

The Briefing

Greening Greater Manchester

TEP Briefing Note: May 2020



As demand for increased biodiversity reaches into the heart of urban areas, a new environmental currency enters circulation and the campaign for Biodiversity Units begins.

The UK is said to be one of the most “nature-depleted” countries of the world. The Government’s 25 Year Environment Plan aims to restore biodiversity after decades of decline.

As part of that plan, a new Environment Act will soon be passed. This will require planners to calculate the number of Biodiversity Unit’s (BU’s) on development land, and ensure that any future development results in a net increase of at least 10%. This will increase the value of Biodiversity Units as developers, landowners and local authorities search for innovative ways to provide them.

Using open source data and the power of cloud computing, TEP has examined what this means for Greater Manchester. TEP has developed a method of estimating how many Biodiversity Units the city region has. This is an early step in planning how Greater Manchester can grow sustainably.

How Green Is Greater Manchester?



Greater Manchester encompasses ten local authority areas and covers about 132,000 hectares. Despite its perception as a very built-up area, only a quarter is built over. In fact grasslands are the largest land-use, covering 34% of the city region. Gardens cover about 19,000 hectares, about twice as much as woodlands, which cover about 10,000 hectares.

Using Defra's metric, TEP has estimated that Greater Manchester has about 760,000 Biodiversity Units (BU's) in total. Oldham and Rochdale have the most BU's; reflecting their Pennine Edge geography and their wilder character. Unsurprisingly, the central areas of Manchester, Salford and Trafford have the fewest BU's.

This briefing note summarises some highlights from our estimation of Greater Manchester's biodiversity. We also explain our methodology, its limitations and how it might be used.

In our next briefing note, in June 2020, we look into the future. Greater Manchester has ambitions for significant sustainable housing and employment development, alongside restoration of biodiversity. But is green growth possible? A 10% increase in biodiversity across the city region would mean creating 76,000 new BU's; a huge task. TEP will examine how this might be achieved, what contribution might come from new development, and the role of planners, landowners and landscape managers.



What are Biodiversity Units?

Biodiversity units are calculated by Defra's Biodiversity Metric 2.0, which measures a habitat's distinctiveness, its condition, its connectivity and its area. The metric allots different land types a score based on their contribution to biodiversity. Buildings score zero! Species-poor habitats such as playing fields and intensive arable land score 2 BU's per hectare. At the other end of the scale, mature broadleaved woodlands, reedbeds and heathland can score over 20 points per hectare, depending on their condition and degree of connectivity with other habitats.

Defra's metric is still in "beta test mode", but compared to earlier versions, it now includes urban habitats such as Sustainable Urban Drainage Systems, green roofs and street trees. TEP felt the time was right to develop an open-sourced GIS method of estimating BU's at a landscape scale, to aid city planners.

Greater Manchester's Biodiversity Units – Analysis of Habitats

Greater Manchester Habitat Types, Areas and Biodiversity Units

Habitat Type	Area (Hectares)	Biodiversity Units	Biodiversity Units Per Hectare
Grassland	44,740	343,339	7.67
Gardens	19,141	38,282	2
Cropped Land	11,053	24,376	2.21
Woodland	10,747	133,915	12.46
Heathland and Scrub	7,317	153,966	21.04
Reservoirs, Lakes and Ponds	2,469	43,720	17.71
Amenity Grassland	2,097	10,353	4.94
Other	1,404	8,013	5.71
Wetlands and Reedbeds	285	7,488	26.23
Allotments and Orchards	275	2,598	9.46
Built Areas	32,416	0	0
Total	131,944	766,050	5.8



We found that the habitats of Greater Manchester have a total biodiversity score of 766,050 units, approximately 5.8 units per hectare - see Table above.

Grassland and private gardens are the two most widespread habitats. Grassland accounts for 45% of Greater Manchester's BU's, as shown in Figure 2.

However grassland inherently has fewer biodiversity units per hectare than habitats such as heathland, scrub, woodland, ponds and reedbeds, as shown in Figure 3.

Figure 1 - Greater Manchester's Habitats

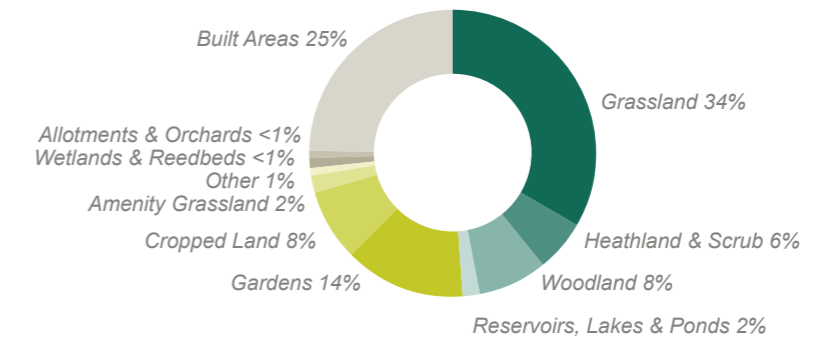


Figure 2 - Greater Manchester's Biodiversity Units

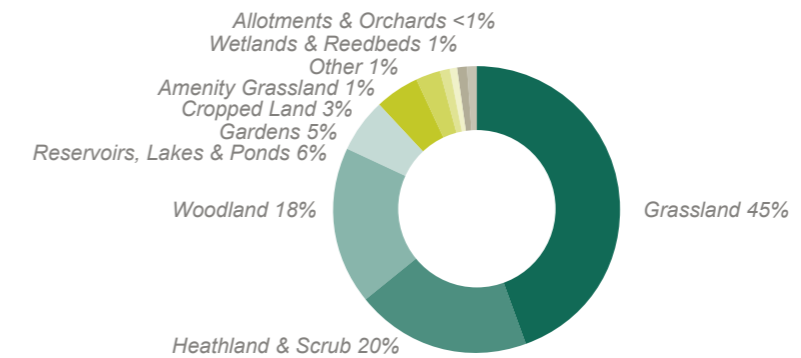
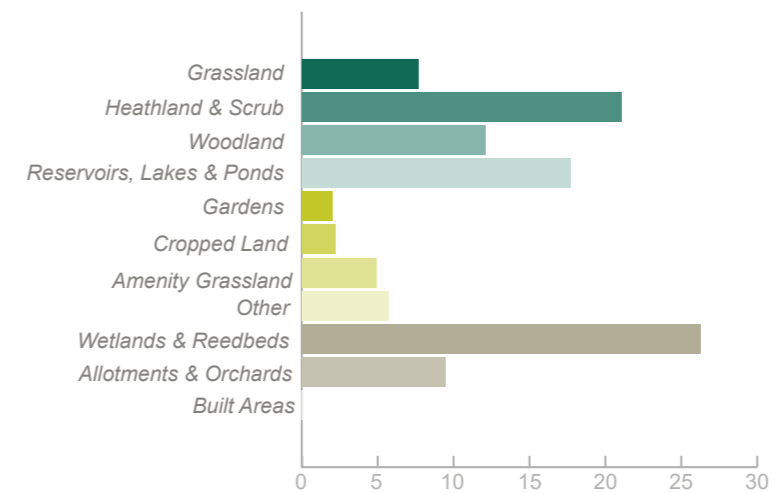


Figure 3 - Greater Manchester's Biodiversity Units Per Hectare



Greater Manchester's Biodiversity – Analysis by Local Authority



Stockport Interchange - TfGM / BDP

Oldham and Rochdale have the most BU's in Greater Manchester, and are also the most valuable per hectare. In fact five authorities with a significant area of upland (Bury, Bolton, Rochdale, Oldham and Tameside) have above-average values per hectare (see Figure 7). This is probably due to the high weighting that the Defra metric places on open upland habitats. The Pennine Edge authorities are, in relative terms, the biodiversity oases for Greater Manchester, given the close relationship with the Peak District National Park and the South Pennines Special Protection Area.

Manchester, Trafford, Salford and Stockport Councils have the lowest scores per hectare, understandably due to the high coverage of built areas in the urban centre. But it is encouraging to see how inner areas can be transformed "from grey to green" during the regeneration process, for example the new roof-top town-centre park planned at [Stockport Interchange](#).

Rather surprisingly, Wigan has fewer biodiversity units per hectare than authorities of a similar character such as Bolton and Bury. This may be due to the relative weight placed on upland habitats.

Figure 5 shows the BU's in value bands across electoral wards. Red areas are the most "nature-deprived". There are many mental and physical health benefits of regular contact with nature, so city-regional planning policy should keep a relentless focus on local environmental improvements and enabling people to enjoy nearby natural assets. During our research we came across the work of the [Sensory Trust](#). They recognise that nature-deprivation impacts hardest on people already living with ill health or poor mobility. Their mission is to make the outdoors accessible to all, and their website includes many ideas for local action groups, local food-growing, seating, shelter, waymarking, sensory gardens and inclusive design.

Figure 4 - Biodiversity Units By Local Authority

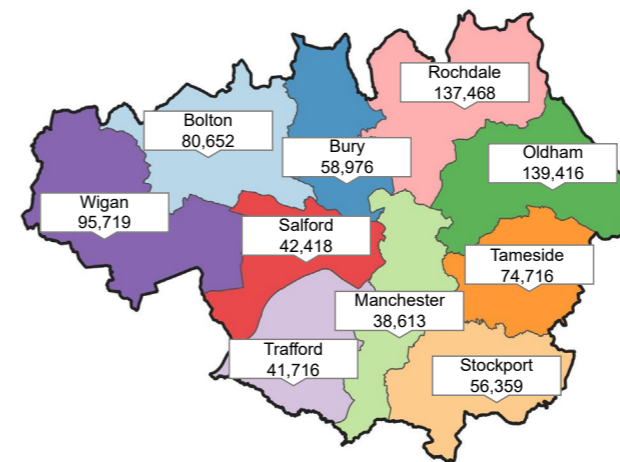


Figure 5 - Biodiversity Units By Ward

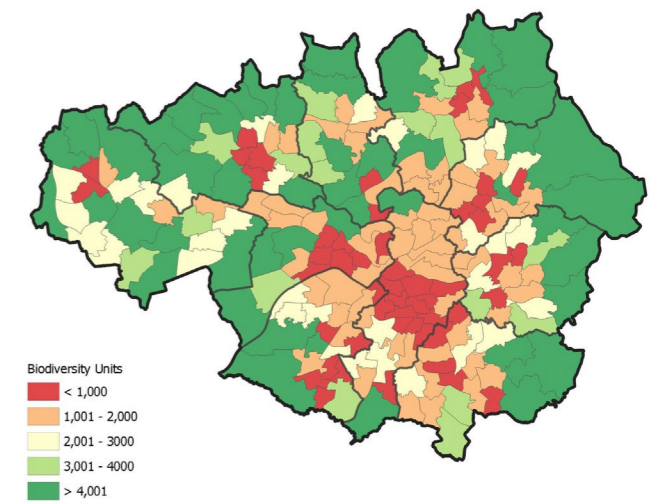


Figure 6 - Biodiversity Units By Local Authority

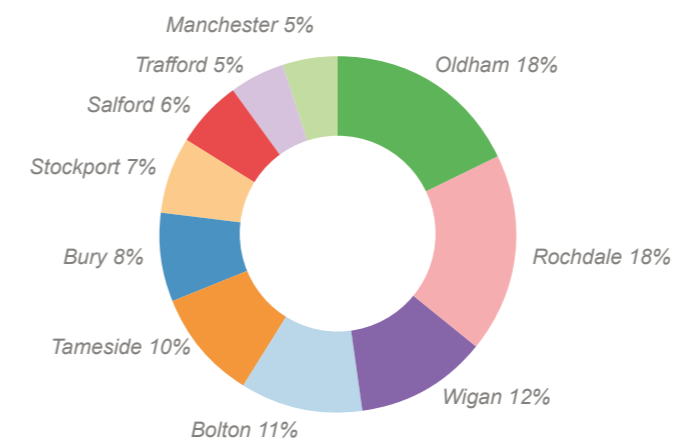
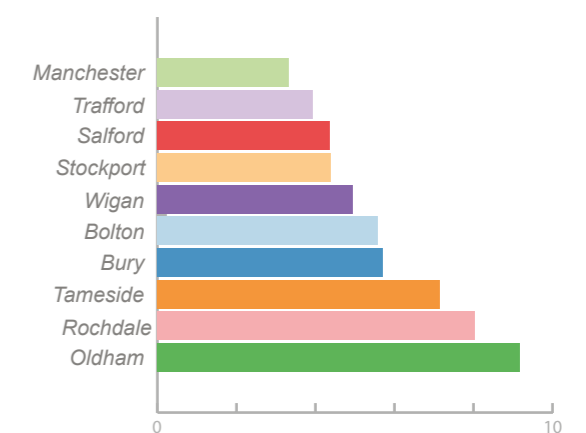


Figure 7 - Biodiversity Units Per Hectare



Mapping the City Region's Biodiversity - The Methodology

The Defra metric is already in widespread use by consultant ecologists on development sites. TEP's aim was to see how the metric performs at a landscape scale. Geographical Information Systems (GIS) is a tool for strategic planning, and is an opportune method to apply the metric at a city-regional scale.

To calculate the baseline biodiversity "score" requires both ecological knowledge and GIS expertise to understand the ecological theory of the metric. In developing our method, we also stuck with a principle of using open-source data as much as possible, so the study could be replicated with minimal cost. Other datasets were acquired through TEP's partnership agreement with Ordnance Survey (OS) for research and development purposes.



Figure 8 - Aerial Image Example

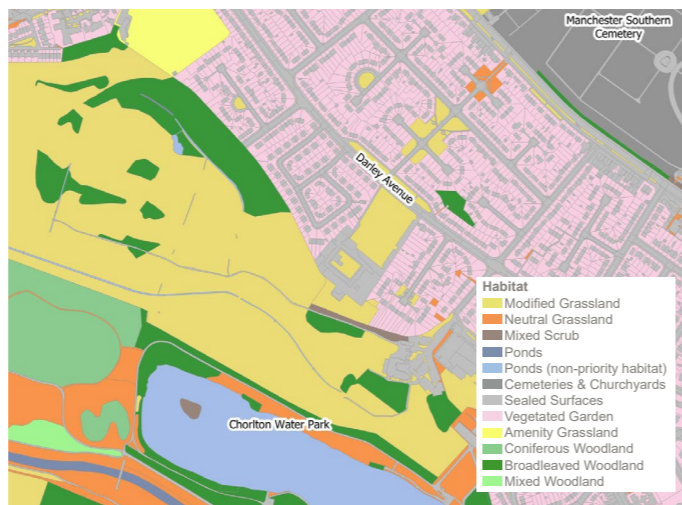


Figure 9 - Habitat Mapping Example

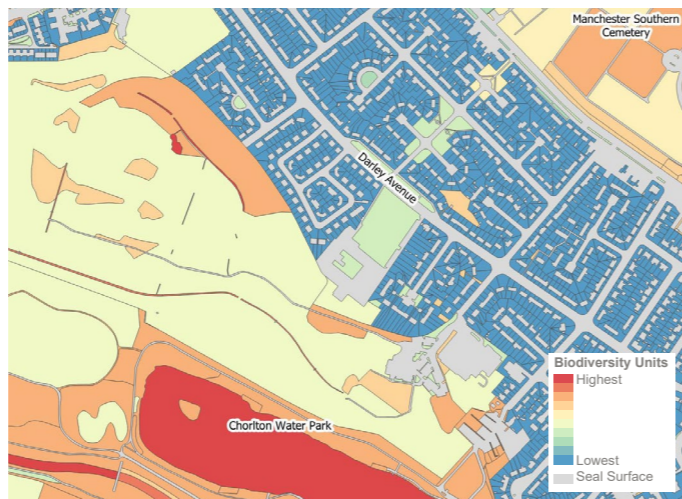


Figure 10 - Habitat Scoring Example

Step 1: Identify The Habitats In Greater Manchester

To provide accurate and complete coverage of land cover, OS MasterMap was used as a baseline dataset. Land cover was categorised through MasterMap and other open-source products, such as OS Open Greenspace and the Crop Map of England.

The land cover map was then translated into an equivalent UK Habitat classification for use in the metric – for example, land cover identified as 'broadleaved woodland' was translated to the 'other woodland; broadleaved' UK Habitat classification.

This process presented computational challenges, as the dataset included over 4,000,000 features over Greater Manchester. Cloud computing technologies were used for data processing, and open-source webmapping was used to present and discuss the findings without the need for specialist software. Figures 8 and 9 show the Mersey Valley and Chorlton Water Park in South Manchester as an aerial image, alongside the corresponding UK Habitat classification.

Step 2: Calculate Biodiversity Units

Defra's Biodiversity Metric 2.0 was applied to calculate the biodiversity units for each habitat parcel. The metric requires input of the following:

- Parcel Size
- Habitat Distinctiveness
- Connectivity
- Condition
- Strategic Importance

The parcel size was derived from the GIS dataset. Defra guidance was used to derive values for habitat distinctiveness and connectivity. Open-source ecological designations were used as a proxy for habitat condition and strategic importance.

The table below sets out an example of the calculation performed for every parcel:

Property	Value	Score
Size (ha)	2	2
Distinctiveness	High	6
Condition	Good	3
Strategic Importance	Moderate	1.1
Connectivity	Moderate	1.1
Biodiversity Units		43.56

It is also possible to identify habitat parcels which already have an optimum value, and parcels with potential for enhancement.

Figure 10 shows the BU's present on each habitat parcel in the sample area.

Step 3: Data Aggregation

The BU's present on each land parcel can be aggregated by any geography. For this study, we looked at the City region as a whole, electoral wards, administrative areas and potential development land. In our next bulletin, in June 2020, we will explore how the data can be used to inform a strategy to enhance biodiversity by 10%, including the extent to which development can contribute.

Limitations

This methodology is purely desk-based, relying on open-source data. Certain assumptions are made when translating OS greenspace types into UK habitat type, and individual trees cannot be scored as there is no open-source dataset for urban tree canopy. Thus any site-specific biodiversity assessment would require on-site ground-truthing.

Scoring of connectivity and strategic importance is on the basis of national datasets only, as local designations (Sites of Biological Importance) were not publicly accessible at the time.

The study uses Defra metric 2.0 which is in beta-test mode and will be finalised in December 2020. The metric is based on habitat types, and doesn't take account of protected and priority species or educational, amenity or carbon-sequestration value associated with different habitats; that may eventually emerge as natural capital accounting and Environmental Net Gain policy become commonplace.

Nevertheless, the study gives a valuable overview of the biodiversity value of Greater Manchester and informs a dialogue around delivering both development and biodiversity enhancement.

In Summary

The Environment Bill presents the opportunity to improve biodiversity through the introduction of measurable targets for developments using Defra's biodiversity metric 2.0.

TEP has developed a system, using open-source data, which estimates biodiversity units (BU's) present at a landscape scale. For Greater Manchester, we estimate that the city region has about 766,000 BU's, an average of 5.8 BU's per hectare. Across local authorities, Oldham has the greatest score (139,416) and Manchester City the lowest (38,613). We have mapped biodiversity units at electoral ward scale, highlighting "nature-rich" and "nature-deprived" areas.

Grasslands in parks, farms, verges and amenity areas, along with private gardens, account for half (66,000 hectares) of Greater Manchester's land cover. With some notable exceptions, these habitat types have relatively few biodiversity units, and perhaps offer the most widespread opportunity for enhancement. Buildings and hard surfaces account for some 32,000 hectares and it is encouraging to see a number of developers and planners adopting "grey to green" practices such as green walls, green roofs, SuDS, and urban tree-planting.

The Environment Bill's requirement for a 10% biodiversity net gain presents a challenge for the planning system to allocate (or at least, prioritise)



significant areas of land required to ensure mandatory gain from development. Beyond the development arena, an aspiration to uplift all of Greater Manchester's biodiversity by 10% would require substantial and sustained intervention over many thousands of hectares of land.

In our next briefing note, in June 2020, we will examine the potential for development and land management to uplift Greater Manchester's biodiversity units by 10%.

This study shows that it is possible to assess biodiversity value on a landscape scale through GIS, and this can be used as a decision-making tool to inform strategic planning.

Available Seminars

- Biodiversity Net Gain and Offsetting Metrics
- Ecosystem Services Opportunity Mapping
- Natural Capital

Get in Touch

To find out more about the study, or how the methodology could be applied to your study area, please get in touch to arrange a free consultation.

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