 2 areas of 'No main habitat but additional habitat exists' and no designated sites within 500 m ([See Magic map results](#)). The site is being developed from a vegetated garden into construction of 11 private dwellings. The site has a total area of 0.394 ha, and plans propose 11 private houses. Therefore, as stated in the Town and Country Planning Act, this site is classified as a major development.

Tunley Environmental have conducted an independent Biodiversity Net Gain assessment to quantify the biodiversity value of the site before and after development to assess biodiversity of the site. Using data provided by Barnes Homes, the baseline 'area habitat' biodiversity units of the site were calculated to be 2.176 units over an area of 0.394 ha. The baseline 'hedgerow and line of trees' biodiversity units of the site were calculated to be 0.491 units (Figure 1).

The proposed development plan will result in 0.197 'area habitat' units and 0.619 'hedgerow habitat' units translating to a **90.95% net loss in 'area habitats'** and **26.16% net gain in 'hedgerow and line of trees' units**. Therefore, Barnes Homes will be required to implement extra initiatives to meet the 10% BNG required for 'area habitats'. Barnes Homes plan to use a combination of off-site biodiversity creation both within their own land and at third-party sites.

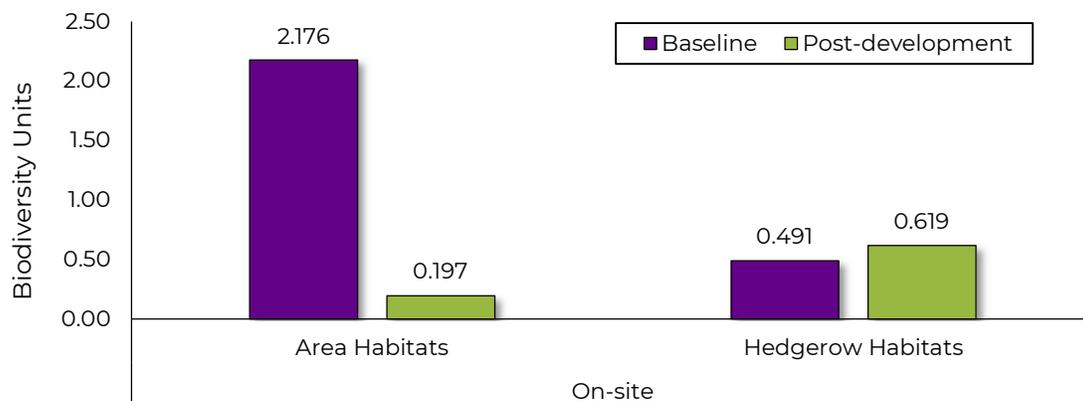


Figure 1. Total biodiversity units of the site, before and after development by Barnes Homes

Introduction

The particular site in question, is a private vegetated garden, has plans to construct 11 private dwellings. It is situated in Cleckheaton, BD19 6LR. Barnes Homes are consulting on this matter and have been asked to provide a biodiversity net gain assessment alongside the application.

Tunley Environmental has conducted an independent Major Development BNG assessment to identify and quantify the biodiversity of the site before and after the development. This BNG assessment calculates the biodiversity value of the land by evaluating the number of habitats present, the habitat types, size, condition, and location. These data inputs are utilised within the statutory metric, due to the development size, to quantify the biodiversity units present before development. This is the baseline habitats and gives a value for baseline biodiversity units.

Below shows the most recent aerial image of the site at Land adjacent to 916 Halifax Road (Figure 2).



Figure 2. Aerial image of the site at Land adjacent to 916 Halifax Road

Historical Baseline Results

Prior to analysing the biodiversity units post development we must conduct a baseline assessment on the site pre-development. This baseline assessment is conducted to determine the existing biodiversity on the project site. This assessment establishes the current state of habitats, species, and ecosystem functions.

The baseline is taken as of April 2020 (latest satellite image) prior to any habitat removal, in order to consider all biodiversity present onsite pre-clearance. Some of the habitats shown on the satellite image were removed; Barnes Homes provided a topography report dated 29th October 2021, this supports Tunley Environmental's analysis on positions, and diameters at breast height, of trees and other habitats previously present.

Barnes Homes also provided a Preliminary Ecological Appraisal (PEA) report detailing condition of two ornamental ponds and native hedgerow at the front of the site. A condition assessment is provided as part of this submission.

The baseline assessment for the site at land adjacent to 916 Halifax Road was conducted by analysing satellite imagery at 2020, site photos (post clearance), topography report (dated 2021) and PEA report to distinguish habitat types as well as implementing Google Earth to accurately analyse site plans alongside dimensions to yield overall meters of the project site by habitat type. Some example images are shown in Figure 3.



Figure 3. Example images provided to Tunley by Barnes Homes of the site post clearance.

A map of the habitats identified from these images is overlaid into the aerial image above in Figure 4.



Figure 4. Mapping of different habitat types identified on site baseline.

For the proposed site for development, ‘area habitats’ and ‘hedgerow and line of trees’ biodiversity units were identified pre-development (Figure 4 and

Table 1). The [UK habitat classification \(UKHab\)](#) system is utilised to define habitats inputted within the metric. There were 13 small, 2 medium and 4 large individual trees on site. This assessment considered 2 medium trees and 4 large trees at the 2020 baseline year; thus they have been considered in calculations.

Table 1. Explanation of baseline habitat types, habitat characteristics, and habitat area/length.

Habitat Type	Habitat Characteristics	Habitat Area	Unit	Condition	Biodiversity Units
Introduced shrub	Shrubs that have been planted and are not native to the area.	0.05	ha	Condition Assessment N/A	0.11
Artificial unvegetated, unsealed surface	Human-made surfaces that are not vegetated and are not sealed with impermeable materials.	0.003	ha	N/A - Other	0
Ornamental lake or pond	Artificial water bodies created for aesthetic or recreational purposes.	0.004	ha	Poor	0.01
Developed land; sealed surface	Areas where the surface has been sealed by materials such as concrete, tarmac, or buildings.	0.02	ha	N/A - Other	0
Vegetated garden	Gardens that support a variety of plants.	0.31	ha	Condition Assessment N/A	0.63
Urban tree	Individual trees located within an urban environment.	0.18	ha	Moderate	1.43
Native hedgerow	A hedgerow with >80% canopy cover of UK native or archaeophyte woody species.	0.03	km	Poor	0.06
Line of trees	A line of trees that is ≥ 20 m long and 2 m in height and there is open habitat on each side.	0.10	km	Moderate	0.41
Non-native and ornamental hedgerow	A hedgerow with >20% canopy cover of UK non-native woody species.	0.02	km	Poor	0.02

Post-development Results

The site at Land adjacent to 916 Halifax Road aims to consider biodiversity impact by implementing habitat enhancement and habitat creation to account for any biodiversity net loss due to construction, as well as to improve the site for the users of this site whilst still contributing to BNG goals.

The plan below (Figure 5) shows the proposed site landscape developed and designed by Barnes Homes, the design will create 0.292 ha and 0.102 ha of developed land; sealed surface and vegetated garden, respectively.



Figure 5. Proposed plan for the site.

These changes in habitats were taken into account through the calculation of their areas, provided by Barnes Homes and verified with an aerial view map, as seen in Figure 6.

Two lines of trees and the non-native ornamental hedgerow will be retained. Only 17.6 m of the original 30.4 m of native hedgerow will be retained. The proposed development includes creation of 46 m of native hedgerow.



Figure 6. Aerial view of the site of post-development.

Of the 0.394 ha area 'habitats' that will be lost during development, the plan creates a variety of different area 'habitats' instead (Table 2).

Table 2. Explanation of habitat type, habitat characteristics, and habitat area of all habitats to be created post-development.

Habitat Type	Habitat Characteristics	Habitat Area	Unit	Condition	Biodiversity Units
Vegetated garden	Gardens that support a variety of plants.	0.10	ha	Condition Assessment N/A	0.20
Developed land; sealed surface	Areas where the surface has been sealed by materials such as concrete, tarmac, or buildings.	0.29	ha	N/A - Other	0.00
Native hedgerow	A hedgerow with >80% canopy cover of UK native or archaeophyte woody species.	0.05	km	Moderate	0.15

The incorporation of these new habitats creates 0.20 biodiversity units post-development, translating to 90.95% net loss in "area habitat" biodiversity. These habitats therefore do not ensure that the 10% net gain target for biodiversity will be met for 'area habitats' (see Table 3). Barnes Homes would like to discuss with the LPA on a combination of creating new habitats off-site, both on their off-site land and third-party land.

Table 3. Detailed losses and gains of biodiversity 'area habitat' units resulting from development.

Description of modifications	Losses & Gains of Biodiversity units
Total on-site baseline biodiversity area habitat units	2.18
On-site retention of baseline biodiversity 'area habitat' units	0.00
On-site loss of baseline biodiversity 'area habitat' units - 0.053 ha of introduced shrub in condition assessment n/a condition - 0.003 ha of artificial unvegetated, unsealed surface in n/a - other condition - 0.004 ha of ornamental lake or pond in poor condition - 0.019 ha of developed land; sealed surface in n/a - other condition - 0.315 ha of vegetated garden in condition assessment n/a condition - 0.18 ha of urban tree in moderate condition	-2.18
On-site creation of area habitats (all low strategic significance): - 0.10206 ha of vegetated garden in condition assessment n/a condition - 0.29194 ha of developed land; sealed surface in n/a - other condition	+0.20
On-site enhancement of area habitats (all low strategic significance):	+0.00
Total on-site post-development biodiversity 'habitat' units	0.20
Total net gain in biodiversity 'habitat' units	-1.98
Overall percentage net change in biodiversity 'habitat' units	-90.95%

Within 'hedge and line of trees' habitats, 0.15 units are created in the development plans, which bring the site to a total of 0.62 biodiversity units post-development, translating to a 26.16% net gain in hedgerow biodiversity. These habitats therefore ensure that the 10% net gain target for biodiversity will be met (Table 4).

Table 4. Detailed losses and gains of biodiversity 'hedges and lines of trees' units resulting from development.

Description of modifications	Losses & Gains of Biodiversity units
Total on-site baseline biodiversity 'hedgerow' units	0.49
On-site retention of baseline biodiversity 'hedgerow' units	0.49
- 0.0176 ha of native hedgerow in poor condition	
On-site loss of baseline biodiversity 'hedgerow' units	
- 0.0128 ha of native hedgerow in poor condition	-0.47
- 0.1023 ha of line of trees in moderate condition	
- 0.0208 ha of non-native and ornamental hedgerow in poor condition	
On-site creation of 'hedgerow' units	+0.15
- 0.046 ha of native hedgerow in moderate condition	
On-site enhancement of 'hedgerow' units	+0.00
Total on-site post-development biodiversity 'hedgerow' units	0.62
Total net gain in biodiversity 'hedgerow' units	+0.13
Overall percentage net change in biodiversity 'hedgerow' units	+26.16%

Conclusion

The BNG assessment by Tunley Environmental have confirmed the site at Land adjacent to 916 Halifax Road, Cleckheaton, BD19 6LR will reach the national standard of 10% BNG for 'hedgerow and line of trees' biodiversity (26.16% net gain). However, the site will not meet the 10% BNG required for 'area habitat' onsite as it is currently at a net loss of 90.95%.

Barnes Homes would like to discuss with the LPA on implementing initiatives off-site both within their own land and at third-party sites (i.e., purchasing third-party BNG credits).

Appendix

Data Sources

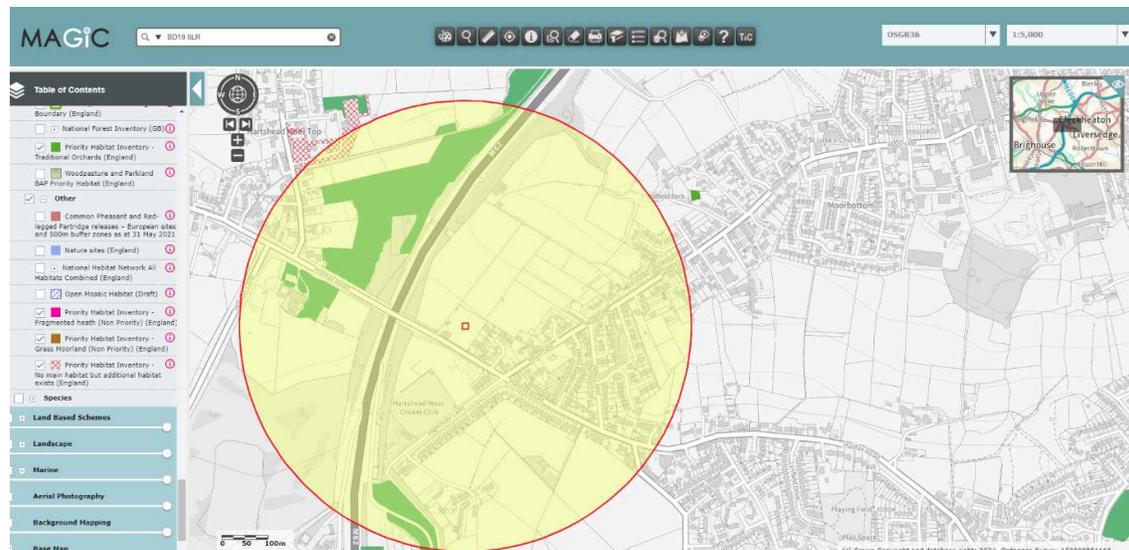
All data results were analysed through the small site metric from DEFRA. The excel version of the metric will also be submitted alongside this report for further evidence and LPA approval and for compliance with BNG regulations.

Habitat Classification and Justification

We conducted a thorough assessment of all habitat types utilising the guidelines outlined in "The UK Habitat Classification Version 2" (UKHab). UKHab serves as a comprehensive, hierarchical system that integrates seamlessly with existing classifications in the UK and Europe. It's architecture, inclusive of primary habitats and secondary codes, enhances the accuracy and consistency of habitat assessments by allowing for the direct attachment of additional features such as habitat mosaics and management strategies. This approach not only facilitates the integration of legacy datasets but also enables efficient sharing of habitat data at regional, national, and international levels. BNG Compliance adheres to these classifications, ensuring consistency and compliance with ecological standards. It's essential that a trained and certified ecologist completes the assessment. For more information, please visit: [UKHab](https://www.ukhab.org/).

Magic Map Results

The site is with 8 areas of Deciduous Woodland, 2 areas of 'No main habitat but additional habitat exists' and no designated sites within 500 m, but not on site.



Competency

Dr Luan Ho, MEnvSc, BEng is a Full Member of The Institution of Environmental Sciences. This title is gained through his in-depth experience and knowledge in environmental sciences. Luan is a senior scientist at Tunley Environmental, having completed over 30 hours of training through in-house procedures and attending UKHab training, making him competent to conduct BNG assessments, provided the habitats are signed off by an in-house ecologist.

Tara Garraty, BSc, MSc, PhD (Pending), is a certified ecologist (holding three higher education degrees in conservation and ecology) with over 15 years of experience in sustainability and conservation. She has led ecological surveys in the UK and Tropics, gaining hands-on experience in diverse ecosystems. Tara has completed professional training with Natural England, CIEEM, and UKHab, focusing on Biodiversity Net Gain (BNG) regulations and UK habitat identification. She remains committed to ongoing training to stay current with BNG standards. At Tunley, she created and facilitated “Navigating Biodiversity Net Gain regulations” CPD sessions, showcasing her leadership and expertise in ecology and BNG regulations.

Dr Aaron Yeardley is the Science Team Co-Lead at Tunley Environmental. He is a Sustainability Scientist who has completed over 20 hours of training through in-house procedures, UKHab webinars, and other accreditations such as CIEEM, making him competent to conduct BNG assessments, provided the habitats are signed off by an ecologist.

Approval

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Reviewed Date:	16 th December 2024
QA approved by:	<input checked="" type="checkbox"/> Approved <input type="checkbox"/> Revision: [CODE] Dr Aaron Yearley, MEng, AMIChemE
Position:	Science Team Co-Lead
Approval date:	16 th December 2024
Reference:	BarnesHomes_916HalifaxRoad-BNG_24-2-A
Revision:	A

Revision History:	Change Description:	Changed by:	Date:	Approved by:	Date:
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