Wildlife Trust for Beds, Cambs & Northants

The Wellcome Trust Genome Campus, Hinxton

Baseline Biodiversity Metric Report: Habitat Units Calculation

June 2022

Wildlife Trust for Beds, Cambs & Northants

Author	Position	Reviewed by	Date Issued
Heather Matthews, CIEEM	Conservation Officer	Martin Baker, Conservation Manager, CEnv., MCIEEM	22/06/2022

Contents

The Genome Campus, Wellcome Trust: Biodiversity Units Calculation

1. Introduction

1.1 Background

The Wildlife Trust BCN was commissioned by The Wellcome Trust to calculate the baseline ecological value of the habitats on The Genome Campus, using the Defra 3.0 metric to calculate habitat units.

This is part of a wider study of the ecological value of the Campus, to inform a long term ambition of The Wellcome Trust to increase the biodiversity value of the Campus grounds by 25%. Further surveys are planned for 2022, including bats, amphibians, birds and invertebrate surveys, in order to evaluate the existing (baseline) value of the Campus site through a broad set of ecological indicator species groups. The starting point was to map and evaluate the broad habitats present and to use the Defra 3.0 Metric calculator to obtain a standardised value of the habitats present into habitat units. This report should be read alongside the Preliminary Ecological Appraisal (PEA) report for the Genome Campus, WTBCN, June 2022.

1.2 Site Location

The Wellcome Trust Genome Campus is a 52 hectare site in the parish of Hinxton in South Cambridgeshire. It is bound by the London Liverpool Street – Cambridge railway line to the west, sewage works and farmland to the south, the A1301 to the east and Hinxton village to the north. The River Cam passes through the western edge of the Campus. The Campus is centred at grid reference TL 498 445.

1.3 Site Description

The Genome Campus was officially opened in 1994 and is now home to the Wellcome Sanger Institute, EMBL-EBI and the Wellcome Trust Conference Centre. Hinxton Hall was built in 1748 and today hosts conferences, events and weddings throughout the year. The grounds are reminiscent of its history as a rural retreat with large parkland trees in expansive grasslands leading to open water. The Campus has expanded its scientific remit a great deal over the years and consequently new facilities have been built to accommodate this. In 2005 the Wetlands Nature Reserve was created as part of a larger extension to the Genome Campus. The reserve is 6.3 hectares to the south-west of the central Campus. It is bounded by the River Cam to the east and the railway line to the west. The site was created to act as a natural flood attenuation mechanism and alongside this function, has matured into a natural area for all to enjoy and a hotspot for wildlife on the Campus.

Today, the buildings are interspersed with greenspaces including formal lawns, plantation woodland, flower beds, lakes and ditches.

Approximately 2,600 people work on the Campus and the footpaths are well-used for walking and jogging. There are also grassland areas for recreational sport. A permissive footpath in the western area connects the Campus to the neighbouring villages of Ickleton and Hinxton.

2.   Methodology for determination of Biodiversity Units

2.1   Introduction

The extended Phase 1 habitat survey information has been used to complete the existing site baseline net gain calculation to establish the biodiversity value of the site, quantified by the number of biodiversity units.

2.2   Calculating biodiversity units

This biodiversity net gain assessment has followed guidance and information in the User Guide that accompanies the Defra Biodiversity Metric 3.0 (Panks, *et al*, 2021).

The calculations of biodiversity value have been carried out using the Defra Biodiversity Metric 3.0.

The metric uses habitat features as a proxy measure for capturing the value and importance of biodiversity. The Metric is a MS Excel spreadsheet that calculates the biodiversity value of a site before and after changes on the site, based on habitat features and accounting for their distinctiveness, size, condition and location in relation to other ecological features. Habitats are classified using the UK Habitats Classification System (Butcher *et al*, 2020).

This assessment has calculated the existing (baseline) value of the site only, because this project is not associated with any proposed development. The Wellcome Trust plan to enhance the site for wildlife, and when enhancements have been decided upon and actioned, the value of the site can be re-assessed, using the Defra Metric 3.0, to calculate changes in habitat units.

The method used is summarised as a series of stages as follows and is set out in more detail in the subsequent report sections:

- Stage 1 - Desk study and field survey to identify and quantify habitats present, and collect information to assess habitat condition
- Stage 2 - Desk based evaluation of the condition of the habitats
- Stage 3 - Calculation of existing biodiversity value of the site using the Defra Metric 3.0

2.3   Stage 1 – Field surveys

A Phase 1 habitat survey of the Site was undertaken and reported in *The Genome Campus PEA report* (WTBCN, June 2022).

The Phase 1 habitat survey followed the method described in JNCC (2010) to map and record the habitat types using standard notation for a Phase 1 habitat survey. Lists of plant species and indications of land management practices were recorded for each habitat parcel. Sufficient information was collected during the field survey, using a working knowledge of the UK Habitats Classification System, to allow habitat parcels to also be subsequently categorised to this alternative classification system for the purpose of the Defra Biodiversity Metric assessment.

The survey and reporting work carried out by The Wildlife Trust BCN included the collection of data to enable the assessment of the condition of each parcel of habitat present on the site, in accordance with the technical guidance that accompanies the Defra Biodiversity Metric 3.0 (Natural England Joint Publication JP039).

2.4   Stage 2 – Evaluation of Condition of habitats

The habitats identified during the survey in March 2022 were expressed in the relevant UK Habitat Classification categories (Butcher *et al*, 2020) as part of the Defra Biodiversity Metric 3.0 requirements.

The Biodiversity Metric 3.0 provides a scoring system for the condition of each habitat compartment, based on a set of criteria that are recorded during the field surveys (Natural England Joint Publication JP039).

The condition of each habitat was assessed and a category of good, moderate or poor is assigned. This information is used in the calculation of habitat units, as described in Stage 3 below.

2.5 Stage 3 – Biodiversity Units calculation

The information obtained from the field survey (classification of habitats into UK Habitats categories, and the condition assessment), along with GIS calculations of areas and lengths of habitats are input to the Defra Biodiversity Metric 3.0 spreadsheet. A decision is also needed as to the 'strategic significance' of the habitats, based on good working knowledge of the local area. The calculator within the spreadsheet calculates the biodiversity value expressed as the number of Biodiversity Units (BU).

To calculate the number of habitat units, the Metric uses the following factors:

- Distinctiveness: A ranking of the habitat based on a combination of its listed conservation status and its value to wildlife as a habitat – this is pre-determined by the Metric.

- Condition: As determined by the field surveys, following set criteria for each habitat type.

- Extent: The area or length of the habitat.

- Strategic significance: Whether the habitat is located in a preferred location for local biodiversity and environmental objectives, such as Nature Recovery Areas or areas identified in local Biodiversity Action Plans.

There are separate worksheets for area-based habitats and linear habitats, such as hedgerows and rivers.

2.6 Site specific approach

Trees

There are a large number of trees on the Campus which fall outside of woodland habitat and hedgerows. The areas within which they were found were also considered not to be categorised as 'Parkland or Wood Pasture' habitat. Therefore, these trees had to be considered under the 'Urban Trees' category. With such a large number of trees present (estimated minimum was 81), it was not possible within the remit and timescales of the surveys to measure the size of each of these trees. However, these trees do represent a significant biodiversity resource at the Campus, and it was therefore considered important to include them in the calculation of habitat units, via the Defra Metric 3.0.

To do this, the results of a previous arboriculture survey were used (Eastern Tree Surgery Ltd, 2021) along with notes made by the WTBCN during the Phase 1 Habitat survey in March 2022.

No data is available on the size of each tree, and the condition assessment made in the Tree Survey Report in 2021 was related to physiological condition rather than ecological condition / value.

From walking the Campus, and from the notes in the Tree Survey Report it is clear that the vast majority of trees on the Campus are of size class Medium or Large (as set out in the Biodiversity Metric 3.0 User Guide, Panks *et al*, 2021). From the Tree Survey Report -

Most of them {the trees on Campus} *are fully mature, in varying states of structural and physiological condition, and containing varying amounts of deadwood, cavities and broken branches*.

The Phase 1 habitat survey included notes on the condition of trees across the Campus and this can be applied to the Condition Assessment for Urban Trees, which for this assessment, relates to all of the trees on the site as a whole.

Therefore, the following approach has been taken:

- All trees categorised as 'Medium' size apart from those noted by the WTBCN as being of significant size and maturity; these have been categorised as 'Large' These trees are shown on the Phase 1 Habitat map included in the separate PEA report.

- The condition of all trees has been assessed as 'Good' because considered as a whole across the site, the majority are considered likely to pass 5 of the criteria set out in the Condition Assessment for Urban Trees.

Waterbodies

Waterbodies in the wetland area, and the waterbody to the north of the main lake on Campus have been classified as 'Ponds - Priority Habitat'. This is due to records showing that they have historically supported one or more of the following:

- Great crested newt
- Common toad
- Grass snake

These are all Species of Principle Importance (also known as Priority Species) as listed on the NERC Act[1]. Under the JNCC (2016) Priority Habitats definition[2], this qualifies the ponds as Priority Habitat.

The two large waterbodies in the centre of the Campus are classified for the Metric calculation as 'Ornamental lakes or ponds'. These are much larger and deeper than the ponds, have significantly different aquatic macrophyte populations and marginal aquatic vegetation, with significant disturbance from non-native fish and a water fountain. They can be classified at present as having a recreational function within the Campus, rather than primarily at ecological one.

Amphibian surveys will be conducted of all waterbodies on the site during April to June 2022, which will provide more up-to-date information on the status of Species of Principal Importance associated with the waterbodies on site.

2.7   Limitations

Trees - Due to the large number of trees on the site, outside of woodland habitats, it was not possible to measure and assess the condition of every tree. A recent arboriculture report from the Campus has been utilised, along with information collected on the Phase 1 Habitat survey, to include trees within the baseline biodiversity assessment. However, some assumptions have had to be made. Further details on the approach taken have been provided above.

River Cam – following published guidelines and methods, in order to determine the condition of rivers within the Defra Metric process, a bespoke series of measurements and information is required about the river to generate the condition of the river required by the assessment. This is done by completing a MoRPh survey which looks at aspects including vegetation, physical properties and the river margins and a desk based hydrological study. Due to the specialist survey requirements, this aspect of the biodiversity assessment will be completed at a later date and the habitat units output updated accordingly.

---

[1] Habitats of Principal Importance are sometimes also referred to as Priority Habitats and are now listed under Section 41 of the NERC Act (2006). These replace the former Biodiversity Acton Plan (BAP) lists.
[2] https://data.jncc.gov.uk/data/dec49c52-a86c-4483-90f2-f43957e560bb/UKBAP-BAPHabitats-42-Ponds.pdf

Grassland habitats – many of the grassland areas on the Campus were mown short at the time of the Phase 1 Habitat survey. This makes identification of grass species very difficult and therefore, in areas of mown grassland, the grass species lists are not comprehensive.

The Genome Campus, Wellcome Trust: Biodiversity Units Calculation

3.   Results

The results of Phase 1 habitat mapping are shown on the map in the separate PEA report.

The total area of mapped and assessed habitats on the Campus is 47.995ha (excluding the River Cam and areas of hardstanding and roads, but including buildings).

Some of the UK Habitat categories did not have a corresponding set of Condition Assessment criteria. The closest alternatives were used instead. Substitutions made were:

- Aquatic Marginal Vegetation assessed under Grassland – moderate / high distinctiveness.
- Areas of seeded wildflower mix assessed under Open Mosaics on Previously Developed Land and Other Neutral Grassland.

The UK Habitats key does not have a habitat category for areas of seeded wildflower mix. Large areas of the Campus currently support habitats created by the relatively recent sowing of wildflower seed mixes. In some areas, these currently support relatively high proportions of flowers over grasses and some areas did not fit into the habitat types defined by UK Habitats (UK Habs). Several large areas were categorised as 'Open Habitat Mosaics on Previously Developed land' but the grassland around the ponds in the Wetland nature reserve, which supports calcareous indicator species, did not fit this definition. The closest habitat type under the UK Habs system was determined to be 'Other Neutral Grassland'.

The Eastern Tree Surgery Ltd (2021) Tree Survey Report identifies 81 trees. Of these, The Wildlife Trust has confirmed that 71 of these are Large. These figures have been used in the Metric calculator to generate an area for Trees.

Table 3.1 below summarises the habitat types across the site, in terms of their Phase 1 habitat classification and their UK Habitats (UK Habs) classification, their area and assessed condition, based on findings at the site as part of the habitat surveys in March 2022.

Appendix A supplies the details as to which criteria in the Condition Assessment each habitat type passed, so as to show how the condition for each habitat type was reached.

Table 3.1 Campus habitat types, areas and Condition assessment

UK Habitats Classification	Phase 1 Habitat(s)	Area (ha)	Condition
Aquatic marginal vegetation (assessed under 'Grassland –moderate / high distinctiveness)	Marginal vegetation, Semi-improved neutral grassland	0.675	Moderate
Bare ground	Bare ground	0.474	Poor
Broadleaved Woodland	Broadleaved semi-natural, Broadleaved plantation Mixed plantation	9.426	Moderate
Buildings (previously developed land)	Buildings, hardstanding and roads	6.823	n/a to assessment
Introduced Shrub	Introduced shrub	0.949	Poor – standardised result

The Genome Campus, Wellcome Trust: Biodiversity Units Calculation

UK Habitats Classification	Phase 1 Habitat(s)	Area (ha)	Condition
Modified Grassland	Semi-improved neutral grassland	0.538	Good
Modified Grassland	Species-poor, semi improved grassland	9.523	Moderate
Modified Grassland	Improved grassland	0.438	Poor
Open Mosaic on Previously developed land (note: includes large mound)	Semi-improved neutral grassland, Ephemeral short perennial	9.482	Good
Orchard	None specified. Mapped for the grassland present – semi-improved neutral grassland	0.16	Good
Ornamental Lakes and Ponds	Standing open water	0.867	Poor
Other Neutral Grassland	Semi-improved neutral grassland (grassland around ponds in Wetlands nature reserve)	2.38	Moderate
Other Neutral Grassland	Semi-improved neutral grassland (in north of site)	2.664	Moderate
Other Neutral Grassland	Tall ruderal	1.202	Poor
Ponds (Priority Habitat)	Standing open water	0.254	Two Moderate, two Good
Reedbed	Swamp	0.22	Good
Blackthorn scrub	Dense scrub	0.68	Moderate
Mixed scrub	Scattered scrub	1.24	Moderate
Site total area		**47.995 ha**	
Urban Trees	Trees	0.8433 (area as calculated by the Metric spreadsheet)	Good
UK Habitats Classification	**Phase 1 Habitat(s)**	**Length (km)**	**Condition**
Ditch	Wet ditch	0.499	Poor
Hedgerow (native)	Intact species-poor hedge	0.289	Poor
Hedgerow (native species rich with trees)	Species-rich hedge with tree	0.074	Good
Hedgerow (native with trees)	Species-poor hedgerow with trees	0.293	Poor
Line of trees (ecologically valuable)	Line of trees	0.157	Good
Line of trees	Line of trees	0.156	Moderate

The Genome Campus, Wellcome Trust: Biodiversity Units Calculation

UK Habitats Classification	Phase 1 Habitat(s)	Area (ha)	Condition
River	Eutrophic open running water	0.644	Not assessed

As shown in Table 3.2 below, the current baseline of the Campus, as derived from the Defra 3.0 Metric, taken from surveys in March 2022, and excluding the river, equates to **465.12 Habitat Units**, **6.15 Hedgerow Units**, and **2.0 River Units**.

This information is also available on request in the original Defra Metric spreadsheet form.

Table 3.2 Output from Defra Metric 3.0

The Wellcome Trust Genome Campus Headline Results		Return to results menu		
On-site baseline		Habitat units	465.12	
		Hedgerow units	6.15	
		River units	2.00	
On-site post-intervention (Including habitat retention, creation & enhancement)		Habitat units	465.12	
		Hedgerow units	6.15	
		River units	2.00	
On-site net % change (Including habitat retention, creation & enhancement)		Habitat units	0.00%	
		Hedgerow units	0.00%	
		River units	0.00%	
Off-site baseline		Habitat units	0.00	
		Hedgerow units	0.00	
		River units	0.00	
Off-site post-intervention (Including habitat retention, creation & enhancement)		Habitat units	0.00	
		Hedgerow units	0.00	
		River units	0.00	
Total net unit change (including all on-site & off-site habitat retention, creation & enhancement)		Habitat units	0.00	
		Hedgerow units	0.00	
		River units	0.00	
Total on-site net % change plus off-site surplus (including all on-site & off-site habitat retention, creation & enhancement)		Habitat units	0.00%	
		Hedgerow units	0.00%	
		River units	0.00%	
Trading rules Satisfied?		Yes		

The Genome Campus, Wellcome Trust: Biodiversity Units Calculation

4.   Conclusions

The current baseline of the Campus, taken from surveys in March 2022, and excluding the river, equates to **465.12 Habitat Units**, as derived from the Defra 3.0 Metric. The baseline hedgerow score is **6.15 Hedgerow Units**, and the baseline score for rivers (ditches) is **2.0 River Units**.

Some assumptions have had to be made, particularly in relation to individual trees across the site, due to the large number present and it is likely that the area assigned to this habitat from the data inputted to the Metric has resulted in an under estimate of the Habitat Units present in the form of individual trees (i.e. those outside of the woodland and orchard habitats).

A dedicated tree survey, to measure each tree (trunk circumference at breast height) in order to assign the size category, and completion of the condition criteria checklist for each tree would be needed for an accurate inclusion of this habitat resource within the site's baseline score.

The River Cam, as it flows through the site, is also a significant habitat resource, and at present, this has not been included at all in the Metric scoring. Specific training and access to data resources (MoRPh Surveys for assessing river habitats) is necessary and this aspect of the work will be completed at a later date. The baseline Habitat Units score will then be updated and re-issued.

Large areas of the Campus currently support habitats created by the relatively recent sowing of wildflower seed mixes. In some areas, the habitats present did not fit clearly into the habitat types defined by UK Habitats (UK Habs) and therefore the closest match was chosen in each case, based on survey data collected in March 2022.

The completed Metric Spreadsheet (in Excel format) has been supplied separately to this report.

5.   References

Butcher, B. Carey, P., Edmonds, R., Norton, L. & Treweek, J. (2020) *The UK Habitat Classification Habitat Definitions version 1.1.* Available at www.ukhab.org

Eastern Tree Surgery Ltd. (2021) Tree Survey Report, Genome Campus, Hinxton

Natural England Joint Publication JP039. *The Biodiversity Metric 3.0: auditing and accounting for biodiversity. Condition Assessment Sheets.*

Panks, S., White, N., Newsome, A., Potter, J., Heydon, M., Mayhew, E., Alvarez, M., Russell, T., Scott, S., Heaver, M., Treweek, J., Butcher, B. & Stone, D. (2021) Biodiversity metric 3.0: Auditing and accounting for biodiversity – User Guide. Natural England.

Appendix A – Condition Assessment Scoring

Habitat type (UK Habs)	Criteria passed / score	Total	Condition
Aquatic marginal vegetation (assessed under 'Grassland – moderate / high distinctiveness)	1, 2, 3, 5	4 of 5	Moderate
Bare ground (includes fenced area of building materials)	0 of 3	0	Poor
Broadleaved Woodland	All areas of woodland across site achieved the same score but with a slightly different scoring distribution across the woodland Indicators	Total score = 28	Moderate
Buildings (previously developed land)	Not assessed in Metric		n/a
Introduced Shrub	Automatically assigned 'Poor' due to nature of habitat type		Poor
Modified Grassland	1, 3, 4, 5, 6, 7	6 of 7	Good
Modified Grassland	1, 3, 4, 5, 6	5 of 7	Moderate
Modified Grassland	3, 5, 6	3 of 7	Poor
Open Mosaic on Previously developed land	1, 2, 3 including requirements for Good within criteria 2 & 3	3 of 3	Good
Orchard	1, 2, 3, 5, 6, 7, 8	7 of 8	Good
Ornamental Lakes	2, 3	2 of 9	Poor
Other Neutral Grassland (grassland in wetland reserve)	1, 2, 3, 5	4 of 5	Moderate
Other Neutral Grassland (in north of Campus)	2, 3, 4, 5	4 of 5	Moderate
Other Neutral Grassland (Tall Ruderal on Phase 1 map)	3, 4	2 of 5	Poor
Ponds (Priority Habitat)	Pond in north of Campus 1,2,3, 4,5,6,7	7 of 9	Moderate
	Pond in north of wetland area 1,2, 3,5,7,8,9	7 of 9	Moderate
	Remaining two ponds in wetland area 1,2,3,4,5,6,7,8,9	9 of 9	Good
	Pond in woodland	7 of 7	Good
Reedbed	1, 2, 3, 4, 5, 7c	5 of 5 plus 7c	Good
Blackthorn scrub	1, 2, 4	3 of 5	Moderate
Mixed scrub	3, 4, 5	3 of 5	Moderate

Habitat type (UK Habs)	Criteria passed / score	Total	Condition
Urban Trees	1,3,4,5,6	5 of 6	Good
Ditch (wet)	1, 3, 5, 8	4 of 8	Poor
Native Hedgerow	B1, B2, C1, D1	4 of 8 and fails more than one attribute in more than one functional group	Poor
Hedgerow (native species rich with trees)	A1, A2, B1, B2, C1, D1, D2, E1, E2	9 of 10 and no more than one failure in any one functional group	Good
Hedgerow (native with trees)	B1, B2, C2, D1, E1, E2	6 of 10 but fails both attributes in more than one functional group	Poor
Line of trees (ecologically valuable)	1,2,3, 4, 5	5 of 5	Good
Line of trees	1,2, 4, 5	4 of 5	Moderate