Environmental Benefits from Nature (EBN) Tool - Beta Release Update User Guide v1.1

BETA TEST

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Substantive updates marked (New). Universal updates to replace reference to Biodiversity Metric 3.0 with the Statutory Biodiversity Metric tool, and reference to MAGIC/EA/Met Office data with links to the GI Portal have been made throughout. Update contains other minor revisions to other areas.

Further information

This report can be downloaded from the Natural England Access to Evidence Catalogue: **http://publications.naturalengland.org.uk/** . For information on Natural England publications contact the Natural England Enquiry Service on 0300 060 3900 or e-mail **enquiries@naturalengland.org.uk**.

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Meaghan Kombol, Department for Education
David Coote, Temple Group

EBNT User Community
Special thanks to all industry members of the EBNT community who have contributed to and helped shape the update.

The UK Habitat Classification System is used under licence from UKHab Ltd.

Please see https://ukhab.org/ for further details about the UK Habitat Classification System.

Users should refer to https://ukhab.org/ for the published definitions and detailed methodologies on the recording of habitats.

Landscape Character Assessment Database provided courtesy of Landscape Institute (NEW)

We are grateful to the Landscape Institute, who have provided permission to embed their Landscape Character Assessment (LCA) Database within the EBNT.

Please see https://www.landscapeinstitute.org/news/the-landscape-character-database-for-the-uk-and-ireland-is-now-available/for further details about the Landscape Character Assessment Database Project.

Users should refer to the above link for methodologies, caveats and the latest list of LCAs.

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Foreword (NEW)

The Environmental Benefits from Nature Tool (EBNT) User Guide contains step-by-step information on how to complete and check EBNT assessments. The guide has been updated to reflect changes to the tool and the associated methods of data collection. Substantive updates are marked (NEW). It is designed to be used after first reading the EBN Principles document. This ensures users have a reasonable understanding of how the tool operates (and its limitations) prior to use. It should then be used alongside the EBN Data Catalogue, particularly when planning collecting and entering data; this ensures data is sourced, measured and entered in a consistent way. The user guide also provides details on how to use the updated EBN tool alongside the Green Infrastructure data mapping website. This repository now provides the majority of contextual data needed to support completion for small and simple sites and offers a custom search for EBN users. Details of how to use the site, and search are provided in Appendix 2. An EBNT QGIS template provides similar functionality for technical users working on large and complex sites. Information on how to use this is provided in a separate user guide (the EBN QGIS User Guide is available within the EBN QGIS zip folder on the main JP038 Access to Evidence site). This should also be used alongside this guide. Users are encouraged to submit feedback on useability of new functionality and guidance via the survey link on the main landing page, or by contacting ebn@naturalengland.org.uk.

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1. Introduction

The Environmental Benefits from Nature Tool (EBN tool)[1] is a voluntary decision-support tool that has been developed to work alongside biodiversity net gain and enable wider benefits for people and nature from habitat change. It was developed by Natural England and the University of Oxford in partnership with Defra, the Forestry Commission and the Environment Agency to support the 25 Year Environment Plan commitment to *expand net gain approaches to include wider Natural Capital benefits such as flood protection, recreation and improved water and air quality.*

The EBN tool is designed to be used in conjunction with the Statutory Biodiversity Metric Tool (SBMT). Once biodiversity net gain has been demonstrated using the SBMT, the EBN tool can be used to identify opportunities to enhance ecosystem service provision and to avoid then minimise any negative impacts. It can help to inform better project design by indicating potential gains or losses in the supply of ecosystem services and can help to make negotiation over land-use change more transparent for all stakeholders. The EBN tool is a scoping tool and is intended to be used alongside a suite of other approaches, including Environmental Impact Assessments (where required) and detailed impact assessments, such as on flood risk or air quality, where necessary.

The EBN tool is based on scores (on a scale of 0-10) for the ability of different types of land cover to deliver 18 ecosystem services, based on a literature review and expert consultations. The scores are modified by applying multipliers based on 38 indicators of habitat condition and spatial location, and then multiplied by the area of habitats, as well as by multipliers to reflect delivery risk and the time taken for new habitats to reach their target condition. This calculation is performed first for the habitats in the baseline (before change) and then for the habitats after the planned development or other land-use intervention (which should deliver biodiversity net gain – as outlined on section 1.3 of the EBN Principles Document). The results indicate the change in provision of ecosystem services from the baseline to the post-intervention situation.

This user guide explains how to operate the tool. It should be used together with:

- **The Principles of the Environmental Benefits from Nature (EBN Tool) approach**. This explains the overall approach and summarises good practice principles, caveats and limitations. This is crucial in ensuring that the tool will be applied correctly as part of the biodiversity mitigation hierarchy and will not lead to perverse outcomes. It is strongly recommended that this document should be read before operating the tool.

[1] The EBN Tool was known as the ‘Eco-metric’ throughout its development phase from 2017 to 2021.

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- **The Data Catalogue**, which explains how to determine values for the condition indicators and spatial factors.
- **The Green Infrastructure Data Portal EBN Search tool/ EBNT QGIS template** (NEW) which provide enhanced and efficient access to required spatial data.

A simplified ‘quick start’ version of the guidance below is also provided on the ‘Instructions’ tab within the EBN tool for ease of reference.

This updated user guide contains instructions relating to new functionality included in v1.1. Details on how to use the new Green Infrastructure Mapping EBNT search and EBNT template are provided in Appendix 2 and the separate EBNT QGIS User Guide respectively.

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2. Getting started

2.1 Hardware and software requirements

The tool is designed to be used with Microsoft Excel from version 2012 onwards. It does not work with earlier versions, including Excel 1997-2003 or Excel Online. The tool was built and tested in MS Windows only.

Two versions of the spreadsheet are available:

1. A macro-enabled short empty version (500 rows)
2. A macro-free version (500 rows) for users unable to use macro-enabled versions.

When you open the tool, you may see a prompt saying '*Macros have been disabled. Click to enable content*'. Click on OK. The tool uses a few basic macros, e.g. to hide and un-hide sheets that are not being used, operate the compare options, and autofill functions. Should the tool only download in PROTECT mode (preventing editing) or generate warning messages due to the presence of macros, utilise the macro-free version.

The macro-enabled tools are saved in Excel binary workbook format (.xlsb) to reduce file size and improve performance. When saving a copy of the macro-enabled tools always save as an Excel binary workbook.

The macro-free version of the tool should be saved with a .xls. extension.

2.2 Welcome and Quick Start Instructions

The Welcome sheet provides a brief overview of the tool, states the version number and number of rows available.

The Quick Start button provides brief instructions and links to the main data entry and results sheets.

The Technical user menu provides access to all sheets in the workbook (see Section 2.6)[2], but most users will not need to access these (see Appendix 1 for details of the other sheets).

Existing users will note that the quick start buttons now provide links to Green Infrastructure Data Portal to allow faster access to datasets required to complete a BASIC assessment for small/simple sites. Instructions on how to use the new portal is included in Appendix 2. Access

[2] These are all open by default within the Macro-free version of the tool.

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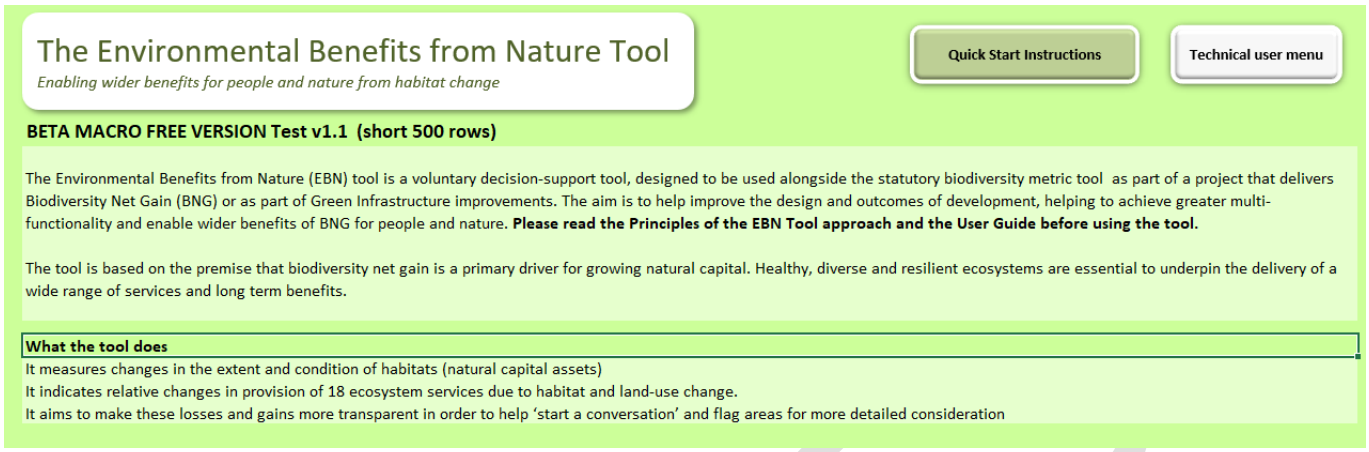
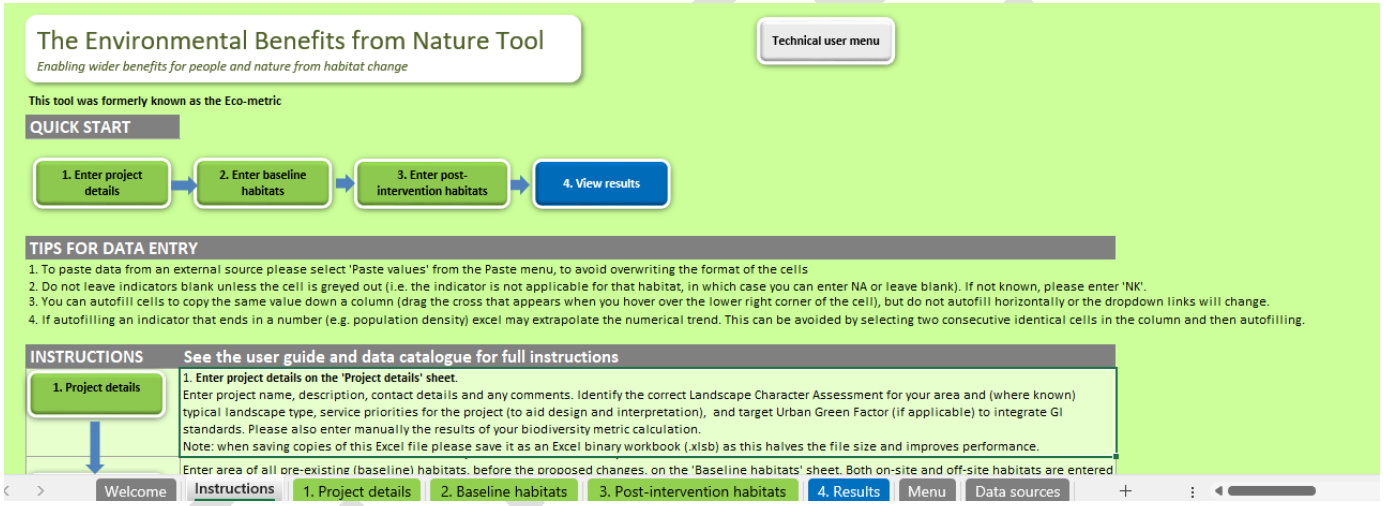
is also provided from within the EBNT QGIS template for GIS users working on larger/more complex sites.

Figure 1. The Welcome and Quick Start Instructions sheets





The tool contains three data entry sheets (green tabs):

1. Project details,
2. Baseline habitats,
3. Post-intervention habitats.

After filling in the Project details sheet (Sections 2.3 to 2.5) you need to fill in the habitat data (Section 3) and indicators (Section 4) on the two main data entry sheets (baseline habitats and post-intervention habitats).

When filling in these sheets, you will see errors generate on the Results sheet, but once they are filled in fully the results will generate as shown in Section 5.

2.3 The Project Details sheet (NEW)

The ‘Project details’ sheet contains white cells that can be populated with project information. Data inputs are outlined below, and Box 1 provides additional guidance on these inputs.

Enter the names and contact details of people working on the EBN tool assessment, a title and a brief description of the project using the boxes provided (there is also space for expanded notes if required).

Identify the appropriate Landscape Character Assessment for your area, using the dropdowns provided and select the corresponding level of landscape diversity for the project.[3]

Enter any applicable green infrastructure requirements for Urban Greening Factor (UGF).

Enter any known ecosystem service priorities for the project. Justification for any priorities should be provided to allow for future verification (e.g. reference the appropriate section of any supporting Local Plan/Local Nature Recovery Strategy/ Green Infrastructure Strategy/ project document/ and or any local engagement).

Demonstrate that biodiversity net gain has been achieved, manually enter the outputs from a completed Statutory Biodiversity Metric Tool (SBMT) into this sheet. Enter this at the bottom of the Project Details Sheet. These results are for information only – they are not used in the EBN tool calculations.

If you are using the EBN tool to inform the design of a biodiversity net gain project, or BNG is not a requirement, you do not need to enter anything in the SBMT outputs section at this stage.

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[3] Where possible a Landscape professional should make this judgement. Entries in this box will be used in subsequent assessment of landscape diversity.

Figure 2. Landscape Character Assessment search, Landscape Diversity, GI standards & Local priorities data fields.

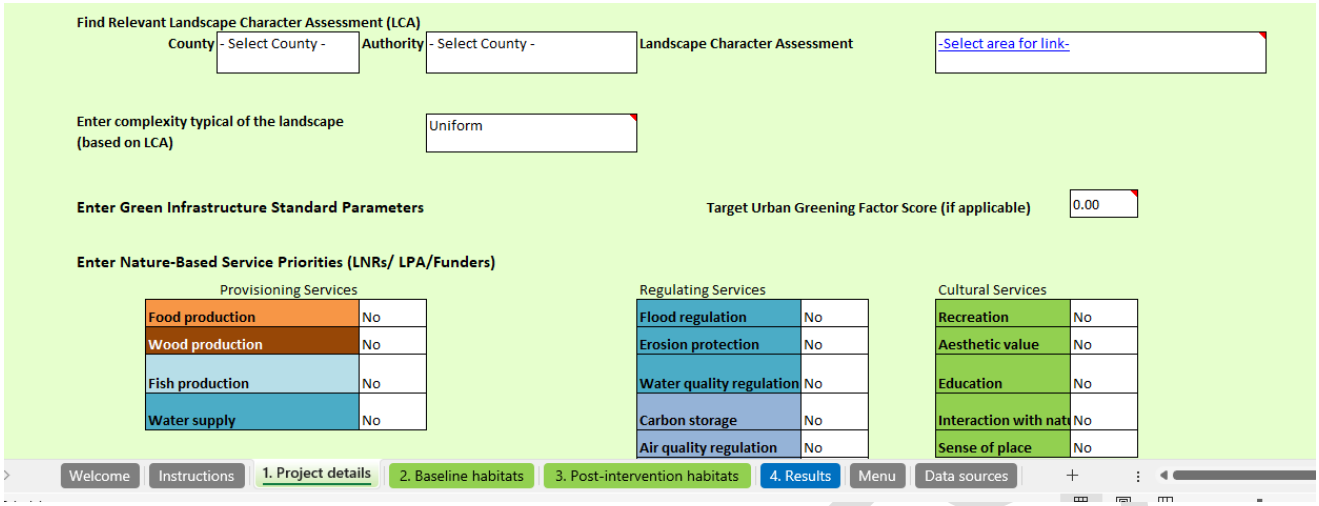
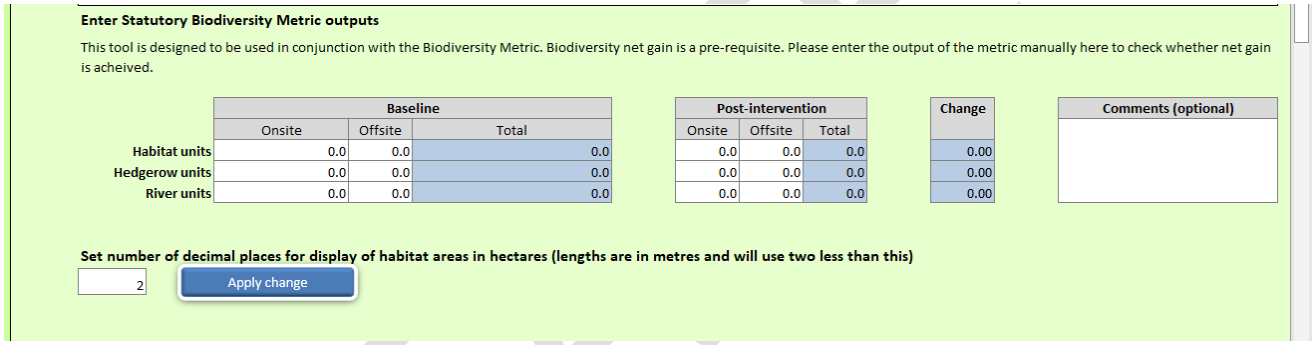


Figure 3. Statutory Biodiversity Metric Tool (SBMT) Outputs – enter units



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Box 1: Help on selecting LCA, determining landscape diversity, and entering Urban Greening factor and service priorities (NEW)

Finding your relevant Landscape Character Assessment (LCA)

First select the appropriate county from the lefthand-dropdown list. This will then generate an associated list of authorities in the righthand-dropdown list. When you have selected the appropriate authority a hyperlink to the local LCA document will appear in the final box, which can be used to inform other parts of the EBN assessment.

Determining landscape diversity

Using the relevant LCA (link provided), consider and enter the landscape diversity that best represents the context of the site, this may be done using the four categories provided (uniform, simple, diverse complex). This should be based on the definitions below repeated in Data catalogue (section 39).

- Uniform – little variation in composition, structure and function of landscape features (in their wider sense, including land use), their spatial arrangement or their connectivity.
- Simple – some variation in composition, structure and function of landscape features (in their wider sense, including land use), their spatial arrangement or their connectivity.
- Diverse – notable variation in composition, structure and function of landscape features (in their wider sense, including land use), their spatial arrangement or their connectivity.
- Complex – considerable variation in composition, structure and function of landscape features (in their wider sense, including land use), their spatial arrangement or their connectivity.

As landscape diversity is not always clear cut, a judgement will need to be made (ideally by a suitable professional) as to the best category for the area[4].

Entering Urban Greening Factor (if applicable)

Where applicable, users should enter the target Urban Green Factor (UGF) score for their project. Where not a requirement this may be left blank. More information on target urban greening factors for different project types can be found here: NE Green infrastructure Standard. More information on how this figure is used is provided in Box 7.

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[4] Entries in this section will later inform later consideration of landscape diversity **(this replaces previous simplified calculation based on number of habitats present).**

Setting priorities

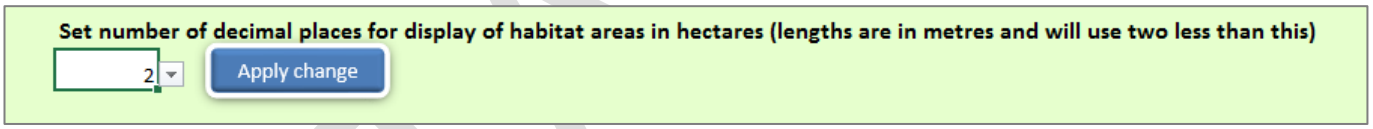
Users are asked to enter in ecosystem service priorities for their project, where known, by entering “yes” using drop downs provided. These may reflect priorities for the area, as expressed within the Local Plan, priority benefits sought from nature through any overlapping Local Nature Recovery Strategies, or, the priorities for the project itself (for example planning conditions, developers own targets, or the priorities of the local community (if known and/or consulted). As set out in the EBN Principles document consideration of priorities should take place collaboratively and returned to iteratively (see section 5.2).

Once entered these priorities are used to highlight relevant services in both the Results and Compare Options sections (see section 5) to assist decision making. Justification should be provided for the services identified as priorities to provide an audit trail and prevent misuse.

2.4 Setting the number of decimal places for areas, lengths and widths

Within the ‘Project Details’ sheet you can set the number of decimal places used for habitat areas data entry. Areas are entered in hectares, for non-linear habitats so options for 3 or 4 decimal places can make viewing data easier for users on very small sites.

Figure 4. Setting number of decimal places to display



2.5 ‘Suburban mosaic’ calculator (use only if post-intervention plans are not yet known)

The Project Details sheet provides a facility to calculate the area of each component of a ‘suburban mosaic’. This can be useful when assessing future urban developments, where detailed post-intervention plans are not yet in place. Where post intervention plan information is available from the SBMT completion is not required.

To use the calculator, enter the total area and the proportions that will be allocated to each of five components:

- sealed surfaces (buildings, roads, car parks etc.),
- artificial unsealed surfaces (such as permeable paving),
- private gardens,
- amenity grass, and
- woodland.

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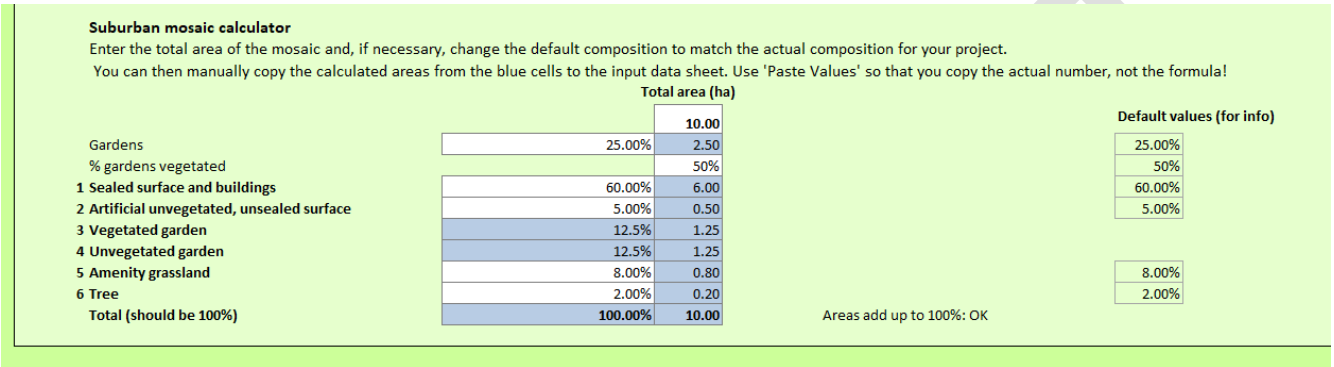
An estimate of what percentage of garden areas are vegetated (rather than sealed surface) is already required. The calculator provides the areas of each component in hectares. Each component should then be entered manually as a separate row in the data entry sheet. To save time you can copy the habitat list and (separately) the area list for the six habitat types and paste them into the appropriate places in the data entry sheet, but you must use '**Paste values**' (see Box 2 in Section 3.2) to avoid changing the data entry cell formats[5].

Figure 5. The suburban mosaic area calculator (for use when exact post-intervention details are not yet known)



Suburban mosaic calculator

Enter the total area of the mosaic and, if necessary, change the default composition to match the actual composition for your project.

You can then manually copy the calculated areas from the blue cells to the input data sheet. Use 'Paste Values' so that you copy the actual number, not the formula!

		Total area (ha)		Default values (for info)
		10.00		
Gardens	25.00%	2.50		25.00%
% gardens vegetated		50%		50%
1 Sealed surface and buildings	60.00%	6.00		60.00%
2 Artificial unvegetated, unsealed surface	5.00%	0.50		5.00%
3 Vegetated garden	12.5%	1.25		
4 Unvegetated garden	12.5%	1.25		
5 Amenity grassland	8.00%	0.80		8.00%
6 Tree	2.00%	0.20		2.00%
Total (should be 100%)	100.00%	10.00	Areas add up to 100%: OK	

Scores for the suburban mosaic are calculated within the tool by weighting the scores for the individual habitats (sealed surfaces, gardens etc.) according to the proportions defined here. The tool is supplied with a 'typical' suburban mosaic, but you can change this on this sheet if your development has a different mix of habitats.

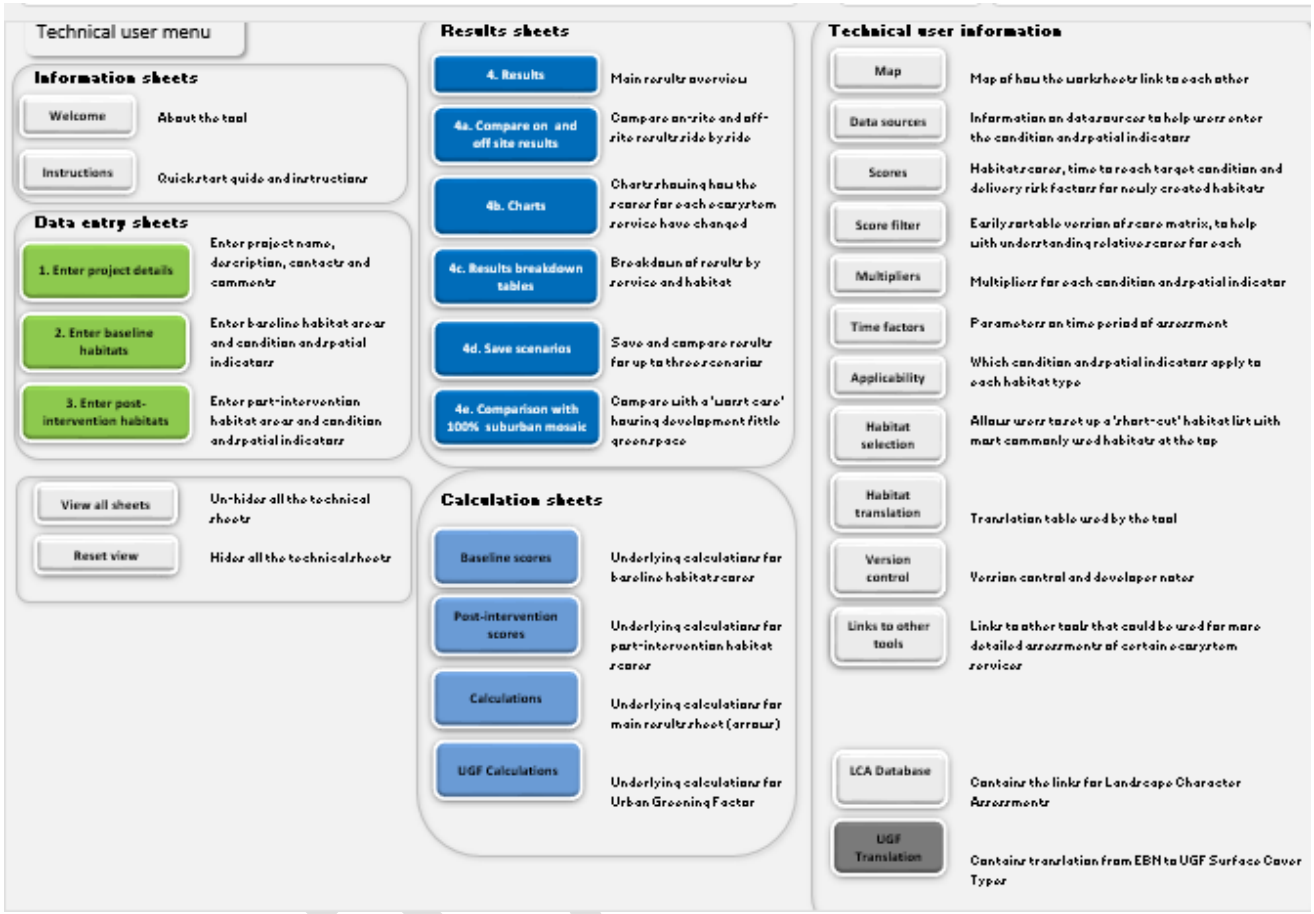
2.6 Technical menu

The EBN tool is designed to be simple to use yet transparent. When the tool is first opened only the essential data entry sheets and the results sheet are displayed. However, all the sheets used within the tool are available from the technical user menu, accessible from the Menu button at the top of each worksheet. This gives access to the underlying scores and multipliers, the habitat translation tables, and the calculation sheets (see Appendix 1 for full list). You can also reset to the default view in which only the essential sheets are displayed, or unhide all the

[5] the first version of the EBN Tool included 'suburban mosaic' as a distinct habitat type, using a weighted average of the scores of the different components. However, this introduced inaccuracies into the calculation because each component of the mosaic has a different time to reach target condition and a different delivery risk, so it was not possible to provide an accurate weighted average. Therefore, users must now enter each component as a separate row, using this calculator to work out the areas. This functionality is not available for users of the macro-free version.

sheets instantly.The updated version of the tool allows access to further tabs that make clear calculations used for new fnctionality, discussed in more detail in the sections below.

Figure 6. Technical menu showing options available for users looking to understand underpinning calculations, translations, scores and multipliers.



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3. Entering habitat types and areas

You should fill in the habitat data on the two main data entry sheets: baseline habitats and post-intervention habitats.

While you are in the process of filling in these sheets, you will see errors on the Results sheet, but once they are filled in correctly (including for the indicators as described in Section 4) the results will appear as shown in Section 5.

3.1 Data structure

The inputs and data formats of the EBN tool have been designed to align with those used within the SBMT used to support BNG. The EBN tool can be used to assess housing or infrastructure developments or changes in land use and management which affect habitat type and condition – though it is not designed to capture the fine detail of projects which only involve subtle changes in habitat condition, such as improvements to land management.

Both the EBN tool and the SBMT require habitat data on for:

- **On-site: the area affected by the development or intervention**
    - before development or intervention (baseline),
    - after development or intervention (post-intervention /biodiversity net gain delivery).
- **Any off-site areas used to create or restore habitats** as part of the development's biodiversity net gain delivery:
    - before habitat creation and/or restoration (baseline),
    - after habitat creation and/or restoration (post-intervention /biodiversity net gain delivery).

This includes data on the type and area of habitats (length and width for linear habitats).

It is possible to paste habitat types and areas from the SBMT into the EBN tool following the instructions in section 3.4. However, you may then need to subdivide the habitat types onto separate rows in the EBN tool data entry sheets, according to their values for the EBN tool condition and spatial indicators (e.g., where a given habitat cuts between different catchments). Therefore, it could be easier to generate the EBN tool input data separately in a standalone process (for example through use of the EBNT QGIS template – see Appendix 3).

Typically, the habitat areas for the baseline (before intervention) could be derived from a habitat survey using JNCC Phase 1 or UKHab, while after the development or intervention the habitat areas could come from a Masterplan, Ecological Impact Assessment (EcIA), detailed site design or biodiversity gain plan. Where habitat information is not required for BNG purposes a

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simpler means of articulating functional ‘green’ components is also offered in the form of a modified list of Surface Cover Types - as used by NE’s Urban Greening Factor GI Standard[6].

In this user guide we will refer to ‘parcels’ of habitat. A parcel is simply a continuous block of habitat as defined on a map, such as a field or garden. Parcels before development do not have to be the same size and shape as parcels after development. There are two main approaches for entering habitat data:

1. For relatively small and simple developments or interventions you can enter a separate row for every parcel of habitat.
2. For large and complex developments with thousands of parcels, you can aggregate parcels of the same habitat into groups that have the same values for all the condition and spatial indicators and enter each group on a single row.

It is best not to start entering habitat data until you know whether you need to sub-divide any of your habitat parcels or groups of parcels to reflect different condition and spatial factors. For example, you might find that an agricultural field is partly in one Agricultural Land Class category and partly in another. The GI data portal search tool described in Appendix 2 will allow you to quickly assess whether such divisions are present. If this is the case, you could either simply choose to assign the whole field to the category that covers the greatest area, or you could split the field into two parcels (this is the most accurate option).

For larger projects, use of a Geographic Information System (GIS) will streamline calculation of habitat areas and (if necessary) enable parcels to be subdivided according to different condition or spatial indicators (see Section 6). A new EBNT QGIS Template has been created to assist GIS users (see Appendix 3).

Sealed surfaces (e.g. roads and buildings) can always be aggregated (i.e. they can be entered on a single row) because they have a score of zero and will therefore not be affected by any condition or spatial factors. Gardens in a new housing development can also probably be aggregated into a single row as their condition is unlikely to vary unless they fall into different zones for indicators such as flood risk.

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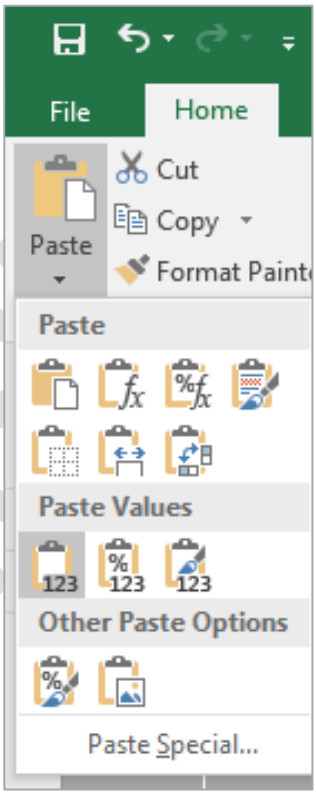
[6] It should be underlined that: any assessment of services that is not based on prior use of SBMT excludes direct impact on biodiversity and is not therefore advisable; and use of UGF surface cover types, while possible, will require users to articulate the nature of the prior baseline, which is not a requirement of UGF, which is based only of post-intervention work.

3.2 Data entry

Box 2: Important tips for data entry

When entering data, please note:



• Use the MS excel function ‘Paste Values’ **if** pasting from another source (Right click on the cell and choose ‘Paste Special’ or go to the Home tab of the menu, click on Paste in the top left of the menu bar, choose ‘Paste Special’. Then select the plain ‘123’ clipboard icon (not the one with a % sign or a paintbrush). This means that only the values will be pasted, not the formats, preserving the format of the cells.

• Do not use excel ‘cut’ or ‘move’ functions as this will corrupt the tool

• You can autofill cells to copy the same value down a column (drag or double click the cross that appears when you hover over the lower right corner of the cell, see **Figure 11**, Section 4.2), but do not autofill horizontally across columns because this will change the dropdown selections. An autofill button has also been provided on the Baseline habitat score which duplicates results across Baseline & Post development tabs, but should only be used on small sites to save time where results are uniform.

• If auto-filling an indicator that ends in a number (e.g. population density), Excel may extrapolate the numerical trend (e.g. population density of 20-39 will become 20-40, 20-41, etc.). To avoid this, always select two consecutive identical cells in the column and then autofill (see **Figure 11**, Section 4.2).

Start by entering habitats on the ‘2. Baseline habitats’ sheet. The white cells are for data entry.

Please note: the data entry sheets and many of the other sheets are set to ‘**Freeze panes’**, so that the left-hand columns and the top rows of labels are always visible as you scroll across and down the sheet. However, this can be turned off if desired by going to the View menu.

There is an **optional 'ID' column** where you can enter a code corresponding to specific habitat parcels, for your own reference. This is filled in as "1,2,3...." by default but can be changed by the user. It is not used in the calculations.

Enter **‘On site’ or ‘Off site’** in the next column. This enables on-site and off-site habitats to be displayed separately on Results sheet 4a. Note that offsetting losses of habitat with gains elsewhere can be on or off-site. If you leave this cell blank but enter a habitat type and area, it will be highlighted in red to remind you to select On site or Off site.

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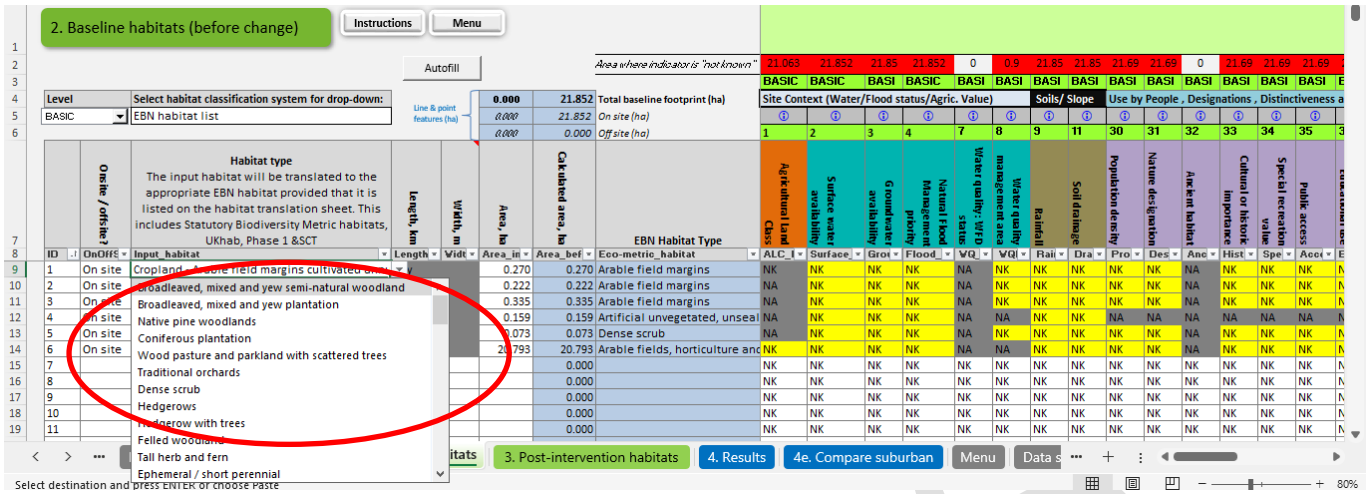
Figure 7. Baseline data entry sheet showing drop-down for habitat selection

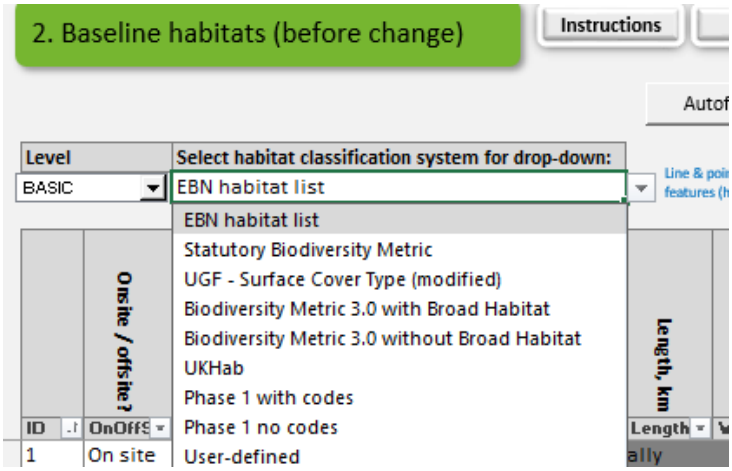


Enter the **type and area** of all baseline habitats, or the length and width for linear features (Section 3.3). For small areas, with few habitat rows, it is easiest to enter the habitat type by selecting a habitat from the dropdown box. Choose the habitat classification system you wish to use for data entry from the drop-down box at the top of the data entry sheets – you can use Phase 1, UKHab, Statutory Biodiversity Metric, Urban Greening Factor Surface Cover Types[7] (new) or the 'EBN habitat list' (formerly Eco-metric habitat list). The definitions for this classification system will then appear in the dropdown boxes for each habitat type data entry cell. You can switch systems at any time to see a different list in the dropdown box - this will not affect the habitat types you have already entered. The habitat type that you enter will be automatically translated to match one of the 'EBN habitats used in the score matrix, which will be displayed in the blue cells to the right of the habitat areas (Column I).

For larger areas, habitat type and area data can be pasted from another source such as the SBMT (see Section 3.4) or a spreadsheet exported from GIS (see Section 6.1), but you must use '**Paste Values**' in order to preserve the formatting of the cell, including the availability of the dropdown habitat selection list (see **Box 2**). If pasting from another source, habitat type and habitat area must be pasted in separately as they are not in adjacent columns (they are separated by the habitat length and width columns to be used for linear features). Habitat names must exactly match one of the names used in the EBN tool (see **Box 3**). However, it does not matter what habitat system is selected in the habitat classification dropdown box when you are pasting in habitat names.

[7] The list included reflects the list included in Natural England's Urban Greening Factor Standard – this has been modified to include sub-types of different types of semi-natural habitat to reflect their different levels of service provide (e.g., grassland vs woodland etc).

Figure 8. Dropdown for selecting the habitat classification system



Box 3. Habitat name errors

If you enter an incorrect habitat name, by typing in directly (not recommended) or pasting from another source, you will see ‘Error - invalid habitat name’ and the translated habitat cell (column I) will be highlighted in red.

This is because there must be an exact match with the spelling and punctuation in one of the names used in the EBN tool habitat lists (for any of the classification systems used), including use of uppercase / lowercase, and any spaces. Sometimes a trailing or leading space can cause an error. To eliminate the error, you can simply select the appropriate habitat from the dropdown list in the cell.

If you enter an area but no habitat type, you will also see an error message ‘Error - no habitat selected’, and the translated habitat cell in column I will be highlighted in red.

Box 4: Customising the habitat selection list

You can create your own sub-set of habitats to appear in the habitat selection dropdown list, using only those relevant to you or putting those that you commonly use at the top of the list – just to make the list shorter and easier to use. This is done on the 'Habitat selection' sheet which you can reach from the Menu. However, you can only use habitats already defined in one of the other pre-defined lists on the Habitat selection sheet. Copy and paste habitats from the other lists to the ‘User–defined list’. 25 rows are available. If you do not use all these rows, there will be blank rows at the bottom of the drop-down list. Then choose ‘User-defined’ from the habitat classification system selection drop-down on the data entry sheets. You can always switch back to one of the other classification systems to enter habitats not on your user-defined list.

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Enter the type and area of all habitats after the development or other land use change on the sheet named ‘3. Post-intervention habitats’ in the same way. On this sheet you must also fill in the **'Type of change'** column by selecting or entering:

- ‘Create’: for replacing a habitat with one of a different type,
- ‘Enhance’: for changing the condition of a habitat but not the habitat type,
- ‘Retain’: for unchanged habitats.

For created habitats, if the habitat has been created in advance of the intervention, e.g. as part of a habitat banking scheme, select the number of years in advance from the dropdown in the column ‘**Years created in advance**’. This number will then be subtracted from the ‘time to reach target condition’ for that habitat parcel, and in most cases should be set to **0**.

For all habitat rows where the habitat has been created, enter the **‘starting habitat’** from the choice in the drop-down list[8]. You can choose from a list: semi-natural grassland, improved grassland, arable, bare ground, sealed surfaces or ‘topsoil removed’ (for a typical housing development where all the soil is removed before construction) or scrub. This is to enable the tool to take account of the initial starting condition when calculating the changes over time. For example, if you are planting woodland on improved grassland, the tool will assume that the carbon storage changes linearly from that of the grassland (3) to that of the woodland (10) over the 40 years that it takes for woodland to reach its target condition. This is a simplification, as changes will often not be linear and initial carbon losses due to soil disturbance are not included. However, it is more accurate than ignoring the starting habitat and assuming that all scores start from zero.

For newly created habitats, enter the target habitat on maturity. For example, enter ‘semi-natural broadleaved woodland’ if that is the target, even though the woodland will resemble a broadleaved plantation until it is established.

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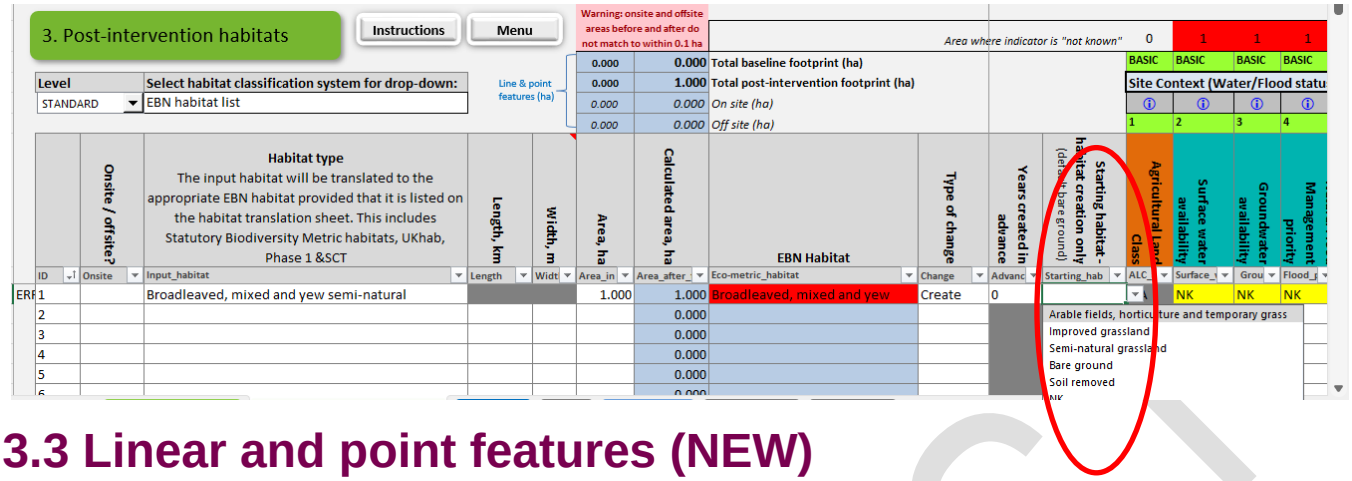
[8] Please note this relates to creation only, and the method of creation, and is separate from enhancement. Where a habitat is enhanced, no starting habitat is required, and this cell is greyed out.

Figure 9. Post-intervention habitat data entry, showing dropdown for choosing 'starting habitat'



3.3 Linear and point features (NEW)

Linear features (e.g. hedges, rivers, or footpaths) can be entered as either an area (in ha); or as a length (in km[9]) (NEW) and width (in m). In fact, any habitat type could be entered either as a length and width or as an area, or with some parcels as each – this makes no difference to the calculations. The area will be automatically calculated from the length and width if both are entered; otherwise, it will be copied from the area input column. If both length and width are entered, any value in the area column will be ignored – the cell will be greyed out to show this. Similarly, if a value is entered in the 'area' cell the length and width cells will be greyed out.

However, although the method of data entry makes no difference, certain habitat types (hedges, trees, green walls and green paths) are treated differently because the tool recognises them as 'line or point' features. The areas of these habitats are listed separately on the Results sheet. **For hedges and trees you should include the area of habitat beneath the feature** (e.g. the full area of the arable field right up to the boundary with the adjacent field, without subtracting the hedge area), **but not for rivers, streams and paths**. For green walls you should enter the area of the wall. **Please refer to the EBN Data Catalogue** for detailed instructions.

For very short and narrow linear features such as a short section of hedge, the area may be less than 0.01 ha and will therefore appear as zero unless you choose to make use of the option of setting the tool to display additional decimal places for areas, lengths and widths (see Section 2).

PLEASE NOTE: Linear feature length was previously entered as metres within EBN v1.0. It has been changed to Kilometres to match the data collection conventions of the Statutory Biodiversity Metric (below). Care should be taken when transferring data between versions of the tool to ensure metre values are not entered as Km.

[9] The updated EBNT now requires linear habitat length in Km to align with the SBMT and simplify data entry removing the need to convert from Km to m.

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3.4 Copying data from the Statutory Biodiversity Metric Tool (SBMT)

If the habitat parcels in the EBN tool need to be grouped or subdivided differently to those entered in the SBMT, to take account of the EBN tool condition indicators, then it could be easier to generate the input data separately (see Section 3.1).

If the habitat parcels or groups entered in the SBMT have the same EBN tool condition indicators, you can paste the input data across from the SBMT tool (see section 3.2). Details on where to paste this data is detailed in the tables below.

Table 1. Sheets to copy from the SBMT to the EBN tool Baseline habitats sheet

Statutory Biodiversity Metric sheet	On site or Off site
A-1 Site Habitat Baseline	On site
D-1 Off Site Habitat Baseline	Off site
B-1 Site Hedge Baseline	On site
E-1 Off Site Hedge Baseline	Off site
C-1 Site River Baseline	On site
C-2 Off Site River Baseline	Off site

Copy habitat areas and types from the above sheets to the corresponding habitat and area columns of the EBNT. This should include linear habitats, such as hedgerows, with length in Km entered into the length rather than area column.

Once you have copied across any linear features (hedges and rivers) you will need to:

- enter a width for each parcel.

This information is not required for the SBMT and therefore cannot be directly copy and pasted. Further information on measurement for linear features, including reference widths for hedgerows are included within the p22-25 of the **EBN Data catalogue.**

For Post-intervention habitats, enter ‘Create’ or ‘Enhance’ in the ‘Type of Change’ column on the Post-intervention habitats sheet. Note that ‘Enhance’ can be used where an existing habitat is being upgraded to one of a higher distinctiveness but the same broad habitat type, e.g. upgrading existing woodland to priority habitat woodland.

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Table 2. Sheets to copy from the SBMT to the EBN tool Post-intervention habitats sheet

Statutory Biodiversity Metric sheet	On site or Off site
A-2 Site Habitat Creation	On site
A-3 Site Habitat Enhancement	On site
D-2 Off Site Habitat Creation	Off site
D-3 Off Site Habitat Enhancement	Off site
B-2 Site Hedge Creation	On site
B-3 Site Hedge Enhancement	Off site
E-2 Off Site Hedge Creation	Off site
E-3 Off Site Hedge Enhancement	Off site
C-2 River Creation	On site
C-3 River Enhancement	On site
F-2 Off Site River Creation	Off site
F-3 Off Site River Enhancement	Off site

Recording 'Type of Change category'

Data pasted into the EBN tool requires a 'Type of Change' category to be assigned. The SBMT will have details on which habitats are retained. Within the EBN tool, for each habitat parcel a dropdown selection is used to enter this information. The options are:

- retain,
- enhance,
- create.

In the EBN tool, retained habitats should be recorded on both the Baseline habitats and the Post-intervention habitats sheets. To do this:

- identify and assign any areas retained within the baseline habitats sheet,
- copy across areas retained within the baseline to the Post-intervention habitats sheet and assign these 'retain'.

Once you have identified retained habitats, assign all other Post-intervention habitats as 'create' or 'enhance'. Note that 'Enhance' can be used where an existing habitat is being upgraded to one of a higher distinctiveness but the same broad habitat type, e.g. upgrading existing woodland to priority habitat woodland.

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Retained habitats.

The SBMT notes the area of any habitats that are retained unchanged on the baseline sheets (column S for Habitats, P for Hedges, T for Rivers). In the EBN tool, enter retained habitats on both the Baseline habitats and the Post-intervention habitats sheets. Enter the initial area on the Baseline habitats sheet and the retained area on the Post-intervention habitats sheet and select 'Retain' in the 'Type of Change' column on the Post-intervention habitats sheet.

Enhanced habitats (NEW)

Where enhanced habitats form a significant part of post-intervention work, users are advised to use an ADVANCED assessment. This requires users to articulate the changes in condition anticipated using the condition indicators below, largely linked to changes in structure that expect to be brought about biodiversity let enhancement. For most habitats this will be sufficient to register benefits, though their scale may not be sufficient to change arrows on main results. In such cases changes can be detected by referring to the underpinning 'Calculation' and/or 'compare options' sheets accessible from the technical menu.

PLEASE NOTE: Gains from enhancement will not be registered by BASIC assessments as the change in habitat structure is not recorded using their indicators.

Reporting errors

If you find that habitat names in the two tools do not match, please report the issue to the email address provided on the EBN tool Welcome sheet.

For example, sometimes trailing or leading spaces have caused errors when copying habitat names from earlier biodiversity metric versions.

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4. Entering condition indicators and spatial factors

4.1 Basic, standard and advanced levels of assessment

There are 38 condition indicators or spatial factors. These are grouped into Basic, Standard and Advanced level indicators (see Table 3).

We suggest that small projects with limited biodiversity impact, or those at an early stage of development with limited data, can apply the Basic level of assessment (see Table 4). This draws mainly on freely available online datasets.

Larger projects and those that affect semi-natural or priority habitats should apply the Standard or Advanced levels, which require additional data to be gathered via site surveys.

Projects that want to focus on specific ecosystem services may wish to apply a mix of indicator levels, e.g. projects affecting rivers might want to apply advanced level indicators for rivers (fish barriers and water body naturalness) but a lower level of assessment for surrounding habitats.

Table 3. Suggested application of Basic, Standard and Advanced level indicators

BASIC	**Generally, from freely available online maps and typically do not vary much, if at all, across the site.**
STANDARD	May require a site survey or collection of local information, or simple GIS analysis. May vary across the site.
ADVANCED	Typically require a site survey or complex GIS analysis and may vary for every habitat parcel.

Table 4. Relationship between project area and level of assessment

Size of project	Low (no semi-natural habitats affected)	Medium (semi-natural habitats affected)	High (priority habitats affected)
Small (0.5 ha)	BASIC	BASIC	STANDARD
Medium (<500 homes)	BASIC	STANDARD	ADVANCED
Large	STANDARD	ADVANCED	ADVANCED

When you first go to the data entry sheets, they will only show the Basic indicators. If you want to reveal the Standard and Advanced indicators, use the dropdown list in the top left of the sheet. This will hide or unhide the appropriate indicator columns.

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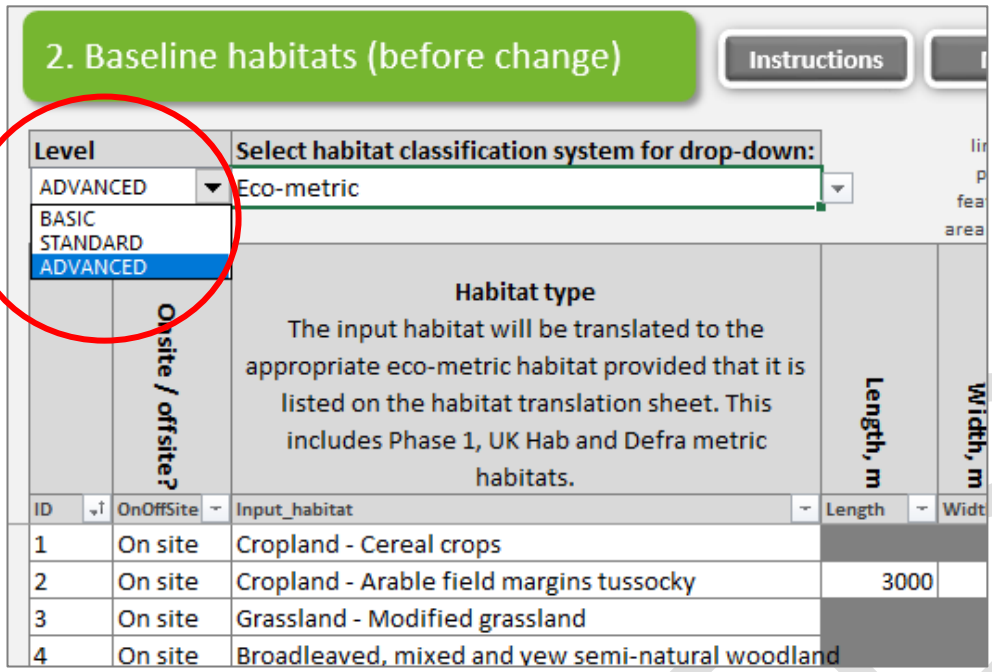
Figure 10. Dropdown list for selecting level of data entry (Basic, Standard or Advanced) – Macro version only (macro-free version defaults to ADVANCED and does not allow toggling by level)



4.2 Entering the indicators.

Fill in all the condition and spatial indicators on both the Baseline habitats and Post-intervention habitats sheets. This can be done either by selecting the appropriate value from the dropdown boxes in each cell, or by pasting in values from another source **using 'paste values**' (see Box 2), provided that the data conforms to the list of valid entries for each indicator. Please **do not use 'cut' or try to drag the cells around**.

Instructions and links to data sources are provided on the 'Data sources' sheet and can be accessed via the ⓘ help links at the top of each indicator column. To return to the appropriate column of the data entry sheets, you can use the links in the final two columns of the data sources sheet. **More detailed information on each indicator can be found in the Data Catalogue.** For small simple sites requiring BASIC assessment the **EBN search tool** may be used as detailed below.

Box 5: Using the GI Portal Data Tool (NEW)

A feature of the update is the provision of a new data tool to assist users working on small sites to complete BASIC assessments. The new EBN search tool (Green Infrastructure Map (naturalengland.org.uk) allows used to quickly and easily search spatial datasets relating to their project area.

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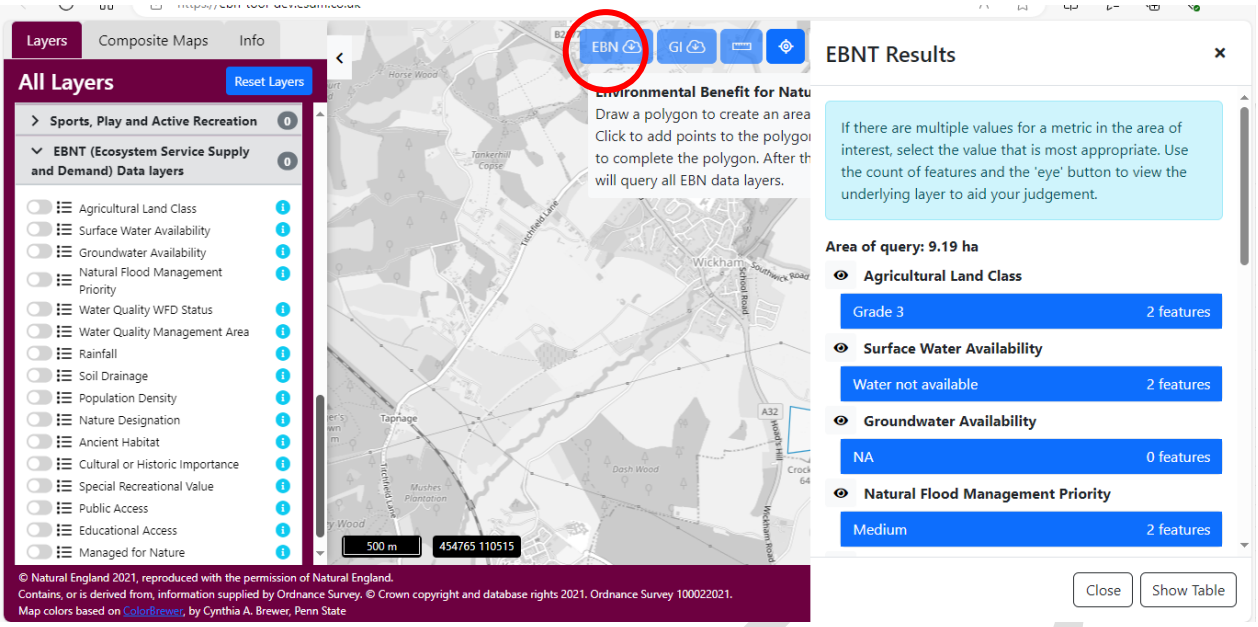

The search box (circled red) will return the information required in a format that can be simply copied pasted into the EBNT tool. Detailed instructions are provided in **Appendix 2.**

When entering the details of new habitats that will be created, for all indicators except tree size you should enter the target condition that will be achieved after 30 years (or 40 for woodland), not the initial condition when you first create the habitat. **For tree size, however, enter 'saplings' for creating a new woodland**. This is because the tool has a separate calculation that changes saplings (either from existing young woodland or created woodland) into 'poles' (the next size category) after 10 years.

Most of the indicators are specific to each row on the data entry sheets, i.e. they apply to a single habitat parcel or group of parcels with identical habitat types and conditions that are entered on a single row. The exceptions are:

- 'Rainfall' which applies to the whole site,
- 'Population density' which applies to the local area,
- 'Landscape diversity' which applies to the whole site.

Each dropdown box contains options for 'not known' (NK) or 'not applicable' (NA):

- **'Not known'(NK)** means that you do not know the value of the indicator, so a default value will be used (usually this means a multiplier of 1). The percentage of 'not known' indicators is reported on the Results sheet as a 'completeness' score.
- '**Not applicable' (NA)** means that an indicator does not apply to a specific habitat. For example, peat quality applies only to bogs. If an indicator does not apply to a specific habitat, the data entry cell will be automatically greyed out. A default multiplier of 1 will be used in the calculations for these cells, regardless of what you enter (i.e. they will be treated as if you have entered 'NA').

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Do not leave values blank unless the area of the habitat is zero or the indicator is not applicable (greyed out) for that habitat. If you are unable to estimate a value, choose 'Not known' (NK), and a default value will be used, as mentioned above. If you are not using some of the Standard level or Advanced level indicators set them all to 'NK' using autofill for the whole column (see below). By default, all indicators are set to “NK” initially.

Different ways to find and enter indicator values (NEW)

There are three ways for users to access and enter information relating to EBNT indicators:

1. Manual investigation and entry- this involves following instruction as taken from the data catalogue and entering results as set out in the instructions above.
2. Use of the Green Infrastructure Data Portal (see Appendix 2) this allows users to either search or investigate datasets.
3. Use of QGIS – this allows QGIS users access to a pre-populated template – See EBNT QGIS Template & User Guide.

Auto-filling columns to save time

For many indicators the value will be the same for all habitat parcels (except those where the indicator is not applicable). You can autofill the whole column: fill in the top cell correctly, then hover over the bottom right corner of the top cell until you see a plus sign (see **Error! R eference source not found.**10), then drag it down to the end of your data.

Auto-filling tips:

- You can double click on the plus sign to fill the whole column. This might fill in all the rows to the bottom of the table (going past the end of your data), especially if all values are pre-filled with ‘NK’ (as in the ‘empty’ version of the tool that we supply). It is fine to leave these surplus values in place, but you can delete them if you want (click on the first cell then use Ctrl-Shift-Down arrow to select to the end of the column, and then press delete).
- If you are **auto-filling numeric values or a string containing numeric values** (such as ‘3 or more’), you may find that autofill increments the number by 1 on each subsequent row. To avoid this happening, fill in the first two rows and select them both before double clicking the plus sign in the bottom right corner of the cell in the second row.
- You must **only auto-fill downwards,** not sideways (across columns) because that will damage the formatting of the cells so that they will then display the wrong dropdown lists. However, **you can auto-fill all the columns (or a selection of adjacent columns) at once** by selecting the first two rows of as many columns as you want, and then auto-filling.
- If you have a lot of rows, instead of dragging the plus symbol down to reach the end of your data, **you can double click on the plus sign to fill the whole column**. However, this might fill in all the rows to the bottom of the table (going past the end of your data), especially if all values are pre-filled with ‘NK’ (as in the ‘empty’ version of the tool that we supply). It is fine to leave these surplus values in place, but you can delete them if you want (click on the first cell then use Ctrl-Shift-Down arrow to select to the end of the column, and then press delete). Also, if there are some blank cells followed by an

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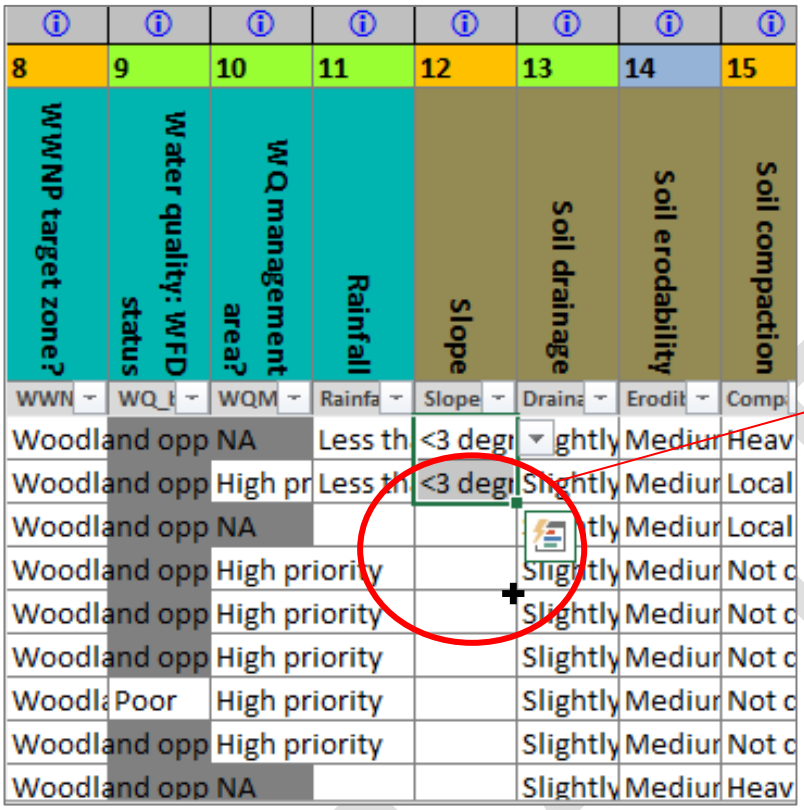
existing entry, the autofill will usually stop at the existing entry – and sometimes these existing entry cells look blank. Deleting all the values in the column before auto-filling will fix this. In any case, be sure to check that the autofill has gone right to the bottom of the rows you wish to change.

Figure 11. Auto-filling a column of indicator values



Hover over the bottom right corner and a plus sign will appear. Drag down to autofill further rows, or double click to autofill to bottom of data block.

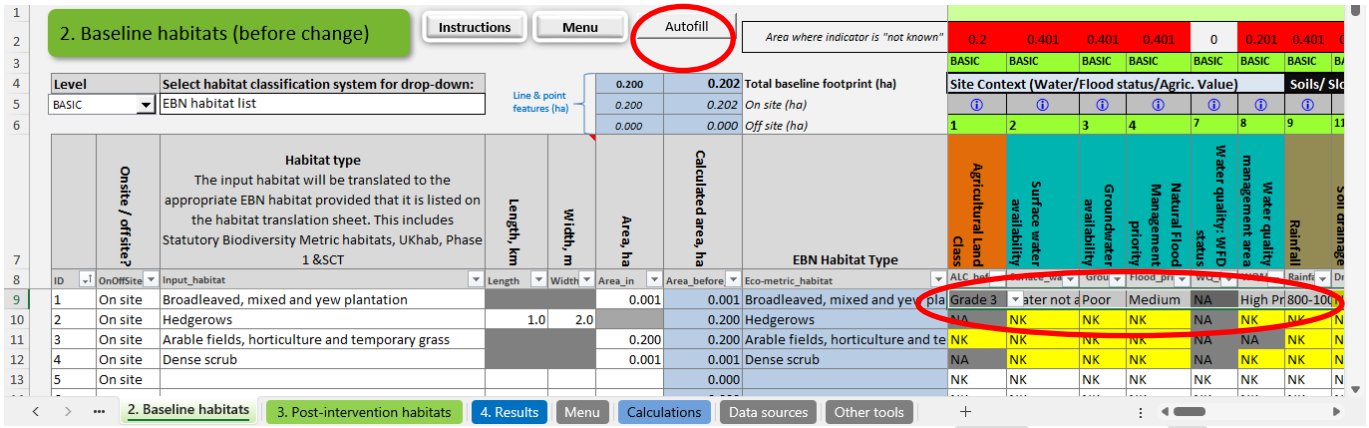
For data containing a number, select the first two cells so the number does not increment on each row.

You can select more than one column to autofill downwards, but do not autofill sideways (across columns) or the dropdowns will be wrong.

If the indicator is not applicable for any of the habitat types, it will be greyed out and it will be ignored in the calculation. You can set these cells to 'NA', or just leave them blank or leave them auto-filled to the same value as all the other cells. However, if you leave them set to 'NK' (not known) they will adversely affect your data completeness score. Greyed out cells have been preset to default to NA, but may require manual checking should preset formatting be altered through subsequent editing.

Where sites are small and simple, and details are expected to be the same across the site for both baseline and post-development, an Autofill macro has been provided (see Figure 12) that allows users to automatically duplicate the top row of user entries, as taken from the baseline tab, across the subsequent rows in both the baseline and post-intervention tabs. This automatically removes issues with sequential numbers covered in Figure 11, but is not suitable for use on more complex sites where entered values will vary line by line. More detailed instructions are provided in **Appendix 2**.

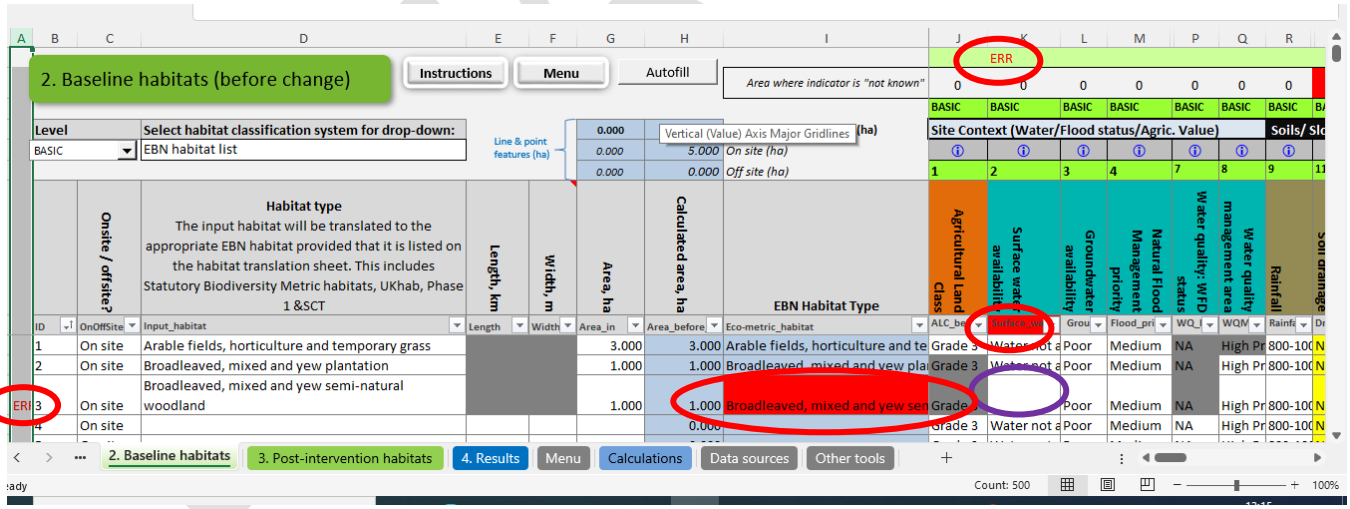
Figure 12. Autofill Button Auto filling from first row



4.3 Error checking

When all the indicators are filled in correctly, the results will appear on the Results sheet. If there are errors, symbols will be displayed instead of arrows in the Results table (see Figure 13) and the errors will be flagged using a red “ERR” in the first column to identify the row containing the error, and at the top of the column containing the error. The cell containing the habitat type and the indicator name will also turn red (Figure 13). Errors are also noted in the error checking section of the Results sheet, which will help you to identify the cause of the error.

Figure 13. Error checking system using red flags to identify the row and column containing the error (in this case a blank indicator cell shown by the purple ring)



Errors are usually caused by missing or invalid indicator values on the 'Baseline habitats' and 'Post-intervention habitats' sheets. The three main causes of errors are:

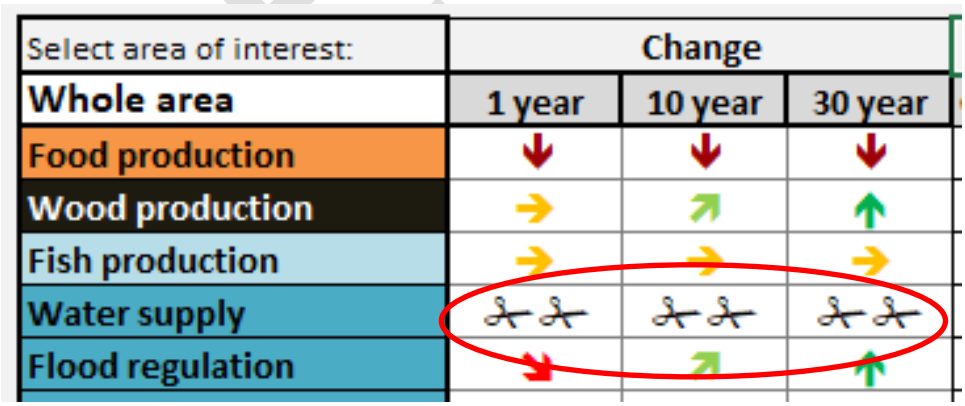
- **Missing values.** All values must be filled in except for cells that are greyed out because they are not applicable for that habitat. If you do not know a value enter "NK". Sometimes it is hard to see where the missing values are because the columns are quite narrow, and the previous column entry may obscure the missing entry. Use the error location section (below) to help track down the missing values.

- **Incrementing values in cells that include numbers.** If you have auto-filled a numeric cell (e.g. for rainfall range) by dragging the autofill handle from the top cell only, this can cause values in each cell to be incremented by one unit. To avoid this, fill in and select the first two cells before auto-filling numeric fields (see Figure 11, Section 4.2). The values will then remain constant when you autofill.
- **Pasting in indicators from an external source** that do not match the specified options in the dropdown box. This can sometimes happen if you are pasting in data from a previous version of the EBN tool but some of the indicator options have been changed. Go to the 'version control' sheet (via the Technical Menu) and check the Release Notes to see if something has changed. You can also simply try entering data directly via the dropdown to see if that fixes the error.

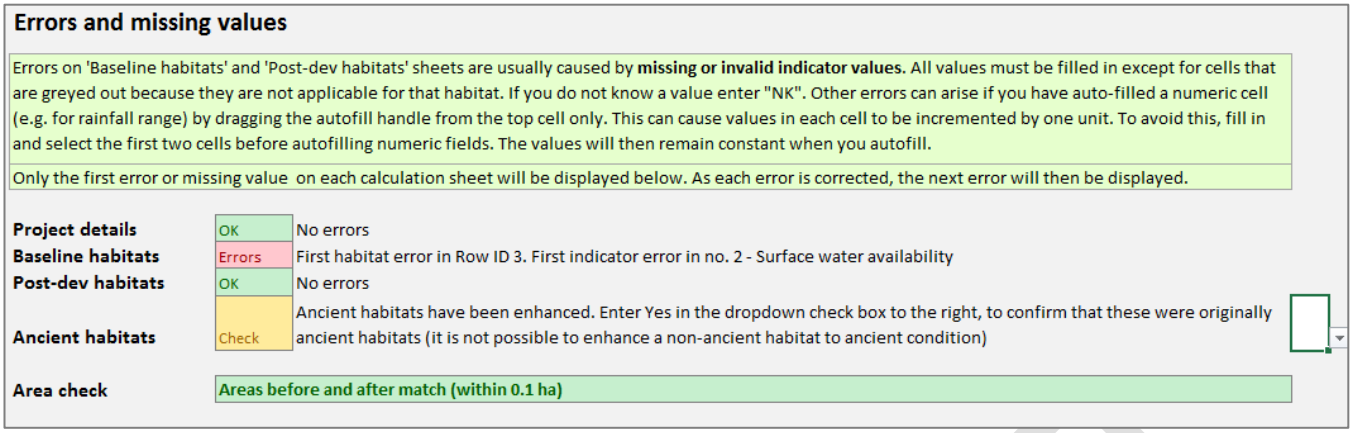
Sometimes the tool gets confused between text and numeric values. It might look as if you have entered the correct value for a numerical indicator but you are still getting an error. This could be because the tool is expecting either a text version or numerical version of the number and you provided the other format. We have tried to prevent this from happening by including both text and numeric versions in indicator lookup tables that include numbers. However, if you get this error and you are pasting from an external source you could try pre-formatting in a separate spreadsheet, by copying your data to a new column using the Excel functions to convert to text or Value to convert to a number (see **Box 2**).

In the example in Figure 14, the user has blank or incorrect values in the 'Surface Water Availability' column, starting in Row 3 of the Baseline habitats table. (Note that the error check on the Results page only identifies the first column where an error occurs and the first row where an error occurs. Once you have fixed those errors, the error check may find further errors further down or further across the sheet. So, it is easier to use the red flags on the data entry sheets to find and fix errors).

Figure 14. Error symbols appear on the results sheet instead of arrows if some indicators are missing or incorrect. The error checking flags on the data entry sheets (see above) will help you to find the errors. Errors are also shown on the Results sheet (lower part of this Figure).



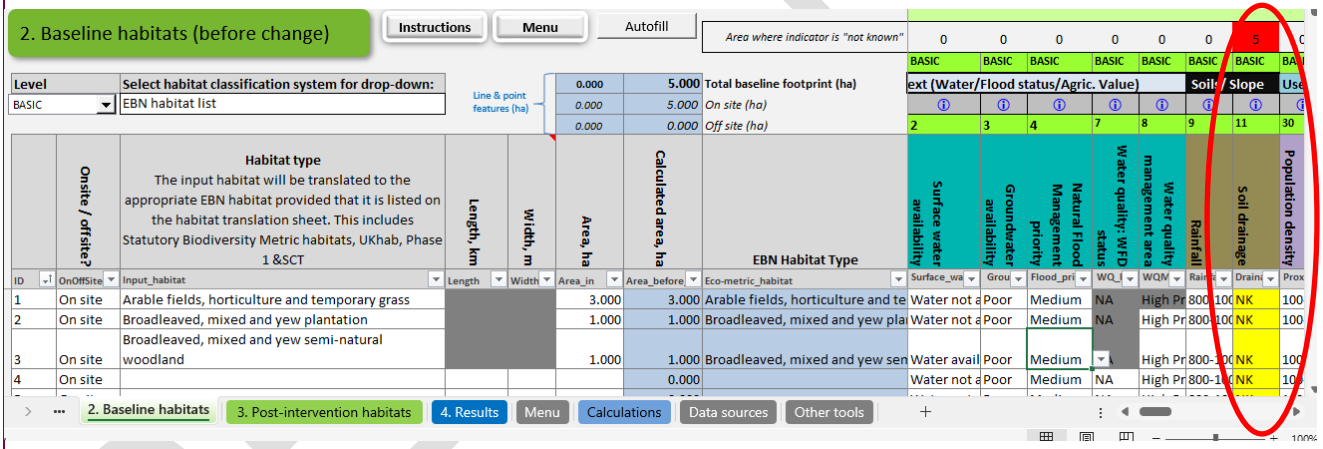
LATEST



Box 6: Spotting Errors & links to level of assessment (NEW)

The updated tool now highlights missing indicator data within the spreadsheet by highlighting cells that have been left as default values in yellow. Any row containing habitat data with incomplete cells, remaining as the default NK, will be highlighted yellow. **These cells need to be completed to reflect site conditions to obtain a given level of assessment.**

Figure 15. Yellow cells highlighting BASIC fields that have been left as NK (not known)



The level achieved is shown above the main results table (Figure 16a). No level will be achieved if any of entries remain NK. For example, if you are seeking a BASIC level of assessment, every single field for every listed BASIC multiplier column must be completed for each habitat row. If any field is left NK (within either the Baseline or Post-intervention tabs) this will result in no level of assessment being achieved (as shown in red below). The reasons for this can be checked by consulting the data completeness box below the main table (see Figure 16b).

Figure 16a. Relationship with EBN Level achieved & Instruction text

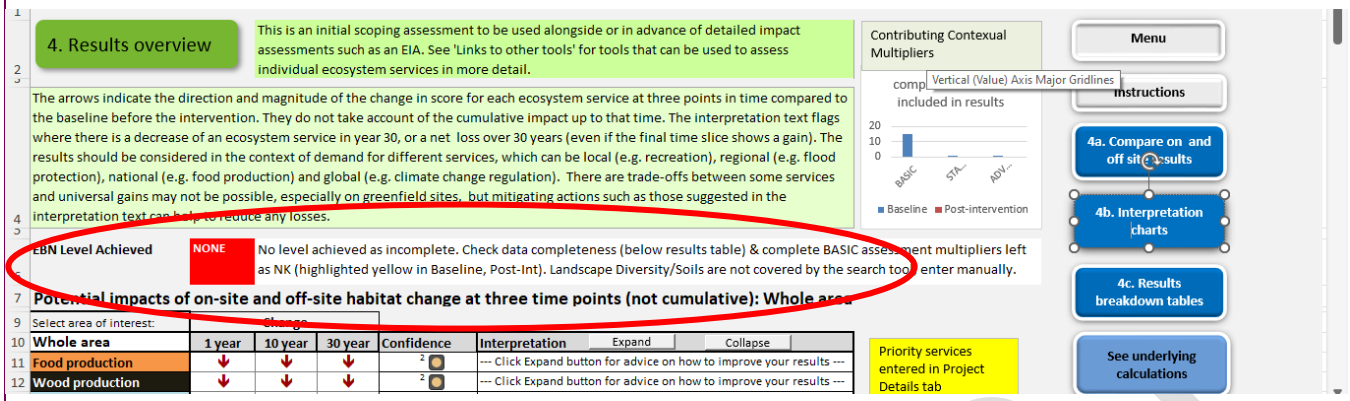
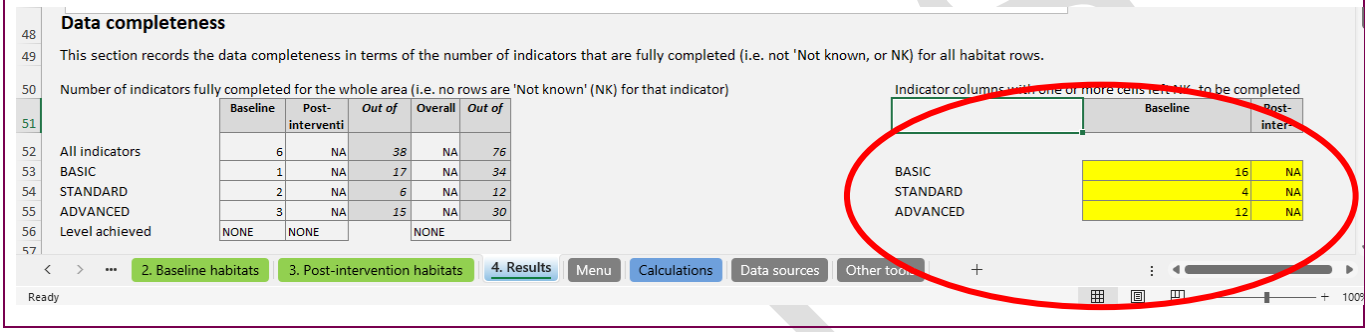


Figure 16b. How to check number of cells remaining



Ancient habitat errors

Ancient habitats (e.g. ancient woodland, peatland or meadows) should be noted via the 'Ancient' condition indicator. The tool will check for the following errors connected to Ancient habitats.

- Users are not allowed to 'create' a new ancient habitat.
- Ancient habitats should be retained or enhanced. An error will be recorded on the Results sheet if this is not the case (i.e. there is a smaller area of ancient habitats in the post-intervention sheet than in the baseline).
- The tool cannot distinguish between genuine enhancement of an ancient habitat and a case where an ancient habitat has been lost and the user has tried to replace it by upgrading a non-ancient habitat to 'ancient', by changing the condition indicator and marking the habitat as 'Enhance'. Therefore, if the tool detects that ancient habitats have been enhanced it will ask users to check a box to confirm that the enhanced habitats were ancient to start with.

BETA

5. Interpreting and using the results

5.1 Results sheets

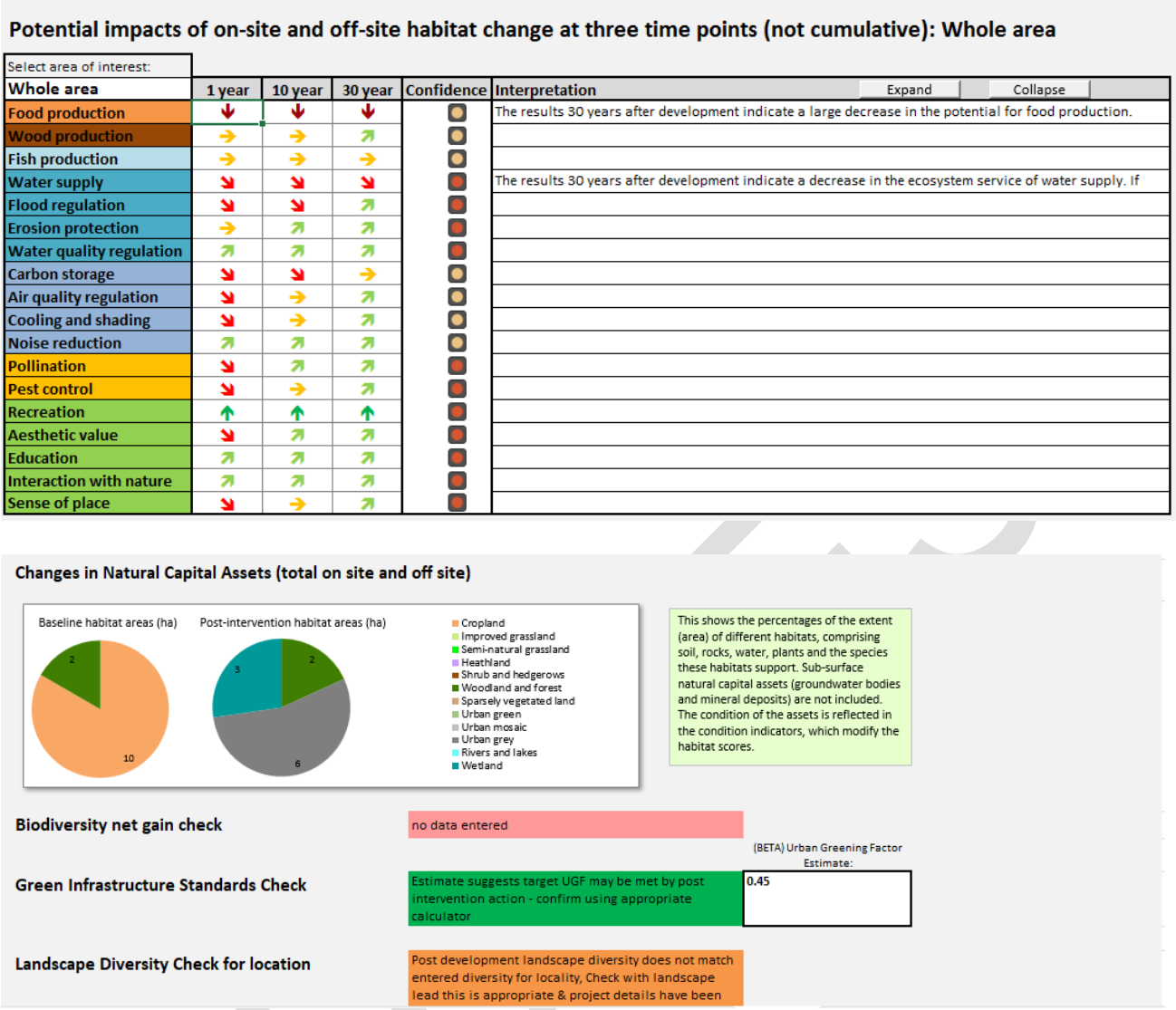
When you have entered all the habitat areas and condition factors, results are calculated automatically and will be displayed on the 'Results' sheet. This shows arrows indicating the direction and magnitude of change in the total score for each of the 18 ecosystem services at three points in time – 1, 10 and 30 years after the development or intervention, compared to the baseline before the development or intervention. The arrows do not take account of the cumulative impact up to that time. Any priority services entered are now highlighted in yellow (see section 5.2).

Pie charts beneath this table show the natural capital asset extent, i.e. the habitat areas, for the baseline and post-intervention. There is also a check of whether biodiversity net gain has been demonstrated, based on the figures entered by the user on the Project Details sheet. This serves as a reminder that the EBN tool is intended to be used in conjunction with the Biodiversity Metric, and that biodiversity net gain is the primary driver. New additional checks are also included for Green Infrastructure and Landscape Diversity. The former is accompanied by an automatic Urban Greening Factor Estimate (see **Box 7/8**).

Beneath the results table are two tables showing the Data Completeness (see Figure 16b). The first shows the number of indicators that have been completely filled in for every habitat row. This determines whether Basic, Standard or Advanced level has been reached. If all the Basic indicators are completely filled in for every row, Basic level is achieved, and so on. However, this means that Basic level will not be achieved if even one cell is not filled in for one of the Basic indicators. The second table is therefore a complementary table that shows the percentage of the total area for which all the Basic, Standard and Advanced indicators have been filled in and number of indicator columns that remain incomplete (yellow).

BETA TEST

Figure 17. Results sheet



Potential impacts of on-site and off-site habitat change at three time points (not cumulative): Whole area

Select area of interest:

Whole area	1 year	10 year	30 year	Confidence	Interpretation (Expand / Collapse)
Food production	↓	↓	↓		The results 30 years after development indicate a large decrease in the potential for food production.
Wood production	→	→	↗		
Fish production	→	→	→		
Water supply	↘	↘	↘		The results 30 years after development indicate a decrease in the ecosystem service of water supply. If
Flood regulation	↘	↘	↗		
Erosion protection	→	↗	↗		
Water quality regulation	↗	↗	↗		
Carbon storage	↘	↘	→		
Air quality regulation	↘	→	↗		
Cooling and shading	↘	→	↗		
Noise reduction	↗	↗	↗		
Pollination	↘	↗	↗		
Pest control	↘	→	↗		
Recreation	↑	↑	↑		
Aesthetic value	↘	↗	↗		
Education	↗	↗	↗		
Interaction with nature	↗	↗	↗		
Sense of place	↘	→	↗		

Changes in Natural Capital Assets (total on site and off site)

This shows the percentages of the extent (area) of different habitats, comprising soil, rocks, water, plants and the species these habitats support. Sub-surface natural capital assets (groundwater bodies and mineral deposits) are not included. The condition of the assets is reflected in the condition indicators, which modify the habitat scores.

Biodiversity net gain check — no data entered

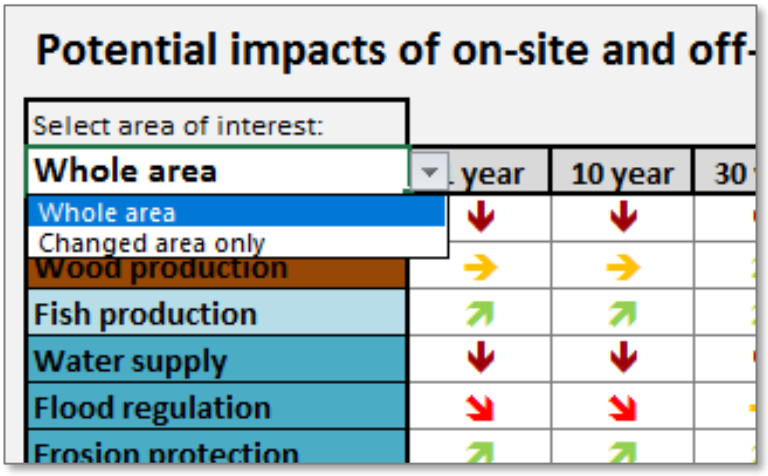
Green Infrastructure Standards Check — Estimate suggests target UGF may be met by post intervention action - confirm using appropriate calculator

(BETA) Urban Greening Factor Estimate: 0.45

Landscape Diversity Check for location — Post development landscape diversity does not match entered diversity for locality, Check with landscape lead this is appropriate & project details have been

There is a dropdown selection box in the top left corner of the results table which allows the user to view the results for the whole site (including and unchanged (retained) habitats) or only for the area where habitats are changed (Figure 18). This can be useful for cases where a relatively small amount of development on a much larger site can cause the changes to be ‘diluted’ so that the impact is hard to see. There is no right or wrong way of viewing the results, but the user should be aware of which option they are looking at.

Figure 18. Dropdown box on Results sheet for selecting whether to view the results per ha for the whole site or for only the habitats that have changed.



Additional results sheets are available from the menu buttons, including:

- **4a. Compare on & off-site results:** arrows and natural capital asset pie charts for on-site and off-site habitats separately. This sheet shows the underlying scores that determine the colour and orientation of the arrows.
- **4b. Interpretation charts.** Charts showing the split of ecosystem service scores between habitat groups for each ecosystem service. These charts are useful for understanding the reasons for the changes in scores.
- **4c. Results breakdown tables.** Detailed result tables for each habitat type and service.
- **Compare options (save current)**. This allows users to compare the main results from up to three different runs of the tool side by side. It also shows the underlying scores.

5.2 How to check and interpret the results

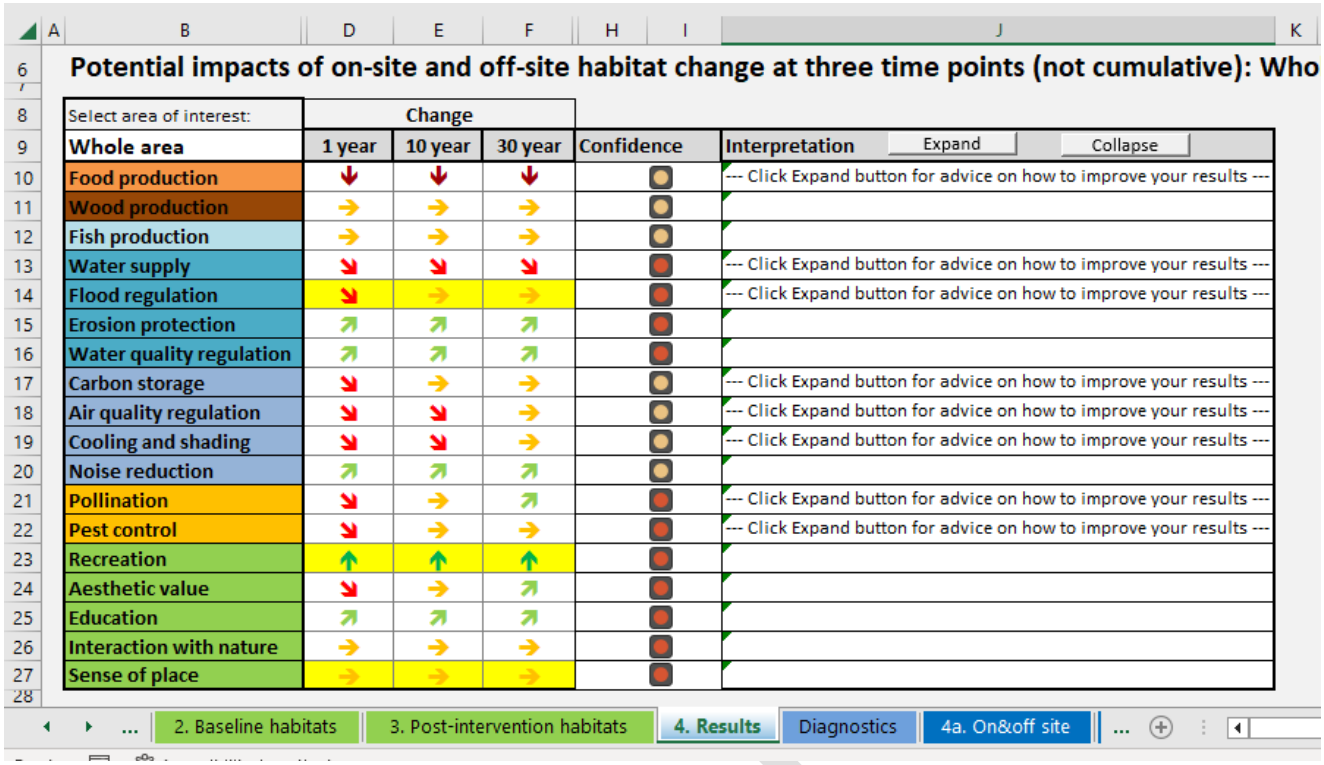
The results show which services are estimated to have gains and which have net losses. Where there are losses, the user can experiment with altering the type, condition, or spatial location of proposed habitats after the development or intervention to see if the score can be improved.

Considering performance against priorities and cross checks (NEW)

Where priority ecosystem services have been identified, (and entered into the Project Details tab) matching rows within the Results table will be highlighted in yellow. This is intended to help the user (and ideally a collaborative group, representing different professions/interests -see EBN Principle 5) to more easily consider and address to impact on key priorities, before considering co-benefits and any resultant trade-offs (losses). The same functionality is shared in the **Save Scenarios** (Compare Options) tab which allows you to compare options with priorities highlighted in the same way.

BETA TEST

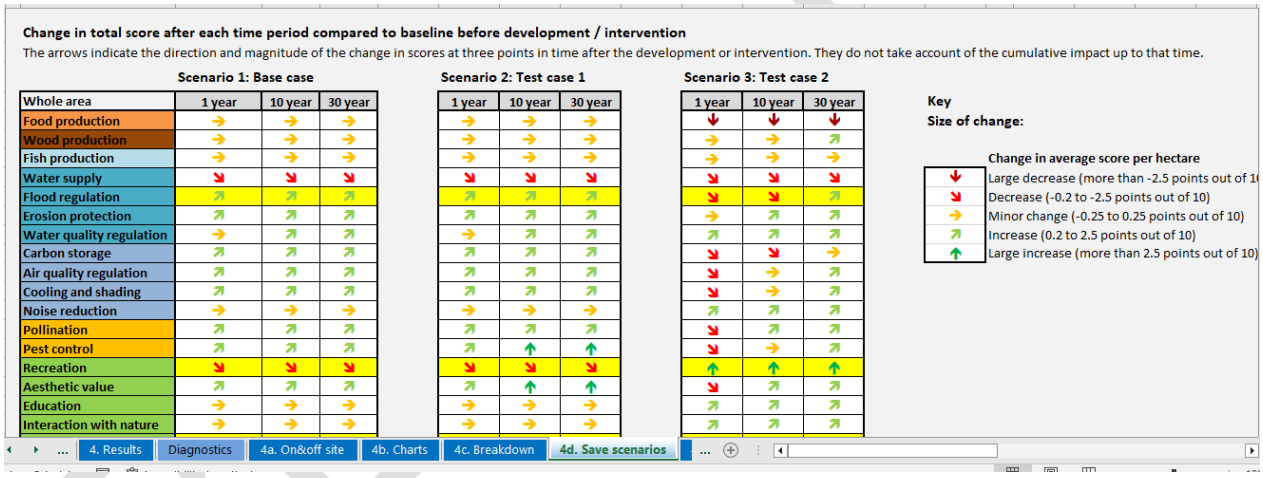
Figure 19. Results and Save & Compare options tabs - *showing priority services highlighted* in yellow and results and options being compared



Potential impacts of on-site and off-site habitat change at three time points (not cumulative): Who

Select area of interest:	Change					
Whole area	1 year	10 year	30 year	Confidence	Interpretation	Expand / Collapse
Food production	↓	↓	↓		--- Click Expand button for advice on how to improve your results ---	
Wood production	→	→	→			
Fish production	→	→	→			
Water supply	↘	↘	↘		--- Click Expand button for advice on how to improve your results ---	
Flood regulation	↘	→	→		--- Click Expand button for advice on how to improve your results ---	
Erosion protection	↗	↗	↗			
Water quality regulation	↗	↗	↗			
Carbon storage	↘	→	→		--- Click Expand button for advice on how to improve your results ---	
Air quality regulation	↘	↘	→		--- Click Expand button for advice on how to improve your results ---	
Cooling and shading	↘	↘	→		--- Click Expand button for advice on how to improve your results ---	
Noise reduction	↗	↗	↗			
Pollination	↘	→	↗		--- Click Expand button for advice on how to improve your results ---	
Pest control	↘	→	→		--- Click Expand button for advice on how to improve your results ---	
Recreation	↑	↑	↑			
Aesthetic value	↘	→	↗			
Education	↗	↗	↗			
Interaction with nature	→	→	→			
Sense of place	→	→	→			

2. Baseline habitats | 3. Post-intervention habitats | 4. Results | Diagnostics | 4a. On&off site



Change in total score after each time period compared to baseline before development / intervention

The arrows indicate the direction and magnitude of the change in scores at three points in time after the development or intervention. They do not take account of the cumulative impact up to that time.

Whole area	Scenario 1: Base case			Scenario 2: Test case 1			Scenario 3: Test case 2		
	1 year	10 year	30 year	1 year	10 year	30 year	1 year	10 year	30 year
Food production	→	→	→	→	→	→	↓	↓	↓
Wood production	→	→	→	→	→	→	→	→	↗
Fish production	→	→	→	→	→	→	→	→	→
Water supply	↘	↘	↘	↘	↘	↘	↘	↘	↘
Flood regulation	↗	↗	↗	↗	↗	↗	↘	↘	↗
Erosion protection	↗	↗	↗	↗	↗	↗	→	↗	↗
Water quality regulation	→	↗	↗	→	↗	↗	↗	↗	↗
Carbon storage	↗	↗	↗	↗	↗	↗	↘	↘	→
Air quality regulation	↗	↗	↗	↗	↗	↗	↘	→	↗
Cooling and shading	↗	↗	↗	↗	↗	↗	↘	→	↗
Noise reduction	→	→	→	→	→	→	↗	↗	↗
Pollination	↗	↗	↗	↗	↗	↗	↘	↗	↗
Pest control	↗	↗	↗	↗	↑	↑	↘	→	↗
Recreation	↘	↘	↘	↘	↘	↘	↑	↑	↑
Aesthetic value	↗	↗	↗	↗	↑	↑	↘	↗	↗
Education	→	→	→	→	→	→	↗	↗	↗
Interaction with nature	→	→	→	→	→	→	↗	↗	↗

Key

Size of change:

	Change in average score per hectare
↓	Large decrease (more than -2.5 points out of 1
↘	Decrease (-0.2 to -2.5 points out of 10)
→	Minor change (-0.25 to 0.25 points out of 10)
↗	Increase (0.2 to 2.5 points out of 10)
↑	Large increase (more than 2.5 points out of 10)

4. Results | Diagnostics | 4a. On&off site | 4b. Charts | 4c. Breakdown | 4d. Save scenarios

While biodiversity is not considered as a service, an automated cross-check is provided underneath the service table to provide a crude indication whether BNG was likely to have been achieved/(from units taken from SBMT) [10].

[10] Note this relates to units only and is not sophisticated enough to determine whether other trading rules have also been met

Box 7. UGF Estimate & Check (NEW)

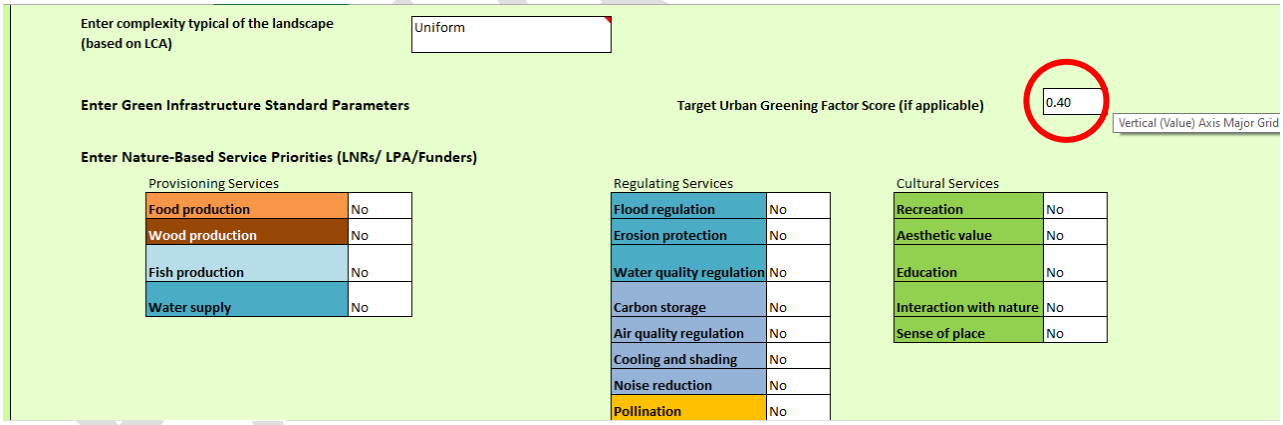
The updated version of the tool prompts users to provide a cross-check against Green Infrastructure Standards in the same way as it prompts users to cross check against Biodiversity Net Gain. At present this uses the Natural England Urban Greening Factor Standard only.

To generate a check, the tool automatically estimates a UGF value from post-intervention habitat information added and compares this with an optional user generated target entered on the Project details tab.

The Project details tab prompts users to enter a Target UGF for development, where applicable, (Figure 20). The tool then uses the post-intervention habitat data provided to match habitats to their nearest neighbour UGF Surface Cover Type (SCT) - using a UGF translation table. It then uses the resultant translation to calculate an estimated UGF using the scores allocated to each matched SCT using a custom UGF calculation table (Figure 21).

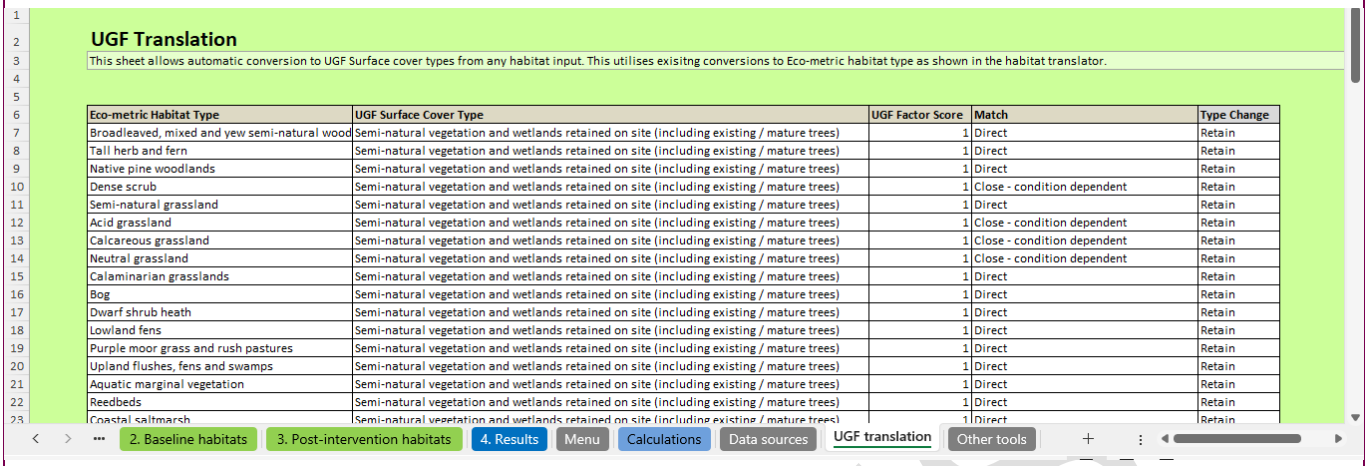
The estimated UGF for proposed work is then **displayed as a value beneath the BNG cross-check below the main results table (**Figure 22), with a message to confirm whether the target UGF looks likely to be achieved. Both UGF translation and UGF calculations table can be accessed from the main menu (see Appendix 1).

Figure 20. UGF Target & Relationship with Results – here a target of 0.4 has been entered for Major Development consistent with NE standards.



DRAFT

Figure 21 – UGF Translation table, showing the relationship between EBN (Ecometric) Habitats & UGF Surface Cover types and the closeness of the match



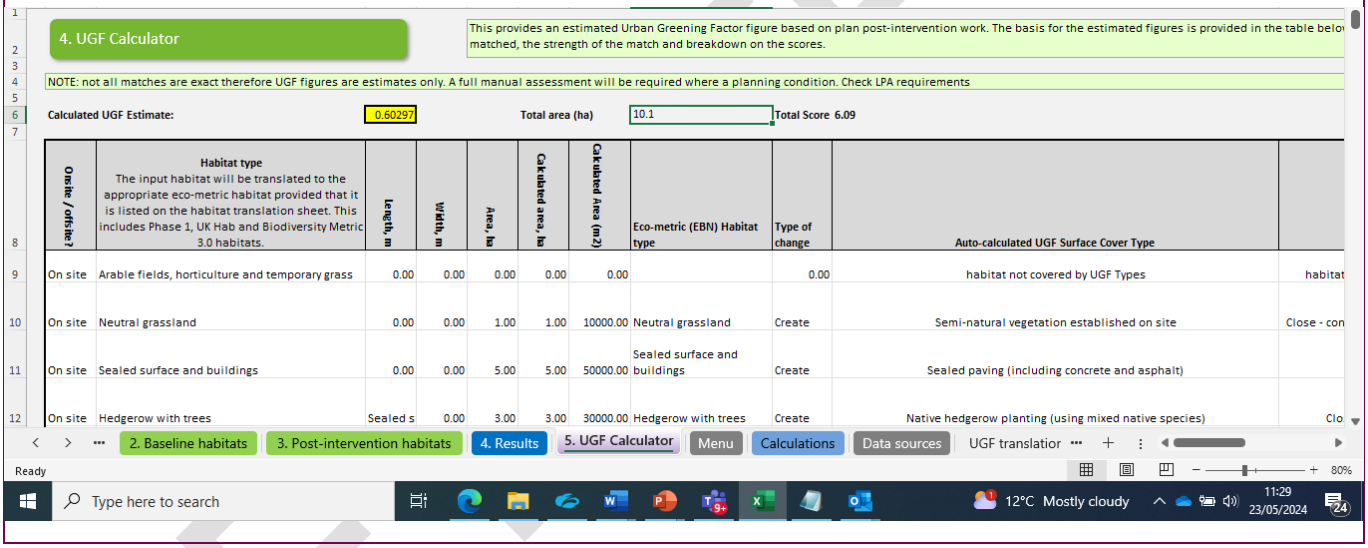
UGF Translation

This sheet allows automatic conversion to UGF Surface cover types from any habitat input. This utilises exisitng conversions to Eco-metric habitat type as shown in the habitat translator.

Eco-metric Habitat Type	UGF Surface Cover Type	UGF Factor Score	Match	Type Change
Broadleaved, mixed and yew semi-natural wood	Semi-natural vegetation and wetlands retained on site (including existing / mature trees)	1	Direct	Retain
Tall herb and fern	Semi-natural vegetation and wetlands retained on site (including existing / mature trees)	1	Direct	Retain
Native pine woodlands	Semi-natural vegetation and wetlands retained on site (including existing / mature trees)	1	Direct	Retain
Dense scrub	Semi-natural vegetation and wetlands retained on site (including existing / mature trees)	1	Close - condition dependent	Retain
Semi-natural grassland	Semi-natural vegetation and wetlands retained on site (including existing / mature trees)	1	Direct	Retain
Acid grassland	Semi-natural vegetation and wetlands retained on site (including existing / mature trees)	1	Close - condition dependent	Retain
Calcareous grassland	Semi-natural vegetation and wetlands retained on site (including existing / mature trees)	1	Close - condition dependent	Retain
Neutral grassland	Semi-natural vegetation and wetlands retained on site (including existing / mature trees)	1	Close - condition dependent	Retain
Calaminarian grasslands	Semi-natural vegetation and wetlands retained on site (including existing / mature trees)	1	Direct	Retain
Bog	Semi-natural vegetation and wetlands retained on site (including existing / mature trees)	1	Direct	Retain
Dwarf shrub heath	Semi-natural vegetation and wetlands retained on site (including existing / mature trees)	1	Direct	Retain
Lowland fens	Semi-natural vegetation and wetlands retained on site (including existing / mature trees)	1	Direct	Retain
Purple moor grass and rush pastures	Semi-natural vegetation and wetlands retained on site (including existing / mature trees)	1	Direct	Retain
Upland flushes, fens and swamps	Semi-natural vegetation and wetlands retained on site (including existing / mature trees)	1	Direct	Retain
Aquatic marginal vegetation	Semi-natural vegetation and wetlands retained on site (including existing / mature trees)	1	Direct	Retain
Reedbeds	Semi-natural vegetation and wetlands retained on site (including existing / mature trees)	1	Direct	Retain
Coastal saltmarsh	Semi-natural vegetation and wetlands retained on site (including existing / mature trees)	1	Direct	Retain

2. Baseline habitats | 3. Post-intervention habitats | 4. Results | Menu | Calculations | Data sources | UGF translation | Other tools

Figure 22 UGF Calculation table – showing the automated process of conversion and allocation of scores & UGF summary table[11] (found to right of main calculation table).



4. UGF Calculator

This provides an estimated Urban Greening Factor figure based on plan post-intervention work. The basis for the estimated figures is provided in the table belo
matched, the strength of the match and breakdown on the scores.

NOTE: not all matches are exact therefore UGF figures are estimates only. A full manual assessment will be required where a planning condition. Check LPA requirements

Calculated UGF Estimate: 0.60297 Total area (ha) 10.1 Total Score 6.09

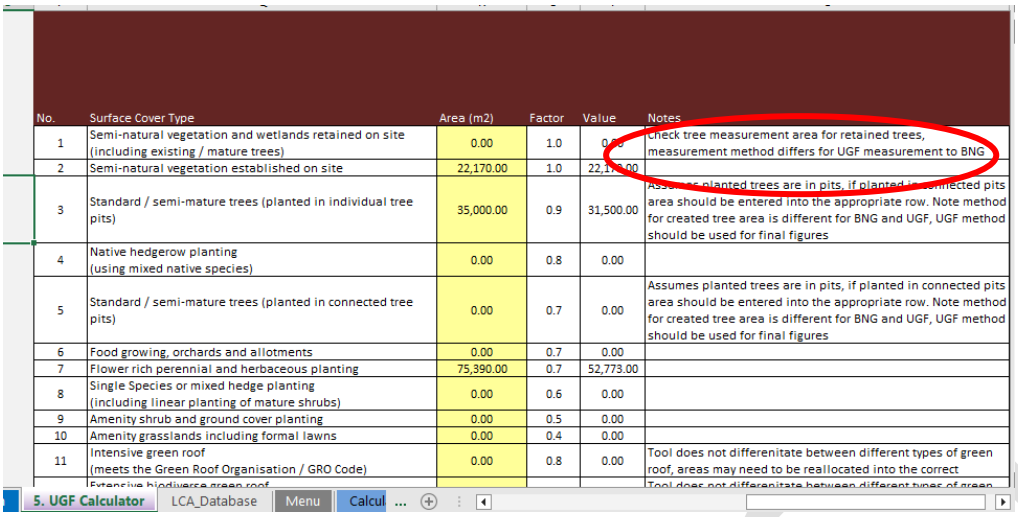
On site / offsite?	Habitat type The input habitat will be translated to the appropriate eco-metric habitat provided that it is listed on the habitat translation sheet. This includes Phase 1, UK Hab and Biodiversity Metric 3.0 habitats.	Length, m	Width, m	Area, ha	Calculated area, ha	Calculated Area (m2)	Eco-metric (EBN) Habitat type	Type of change	Auto-calculated UGF Surface Cover Type	
On site	Arable fields, horticulture and temporary grass	0.00	0.00	0.00	0.00	0.00		0.00	habitat not covered by UGF Types	habitat
On site	Neutral grassland	0.00	0.00	1.00	1.00	10000.00	Neutral grassland	Create	Semi-natural vegetation established on site	Close - con
On site	Sealed surface and buildings	0.00	0.00	5.00	5.00	50000.00	Sealed surface and buildings	Create	Sealed paving (including concrete and asphalt)	
On site	Hedgerow with trees	Sealed s	0.00	3.00	3.00	30000.00	Hedgerow with trees	Create	Native hedgerow planting (using mixed native species)	Clo

2. Baseline habitats | 3. Post-intervention habitats | 4. Results | 5. UGF Calculator | Menu | Calculations | Data sources | UGF translator

Ready 80%

Type here to search 12°C Mostly cloudy 11:29 23/05/2024

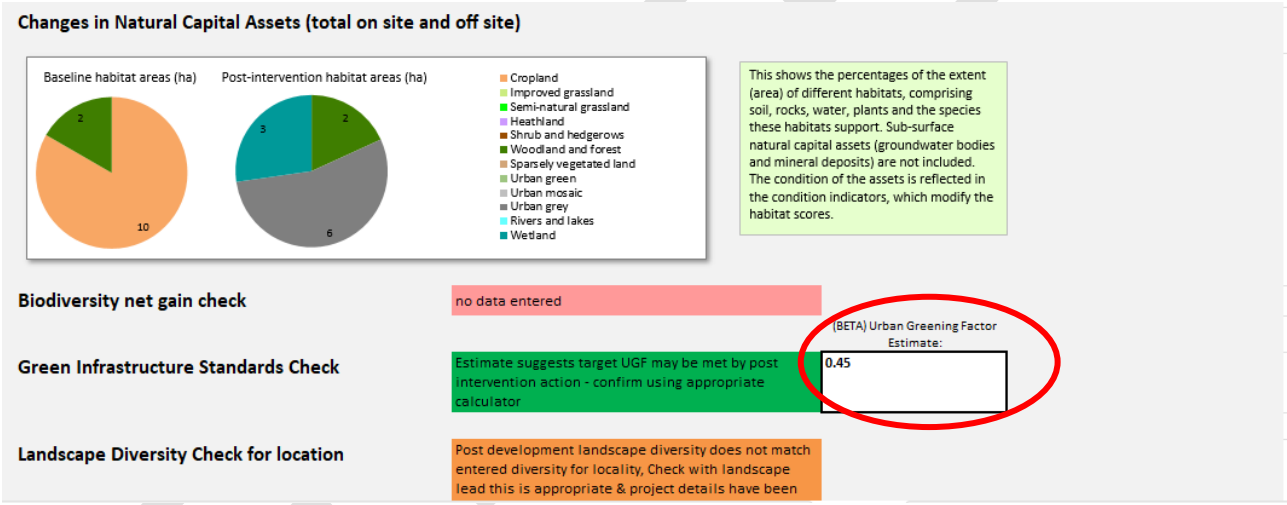
[11] Note all input habitats are first converted to an EBN habitat type before auto-conversion to UGF SCT.



No.	Surface Cover Type	Area (m2)	Factor	Value	Notes
1	Semi-natural vegetation and wetlands retained on site (including existing / mature trees)	0.00	1.0	0.00	Check tree measurement area for retained trees, measurement method differs for UGF measurement to BNG
2	Semi-natural vegetation established on site	22,170.00	1.0	22,170.00	
3	Standard / semi-mature trees (planted in individual tree pits)	35,000.00	0.9	31,500.00	Assumes planted trees are in pits, if planted in connected pits area should be entered into the appropriate row. Note method for created tree area is different for BNG and UGF, UGF method should be used for final figures
4	Native hedgerow planting (using mixed native species)	0.00	0.8	0.00	
5	Standard / semi-mature trees (planted in connected tree pits)	0.00	0.7	0.00	Assumes planted trees are in pits, if planted in connected pits area should be entered into the appropriate row. Note method for created tree area is different for BNG and UGF, UGF method should be used for final figures
6	Food growing, orchards and allotments	0.00	0.7	0.00	
7	Flower rich perennial and herbaceous planting	75,390.00	0.7	52,773.00	
8	Single Species or mixed hedge planting (including linear planting of mature shrubs)	0.00	0.6	0.00	
9	Amenity shrub and ground cover planting	0.00	0.5	0.00	
10	Amenity grasslands including formal lawns	0.00	0.4	0.00	
11	Intensive green roof (meets the Green Roof Organisation / GRO Code)	0.00	0.8	0.00	Tool does not differenitate between different types of green roof, areas may need to be reallocated into the correct
	Extensive biodiverse green roof				Tool does not differenitate between different types of green

5. UGF Calculator | LCA_Database | Menu | Calcul ...

Figure 23 Green Infrastructure Check & UGF estimate – Estimated UGF value calculated (shown ringed) is compared with the target UGF entered – here the target UGF is exceeded. A message below highlights this is an estimate only and that a full assessment is needed to confirm.



Box 8. Landscape Cross-check (NEW)

The updated tool performs a similar cross-check relating to landscape character. This makes use of the landscape diversity information entered within the project details tab (Figure 24), it then compares this with the post-intervention landscape diversity entered.

Where the landscape diversity matches that entered as typical for the area, a message is provided (below the BNG/UGF checks) confirming this. Where the post-intervention landscape diversity entered does not match that entered for the area (in the project details tab) a message is provided encouraging further consideration of whether the change in landscape diversity proposed is appropriate for the area.

Figure 24. Project Details tab showing complexity typical of landscape – determined having used the relevant LCA (link shown)

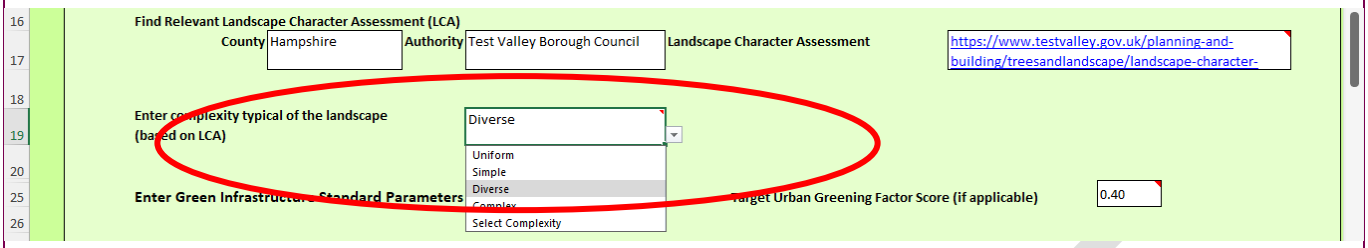


Figure 25. Post-intervention landscape diversity entered (which is compared to the above)

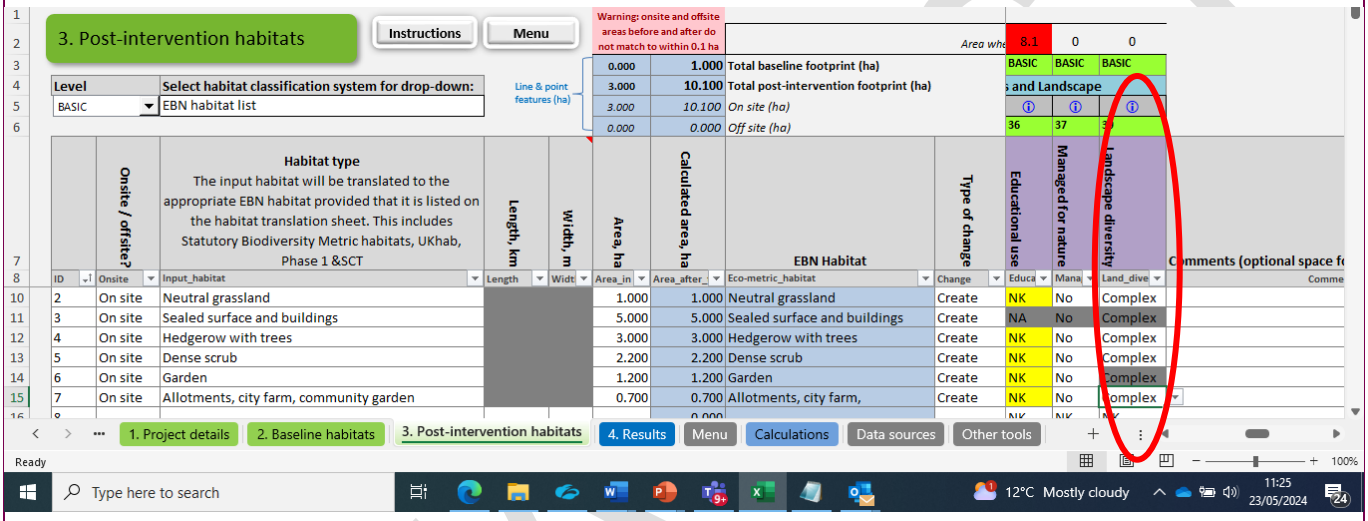
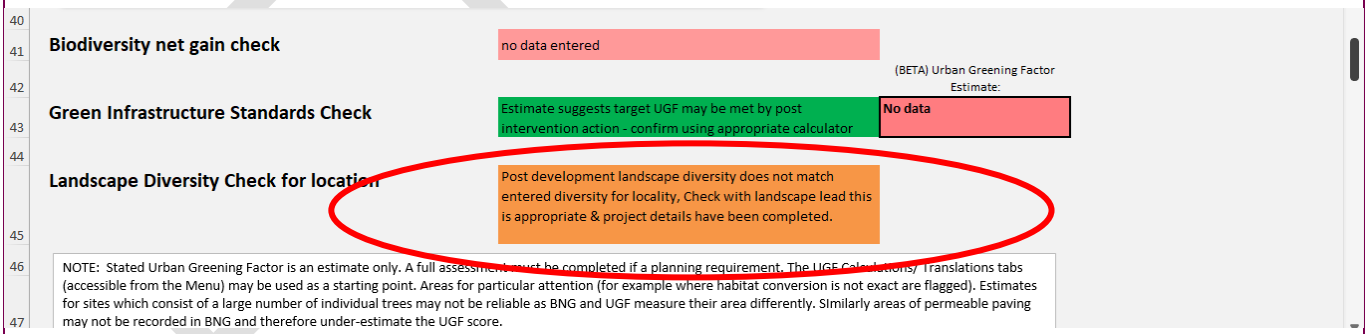


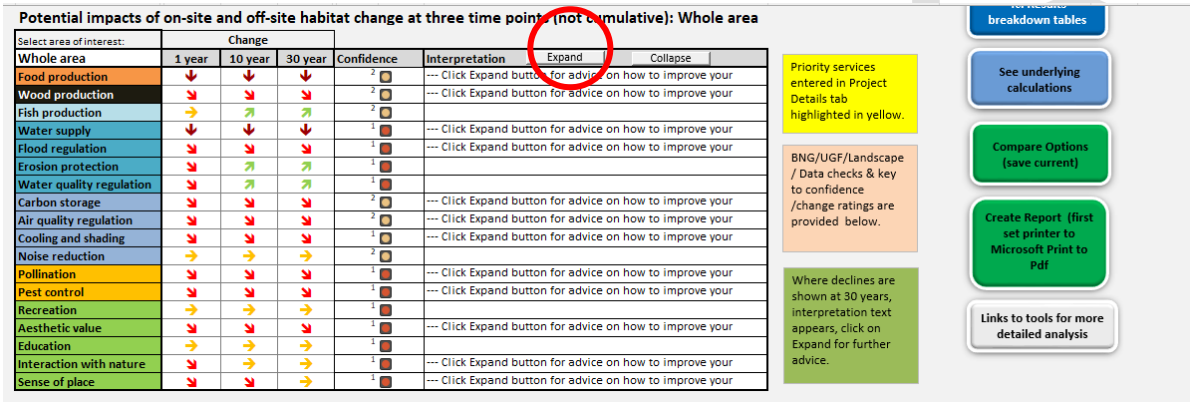
Figure 26. Landscape Diversity Check text – here the landscape diversity entered does not match that entered for the area – text provides a suggestion to check and confirm that this difference is appropriate to the area, calling on expertise if present.



Considering reasons for declines, and potential positive changes to design (NEW)

To help users better understand their results, interpretation text has been added to the right of each of the arrow displays. These boxes contain custom text that directly relates to the results shown. Where declines are registered at 30 years (or results suggests cumulative decline over this period) the tool generates interpretation text to help explain why this might be the case. It also includes suggestions for potential improvements. For example, for water supply this might state that declines are likely due to increase in the sealed surface and suggest reduction in sealed surface area alongside positive features, such as wetlands or SuDs assets, as a means of increasing scores, where this service is a priority.

Figure 27 Interpretation results - use expand button to reveal text where results suggest a decrease in provision.



Comparing against other options

You can make copies of the Excel spreadsheet to test different scenarios if you wish. The '**Compare Options (save current**)' button to the right of the main results takes you to sheet 4d, where multiple scenarios can be saved. This also allows rapid testing and comparison of up to three different options (see **Appendix 4).** Following proposed changes to the habitat types and conditions, the separate biodiversity metric calculation should be updated to check that the project still produces a biodiversity net gain.

Considering multi-functionality and co-benefits (NEW)

While the updated tool provides greater clarity on known priorities within the decision-making process, users are encouraged to try to take steps to maximise wider gains in addition to priorities and minimise trade-offs. For example, simple steps like locating planned tree planting adjacent to roads can help reduce air and noise pollution at little or no additional cost. In addition, reducing areas of sealed surface (such as through addition of permeable paving can help reduce losses to water supply). Increasing access or adding interpretation can also increase the overall services offered by wider improvements that are already planned. While these changes may not always be sufficient to change the overall arrow displays their positive impact can be seen on score calculation sheets. These improvements may also show positive improvements to factors such as UGF - where areas of permeable paving receive score. Care

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should be taken to ensure that delivery is in line with the EBN principles set out in the accompanying document, and that users do not seek to game the system.

Considering change in more detail (NEW)

The EBN Tool is designed to indicate broad changes in services, shown as the five arrow types (large decrease, decrease, minor change, increase or large increase). The underlying scores are therefore not shown in the main results tab. However, for transparency, the scores underlying the arrows are shown on other results sheets including tab 4a (On-site and off-site results) and 4d (Save scenarios/ compare options). These may reveal the impact of smaller changes to project design, Sheet 4d is particularly useful for comparing the impact of incremental changes.

Overall, the results will reveal synergies and trade-offs between different services. For example, planting new woodland on arable land could provide multiple benefits for carbon storage, aesthetic value, flood protection and air quality regulation, but result in a loss in food provision. The EBN tool makes these synergies and trade-offs explicit, so that local stakeholders can consider their priorities and take decisions accordingly.

Users should consider local priorities to determine which ecosystem services are most important for a given area. It is recommended that the EBN tool is applied as part of a participatory process, if possible, to ensure that priority setting is inclusive, consistent, transparent and thorough. Local stakeholders should be included, but national priorities such as food production or carbon storage should also be considered. Although it is unlikely that net gains in all services can be achieved, the EBN tool can be useful to make net gains and losses visible, to inform decisions. It could be applied as part of a process of Multi-Criteria Decision Analysis (MCDA).

When interpreting the results, it is very important to keep in mind the limitations of the EBN tool, as described in the EBNT Principles document and ensure scores are not added together and that scores are not maximised within the tool for their own sake. It is just one tool to support decision-making and should always be supported by any other available information. We have provided a button on the Results page to ‘Link to other tools’, which links to two good sources of information on additional tools that could be used to supplement the EBN assessment: ENCA and the EKN Tool Assessor.

The outputs should not be presented in isolation but should be used to develop a supporting narrative that explains the reasons for the changes in ecosystem service delivery in simple terms, to check that the outputs are logical and consistent with other assessments. Users should therefore perform a ‘sense check’ to ensure that the results make sense intuitively. You may wish to examine the interpretation charts and the underlying calculations to get a feel for the reasons behind the changes in EBN tool scores. To aid this, the Results sheet provides a link to a summary of the underlying calculations via the ‘Calculations’ button. If you want to see more detailed information, calculations for each habitat group or parcel can be seen on the ‘Baseline score’ and ‘Post-intervention score’ sheets, accessible from the menu or from the Calculations sheet. On these sheets, the habitat parcels that are particularly valuable for

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delivering each service, in terms of the score per hectare including condition and spatial factors, are highlighted using a white-yellow-green colour scale (with more valuable habitats in darker shades of green). On the post-intervention scores sheet these are the scores per hectare that will be delivered *after* newly created post-intervention habitats have reached target condition.

The 'Breakdown tables', also accessed from the Results sheet, offer a breakdown of the scores for each type of habitat (grouped into either the Broad habitat categories used by Natural England or the habitat groups used by versions of the Biodiversity Metric). Further down this sheet you can also see how the basic scores for each habitat type change after the condition and spatial multipliers are applied, and again after the multipliers for time to reach target condition and delivery risk are applied. This information is also presented for every individual habitat type, as well as the broad groups (you can filter out the un-used habitats for ease of viewing). This can help you to understand how the final scores depend on the habitat condition, spatial location and time and delivery factors.

Considering confidence

Ratings have also been included to provide confidence using the results (Figure 28). These are displayed adjacent to results in the main dashboard. Ratings provided are set out below. These are each service-specific and will not alter according to the level of assessment used (e.g. Basic/Standard/Advanced).

Figure 28. Confidence ratings within the tool

	The relationship between the provision of the ecosystem service and habitats is complex. Evidence for scoring/multipliers is partial, although may be stronger for some habitats than others. Evidence gaps have been filled by consulting experts and with a degree of subjectivity, particularly for cultural services.
	We have some suitable evidence to calibrate our range of scores across habitats and multipliers and/ or scoring applied to a limited range of habitats/ multipliers for which there is a sound and simple rationale.
	We have a strong evidence base upon which to base scores across the range of habitats and multipliers used for this ecosystem service.

5.3 Printing the output

There are four main ways of printing the output (as stated on the main print button it is suggested that this is set to print to pdf in most cases).

1. Select File, Print to print directly from the page. The two main results sheets ('4. Results overview' and '4a. Onsite and Offsite results') have been formatted to print out in landscape format.
2. Export a pdf. From the two main results sheets ('4. Results overview' and '4a. On & Off-site') select File, Export, Create pdf/xps document, enter a filename, click on Options and

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make sure it is set to print the Active sheet, not the entire workbook, and click ‘Publish’. This will create a two-page pdf of the main results overview sheet.

3. For a shortcut, the ‘Print’ button on the main results sheet will simply print the results using the default mode last selected by the user (which could be to pdf or to a printer) – Macro version only. As stated on the button it is recommended that this is set to pdf before clicking on the button as this will initiate the print process.
4. From any sheet, take a snapshot of the screen using Shift-PrtSc (to copy the whole screen and crop later) or the Windows snipping tool (accessed by typing ‘snipping tool’ into the Windows Start menu, which allows you to select only the desired area). You can then paste this into any application (Word, Powerpoint, etc.).

6. Linking to spatial data

Input data for the EBN tool can be generated with a GIS (Geographic Information System) package such as ArcGIS or QGIS. Similarly, the output scores for each habitat parcel could be shown on maps in GIS.

Appendix 3 Provides details on use of the tool alongside the supporting QGIS Template that works alongside the Biodiversity Metric QGIS template to provide access to spatial data direct from supporting servers to interface with habitat related data.

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Appendix 1: Structure of the tool

The EBN tool is an MS EXCEL workbook consisting of the following worksheets.

Worksheets needed by the user

- **Welcome**: introduction to the tool; what it does and does not do.
- **Instructions:** quick start instructions
- **1. Project details**: space for users to enter basic project details (see section 2).
- **2. Baseline habitats**: data entry sheet for habitat area and condition indicators before development or intervention, both on site and for any compensatory habitat creation or enhancement off site
- **3. Post-intervention habitats:** data entry sheet for habitat area and condition indicators after the development or intervention and the associated biodiversity net gain (retained, created, or enhanced habitats) both on site and off site
- **4. Results**: Arrows showing direction and magnitude of change for each ecosystem service at 1, 10 and 30 years after development, and pie charts of natural capital assets (habitat extent)
- **4a. Compare on & off-site results:** arrows and natural capital asset pie charts for on-site and off-site habitats separately.
- **4b. Interpretation charts.** Charts showing the split of ecosystem service scores between habitat groups for each ecosystem service. These charts are useful for understanding the reasons for the changes in scores.
- **4c. Results breakdown tables.** Detailed result tables for each habitat type and service.
- **4d. Save scenarios (Compare Options (save current)).** Save the main results table for up to three different scenarios so that you can compare them side by side.
- **4e. Comparison with 100% suburban mosaic.** For housing developments only – shows a comparison with what would have happened if the whole site was converted to a 'typical suburban mosaic'. This can be useful to illustrate the benefits of on-site green infrastructure.
- **5. UGF Calculations** shows the basis of UGF estimate calculated.
- **Data sources**: summary table with information on each condition or spatial indicator, including links to the appropriate data sources. Accessed directly or via the info links on the data entry sheets.

Worksheets used internally by the tool (the user does not need to access these unless interested).

- **Baseline scores:** calculation sheet where the EBN tool units for the habitats before the development or intervention are calculated.

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- **Post-intervention scores:** calculation sheet where the EBN tool units for the habitats after the development or intervention to deliver biodiversity net gain are calculated.
- **Calculations:** summary calculations which underlie the arrows on the results sheets.
- **Map**: a map showing how the different worksheets are connected (see 3).
- **Scores**: the matrix of habitat scores.
- **Score filter**: a sortable version of the score matrix if users want to see the top habitats for different ecosystem services.
- **Multipliers**: tables of condition and spatial multipliers.
- **Time factors**: table of multipliers to correct for 'time to reach target condition'
- **Applicability**: used to determine which condition and spatial indicators apply to each habitat type.
- **Habitat selection**: source of the dropdown lists of habitat types used for data entry. The user can define their own list on this sheet if desired.
- **Habitat translation**: used to automatically translate different habitat classification systems into the appropriate EBN tool habitat.
- **LCA Database -** contains links to LCA statements for each authority, pulled upon by the Project Details tab
- **UGF translation –** converts Eco-metric (EBN) habitat types used by the tool to UGF Surface Cover Type Equivalents for the purposes of UGF calculations.
- **Version control:** list of updates including release notes where applicable.

The sheets are colour coded as shown in Figure 29. There are only three data entry sheets, identified with green tabs. The user enters input data on these three sheets, and the results are calculated automatically and displayed on the results sheets.

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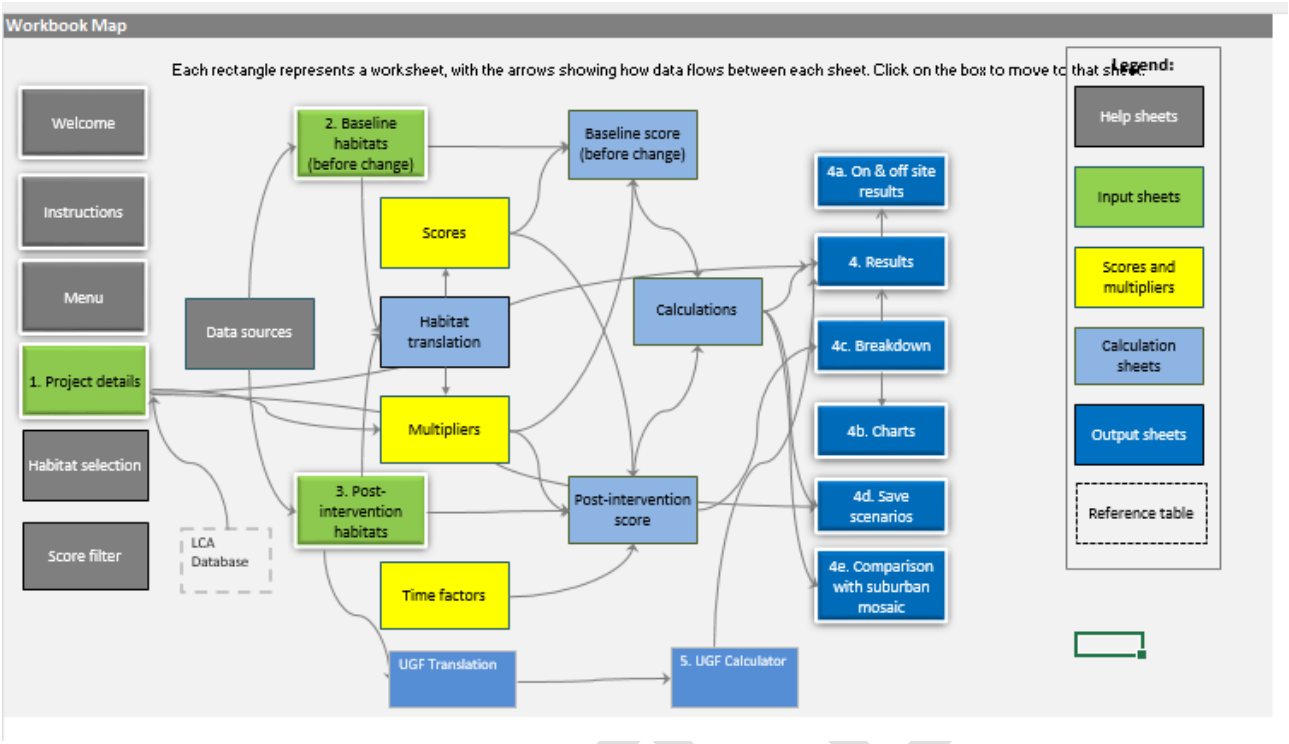
Figure 29. Map of the EBN tool workbook (this is in the workbook)



Appendix 2 – Use of Green Infrastructure Data Portal (NEW)

The Natural England Green Infrastructure (GI) Data Portal can be found at the following address: https://designatedsites.naturalengland.org.uk/GreenInfrastructure/Map.aspx

This now hosts datasets required to complete a BASIC EBNT assessment. This data can be accessed in two ways, thorough either:

1. An automated process using an EBN site search to provide customised outputs for the site,
2. A manual process – allowing users to consider data attributes co-located with habitat features (using instructions set out in the EBN catalogue).

Instructions on how to complete each type of assessment are included below:

i) Automated process - EBN Search box assessment

The GI data portal contains a “EBN search’ box as a blue button (top centre). This provides new functionality that can allow users to quickly interface with the additional data required to complete a BASIC EBNT assessment for small/ simple sites. It offers the potential to greatly speed up the process of assessment and improve consistency of application.

This method recommended for small simple sites, lacking designations or ancient habitats, where contextual data is more likely to be shared across the whole site. A process diagram is provided below.

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STEP 1. User transfers habitats and areas into Baseline and Post Intervention tabs of EBNT from **Statutory Biodiversity Metric Tool**

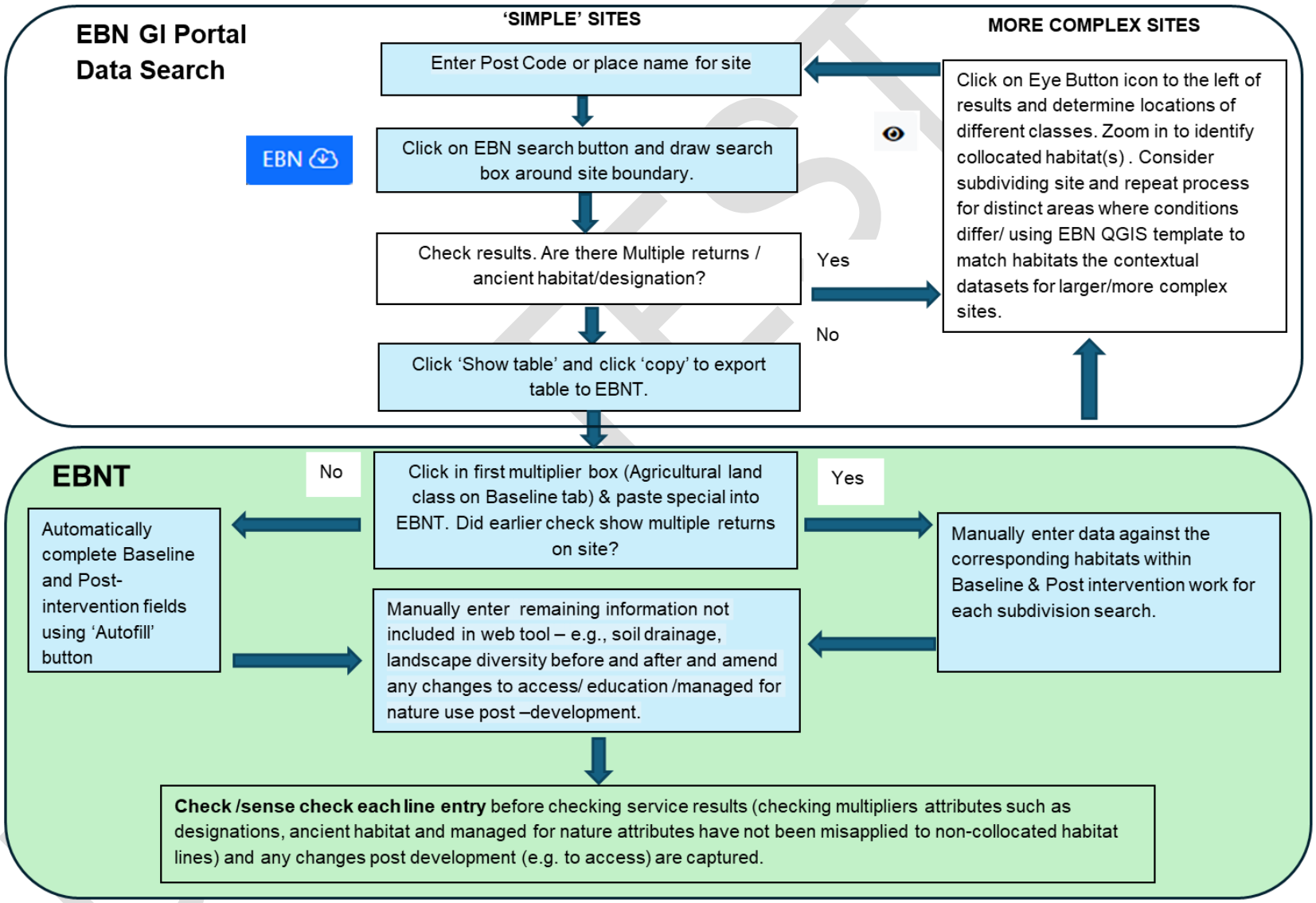
STEP 2. User visits the GI data portal to collect contextual data.

STEP 3 User completes data search (process top right)

STEP 4. User exports data into the EBN tool.

STEP 5. User checks & amends entries to include missing data manually + post – development changes (process bottom right)

STEP 6. User checks line by line entries to ensure no attributes have been mis-applied



Note the search is for the site only and does not link returns to co-located habitats. Where the EBN search reveals multiple returns (e.g., different grades of land/zones or the presence of designations with a project boundary) we suggest users either:

1. Zoom in further and repeat the above process row by row/ field by field to ensure correct allocation of each variable to its corresponding habitat.

2. Where multiple results are limited to a single dataset only, proceed to step 4 and manually correct results for relevant rows. E.g., where only grades of agricultural land differ across the site and the other attributes are the same, use the simple search and manually correct agricultural land for the matching line of arable habitat to grade 2).

Alternatively for larger more complex sites we recommend use of the EBNT QGIS template. This more complex process allows users to “cookie” cut habitats by contextual datasets to allow line by line completion for each habitat.

A step-by-step walkthrough highlighting the above process is set out below

Figure 30 - User first enters post code to zoom to their desired location then clicks on the blue EBN buttons to then draw around the relevant boundary.

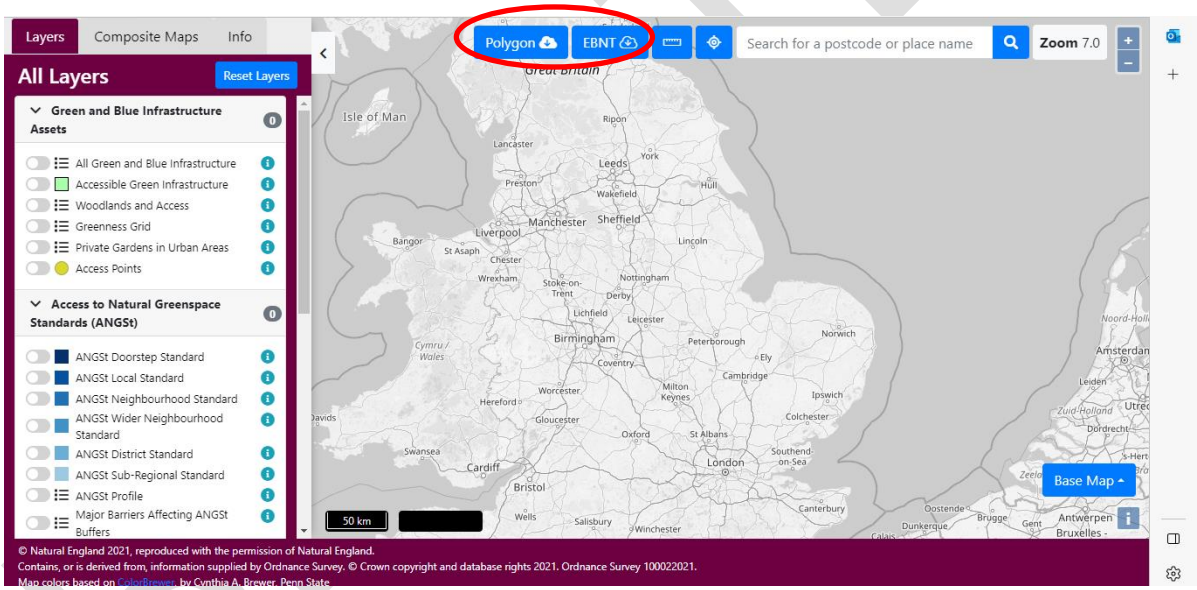


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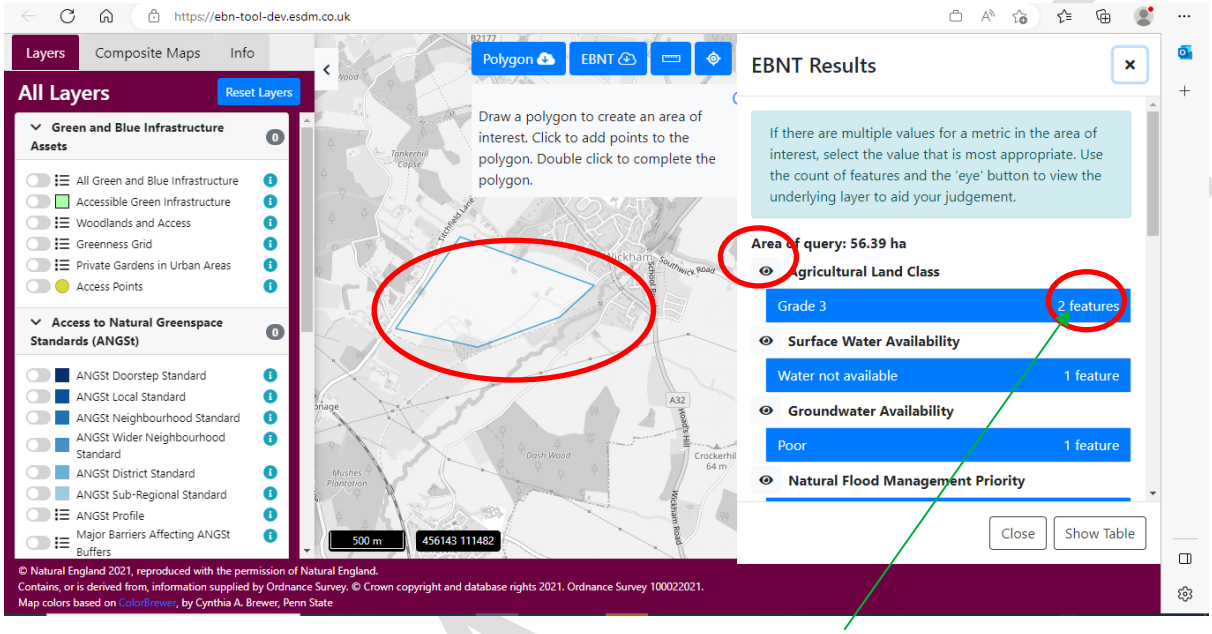
Figure 31. User draws search box around boundary. Upon finishing drawing the polygon the initial EBNT search results are provided. These show the attributes for the area as well as if multiple potential results are present and/or features that may occur across only part of the site (red). In some cases, these will be multiple polygons with the same attribute or may be polygons clipping the edge of the polygon. To check this, users can click on the eye icon to the left of each heading which will show the location so of the different attributes.



Multiple Returns appear here, e.g., if there are multiple grades of agricultural land within the search box. The eye button to the left of the title (ringed) will show their location.

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Figure 32. Export table. Once users are happy that results are either the same across the site / or have zoomed in to a suitable scale that provide single results that can be linked to a particular parcel/habitat, users click show table. This then provides tabular data ready to enter straight into the tool. Clicking copy puts this onto your clipboard.

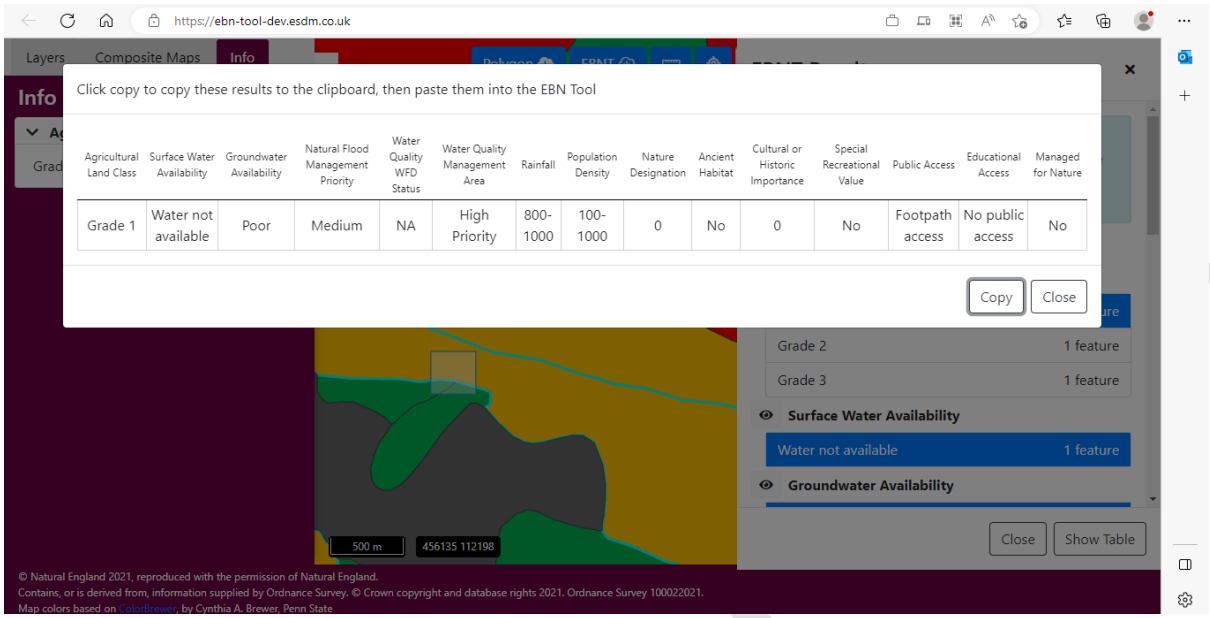
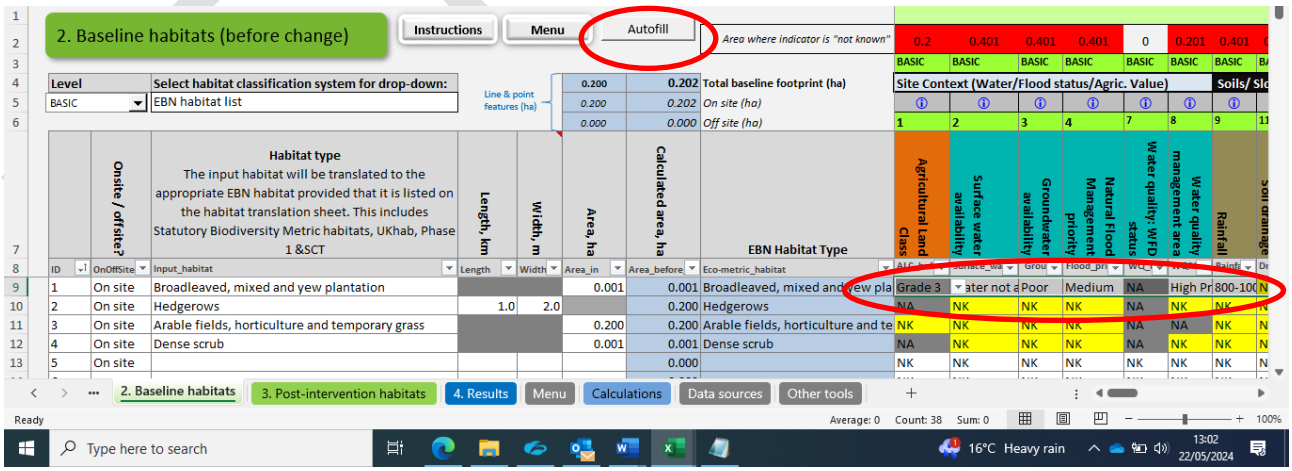


Figure 33. Pasting Data & Autofill - copied data is pasted into the first multiplier cell in the Baseline tab (1. Agricultural Land Class). The results should automatically populate the first row of the spreadsheet. If results are the same across the site (and work is all delivered on-site) the user can click the autofill button. This populates the same variables into the post-intervention tab.



ii) Manual assessment using the GI Portal

The process of manual assessment mirrors the line-by-line instructions outlined in pages section 4 of the EBN User Guide (above). The GI portal now replaces the need to visit all the different locations to obtain spatial data as previously outlined in the EBN Data Catalogue. This process presents efficiencies by providing information in one place. Manual assessment requires users to determine co-located datasets by switching on the relevant datasets from the left-hand menu of the data portal and clicking on corresponding mapped layers to collect attributes (as shown below). As noted above, use of the EBNT QGIS template is recommended for larger complex sites to automate this process.

Figure 34. Manual Process Step 1.- EBNT Data is displayed in left menu – user zooms into their area of search and toggles allow users to switch data layers off and on. Here the ALC dataset has been switched on and relevant attributes returned and colour coded.

Figure 35. Manual Process Step 2. - Information needed to complete the EBN tool is provided by clicking on the mapped Datasets (only the information needed for the EBN is provided) this then needs to be manually transferred to corresponding habitat rows within the EBNT. This process is then repeated for other datasets/rows until the tool is complete.

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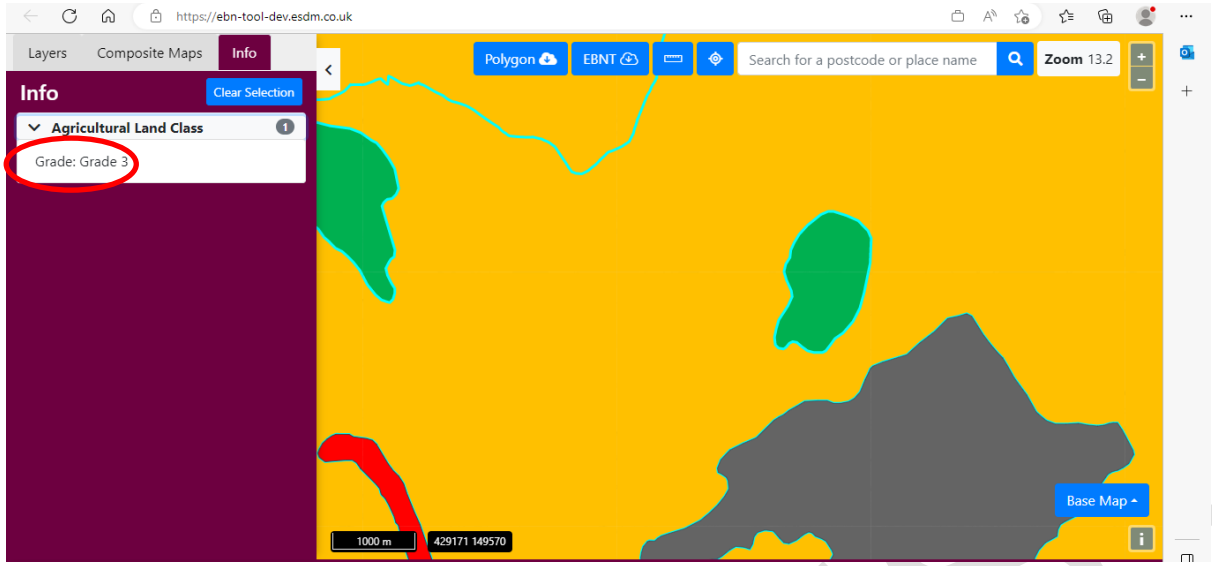
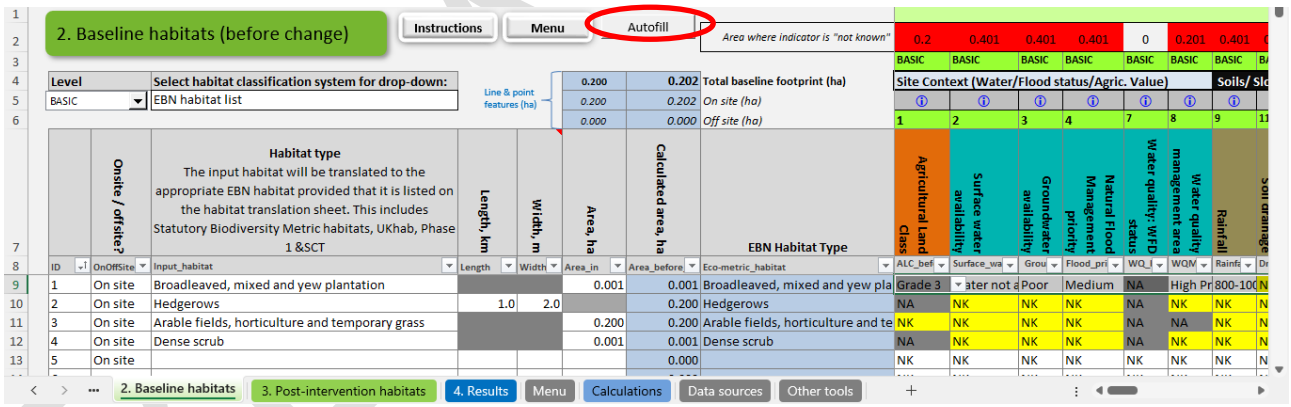


NOTE: Multipliers contained within the tool without matching OGL spatial datasets (such as Landscape Diversity/ Soil Drainage) and changes to baseline attributes (such as provision of improved access or changes to management for nature) need to be entered a part of an additional manual process. This is described in the Data Catalogue for these multipliers with short versions described by clicking on the i button above each column in the tool.

Figure 36. Autofill Button



i) When to use Optional Autofill Functionality

As mentioned above, for small (non-complex) sites, the multiplier values will often be the same across the site (covering the same catchment and grades of agricultural land, with the same population density, rainfall and access across the site, lacking any designations or ancient habitat). Where the post-intervention work is also delivered on site, results will also be the same (barring a small number of potential improvements/changes – see note below). An autofill button has therefore been created as an optional feature that can allow users in such situations to quickly populate their baseline and post-intervention attributes. The autofill button simply repeats the first line entry, as taken from the search tool. This then repeats across the baseline and post-intervention habitat tabs. The macro also then

corrects some of the issues with sequential values identified in the ‘Auto-filling columns to save time’ in the EBN User Guidance.

NOTE: i) If using the autofill functionality care must be taken to ensure values are relevant to all rows and update access and managed for nature fields where this has changed, for example access may be improved post-development, land previously in a scheme would not be managed for nature etc. ii) landscape diversity should also be entered manually for each entry – see EBN Data catalogue.

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Appendix 3 Use of EBNT QGIS Template

The Beta EBNT QGIS Template has been designed to support QGIS users working on larger or more complex projects. It is intended to complement the updated EBNT v1-1 tool by providing a faster, custom, means of data access and processing. It allows the user to match mapped habitat data (required by BNG) to the contextual counterparts (required by the EBNT) to obtain a BASIC level assessment of ecosystem service change.

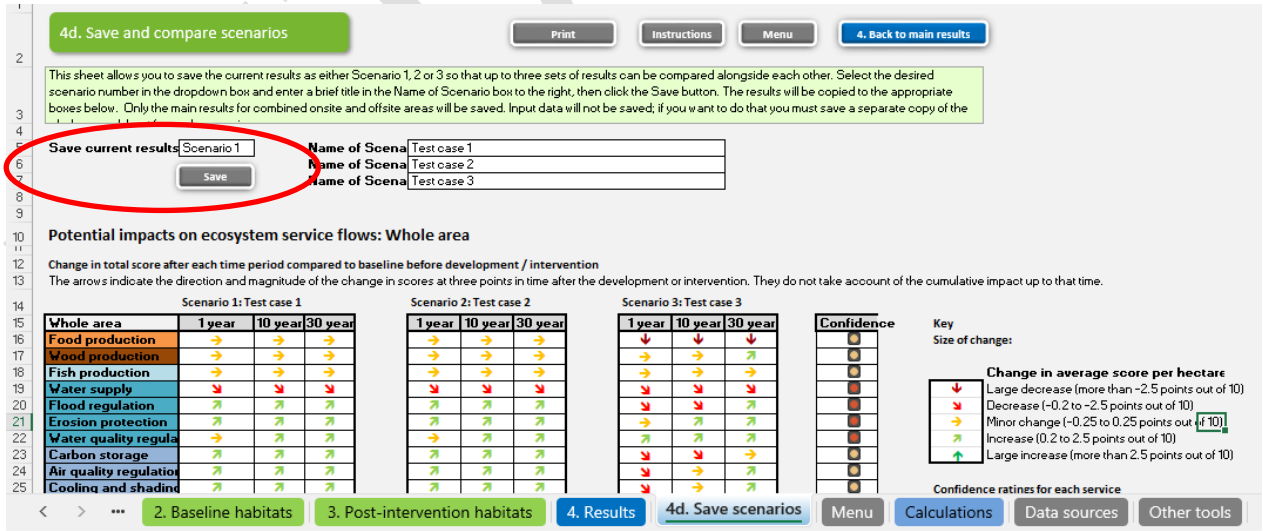
This tool is available to download from the EBNT webpage. Further information on this process can be found in the EBNT QGIS User Guide.

Appendix 4: Saving scenarios

To compare scenarios within the tool first record your 'base case' against which you wish to compare results. This should be Scenario 1.

This can be done by running the results, in accordance with instructions above and clicking on the 4d Save Scenario button on the Results tab. This will take you to the screen set out below. Toggle the dropdown box left to Scenario 1 and click on the save button below. The name of the scenario can be changed using the box provided and appears above the left chart.

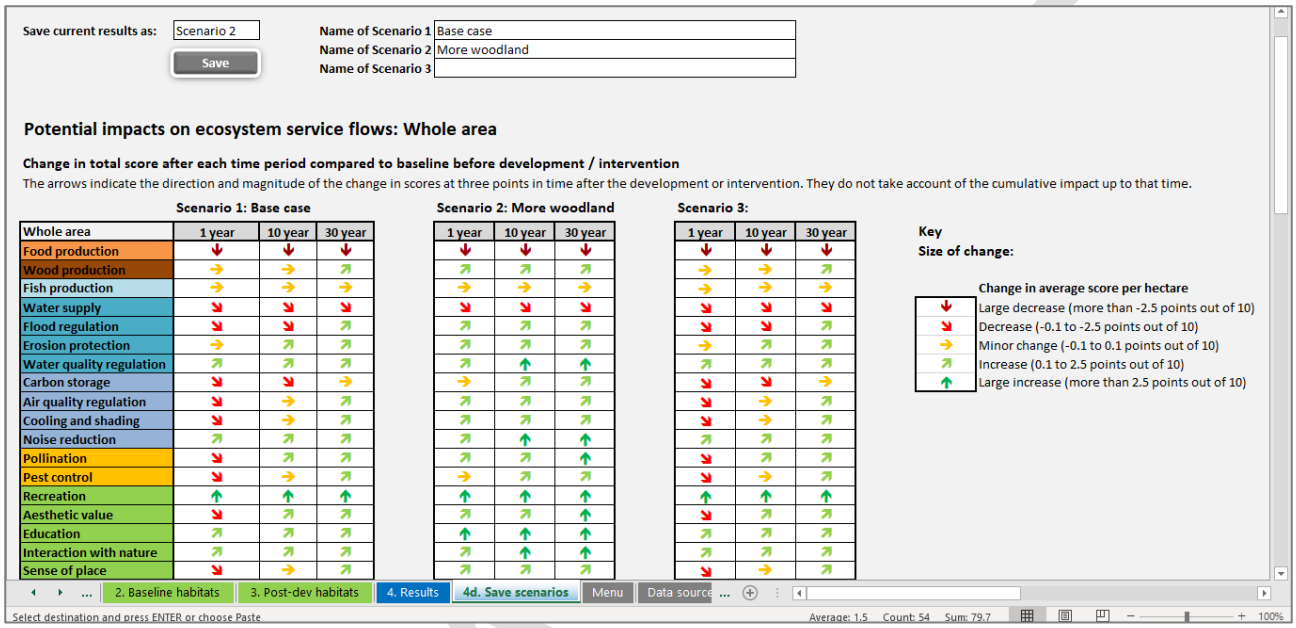
Figure 37. Save Scenario Screenshot



To compare it to a second scenario, make the necessary changes to the baseline habitats or post development plans (for example retaining more of the original habitat, increasing the area of post development habitat, or changing its type for example from grassland to

woodland). The results should be re-calculated automatically. The above process then needs to be repeated, this time selecting scenario 2 from the drop down. The charts will then automatically change upon clicking on the save button allowing you to easily compare impact against your original plans (as can be seen in Figure 3).

Figure 38. Example showing impact of significant increase in post-intervention woodland saved in Scenario 2



A third scenario can be entered in the same way.

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Appendix 5: Troubleshooting

Results do not match previous version of the tool

The tool has been tested to ensure results are broadly consistent with the previous version. Check that linear features have not been imported with length as metres, rather than kilometres. Note the previous version of the tool required linear features to be imported in metres. Pasting data directly from the prior version of the tool will greatly over-estimate the area of linear features and therefore can have a significant impact on results.

Results appear to include standard/ advanced indicators – even though no data has been entered.

The tool automatically enters NA where an indicator is not relevant to the habitat. This then counts as complete and will appear in data completeness fields without data entry

No level achieved following use of the EBN search

Note that soil drainage and landscape diversity fields need to be manually entered – as are not covered by the EBN search tool.

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