Valuing our urban trees II

Assessing the condition of urban tree habitats using Biodiversity Metric 3.0

Our blog, **Valuing our urban trees**, pointed out the failings of the methodology for calculating the size of urban tree habitats as set out in Biodiversity Metric 3.0 (BNG 3.0). We would now like to show how this is compounded by the inappropriate assessment criteria used to determine the condition of Urban Tree habitats, as also set out in BNG 3.0 (see Annex 1).

We use the following example - taken from a recently approved planning application[1] which will result in the removal of 13 urban trees – to demonstrate why this is approach is inappropriate.

Figure 1 The example tree – Google Street View 2020

This street tree is a London Plane (*Platanus* × *acerifolia*) with a stem diameter (called DBH) of 118 cm. It is a non-native species planted in hard standing on Bridge St, Bristol BS1 2AN in about

[1] The Developer used BNG 2.0 in its submissions and applied a different Condition assessment to the one used here.

1967. Using **BS 5837:2012,**[2] it has been categorised as **A,1,2** (see Annex 2). The developer's surveyor described it as having a '*Large, broad crown with excellent form and vigour*.'

The tree's BS 5837:2012-calculated Root Protection Area (RPA) radius[3] is 14.6 metres, so it has an RPA of 630 square metres. The tree has an average crown radius of 9.88 metres and a calculated canopy area of 306 square metres.

Using BNG 3.0 **TABLE 7-2: Urban tree size by girth and their area equivalent** (see Annex 1), the calculated RPA of the tree is set at **Large**, so its habitat size is limited to just 113 square metres - a discount of 82% of its calculated RPA and 37% of its canopy area.

Notwithstanding categorisation of the tree as **A,1,2**, the BNG 3.0 Condition Assessment Criteria categorises the condition of this tree as **Poor** because it meets only two of the six criteria, as shown below:

Condition Assessment Criteria		
1	More than 70% of trees are native species.	
2	Tree canopy is predominantly continuous with gaps in canopy cover making up <10% of total area and no individual gap being >5 m wide.	
3	More than 50% of trees are mature or veteran.	**X**
4	There is little or no evidence of an adverse impact on tree health by anthropogenic activities such as vandalism or herbicide use. There is no current regular pruning regime, so the trees retain >75% of expected canopy for their age range and height.	**X**
5	Management regime has encouraged micro habitat sites for birds, mammals and insects, e.g., presence of deadwood, cavities or loose bark etc.	
6	Trees are immediately adjacent to other vegetation, and tree canopies are oversailing vegetation beneath.	

[2] Trees in relation to design, demolition and construction – Recommendations (BSI Standards Publication)
[3] RPA radius = 12 x DBH

Using BNG 3.0, the calculation of the baseline habitat (called Habitat Units) of this tree is as follows:

HABITAT TYPE	URBAN TREE	0.0113 HA
CRITERIA	**RESULT**	**SCORE**
DISTINCTIVENESS	Moderate	4
CONDITION	Poor	1
STRATEGIC SIGNIFICANCE	Area/compensation not in local strategy/ no local strategy	1
HABITAT UNITS	0.0113 x 4 x 1 x 1	**0.0452**

Had the BS 5837:2012 condition of the tree been allowed for, and its condition set to '**Good**', then the habitat units of this tree would be three times the habitat unit value of 0.0452, i.e. 0.1356 as shown below.

HABITAT TYPE	URBAN TREE	0.0113 HA
CRITERIA	**RESULT**	**SCORE**
DISTINCTIVENESS	Moderate	4
CONDITION	Good	3
STRATEGIC SIGNIFICANCE	Area/compensation not in local strategy/ no local strategy	1
HABITAT UNITS	0.0113 x 4 x 3 x 1	**0.1356**

Not only has the true size of the urban tree habitat been seriously undervalued (because its actual RPA has not been used), but its assessed condition using the BNG 3.0 criteria is also clearly inappropriate given that this tree has been assessed at the highest category under BS 5837:2012:

> ***Category A - Trees of high quality*** *with an estimated remaining life expectancy of at least 40 years …that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g., the dominant and/or principal trees within an avenue).*

The proposed solution

BNG 3.0 is seriously flawed when it comes to evaluating Urban Tree habitats. We have already commented on this when it comes to calculating habitat size.

In our view, the solution to the issue of assessing the correct condition of urban tree habitats is already available in BS 5837:2012. The standard may require some amendment to align it with BNG 3.0, but it is a well-established and practical approach used by the arboricultural community. This British Standard gives recommendations and guidance on the relationship between trees and design, demolition and construction processes and is used whether or not planning permission is required.

Bristol Tree Forum

30 January 2021

Annex 1

The Biodiversity Metric 3.0 - auditing and accounting for biodiversity

USER GUIDE (page 68)

TABLE 7-2: Urban tree size by girth and their area equivalent

Size	Diameter at Breast Height (cm)	Stem Diameter (cm)	RPA (radius in metres)	Area equivalent (ha)	No. of Trees equivalent to 1 ha
Small	30cm	10cm	1.2m	0.0005 ha	2,000 trees
Medium	90cm	30cm	3.6m	0.0041 ha	244 trees
Large	150cm	50cm	6 m	0.113	89 trees

Condition assessment

7.10 Urban trees are split into small, medium and large trees and are assessed using an Urban tree condition assessment proforma to score the trees as Poor (score of 1), Moderate (score of 2) or Good (Score of 3) condition (see Technical Supplement Part 1a).

7.11 It is important that both size and condition are recorded for each tree. Trees of the same size and condition can then be grouped together before entry into the 'Urban tree helper' to generate an area equivalent for each condition category. The number of small, medium and large trees is then automatically converted into a total area equivalent value which can be used in the metric calculation. (See Box 7-1).

TECHNICAL SUPPLEMENT (pages 193-194)

22 Urban trees

Condition Sheet: URBAN TREES (INCLUDING STREET TREES) Habitat Type	
UKHab Habitat Type(s)	
Urban - Urban tree	
Habitat Description	
Covers the following topographical formations most commonly found in urban areas[1]: **Individual Trees:** Young trees over 75mm in diameter measured at 1.5m from ground level and individual semi-mature and mature trees of significant stature and size that dominant their surroundings whose canopies are not touching but that are in close proximity to other trees.**Perimeter Blocks:** Groups or stands of trees within and around boundaries of land, former field boundary trees incorporated into developments, individual trees in gardens whose canopies overlap continuously **Linear Blocks:** Lines of trees along streets, highways, railways and canals whose canopies may or may not overlap continuously.	
Condition Assessment Criteria	
1	More than 70% of trees are native species.
2	Tree canopy is predominantly continuous with gaps in canopy cover making up <10% of total area and no individual gap being >5 m wide.
3	More than 50% of trees are mature[2] or veteran[3].
4	There is little or no evidence of an adverse impact on tree health by anthropogenic activities such as vandalism or herbicide use. There is no current regular pruning regime, so the trees retain >75% of expected canopy for their age range and height.
5	Management regime has encouraged micro habitat sites for birds, mammals and insects e.g. presence of deadwood, cavities or loose bark etc.
6	Trees are immediately adjacent to other vegetation, and tree canopies are oversailing vegetation beneath.
FC	**Condition Assessment Score**
Passes 5 or 6 of 6 criteria	Good (3)
Passes 3 or 4 of 6 criteria	Moderate (2)
Passes 0, 1 or 2 of 6 criteria	Poor (1)
Notes	

Footnote 1 - This covers all trees in artificial urban habitats such as private gardens, private land, institutional land and land used for transport functions; roads, streets, canals, rail, footpaths etc. Trees in urban areas can under the right conditions provide a large range of habitat opportunities, supporting lichens, invertebrates and birds. Tree planting in urban areas has for over two hundred years also introduced non-native species into towns and cities. In the context of biodiversity native species are the preferred option. However, non-native tree species can contribute positively to biodiversity richness particularly in relation to providing a seasonal food source for nectar feeders and other invertebrates as well as supporting vertebrates that feed on species that are hosted by non-native trees. Examples are early and late flowering species of *Prunus* and aphids on varieties of *Acer* providing food for species higher up the food chain. The species of trees (native or non-native) together with the intensity and type of management they are subject to will determine the biodiversity value of the trees in question. Trees in urban areas provide opportunistic sites for biodiversity to colonise and re-colonise, increasing connectivity and contributing to biodiversity critical mass between already established patches or sites. This is especially so where transport corridors are populated with mixed native species

Footnote 2 - A mature tree in this context is one that is at least 2/3 expected fully mature height for the species.

Footnote 3 - All ancient trees are veteran trees, but not all veteran trees are ancient. A veteran tree may not be very old, but it has decay features, such as branch death and hollowing. These features contribute to its biodiversity, cultural and heritage value. Veteran trees can be classified if they have four out of the five following features:

1. Rot sites associated with wounds which are decaying >400cm2;
2. Holes and water pockets in the trunk and mature crown >5 cm diameter;
3. Dead branches or stems >15 cm diameter;
4. Any hollowing in the trunk or major limbs;
5. Fruit bodies of fungi known to cause wood decay.

Annex 2

BS5837:2012 4.5 Tree categorization method - tree category definitions

Table 1 **Cascade chart for tree quality assessment**

Category and definition	Criteria (including subcategories where appropriate)			Identification on plan
Trees unsuitable for retention (see Note)				
Category U Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years	• Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning) • Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline • Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality *NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see **4.5.7**.*			See Table 2
	1 Mainly arboricultural qualities	**2 Mainly landscape qualities**	**3 Mainly cultural values, including conservation**	
Trees to be considered for retention				
Category A **Trees of high quality** with an estimated remaining life expectancy of at least 40 years	Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)	See Table 2
Category B **Trees of moderate quality** with an estimated remaining life expectancy of at least 20 years	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation	Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality	Trees with material conservation or other cultural value	See Table 2
Category C **Trees of low quality** with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value	See Table 2