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Transport Infrastructure Ireland Biodiversity Metric Tool for Road, Greenway and Light Rail Projects: User Guide Document

GE-ENV-01112

December 2025

TII Biodiversity Metric

GE General

Technical

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TII Publications

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Contents

Contents

1. Introduction to Biodiversity Accounting

1.1 Introduction

The purpose of this document is to offer guidance on the use of the Transport Infrastructure Ireland (TII) Biodiversity Metric Tool for quantifying impacts on biodiversity, associated with national road, greenway, and light rail infrastructure projects in Ireland.

Additionally, this document provides Users of the TII Biodiversity Metric Tool with supplementary background information on the development, format, and application of these tools. The document is organised into two parts:

- **Part I:** Overview of the TII Biodiversity Metric (BM) Tool, covering its development, purpose, boundaries, assumptions, layout, and functionality. This includes an introduction to both the Options Appraisal Toolkit and the Full Biodiversity Metric Toolkit.
- **Part II:** This section provides a step-by-step guide to the TII Biodiversity Metric Tool's stages, ensuring alignment with the design and planning process. It includes a case study showcasing a practical example and describes the expected detail for each project phase.

The TII Biodiversity Metric Tool includes integrated guidance designed specifically for its Users. This method facilitates usability and eliminates the need for Users to consult various documents during the completion process.

Please note that to access the TII Biodiversity Metric Tool, prospective Users should contact biodiversitymetric@tii.ie to be set up as an authorised User.

1.2 Project Background – Biodiversity Metric

This project developed a bespoke Biodiversity Metric specifically tailored to the Irish ecological context and designed for application on Transport Infrastructure Ireland's (TII) linear infrastructure projects. The metric enables a structured, quantitative assessment of biodiversity impacts using biodiversity units, which are calculated based on habitat area or length, condition, distinctiveness and strategic significance. Additional multipliers to account for the risks associated with creating or enhancing habitat are applied to post-development habitats. For readers seeking further detail, please refer to the literature review completed as part of this project, which examines international biodiversity metrics and their applications to transport linear infrastructure projects. The literature review can be found on the TII publications website. This tool is intended to inform decision-making throughout the project lifecycle —from route selection and environmental assessment to post-construction auditing —by providing a consistent and evidence-based approach to evaluating biodiversity loss and gain. It also aims to standardise biodiversity evaluation across all TII project types, including national roads, greenways and light rail.

While inspired by international best practices such as the UK's Statutory Biodiversity Metric (Defra, 2023), the TII Biodiversity Metric has been adapted to reflect Ireland's unique habitat classifications, legislative frameworks, and ecological priorities.

The development of this metric directly supports objectives set out in the TII Biodiversity Plan, which commits to achieving no net loss and striving for net gain in biodiversity across infrastructure projects.

By enabling transparent, repeatable, and habitat-specific assessments, the metric provides a practical mechanism for implementing these strategic goals and embedding biodiversity considerations into all stages of project planning and delivery.

1.2.1 Scope of the Tool

The TII Biodiversity Metric Tool is designed to integrate seamlessly with the planning and design cycle for road, greenway, and light rail projects. It provides TII and its contractors with the information needed to understand, compare, evaluate, and reduce biodiversity impacts across multiple design options for any given project.

By combining project-specific habitat data with assessments of condition, distinctiveness, and strategic value, the tool calculates biodiversity units and enables Users to assess potential losses and gains. This supports informed decision-making at key project stages – from early route selection through to detailed environmental assessment and post-construction auditing.

In addition to supporting biodiversity evaluation across multiple project stages, the TII Biodiversity Metric Tool introduces a structured, quantitative approach to biodiversity assessment. Unlike traditional qualitative methods typically employed in EIA, which rely heavily on expert judgement and descriptive analysis, this tool applies a formulaic scoring system to habitat data. By integrating metrics for habitat extent, condition, distinctiveness, and strategic significance, it calculates biodiversity units which reflect ecological value in a consistent and repeatable manner. This quantitative framework enables Users to compare design options objectively, identify biodiversity losses and gains with precision, and support transparent decision-making. It also facilitates post-construction auditing and long-term monitoring, ensuring that biodiversity outcomes are measurable and verifiable over time.

Not only does the tool account for habitats lost versus retained, but it also provides the opportunity to achieve no net loss by identifying areas for habitat enhancement and creation. Users can explore where biodiversity units that may be lost within a proposed route corridor can be offset – either through enhancement of existing habitats or creation of new ones – within or beyond the project boundary depending on ecological and project constraints.

The tool also facilitates consistent biodiversity reporting across TII's project phases, helping to embed biodiversity considerations into infrastructure delivery and align with TII's strategic commitment to no net loss and net gain in biodiversity.

The scope of the tool is designed to fulfil the following criteria:

- **Supports national road, greenway and light rail projects**: The tool includes functionality to assess biodiversity impacts across road, greenway, and light rail projects within a single platform;
- **Biodiversity unit calculation across project lifecycle:** Enables biodiversity data to be presented for different project stages, from early design through to implementation, using habitat-specific metrics aligned with ecological best practice;

Alignment with TII Project Phases: Usable across TII's project phases – from initial outline design and option selection to detailed design and final implementation – ensuring biodiversity considerations are embedded throughout.

- **Model Multiple Design Scenarios and Baseline Conditions:** Allows Users to compare biodiversity outcomes across multiple design options and a baseline scenario, helping to identify the most ecologically beneficial approach.

- **Flexible Inputs and Outputs:** Supports varying levels of assessment depending on project phase and data availability. The tool is designed to accommodate updates to habitat classifications, distinctiveness scoring, condition scoring, and components of strategic significance as ecological data evolves.
- **Capture Biodiversity Enhancement and Creation Measures**: Not only does the tool account for habitat loss versus retention, but it also enables Users to identify opportunities for achieving no net loss by enhancing or creating habitats. Users can decide where biodiversity units lost within a route corridor can be offset – either within or beyond the project boundary.
- **Exportable Outputs for Reporting and Review:** Provides a range of output formats that can be exported for use in project documentation, stakeholder engagement, and regulatory submissions.

1.3 Definitions

Table 1.1 - Key definitions

Term	Definition
Biodiversity unit	'Biodiversity units' are used to describe relative biodiversity value. There are three types of biodiversity units: area habitat units, hedgerow units and watercourse units. Each of these are calculated in separate sections of the biodiversity metric.
Condition	A measure of the habitat against its ecological optimum state. Condition is a way of measuring variation in the quality of patches of the same habitat type.
Condition assessment	The process of assigning habitat condition, to be undertaken by a competent person.
Difficulty risk	A measure which represents the uncertainty in the effectiveness of management techniques used to enhance or create habitat.
Distinctiveness	A measure based on the type of habitat and its distinguishing features. This includes: • consideration of species richness and rarity • the extent to which the habitat is protected by designations • the degree to which a habitat supports species rarely found in other habitats.
Habitat parcel	A linked area of habitat of the same distinctiveness, condition and strategic significance.
Strategic significance	The local significance of the habitat. In the TII Metric, this is determined by three criteria: 1. Protected Species Presence 2. Policy Recognition Proximity to Protected Sites.
Time to target condition	The average time taken between starting creation or enhancement of habitats and that habitat reaching its target condition or distinctiveness.

1.4 Guidance Criteria

The TII Biodiversity Metric Tool is grounded in the internationally recognised Business and Biodiversity Offsets Programme (BBOP) principles (Business and Biodiversity Offsets Programme, 2018), which provide a robust ethical and ecological framework for biodiversity accounting and offsetting. These principles ensure that the tool not only delivers measurable outcomes but also aligns with best practice in biodiversity conservation and infrastructure planning.

The tool is designed to support TII's commitment to achieving no net loss and, where possible, net gain in biodiversity. It does so by embedding the following core principles into its structure and application:

- **Mitigation Hierarchy –** Prioritising avoidance of impacts before minimising, restoring, or offsetting them.
- **Limits to Offsetting –** Recognising that some habitats and species are irreplaceable and cannot be offset.
- **Landscape Context –** Ensuring that biodiversity outcomes are relevant and beneficial within the broader ecological landscape.
- **No Net Loss –** Delivering in situ, measurable outcomes that maintain or enhance biodiversity values.
- **Additionality –** Ensuring that biodiversity gains go beyond what would have occurred without the intervention.
- **Stakeholder Participation –** Engaging relevant stakeholders in the design and implementation of biodiversity measures.
- **Equity –** Designing biodiversity interventions in a fair and inclusive manner.
- **Long-Term Outcomes –** Securing biodiversity benefits that are sustainable over time.
- **Transparency –** Ensuring open, clear, and accountable processes and reporting.
- **Science and Traditional Knowledge –** Grounding decisions in sound ecological science while respecting local and traditional knowledge systems.

1.5 Irreplaceable Habitats

Irreplaceable habitats are those that, due to their unique ecological characteristics, rarity, or slow recovery potential, cannot be recreated or restored to their original condition within meaningful timeframes. These habitats often support highly specialised or rare species, provide critical ecosystem functions, and are typically the result of long-term natural processes. In the Irish context, irreplaceable habitats within the TII Biodiversity Metric are:

- Ancient Long-Established woodland – woodland that has existed for centuries, supporting rich biodiversity and ecological complexity that cannot be replaced once lost;
- Limestone pavement – a rare karst habitat formed by scouring of limestone bedrock, characterised by clints and grikes, supporting specialist flora and fauna and considered irreplaceable due to its geological uniqueness and slow formation;
- Machair – coastal grasslands found only in the northwest of Ireland and Scotland, shaped by centuries of traditional land use;

- Peatlands – confined to blanket bogs and active raised bogs, which develop over decades to centuries and serve as vital carbon sinks; and
- Turloughs – seasonal karst waterbodies unique to Ireland, with complex hydrological regimes and specialist biodiversity.

These habitats are often afforded legal protection under national and EU legislation, such as the Habitats Directive, even when they fall outside designated conservation sites. In line with the BBOP principles and the mitigation hierarchy, the TII Biodiversity Metric recognises that impacts on irreplaceable habitats should be avoided entirely wherever possible. They are assigned the highest distinctiveness scores in the metric, reflecting their exceptional biodiversity value and the fact that they cannot be offset through habitat creation or enhancement elsewhere.

The tool requires Users to identify whether each habitat entered is irreplaceable or not. If a habitat is identified as irreplaceable, a 'reminder message' appears to flag to the User that irreplaceable habitat must not be lost, and that appropriate enhancement or creation is required.

For further guidance on scenarios where 'very high' distinctiveness habitats coincide with Annex habitats—and the criteria that trigger classification as irreplaceable—Users are strongly encouraged to consult Section 1.8.4. This section offers crucial detail on how such overlaps are managed within the metric, clarifying when a habitat must be flagged as irreplaceable and the specific considerations that apply in these complex cases.

1.6 Biodiversity Metric Users and User Competency

The TII Biodiversity Metric tool is designed for use by Ecologists, environmental consultants, and project teams involved in the planning, assessment, and delivery of transport infrastructure projects. It supports biodiversity evaluation across a range of project types, including roads, greenways, light rail, and active travel schemes.

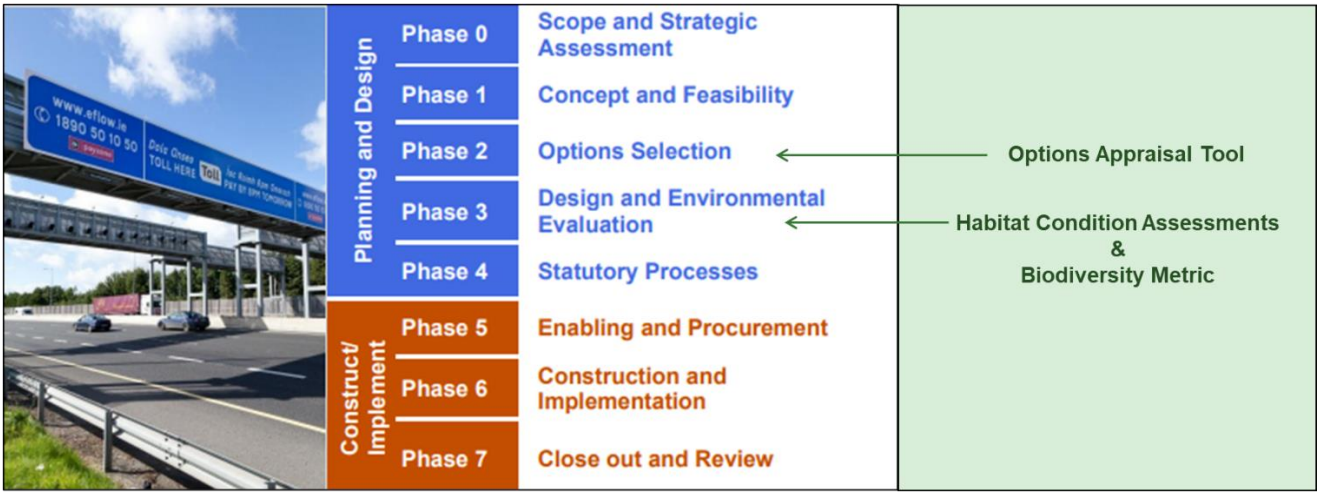


Figure 1.1 - Alignment of the TII Biodiversity Metric Toolkits with the TII Project Phases

The tool is structured to be applied at multiple stages of the project lifecycle:

- At the options selection stage, a high-level version helps identify route corridors with the least biodiversity impact using spatial data and pre-loaded habitat layers; and

- At the environmental assessment stage, a more detailed version enables full biodiversity accounting, allowing Users to quantify biodiversity units and assess potential losses or gains.

The TII Biodiversity Metric Tool is primarily intended for use by Ecologists and environmental specialists with demonstrated experience in biodiversity assessment, habitat management, and ecological planning. These Users may be part of TII's internal teams or external consultants, designers, or contractors engaged in the delivery of road, greenway, and light rail projects.

While the tool automates biodiversity unit calculations, Users are expected to have a strong working knowledge of biodiversity net gain (BNG) and no net loss principles, as well as familiarity with habitat classification systems (e.g. Fossitt), ecological condition assessment, and the mitigation hierarchy.

Although expert-level knowledge is not required to operate the tool itself – thanks to built-in guidance and structured scoring systems – the overall process of applying the metric should be overseen by an appropriately qualified Ecologist or environmental specialist. This ensures that data inputs are ecologically sound, outputs are interpreted correctly, and biodiversity outcomes are robust and defensible. Users are expected to possess a basic level of GIS proficiency. This includes the ability to input and manage spatial data, perform clipping operations, create and organise geodatabases, and export both feature classes and tabular data. These competencies are essential to ensure the integrity and accuracy of biodiversity assessments within the TII Biodiversity Metric Tool.

1.7 Calculating Baseline Biodiversity Units

1.7.1 Habitat Type

The TII Biodiversity Metric Tool uses a tiered approach to habitat classification, tailored to the level of detail and data availability at different project stages. It draws on nationally recognised systems to ensure consistency, ecological relevance, and compatibility with Irish biodiversity policy and planning frameworks.

For the Options Appraisal Toolkit, habitat data is sourced from the Tailte Éireann Land Cover Map, which provides full digital coverage of the Republic of Ireland. This dataset is classified to Fossitt Level 2+, offering a balance between national consistency and ecological detail.

- Fossitt Level 2+ refers to a modified version of the Fossitt (2000) habitat classification system, which is the standard for habitat mapping in Ireland. Level 2 includes broad habitat groups (e.g., grassland, woodland, wetland), while the "+" indicates additional subcategories or refinements that improve spatial resolution and ecological accuracy for strategic assessments.
- This level of classification is particularly suited to high-level comparisons between route corridors, where detailed field data may not yet be available.

Irreplaceable habitat layers and protected site boundaries are sourced from the National Parks and Wildlife Service (NPWS) data webpage[1] to inform the Options Appraisal process.

- Irreplaceable habitat layers are sourced from Article 17 spatial data for 2019[2]. These layers comprise Raised bog, blanket bogs, machair, turloughs, limestone pavement and ancient long established woodland; and

[1] National Parks and Wildlife Service (NPWS) Maps and Data webpage - https://www.npws.ie/maps-and-data
[2] Article 17 data: https://www.npws.ie/maps-and-data/habitat-and-species-data/article-17/2019

- Protected site boundaries[3] for SACs, SPAs (inclusive of SPA Marine sites), NHAs and pNHAs are included within the Options Appraisal toolkit package.

For the Full Biodiversity Metric Tool used during environmental assessment and detailed design, the tool incorporates:

- Fossitt Level 3: This provides more granular habitat types with habitats identified to species-level, enabling precise biodiversity unit calculations in the Biodiversity Metric Tool.
- Hedgerow Appraisal System: Recognising the ecological importance of hedgerows in Ireland – and the limitations of Fossitt, which classifies all hedgerows under a single category – the tool integrates a dedicated hedgerow appraisal framework. This enables an objective assessment of hedgerow structure, species diversity, and connectivity, which are important for biodiversity evaluation and mitigation planning.

By combining these systems, the TII Biodiversity Metric Tool ensures that habitat assessments are both scalable and ecologically meaningful, supporting robust biodiversity accounting from early planning through to implementation. For further detail on the decision-making processes that have shaped the Options Appraisal and Biodiversity Metric, please refer to the accompanying Technical Report. This document provides comprehensive insight into the methodologies, data sources, and rationale underpinning the approaches described.

1.7.2 Habitat Extent

Most habitats are recorded as areas, and their extent measured in hectares (ha). For linear features (hedgerows, lines of trees, stone walls, watercourses, ditches), the habitat type is selected and the length of the feature is entered into the metric in kilometres (km). To account for the area occupied by linear features, the broad habitat type 'Area of linear habitat (no units)' must also be selected, and the associated area to be entered in hectares (ha). All habitat areas and lengths are recorded to a maximum of two decimal places.

This guidance applies to both habitat mapping and habitat condition assessments within the TII Biodiversity Metric. It outlines how to handle minimum mapping thresholds, mixed habitat parcels, and the recording of sub-threshold habitat features. The minimum parcel size that can be mapped is 0.001 hectares (10 m²). This threshold ensures consistency in spatial data while allowing for meaningful ecological assessment.

Where habitat patches fall below this minimum mapping threshold, they should not be mapped as standalone parcels. Instead, their presence should be noted in the 'Habitat Description' section of the larger parcel in which they occur. For example, if a 5 m² patch of WS1 Scrub is found within a 50 m² GA1 Agricultural Grassland parcel, the entire area should be mapped as GA1, with WS1 recorded in the habitat description.

In cases where a parcel contains a mix of habitat types, the preferred approach is to divide the parcel into separate units for each habitat type, provided this can be done accurately. However, if the habitat mosaic is too complex to separate, the parcel should be mapped according to the dominant habitat type, and the condition assessment should be applied to the habitat with the highest Distinctiveness rating.

[3] Protected site boundaries from NPWS: https://www.npws.ie/maps-and-data/designated-site-data/download-boundary-data

Regardless of mapping decisions, it is essential that all habitat types present within a parcel are documented in the notes. This includes their Fossitt codes, estimated areas (if below the mapping threshold), and any condition indicators that may influence the assessment outcome. This ensures that the ecological complexity of each parcel is fully captured, even where mapping constraints apply.

1.7.3 Habitat Distinctiveness

Distinctiveness reflects the inherent biodiversity value of a habitat type, based on its rarity, ecological function, and species richness. High distinctiveness habitats are typically those that support diverse and complex ecological communities, are difficult or impossible to recreate, and play a critical role in maintaining ecosystem integrity.

In the Irish context, this includes habitats such as blanket bogs and turloughs – the latter being a globally rare habitat type found only in Ireland. These habitats are not only ecologically significant but are also afforded national protection under Irish legislation, even when they occur outside designated conservation sites. Their inclusion in the metric ensures that their conservation value is appropriately recognised and prioritised.

Each habitat type is assigned an automated distinctiveness score, which acts as a multiplier in the biodiversity unit calculation. This ensures that high-value habitats contribute more significantly to the overall biodiversity balance and are prioritised for retention, enhancement, or appropriate offsetting.

Table 1.2 outlines the automated distinctiveness scoring for each of the habitats described in the TII Biodiversity Metric.

Users can adjust the distinctiveness score by entering a ‘manual distinctiveness’ score. This will override the automated distinctiveness score and should only be utilised when there is evidence to demonstrate that a habitat parcel is of higher or lower distinctiveness than its automated distinctiveness score suggests. Justification for any deviation from automated distinctiveness scores should be provided in the ‘User Comments’ cell.

In some cases, Users may find that the automated distinctiveness score does not fully reflect the ecological value or context of a habitat parcel. Below are examples where a manual adjustment might be considered appropriate:

- **Example 1: Scrub habitat supporting Annex species**
  A parcel classified as ‘Low’ distinctiveness Scrub may support species of conservation concern, such as the Marsh Fritillary (*Euphydryas aurinia*). In such cases, the distinctiveness score could be manually raised to ‘Medium’ to reflect the presence of qualifying biodiversity features.
- **Example 2: Marine Rock habitat in a region with limited coastline**
  A ‘Medium’ distinctiveness Marine Rock habitat (e.g. Fossitt codes SS1–SS8) located in a county with minimal coastal extent, such as County Meath, may be considered ‘High’ due to its relative rarity and ecological importance in the local context.
- **Example 3: High species diversity**
  A habitat parcel **exhibiting exceptional species richness**, including multiple indicator or specialist species, may warrant an upward adjustment in distinctiveness to reflect its enhanced ecological value.
- **Example 4: Presence of Invasive Alien Plant Species (IAPS)**
  A habitat parcel with significant colonisation by IAPS, such as Japanese Knotweed or Himalayan Balsam, may have its distinctiveness score lowered to reflect reduced habitat quality and ecological function.

Table 1.2 - Distinctiveness scoring for the TII Biodiversity Metric

Distinctiveness		Habitat Types which fall under this category	
Name	**Score**	**Habitat Name**	**Habitat Code**
Very High	8	Sand dunes	CD1-CD6
		Salt Marsh	CM1, CM2
		Turloughs	FL6
		Springs	FP1, FP2
		Montane heath	HH4
		Peatlands	PB1, PB2, PB3
		Woodlands	WN1-WN7
High	6	Coastal	CS1-CS3, CW1, CW2
		Lakes	FL1-FL6
		Rivers	FW1, FW2
		Grasslands	GS1, GS3
		Heaths	HH1-HH3
		Fens	PF1, PF3
		Woodlands	WD1, WD2
		Species Rich Native Hedgerow	WL1
Medium	4	Built	BL1
		Coastal	CB1
		Earth	ED3
		Rock	ER1-ER4
		Caves	EU1, EU2
		Modified Wetlands	FL7, FL8
		Swamps	FS1, FS2
		Grasslands	GM1, GS2, GS4
		Shorelines	LR1-LR5, LS1-LS5
		Marine	MW1-MW4
		Modified Peatlands	PB4, PB5
		Poor Fen	PF2
		Marine Rock	SS1-SS8
		Woodland	WD3,WD5
		Native Hedgerow	WL1
		WL1 Immature Hedgerow	WL1

Distinctiveness		Habitat Types which fall under this category	
Name	**Score**	**Habitat Name**	**Habitat Code**
Low	2	Arable	BC1-BC4
		Built	BL2, BL3
		Coastal	CC1, CC
		Ground	ED1, ED2
		Modified waterbodies	FW3, FW4
		Grasslands	GA1, GA2
		Bracken	HD1
		Other Native Hedgerows	WL1
		Non-Native and Ornamental Hedgerow	WS2
		Scrub	WS3-WS5, WD4
		Modified Woodland	

1.7.3.1 Manual Distinctiveness Override

It is recognised that there will inevitably be occasions where an Ecologist or User may disagree with the pre-assigned distinctiveness scores. To accommodate such scenarios, the Full Biodiversity Metric Toolkit includes a manual distinctiveness input, enabling the User to adjust the distinctiveness score where justified—for example, if a habitat identified as ER1 is determined to correspond to an 8220 Annex habitat, the score may be changed from 4 (medium) to 6 (high) or 8 (very high). This adjustment is at the professional discretion of the Ecologist, who must provide clear justification for any amendments in the Notes section of the same sheet within the Toolkit.

In some cases, a habitat already classified as having 'very high' distinctiveness—such as CM1 lower salt marsh—may overlap with an Annex I 1310 Salicornia and other annuals colonising mud and sand habitat. Where the highest level of distinctiveness is already assigned and the habitat is recognised as an Annex habitat, it is recommended that Users designate this as an 'irreplaceable habitat'. This classification underscores its exceptional value and the requirement for appropriate compensation should the habitat be lost; in other words, any loss must be offset by the creation or restoration of a habitat of equal ecological value.

There may be circumstances where the default distinctiveness rating assigned to a habitat does not adequately reflect its ecological value in the local context. In such cases, the User/Ecologist may apply a manual override. A selection of potential scenarios is outlined below; however, this list is not exhaustive, and it remains the responsibility of the User to provide a clear and justified rationale for any adjustment.

It is important to note that overrides must not be based on factors already accounted for under Strategic Significance—including the presence of protected species, references in county development plans, biodiversity action plans, local area plans, or proximity (within 100m) to protected sites.

Instead, valid reasons for adjusting distinctiveness may include:

- Unusual Habitat Mosaic: The habitat forms part of a rare or locally unique assemblage that enhances its ecological function.

- Landscape Context: The habitat plays a critical role in connectivity or is the only remaining example of its type in a fragmented landscape.
- Species Assemblage: The habitat supports a noteworthy community of non-protected species that contribute to biodiversity value.
- Cultural or Historical Value: The habitat has long-standing traditional management or cultural associations that enhance its ecological importance.

1.7.4 Habitat Condition

The condition of a habitat reflects its current ecological quality and functional integrity. It is assessed using a structured set of criteria that consider vegetation structure, species composition, evidence of disturbance, and ecological function. Importantly, the presence of invasive species and the level of active habitat management (or lack thereof) are also key determinants of condition.

Habitats are scored as 'Poor', 'Moderate', or 'Good', and this score directly influences the biodiversity units assigned. Table 1.3 outlines the condition scoring for the each of the habitats in the TII Biodiversity metric.

Table 1.3 - Condition Scoring for the TII Biodiversity Metric

Condition	
Name	**Score**
Good	3
Moderate	2
Poor	1
Condition assessment N/A	1
N/A – Other	0

1.7.5 Strategic Significance

Strategic significance evaluates the ecological importance of a habitat based on its location and conservation relevance. In the TII Biodiversity Metric, this is determined by three criteria:

1. **Protected Species Presence** – There is evidence of or records of one or more protected species using the habitat for a key part of its lifecycle, as determined by a competent person. Records are considered relevant if they are dated within the last 2 years. Evidence should be provided in the comments section of the tool.
2. **Policy Recognition** – The habitat is formally identified in a County Development Plan, Local Area Plan, National and Local Biodiversity Action Plans, or equivalent. The relevant policy should be referenced in the comments section of the tool.
3. **Proximity to Protected Sites** – The habitat lies within 100 metres of a designated site such as an SAC, SPA, NHA, pNHA, National Park, or Nature Reserve. The relevant protected site(s) should be detailed in the comments section of the tool.

Habitats are assigned multipliers for each of the three components of strategic significance they meet, which increases their biodiversity unit value and prioritises their retention or enhancement.

1.8 Calculating Post Construction Biodiversity Units

1.8.1 Retention, Enhancement and Creation

Retention refers to the preservation of existing habitats within the project footprint. Retained habitats are assessed for their condition and strategic significance and contribute positively to the biodiversity unit balance. Retention is prioritised in line with the mitigation hierarchy, which seeks to avoid impacts before considering mitigation or offsetting. Retained habitats are recorded in the 'Pre Construction Baseline' tab of the tool.

Enhancement involves improving the condition or ecological function of an existing habitat. This may include actions such as increasing species diversity, restoring hydrology, or removing invasive species. Enhanced habitats are re-assessed post-intervention and can generate biodiversity gains if their condition improves relative to baseline. Enhanced habitats are recorded in the 'Post Construction Enhancement' tab of the tool.

Creation refers to the establishment of new habitats where none previously existed, designed to replicate or complement natural ecosystems. Created habitats must be appropriate to the local landscape and capable of achieving the target condition within a defined timeframe. Like enhancement, creation contributes to biodiversity gains and is used to offset unavoidable losses elsewhere in the project. Created habitats are recorded in the 'Post Construction Creation' tab of the tool.

1.8.2 Habitat Type

Post construction habitat type is classified and recorded in the tool in the same way as baseline habitat type (see Section 1.7.1).

1.8.3 Habitat Extent

Post construction habitat extent is classified and recorded in the tool in the same way as baseline habitat extent (see Section 1.7.2).

1.8.4 Habitat Distinctiveness

Post construction habitat distinctiveness is classified and recorded in the tool in the same way as baseline habitat distinctiveness (see Section 1.7.3).

1.8.5 Habitat Condition

Post construction habitat condition is classified and recorded in the tool in the same way as baseline habitat condition (see Section 1.7.4). Users should select realistic goals for the target condition of habitats to be created or enhanced.

1.8.6 Strategic Significance

Post construction strategic significance is classified and recorded in the tool in the same way as baseline strategic significance (see Section 1.7.5). The protected species component of post construction strategic significance is considered achieved if Users can demonstrate targeted measures to provide suitable habitat, features, or provisions for a given protected species or species group. Details of such measures should be recorded in the comments section of the tool.

1.8.7 Temporal Risk

The temporal risk multiplier represents the average time lag between the start of habitat creation or enhancement works and the habitat reaching its target condition and distinctiveness. This is known as 'time to target condition'. Time to target condition is measured in years.

The tool automatically applies a standard time to target condition to each habitat type which Users can adjust to account for time differences between habitat loss and compensation by selecting a response from the 'habitat created in advance (-) or delay (+) (years)' column.

If time to target condition is manually adjusted, justification for doing so must be provided in the 'time to target adjustment justification'.

1.8.8 Difficulty Risk

The difficulty risk multiplier represents the uncertainty in the effectiveness of techniques to create or enhance habitats. The tool automatically applies a standard difficulty risk multiplier based on habitat type and action (creation or enhancement). Users can manually adjust difficulty risk and must provide justification for doing so.

2. Getting Started with the Toolkits – Data

2.1 Initial Setup and Data Input

Before using the TII Biodiversity Metric Tool, Users must ensure that all required data is prepared and that the toolkit files are saved in a structured folder system. This includes GIS data (e.g. habitat polygons, route corridors), condition assessments, and any supporting ecological survey data. Users should also ensure that the Excel and ArcGIS Pro files provided with the toolkit are saved locally and not renamed, as the tool relies on specific file structures and tab names to function correctly.

2.2 Types of Data Required

The toolkit requires different types of data depending on the stage of the project and the version of the tool being used. There are two main toolkits: the **Options Appraisal Toolkit** and the **Biodiversity Metric (BM) Toolkit**.

2.2.1 Options Appraisal Toolkit

The Options Appraisal Toolkit is used during the early design phase to compare potential route corridors. It requires:

- GIS shapefiles of each Route Option
- Tailte Éireann Land Cover Map (Level 2+) (available by request)
- Spatial data on designated sites and irreplaceable habitats (Included within the Options Appraisal APRX)
- No field survey data is required at this stage[4]

The tool uses this data to calculate biodiversity units for each route corridor, helping to identify the option with the least ecological impact.

2.2.2 Full Biodiversity Metric Toolkit

The Full Biodiversity Metric Toolkit is used during the environmental assessment and detailed design stages. It requires:

- Detailed habitat survey data (Fossitt Level 3 & Irish Hedgerow Appraisal System);
- Habitat condition assessments outcomes;
- Spatial data on habitat parcels and protected sites;
- Information on proposed habitat retention, enhancement, and creation.

This version of the tool supports full biodiversity accounting and is used to demonstrate biodiversity net gain or no net loss.

[4] Field survey data is not required to operate the Options Appraisal Toolkit; however, surveys may be undertaken where appropriate. As the toolkit assigns habitats to Fossitt Level 2+ based on the Tailte Éireann NLC Map, any field-identified habitats must be aligned to these categories for input. Users should manually update the attribute table in GIS after running the tool and before exporting outputs to Excel

2.3 System Requirements and Installation

To run the toolkit effectively, Users must have access to both ArcGIS Pro and Microsoft Excel. The tool is designed to work within these platforms and relies on specific features from each.

2.3.1 ArcGIS Pro

ArcGIS Pro is required for the spatial analysis component of the Options Appraisal Toolkit. Users must:

- Have ArcGIS Pro installed and licensed
- Use the ArcGIS Pro Package (.ppkx) provided with the toolkit
- Ensure the “Catalog” and “Drawing Order” panes are visible
- Export clipped landcover data as .csv files for use in Excel

2.3.2 Excel

The Excel-based calculators are used in both toolkits. Users must:

- Use Microsoft Excel (desktop version recommended)
- Enable macros if prompted
- Avoid renaming tabs or deleting pre-filled formulas
- Paste data only into designated input cells (e.g. starting at cell C13)

It is recommended to work from a copy of the Excel file to avoid accidental overwriting of formulas or structure.

3. Options Appraisal Toolkit User Steps

3.1 Overview

The Options Appraisal Toolkit consists of two main components:

- **Spatial analysis in ArcGIS Pro** – This evaluates Route Options against the Tailte Éireann Landcover Map, designated sites, and irreplaceable habitats.
- **Excel-based calculations** – These automatically calculate biodiversity units and summarise habitat data for each route.

No manual data analysis is required. Simply follow the steps in this guide and ensure you download both the ArcGIS Pro package and the Excel tool provided.

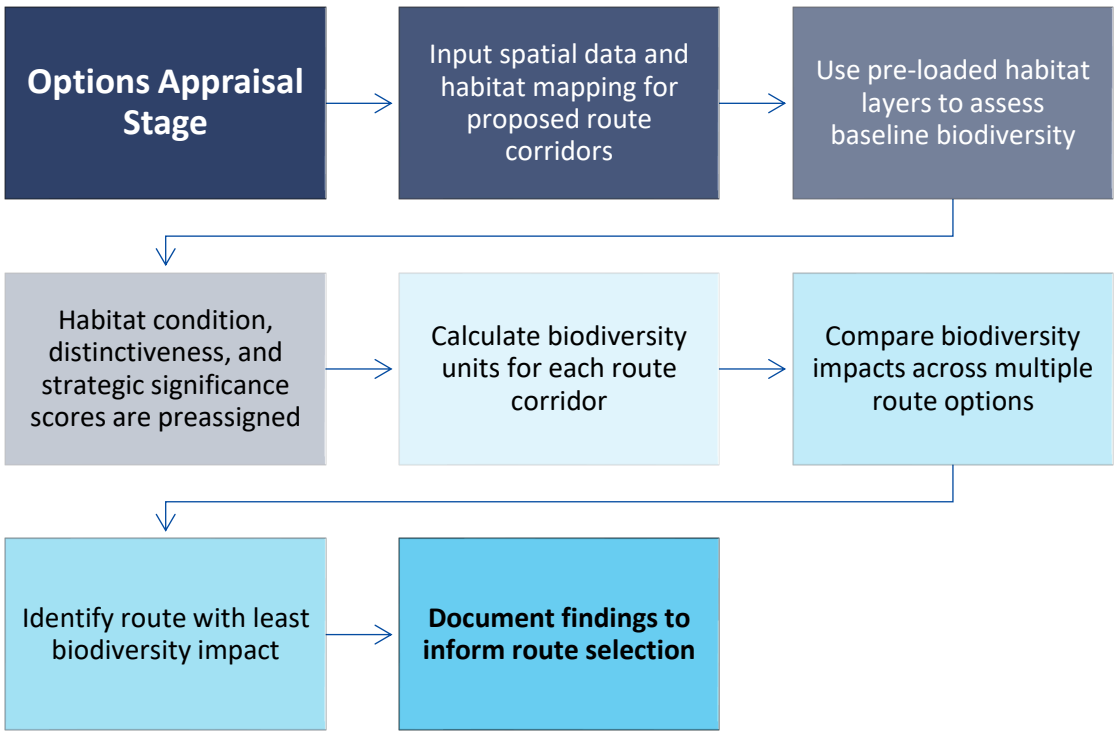


Figure 3.1 - Options Appraisal Process

3.2 GIS

3.2.1 Naming Conventions

The Model Builder in ArcPro is powered by a Python script that relies on specific layer names to function correctly. If these names are changed, the toolkit will not be able to locate the layers, and the model will fail to run.

Upon opening the APRX, the Irreplaceable Habitats and Protected Site layers will automatically populate, there is no need to manually upload these datasets to the project. However, should these datasets be updated in the future, it is essential that the naming conventions outlined here are followed precisely and that the updated datasets are stored in the same geodatabases. This ensures seamless functionality of the Python script and prevents errors in the appraisal process.

To avoid errors, please follow the naming conventions exactly as outlined below. Your APRX must be set up using the specified names and structure.

Table 3.1 - Naming conventions required within GIS

Data	Information	Naming Convention in GIS
Protected Site Network	• Special Areas of Conservation • SAC sites with a 100m buffer • Special Protection Areas • SPA sites with a 100m buffer • Special Protection Areas (Marine) • SPA Marine sites with a 100m buffer • Natural Heritage Areas • NHAs with a 10m buffer • Potential Natural Heritage Areas • pNHAs with a 10m buffer	• SAC • SACs_100m • SPA • SPAs_100m • SPAMarine • SPA_Marine_100m • NHA • NHA_10m • pNHA • pNHA_10m
Irreplaceable Habitats	• Raised Bog • Turloughs • Machair • Limestone Pavement • Blanket Bog • Ancient Long-Established Woodland	• RaisedBog • Turloughs • Machair • LimestonePavement • BlanketBog • AncientLongEstablishedWoodland
Tailte Eireann Land Cover Mapping	• Landcover mapping for the study area for Route Options	• Landcover

3.2.2 Loading and Saving the Data

1. Create a folder on your C: drive and save the zipped ArcPro Package there. Unzip and extract all files—this may take up to 15 minutes.
2. Save Route Option feature classes in a geodatabase within the ‘commondata’ folder located at:

   ……TII_BiodiversityAccountingTool\TII_ToolDemoArcGISProPackage\commondata

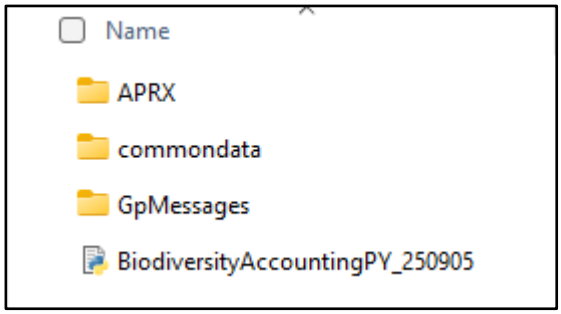


Figure 3.2 - Location of 'commondata'

3. Use standard GIS naming conventions (e.g. Route_1, not Route 1) and avoid spaces or special characters.

3.2.3 Loading New Route Options

The zipped package provided in the Options Appraisal toolkit has an empty Route Options geodatabase within. In order to upload and test Route Options for your project, please follow these steps:

1. Ensure to use the 'Irish Transverse Mercator' coordinate system.
2. Save them in .gdb format to the 'commondata' folder within the geodatabase entitled 'route_options.gdb' (Figure 3.3).
3. They will appear in ArcPro under the folder icon in the Catalog Pane

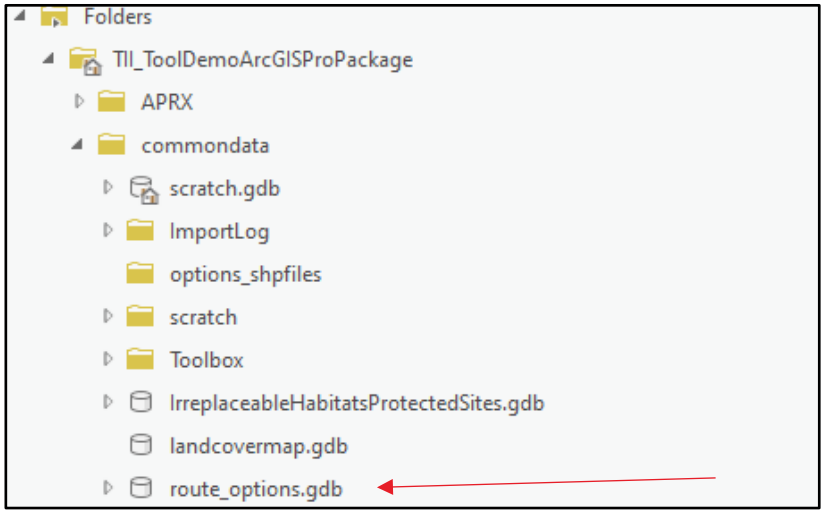


Figure 3.3 - Location of 'route_options' geodatabase for storing Route Options for the Options Appraisal toolkit

4. These Route Options will appear in ArcPro under the folder icon within the Catalog Pane (see Figure 3.3).

3.2.4 Loading and Storing the Tailte Éireann NLC Map

The Options Appraisal Toolkit requires the Tailte Éireann National Land Cover (NLC) mapping for the given location in which the Route Options are being assessed.

To ensure that the Options Appraisal Toolkit runs correctly, it is essential to follow the steps below when storing the landcover map layer.

Adhering strictly to the prescribed naming convention is mandatory, as the associated Python Script depends on exact file names and will return errors if any deviations—such as spaces, special characters, or inconsistencies—are present.

1. Download the NLC map layer and save it in the 'commondata' folder on your local system. This ensures consistency across all Users and supports the Python script functionality.
2. Open the 'landcovermap.gdb' geodatabase and store the NLC map layer within it, as illustrated in Figure 3.4. This step integrates the layer into your project workspace.
3. Ensure that the landcover mapping is named 'Landcover' as this is recognised by the Python Script. An alternative name will not be recognised, and the Toolkit will fail to run.
4. Avoid making any changes to the fields or attributes of the NLC map layer. Altering these may cause errors when running the Python script, which relies on the original structure of the data.
5. To use the layer within your APRX project file:
    - Expand the landcovermap.gdb in the Catalog pane.
    - Right-click the Landcover map layer.
    - Select 'Add to Current Map' to display it in your active map view.

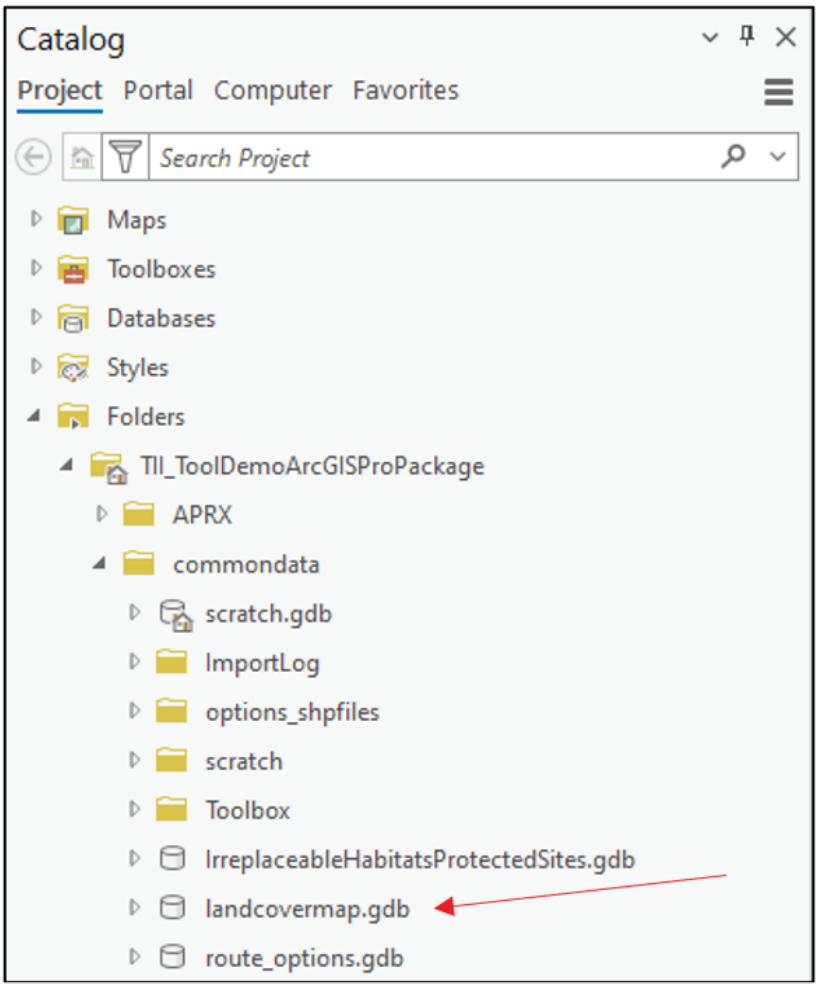


Figure 3.4 - Location where landcover mapping should be stored.

3.2.5 Using the Options Appraisal Toolkit In ArcPro

1. Ensure ESRI ArcPro is installed.
2. Open the APRX file from the unzipped package.
3. The 'Drawing Order' on the left-hand pane should appear as follows:

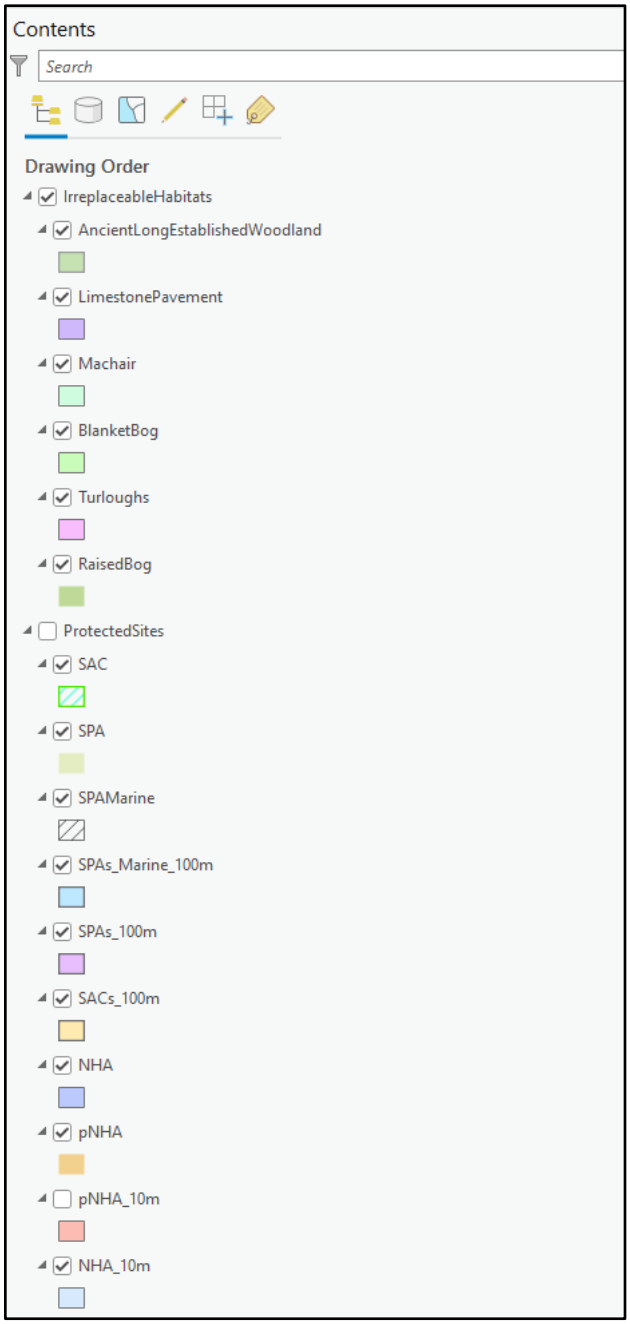


Figure 3.5 - Drawing Order on Contents Pane of APRX

4. On the right-hand pane you will see the 'Catalog' pane. If this is not visible, navigate to the 'View' tab and select 'Catalog Pane'. Expand 'toolboxes' and then 'Biodiversity Accounting – Model Builder Export.atbx. This will store your data outputs.

5. In the Catalog Pane, expand Toolboxes > Biodiversity Accounting – Model Builder Export.atbx.

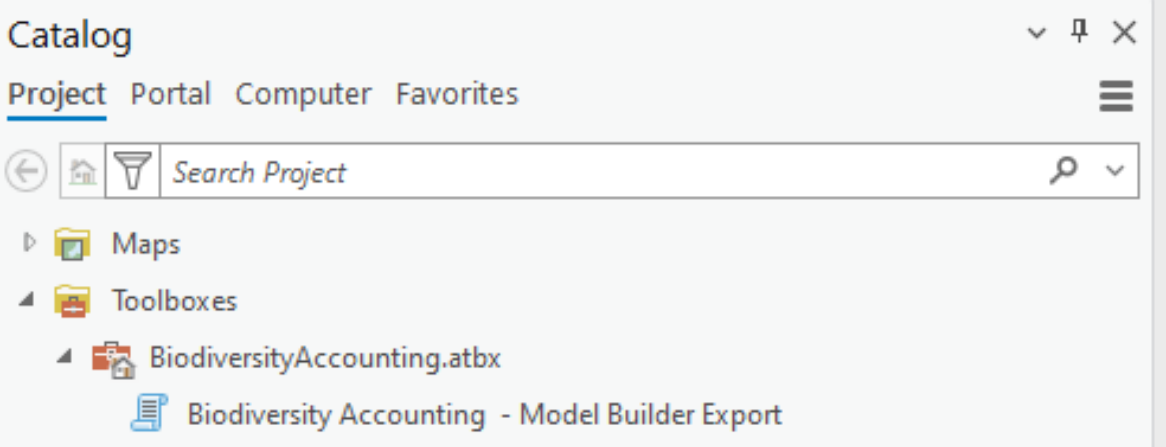


Figure 3.6 - Biodiversity Accounting - Model Builder Export

6. Double click (or right-click and select open) on 'Biodiversity Accounting – Model Builder Export'. The 'Geoprocessing' tab will automatically open in the right hand pane.
7. The tool will ask you for the following inputs:
    - Location of the Tailte Eireann Landcover map (Must be entitled 'Landcover');
    - Location of your Route Option shp file;
    - Location of where the tool will store the Excel output – please ensure that you give each excel a unique output name e.g. Route A becomes 'RouteA_Test.xls;
8. Add in your buffer distance (whether you are inputting a polyline or polygon, a bespoke buffer area around your route can be made. If you do not want a buffer, select 0).

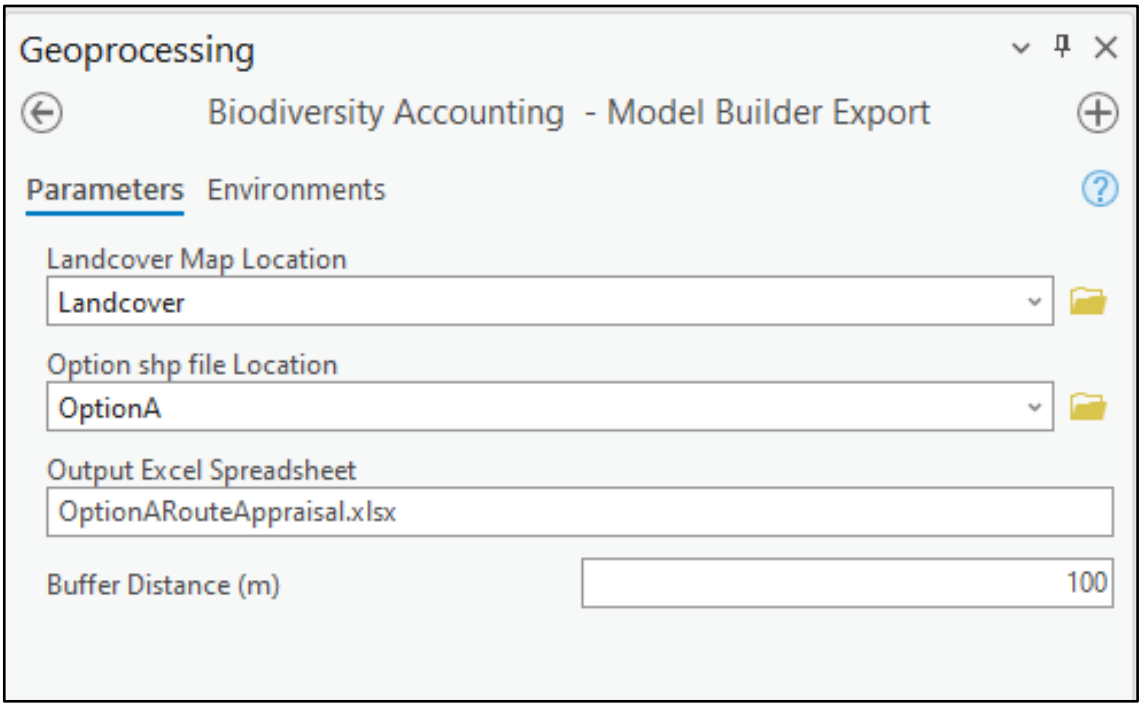


Figure 3.7 - Geoprocessing pane for the Biodiversity Accounting - Model Builder Export

9. Click 'Run' on the tool – located bottom right.
10. When the tool has successfully completed, the below message will appear:

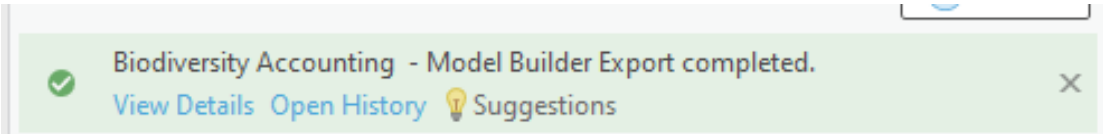


Figure 3.8 - Success of Biodiversity Accounting Model Builder Export completed

11. Click on 'View Details' to see where the excel file has saved to. (It can be found under 'Messages' in the pop-up).

3.2.6 Saving the Route Options Habitat Data

1. After running the tool, a new layer called 'OptionWithLandcover' will appear in the Drawing Order pane. This contains clipped habitat data for your route.

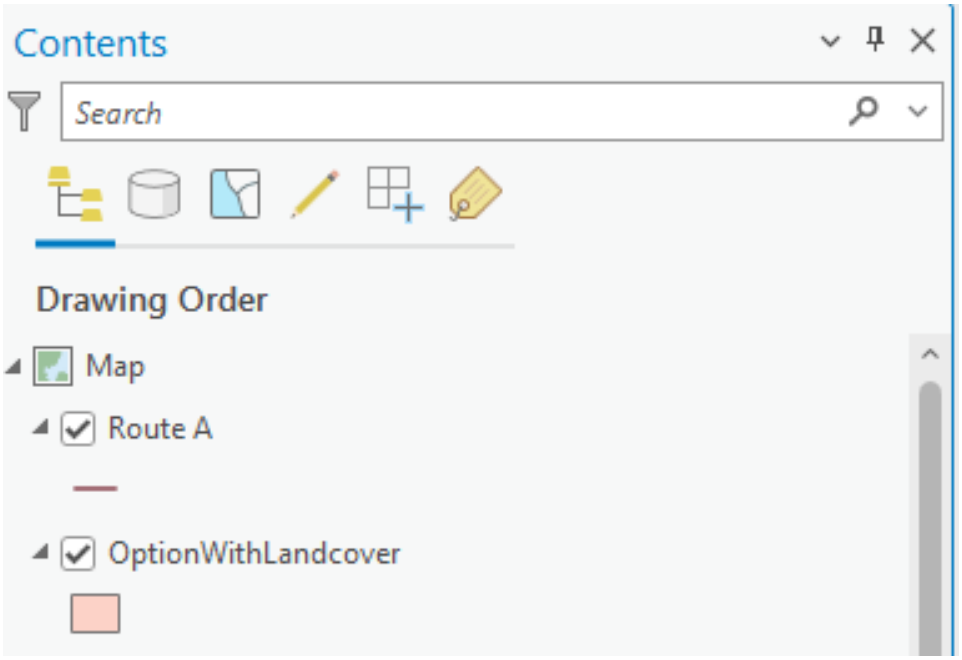


Figure 3.9 - Contents pane - saving the Route Options habitat data

2. This 'OptionWithLandcover' feature class hosts all the habitat data from Tailte Eireann landcover map clipped to the chosen buffer distance around the Route Option.
3. To save it:
   - Right-click OptionWithLandcover
   - Select Data > Export Features
   - Name the output (e.g. RouteA_Habitats) and save it to a designated folder on your C: drive

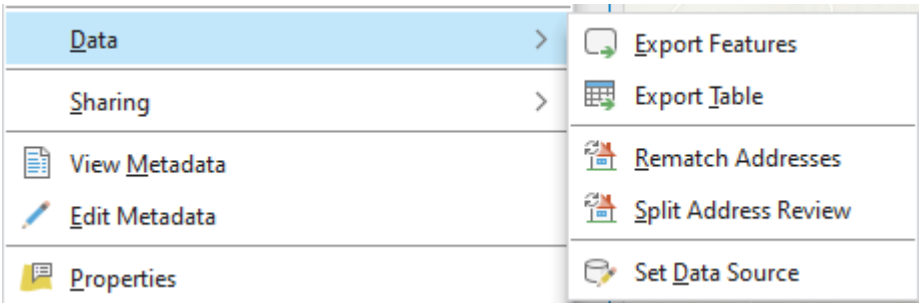
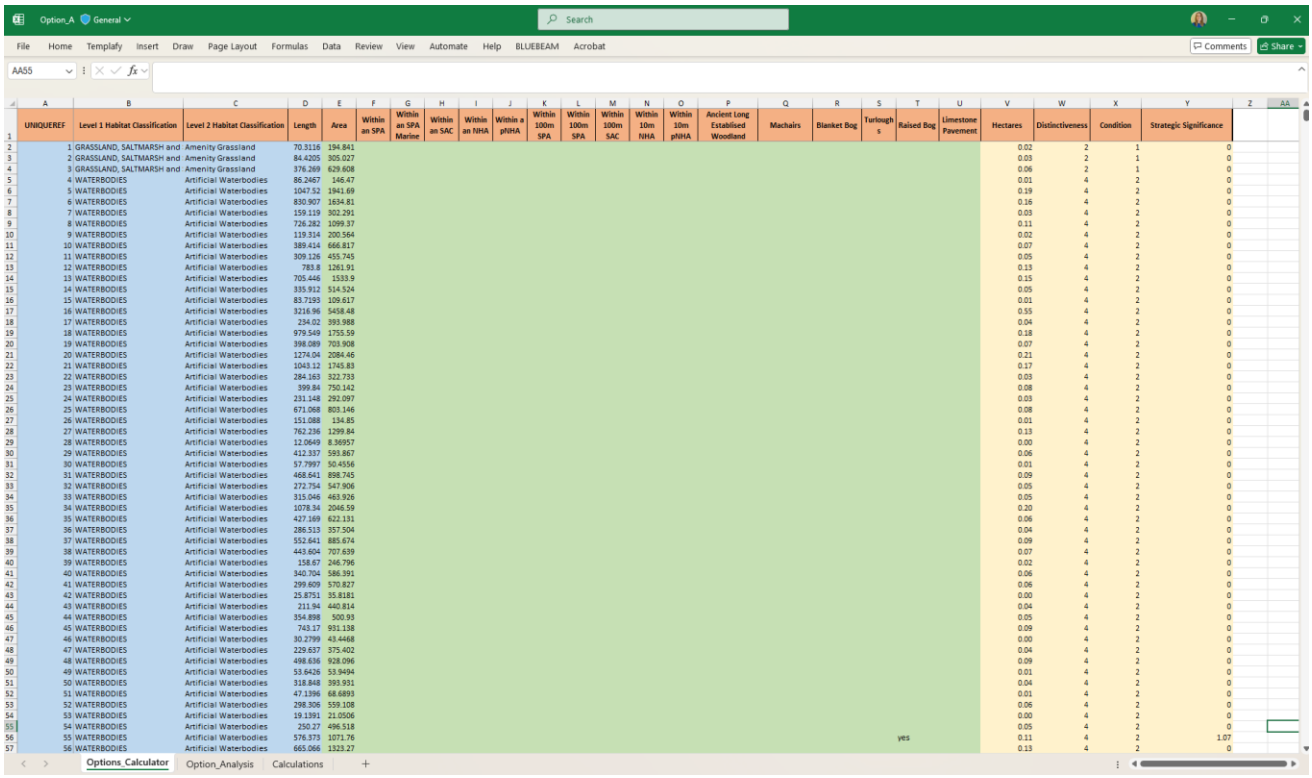


Figure 3.10 - Exporting the Route Options habitat data

Please be advised that failure to save the habitat layer after processing each route with the toolkit will result in the previous Route Option being overwritten.

3.2.7 Saving the Excel Output

1. Navigate to the folder where you have saved the Excel from ArcPro
2. Open the Excel by double-clicking – the excel should look like this:



UNIQUEREF	Level 1 Habitat Classification	Level 2 Habitat Classification	Length	Area	Within an SPA	Within an SPA Marine	Within an SAC	Within an NHA	Within a pNHA	Within 100m SPA	Within 100m SPA	Within 100m SAC	Within 10m NHA	Within 10m pNHA	Ancient Long Estabilised Woodland	Machairs	Blanket Bog	Turlough s	Raised Bog	Limestone Pavement	Hectares	Distinctiveness	Condition	Strategic Significance
1	GRASSLAND, SALTMARSH and	Amenity Grassland	70.3116	194.841																	0.02	2	1	0
2	GRASSLAND, SALTMARSH and	Amenity Grassland	84.4205	305.027																	0.03	2	1	0
3	GRASSLAND, SALTMARSH and	Amenity Grassland	376.269	629.608																	0.06	2	1	0
4	WATERBODIES	Artificial Waterbodies	86.2467	146.47																	0.01	4	2	0
5	WATERBODIES	Artificial Waterbodies	1047.52	1941.69																	0.19	4	2	0
6	WATERBODIES	Artificial Waterbodies	830.907	1634.81																	0.16	4	2	0
7	WATERBODIES	Artificial Waterbodies	159.119	302.291																	0.03	4	2	0
8	WATERBODIES	Artificial Waterbodies	726.282	1099.37																	0.11	4	2	0
9	WATERBODIES	Artificial Waterbodies	119.314	200.564																	0.02	4	2	0
10	WATERBODIES	Artificial Waterbodies	389.414	666.817																	0.07	4	2	0
11	WATERBODIES	Artificial Waterbodies	309.126	455.745																	0.05	4	2	0
12	WATERBODIES	Artificial Waterbodies	783.8	1261.91																	0.13	4	2	0
13	WATERBODIES	Artificial Waterbodies	705.446	1533.9																	0.15	4	2	0
14	WATERBODIES	Artificial Waterbodies	335.912	514.524																	0.05	4	2	0
15	WATERBODIES	Artificial Waterbodies	83.7193	109.617																	0.01	4	2	0
16	WATERBODIES	Artificial Waterbodies	3216.96	5458.48																	0.55	4	2	0
17	WATERBODIES	Artificial Waterbodies	234.02	393.988																	0.04	4	2	0
18	WATERBODIES	Artificial Waterbodies	979.549	1755.59																	0.18	4	2	0
19	WATERBODIES	Artificial Waterbodies	398.089	703.908																	0.07	4	2	0
20	WATERBODIES	Artificial Waterbodies	1274.04	2084.46																	0.21	4	2	0
21	WATERBODIES	Artificial Waterbodies	1043.12	1745.83																	0.17	4	2	0
22	WATERBODIES	Artificial Waterbodies	284.163	322.733																	0.03	4	2	0
23	WATERBODIES	Artificial Waterbodies	399.84	750.142																	0.08	4	2	0
24	WATERBODIES	Artificial Waterbodies	231.148	292.097																	0.03	4	2	0
25	WATERBODIES	Artificial Waterbodies	671.068	803.146																	0.08	4	2	0
26	WATERBODIES	Artificial Waterbodies	151.088	134.85																	0.01	4	2	0
27	WATERBODIES	Artificial Waterbodies	762.236	1299.84																	0.13	4	2	0
28	WATERBODIES	Artificial Waterbodies	12.0649	8.36957																	0.00	4	2	0
29	WATERBODIES	Artificial Waterbodies	412.337	593.867																	0.06	4	2	0
30	WATERBODIES	Artificial Waterbodies	57.7997	50.4556																	0.01	4	2	0
31	WATERBODIES	Artificial Waterbodies	468.641	898.745																	0.09	4	2	0
32	WATERBODIES	Artificial Waterbodies	272.754	547.906																	0.05	4	2	0
33	WATERBODIES	Artificial Waterbodies	315.046	463.926																	0.05	4	2	0
34	WATERBODIES	Artificial Waterbodies	1078.34	2046.59																	0.20	4	2	0
35	WATERBODIES	Artificial Waterbodies	427.169	622.131																	0.06	4	2	0
36	WATERBODIES	Artificial Waterbodies	286.513	357.504																	0.04	4	2	0
37	WATERBODIES	Artificial Waterbodies	552.641	885.674																	0.09	4	2	0
38	WATERBODIES	Artificial Waterbodies	443.604	707.639																	0.07	4	2	0
39	WATERBODIES	Artificial Waterbodies	158.67	246.796																	0.02	4	2	0
40	WATERBODIES	Artificial Waterbodies	340.704	586.391																	0.06	4	2	0
41	WATERBODIES	Artificial Waterbodies	299.609	570.827																	0.06	4	2	0
42	WATERBODIES	Artificial Waterbodies	25.8751	35.8181																	0.00	4	2	0
43	WATERBODIES	Artificial Waterbodies	211.94	440.814																	0.04	4	2	0
44	WATERBODIES	Artificial Waterbodies	354.898	500.93																	0.05	4	2	0
45	WATERBODIES	Artificial Waterbodies	743.17	931.138																	0.09	4	2	0
46	WATERBODIES	Artificial Waterbodies	30.2799	43.4468																	0.00	4	2	0
47	WATERBODIES	Artificial Waterbodies	229.637	375.402																	0.04	4	2	0
48	WATERBODIES	Artificial Waterbodies	498.636	928.096																	0.09	4	2	0
49	WATERBODIES	Artificial Waterbodies	53.6426	53.9494																	0.01	4	2	0
50	WATERBODIES	Artificial Waterbodies	318.848	393.931																	0.04	4	2	0
51	WATERBODIES	Artificial Waterbodies	47.1396	68.6893																	0.01	4	2	0
52	WATERBODIES	Artificial Waterbodies	298.306	559.108																	0.06	4	2	0
53	WATERBODIES	Artificial Waterbodies	19.1391	21.0506																	0.00	4	2	0
54	WATERBODIES	Artificial Waterbodies	250.27	496.518																	0.05	4	2	0
55	WATERBODIES	Artificial Waterbodies	576.373	1071.76															yes		0.11	4	2	1.07
56	WATERBODIES	Artificial Waterbodies	665.066	1323.27																	0.13	4	2	0

Figure 3.11 - Excel output for the Options Appraisal Toolkit

3. Click ‘Enable Content’
4. Save the Excel output in a designated folder of your choosing. Ensure that the file has a unique and identifiable name for the Route Option.

3.3 Excel

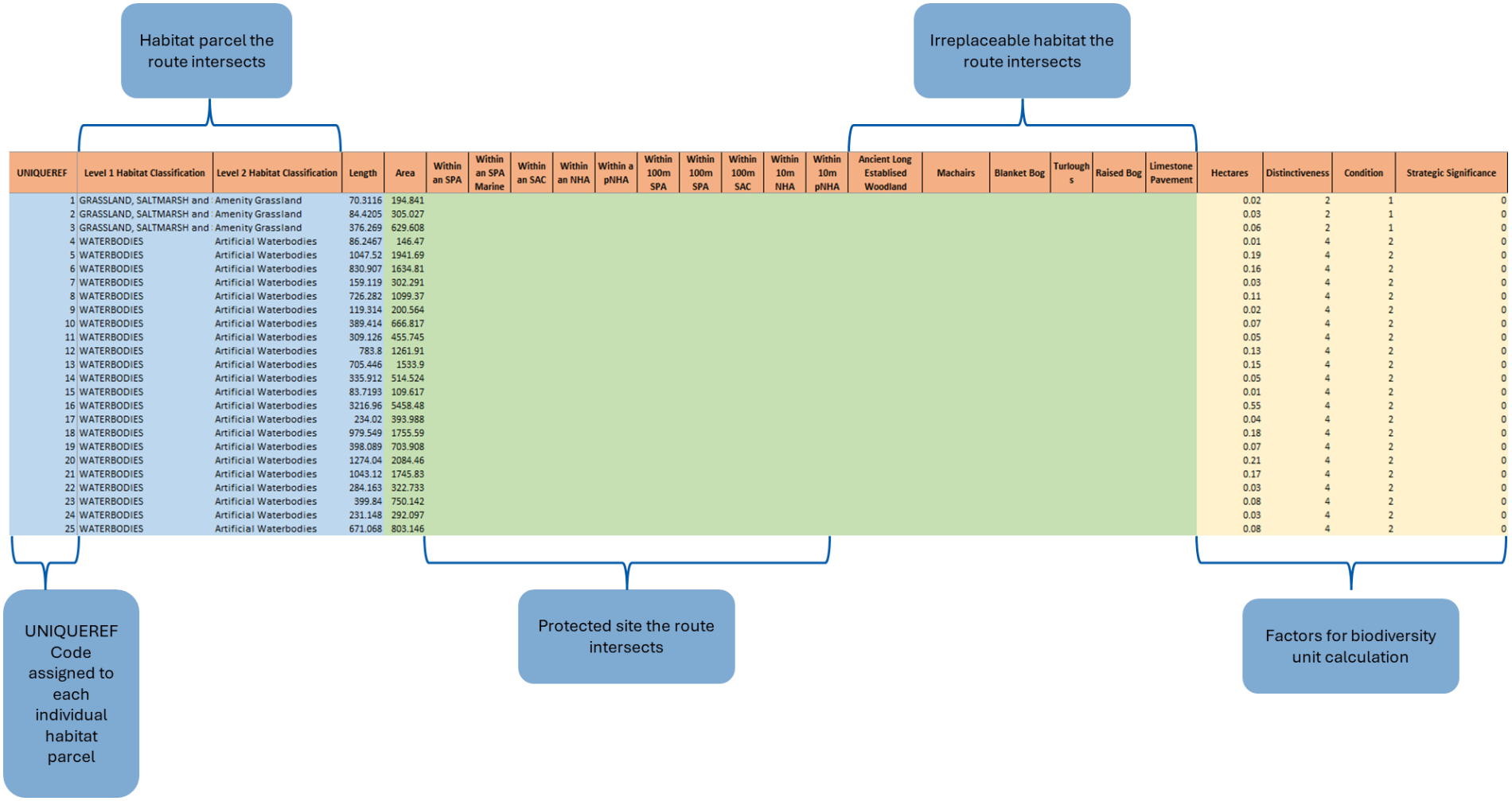
Open the calculator and you will see three tabs

- **Options_Calculator**: this provides the raw calculation for each habitat parcel that the route has intersected.
- **Option_Analysis**:- This is the analysis of your Route Option which will be automatically generated from the Options_Calculator.
- **Calculations**:- this tab will show you the figures used in the calculations.

No data analysis or interpretation is required from the User at this stage. The tool processes and summarises the data for you. Ensure each Excel file is saved with a unique, descriptive name and follow good data management practices.

3.3.1 Options Calculator

When you open the Excel for a Route Option, the first tab will be shown as below in Figure 3.12.



UNIQUEREF	Level 1 Habitat Classification	Level 2 Habitat Classification	Length	Area	Within an SPA	Within an SPA Marine	Within an SAC	Within an NHA	Within a pNHA	Within 100m SPA	Within 100m SPA	Within 100m SAC	Within 10m NHA	Within 10m pNHA	Ancient Long Estabilised Woodland	Machairs	Blanket Bog	Turloughs	Raised Bog	Limestone Pavement	Hectares	Distinctiveness	Condition	Strategic Significance
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2	GRASSLAND, SALTMARSH and	Amenity Grassland	84.4205	305.027																	0.03	2	1	0
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6	WATERBODIES	Artificial Waterbodies	830.907	1634.81																	0.16	4	2	0
7	WATERBODIES	Artificial Waterbodies	159.119	302.291																	0.03	4	2	0
8	WATERBODIES	Artificial Waterbodies	726.282	1099.37																	0.11	4	2	0
9	WATERBODIES	Artificial Waterbodies	119.314	200.564																	0.02	4	2	0
10	WATERBODIES	Artificial Waterbodies	389.414	666.817																	0.07	4	2	0
11	WATERBODIES	Artificial Waterbodies	309.126	455.745																	0.05	4	2	0
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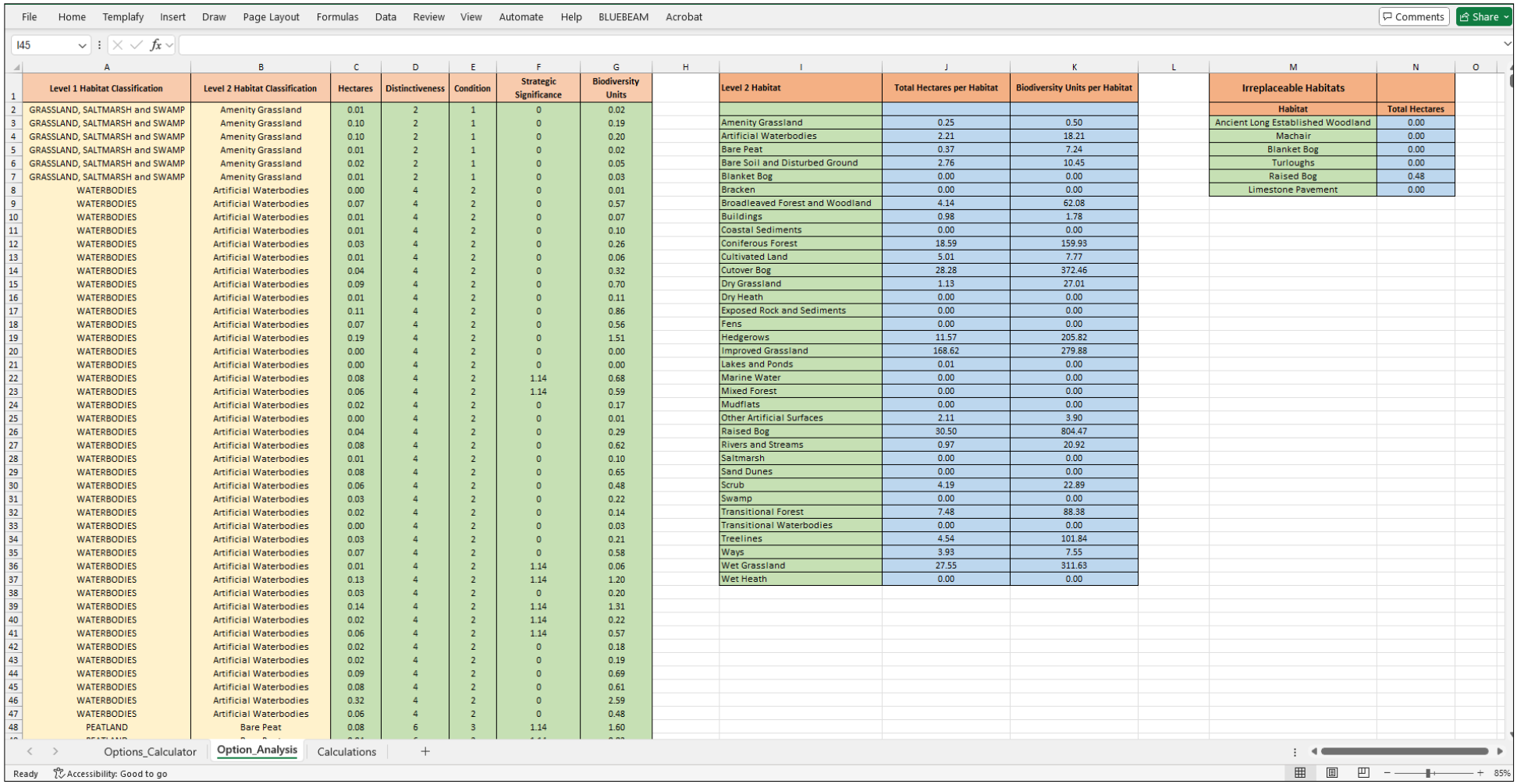
24	WATERBODIES	Artificial Waterbodies	231.148	292.097																	0.03	4	2	0
25	WATERBODIES	Artificial Waterbodies	671.068	803.146																	0.08	4	2	0

Figure 3.12 - Options Calculator within the Options Appraisal Toolkit

3.3.2 Options Analysis

The Options Analysis tab is presented as below:



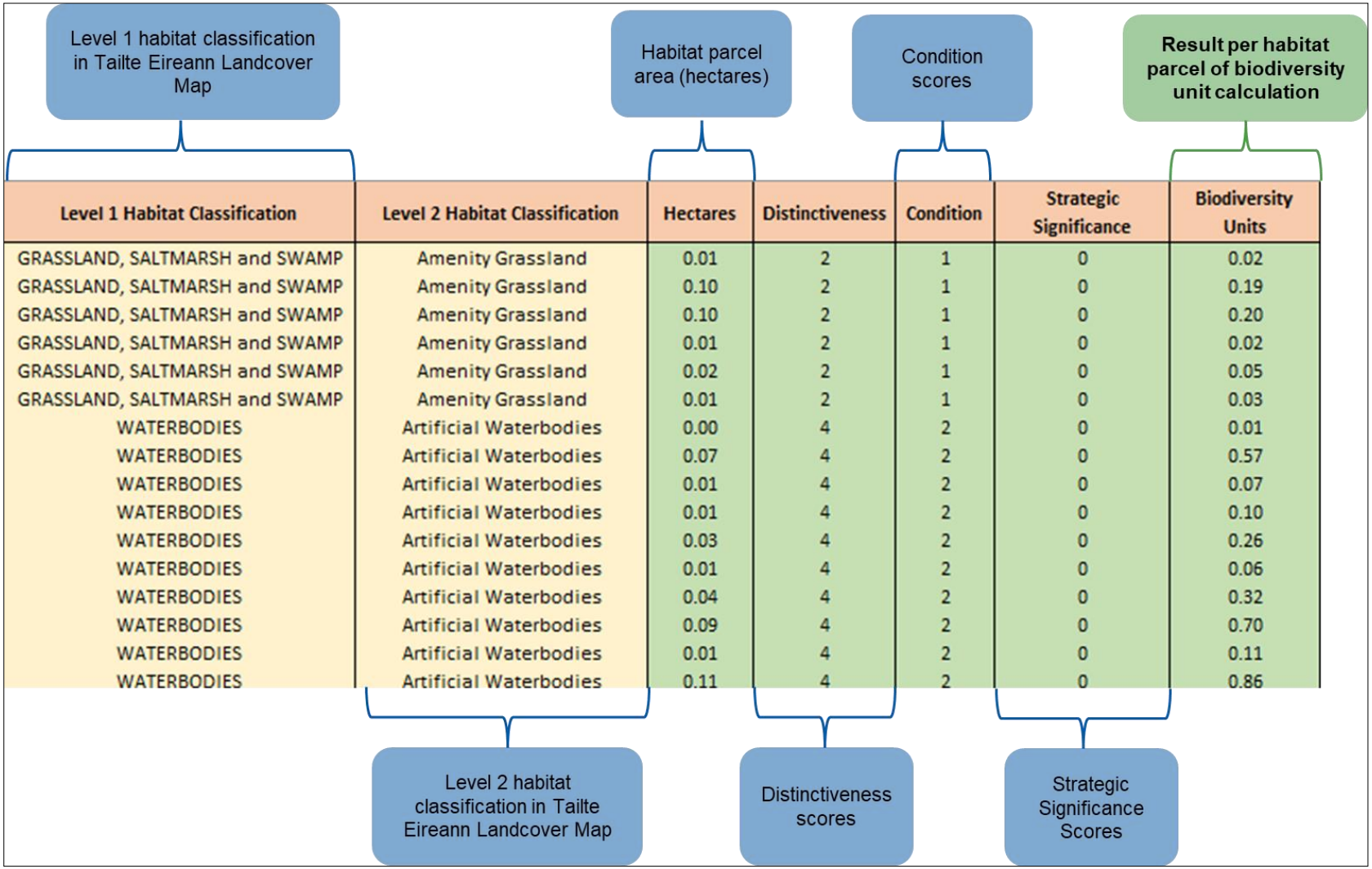
Level 1 Habitat Classification	Level 2 Habitat Classification	Hectares	Distinctiveness	Condition	Strategic Significance	Biodiversity Units
GRASSLAND, SALTMARSH and SWAMP	Amenity Grassland	0.01	2	1	0	0.02
GRASSLAND, SALTMARSH and SWAMP	Amenity Grassland	0.10	2	1	0	0.19
GRASSLAND, SALTMARSH and SWAMP	Amenity Grassland	0.10	2	1	0	0.20
GRASSLAND, SALTMARSH and SWAMP	Amenity Grassland	0.01	2	1	0	0.02
GRASSLAND, SALTMARSH and SWAMP	Amenity Grassland	0.02	2	1	0	0.05
GRASSLAND, SALTMARSH and SWAMP	Amenity Grassland	0.01	2	1	0	0.03
WATERBODIES	Artificial Waterbodies	0.00	4	2	0	0.01
WATERBODIES	Artificial Waterbodies	0.07	4	2	0	0.57
WATERBODIES	Artificial Waterbodies	0.01	4	2	0	0.07
WATERBODIES	Artificial Waterbodies	0.01	4	2	0	0.10
WATERBODIES	Artificial Waterbodies	0.03	4	2	0	0.26
WATERBODIES	Artificial Waterbodies	0.01	4	2	0	0.06
WATERBODIES	Artificial Waterbodies	0.04	4	2	0	0.32
WATERBODIES	Artificial Waterbodies	0.09	4	2	0	0.70
WATERBODIES	Artificial Waterbodies	0.01	4	2	0	0.11
WATERBODIES	Artificial Waterbodies	0.11	4	2	0	0.86
WATERBODIES	Artificial Waterbodies	0.07	4	2	0	0.56
WATERBODIES	Artificial Waterbodies	0.19	4	2	0	1.51
WATERBODIES	Artificial Waterbodies	0.00	4	2	0	0.00
WATERBODIES	Artificial Waterbodies	0.00	4	2	0	0.00
WATERBODIES	Artificial Waterbodies	0.08	4	2	1.14	0.68
WATERBODIES	Artificial Waterbodies	0.06	4	2	1.14	0.59
WATERBODIES	Artificial Waterbodies	0.02	4	2	0	0.17
WATERBODIES	Artificial Waterbodies	0.00	4	2	0	0.01
WATERBODIES	Artificial Waterbodies	0.04	4	2	0	0.29
WATERBODIES	Artificial Waterbodies	0.08	4	2	0	0.62
WATERBODIES	Artificial Waterbodies	0.01	4	2	0	0.10
WATERBODIES	Artificial Waterbodies	0.08	4	2	0	0.65
WATERBODIES	Artificial Waterbodies	0.06	4	2	0	0.48
WATERBODIES	Artificial Waterbodies	0.03	4	2	0	0.22
WATERBODIES	Artificial Waterbodies	0.02	4	2	0	0.14
WATERBODIES	Artificial Waterbodies	0.00	4	2	0	0.03
WATERBODIES	Artificial Waterbodies	0.03	4	2	0	0.21
WATERBODIES	Artificial Waterbodies	0.07	4	2	0	0.58
WATERBODIES	Artificial Waterbodies	0.01	4	2	1.14	0.06
WATERBODIES	Artificial Waterbodies	0.13	4	2	1.14	1.20
WATERBODIES	Artificial Waterbodies	0.03	4	2	0	0.20
WATERBODIES	Artificial Waterbodies	0.14	4	2	1.14	1.31
WATERBODIES	Artificial Waterbodies	0.02	4	2	1.14	0.22
WATERBODIES	Artificial Waterbodies	0.06	4	2	1.14	0.57
WATERBODIES	Artificial Waterbodies	0.02	4	2	0	0.18
WATERBODIES	Artificial Waterbodies	0.02	4	2	0	0.19
WATERBODIES	Artificial Waterbodies	0.09	4	2	0	0.69
WATERBODIES	Artificial Waterbodies	0.08	4	2	0	0.61
WATERBODIES	Artificial Waterbodies	0.32	4	2	0	2.59
WATERBODIES	Artificial Waterbodies	0.06	4	2	0	0.48
PEATLAND	Bare Peat	0.08	6	3	1.14	1.60

Level 2 Habitat	Total Hectares per Habitat	Biodiversity Units per Habitat
Amenity Grassland	0.25	0.50
Artificial Waterbodies	2.21	18.21
Bare Peat	0.37	7.24
Bare Soil and Disturbed Ground	2.76	10.45
Blanket Bog	0.00	0.00
Bracken	0.00	0.00
Broadleaved Forest and Woodland	4.14	62.08
Buildings	0.98	1.78
Coastal Sediments	0.00	0.00
Coniferous Forest	18.59	159.93
Cultivated Land	5.01	7.77
Cutover Bog	28.28	372.46
Dry Grassland	1.13	27.01
Dry Heath	0.00	0.00
Exposed Rock and Sediments	0.00	0.00
Fens	0.00	0.00
Hedgerows	11.57	205.82
Improved Grassland	168.62	279.88
Lakes and Ponds	0.01	0.00
Marine Water	0.00	0.00
Mixed Forest	0.00	0.00
Mudflats	0.00	0.00
Other Artificial Surfaces	2.11	3.90
Raised Bog	30.50	804.47
Rivers and Streams	0.97	20.92
Saltmarsh	0.00	0.00
Sand Dunes	0.00	0.00
Scrub	4.19	22.89
Swamp	0.00	0.00
Transitional Forest	7.48	88.38
Transitional Waterbodies	0.00	0.00
Treelines	4.54	101.84
Ways	3.93	7.55
Wet Grassland	27.55	311.63
Wet Heath	0.00	0.00

Irreplaceable Habitats	
Habitat	Total Hectares
Ancient Long Established Woodland	0.00
Machair	0.00
Blanket Bog	0.00
Turloughs	0.00
Raised Bog	0.48
Limestone Pavement	0.00

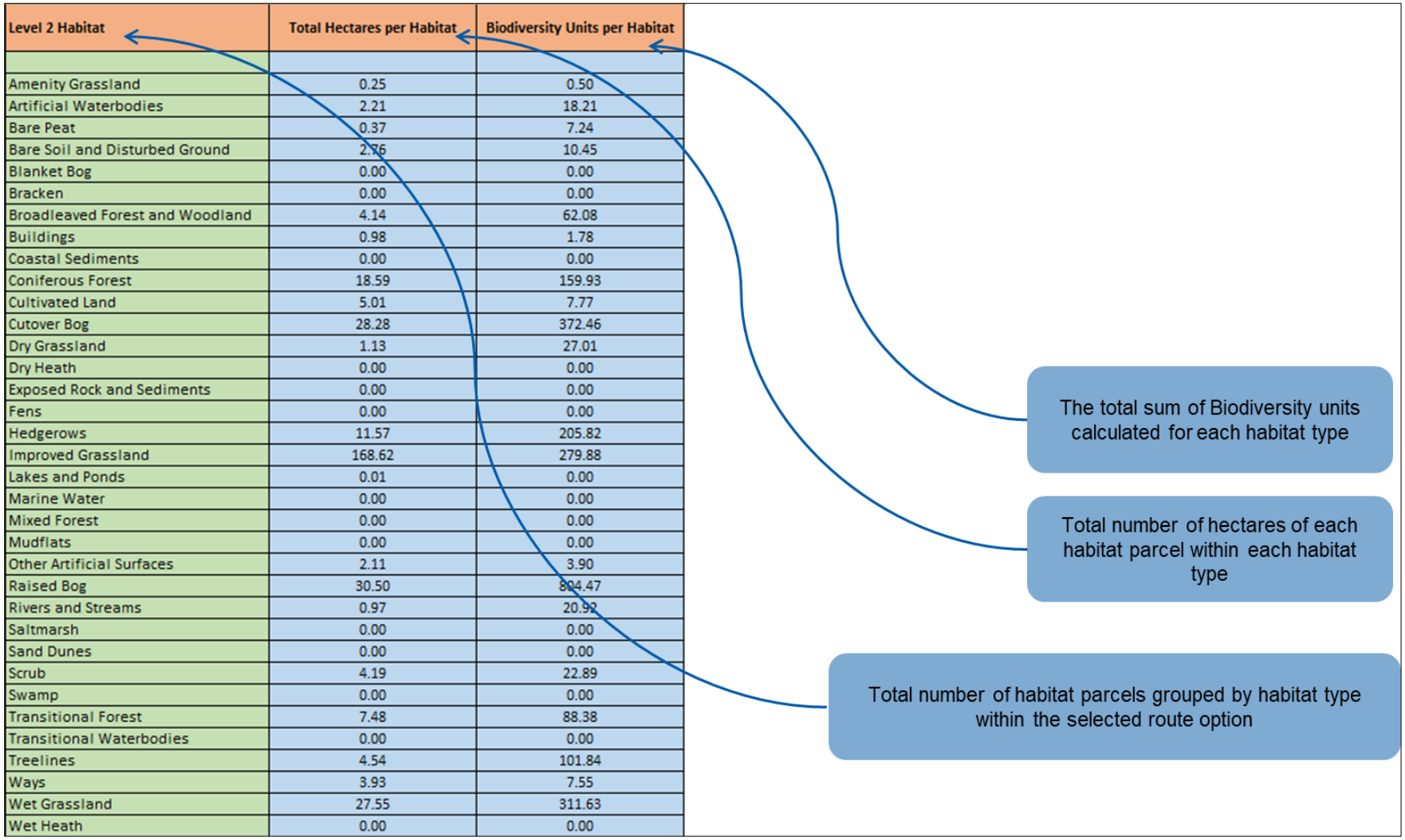
Figure 3.13 - Option Analysis Tab in the Options Appraisal Toolkit

The rationale for each section is provided below:



Level 1 Habitat Classification	Level 2 Habitat Classification	Hectares	Distinctiveness	Condition	Strategic Significance	Biodiversity Units
GRASSLAND, SALTMARSH and SWAMP	Amenity Grassland	0.01	2	1	0	0.02
GRASSLAND, SALTMARSH and SWAMP	Amenity Grassland	0.10	2	1	0	0.19
GRASSLAND, SALTMARSH and SWAMP	Amenity Grassland	0.10	2	1	0	0.20
GRASSLAND, SALTMARSH and SWAMP	Amenity Grassland	0.01	2	1	0	0.02
GRASSLAND, SALTMARSH and SWAMP	Amenity Grassland	0.02	2	1	0	0.05
GRASSLAND, SALTMARSH and SWAMP	Amenity Grassland	0.01	2	1	0	0.03
WATERBODIES	Artificial Waterbodies	0.00	4	2	0	0.01
WATERBODIES	Artificial Waterbodies	0.07	4	2	0	0.57
WATERBODIES	Artificial Waterbodies	0.01	4	2	0	0.07
WATERBODIES	Artificial Waterbodies	0.01	4	2	0	0.10
WATERBODIES	Artificial Waterbodies	0.03	4	2	0	0.26
WATERBODIES	Artificial Waterbodies	0.01	4	2	0	0.06
WATERBODIES	Artificial Waterbodies	0.04	4	2	0	0.32
WATERBODIES	Artificial Waterbodies	0.09	4	2	0	0.70
WATERBODIES	Artificial Waterbodies	0.01	4	2	0	0.11
WATERBODIES	Artificial Waterbodies	0.11	4	2	0	0.86

Figure 3.14 - Options Analysis - explanation of terms



Level 2 Habitat	Total Hectares per Habitat	Biodiversity Units per Habitat
Amenity Grassland	0.25	0.50
Artificial Waterbodies	2.21	18.21
Bare Peat	0.37	7.24
Bare Soil and Disturbed Ground	2.76	10.45
Blanket Bog	0.00	0.00
Bracken	0.00	0.00
Broadleaved Forest and Woodland	4.14	62.08
Buildings	0.98	1.78
Coastal Sediments	0.00	0.00
Coniferous Forest	18.59	159.93
Cultivated Land	5.01	7.77
Cutover Bog	28.28	372.46
Dry Grassland	1.13	27.01
Dry Heath	0.00	0.00
Exposed Rock and Sediments	0.00	0.00
Fens	0.00	0.00
Hedgerows	11.57	205.82
Improved Grassland	168.62	279.88
Lakes and Ponds	0.01	0.00
Marine Water	0.00	0.00
Mixed Forest	0.00	0.00
Mudflats	0.00	0.00
Other Artificial Surfaces	2.11	3.90
Raised Bog	30.50	804.47
Rivers and Streams	0.97	20.92
Saltmarsh	0.00	0.00
Sand Dunes	0.00	0.00
Scrub	4.19	22.89
Swamp	0.00	0.00
Transitional Forest	7.48	88.38
Transitional Waterbodies	0.00	0.00
Treelines	4.54	101.84
Ways	3.93	7.55
Wet Grassland	27.55	311.63
Wet Heath	0.00	0.00

Figure 3.15 - Options Analysis tab - Summary of total habitat types, areas and biodiversity units

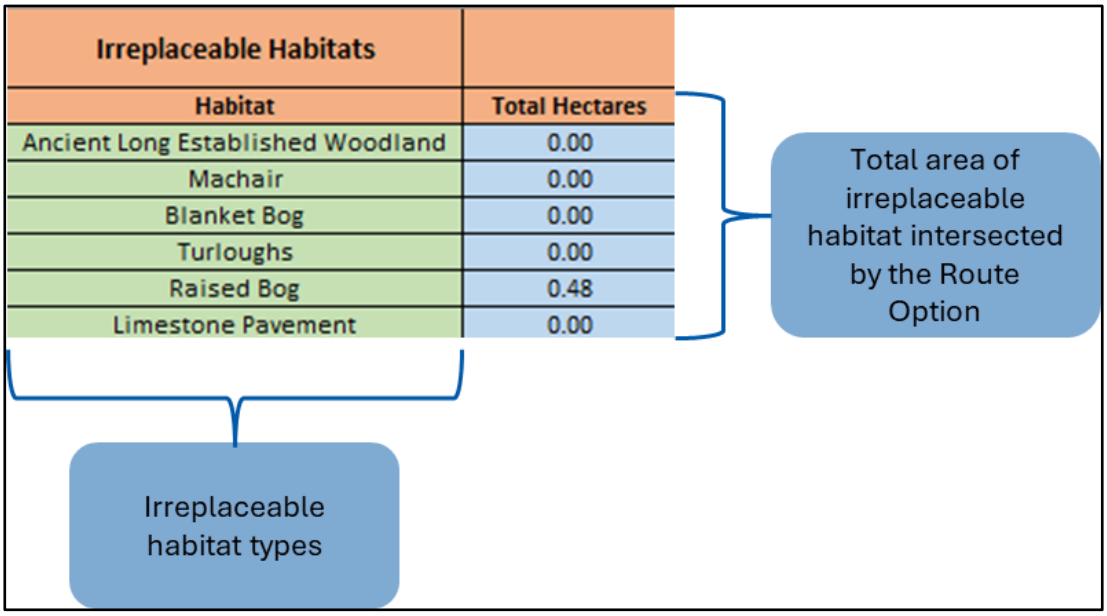


Figure 3.16 - Options Analysis tab - Irreplaceable habitats summary information

1. Comparing Route Options
    - Save each Route Output
        - Export and save each Excel file for your Route Options (e.g. Route_A.xlsx, Route_B.xlsx, etc.).
2. Create a Master Comparison Workbook
    - Open a new Excel file. This will be your central workbook for comparing all Route Options.
    - Add Individual Sheets
    - Create a separate sheet for each route (e.g. Route_A, Route_B) and name them clearly.
    - Paste Route Data from the Options Analysis tab (Figure 3.15 and Figure 3.16)
    - Copy the habitat tables from each route's Excel file and paste them into their respective sheets in the master workbook
3. Compare Route Options
    - Create a Summary Sheet:
    - Add a new sheet called Comparison Summary.
        - Use formulas like =SUM() to total biodiversity units and hectares per habitat type across routes.
        - Use =VLOOKUP() or =INDEX-MATCH() to pull values from each route sheet for side-by-side comparison.

4. Build a Comparison Table
    - Structure it like this:

Table 3.2 - Example comparison table

Habitat Type	Route_A Biodiversity Units	Route_B Biodiversity Units	Route_C Biodiversity Units	Route_D Biodiversity Units
Amenity Grassland	0.25	2.11	27.55	2.0
Artificial Waterbodies	0	22.89	159.93	7.77
……	……	……	……	……

5. Use Conditional Formatting:
    - Highlight cells where biodiversity units or hectares differ significantly between routes.
        - This helps quickly spot which route offers greater ecological value or impact.
    - Add Charts (Optional):
        - Insert bar or column charts to visualise differences in biodiversity units or habitat coverage across routes

Once the biodiversity units and habitat areas have been compared across all Route Options, the most ecologically favourable route can be identified and progressed to the final biodiversity metric assessment.

4. Full Biodiversity Metric Toolkit User Steps

4.1 Overview

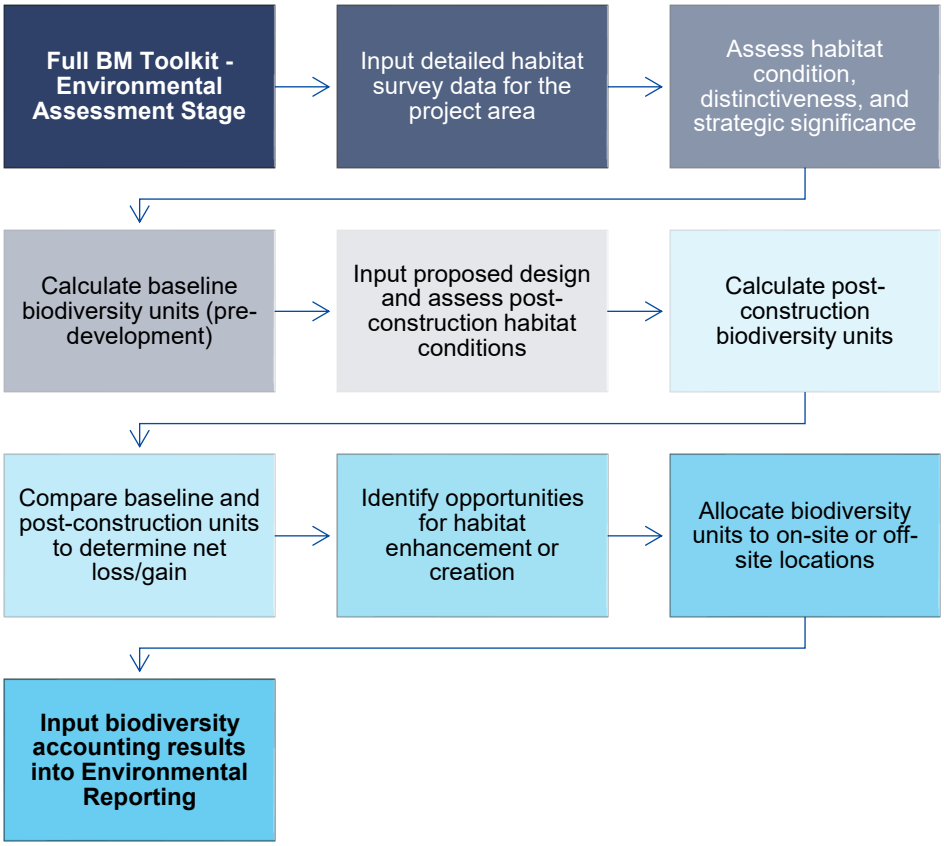
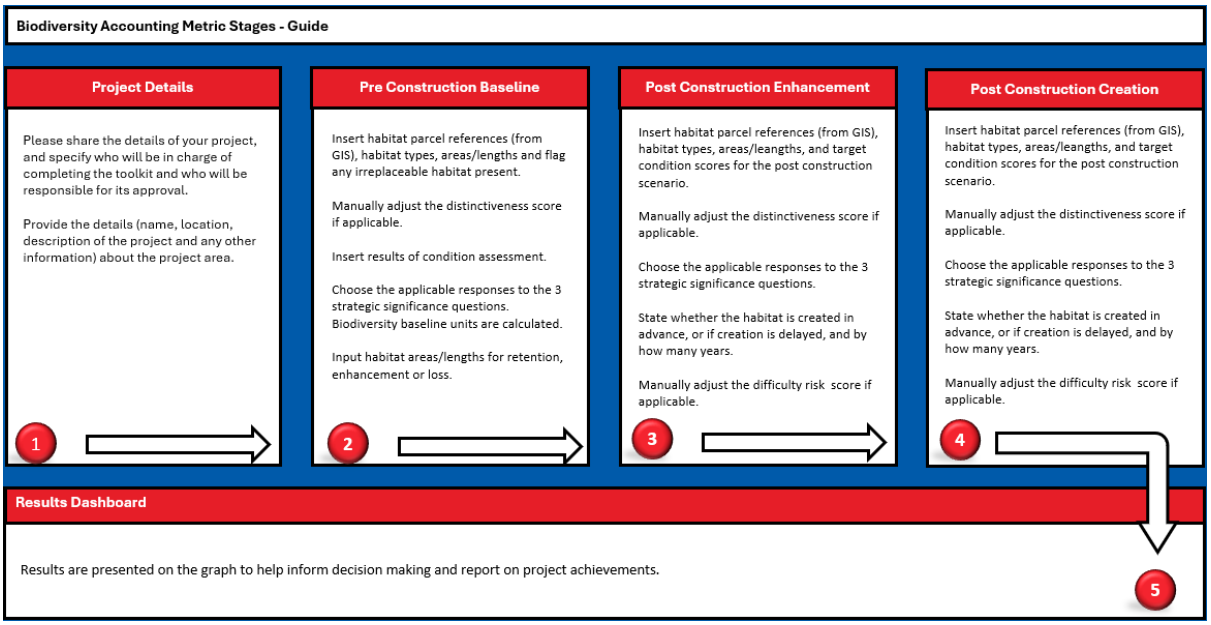


Figure 4.1 - Full Biodiversity Metric Process



4.2 GIS

Purpose of this page: This section is intended to offer guidance on the key steps for using GIS to inform the Biodiversity Metric process. While the recommended approach provides a framework, the actual workflow and method of operation will vary between Users and Ecologists depending on their GIS experience, tools, and project requirements. Users are encouraged to adapt these steps to suit their own practice but should ensure that their GIS outputs align with and support the final stage of the Biodiversity Metric process as outlined in this guide.

Once you've selected your preferred Option layer (e.g. OptionWithLandcover), follow these steps to ensure your GIS outputs are ready to support the Full Biodiversity Metric. It is important to retain the fields within the chosen Option Layer as they directly relate to the Strategic Significance questions within the Full Biodiversity Metric Toolkit

Step 1: Field Verification of Habitat Parcels

Use the attribute table from your selected Option layer as a base map during field surveys.

- Bring this layer into your mobile GIS or printed maps.
- Verify the habitat types on the ground.
- Identify and refine habitat classifications to Fossitt Level 3, based on field observations.

Step 2: Add ‘Habitat Type’ Field

In your GIS attribute table:

- Create a new field called ‘Habitat Type’.
- Populate this field with the Fossitt Level 3 codes identified during your field survey.

Step 3: Add ‘Condition’ Field

After completing habitat condition assessments:

- Add a new field called **‘**Condition’ to your attribute table.
- Enter the condition score for each habitat parcel based on your field assessment.

Step 4: Prepare Your Attribute Table for the Full Biodiversity Metric Toolkit

Once your habitat parcels have been verified and updated with habitat type and condition data, the next step is to prepare your attribute table for integration with the Full Biodiversity Metric Toolkit.

You have two options:

- **Option A**: Keep the attribute table open within your GIS software for direct reference while completing the Full Biodiversity Metric.
- **Option B (Recommended)**: Export the attribute table as a spreadsheet (e.g. CSV or Excel format). This approach allows for **direct copy-and-paste** from Excel into the Full Biodiversity Metric Toolkit, which can significantly speed up the process for Users.

Important:

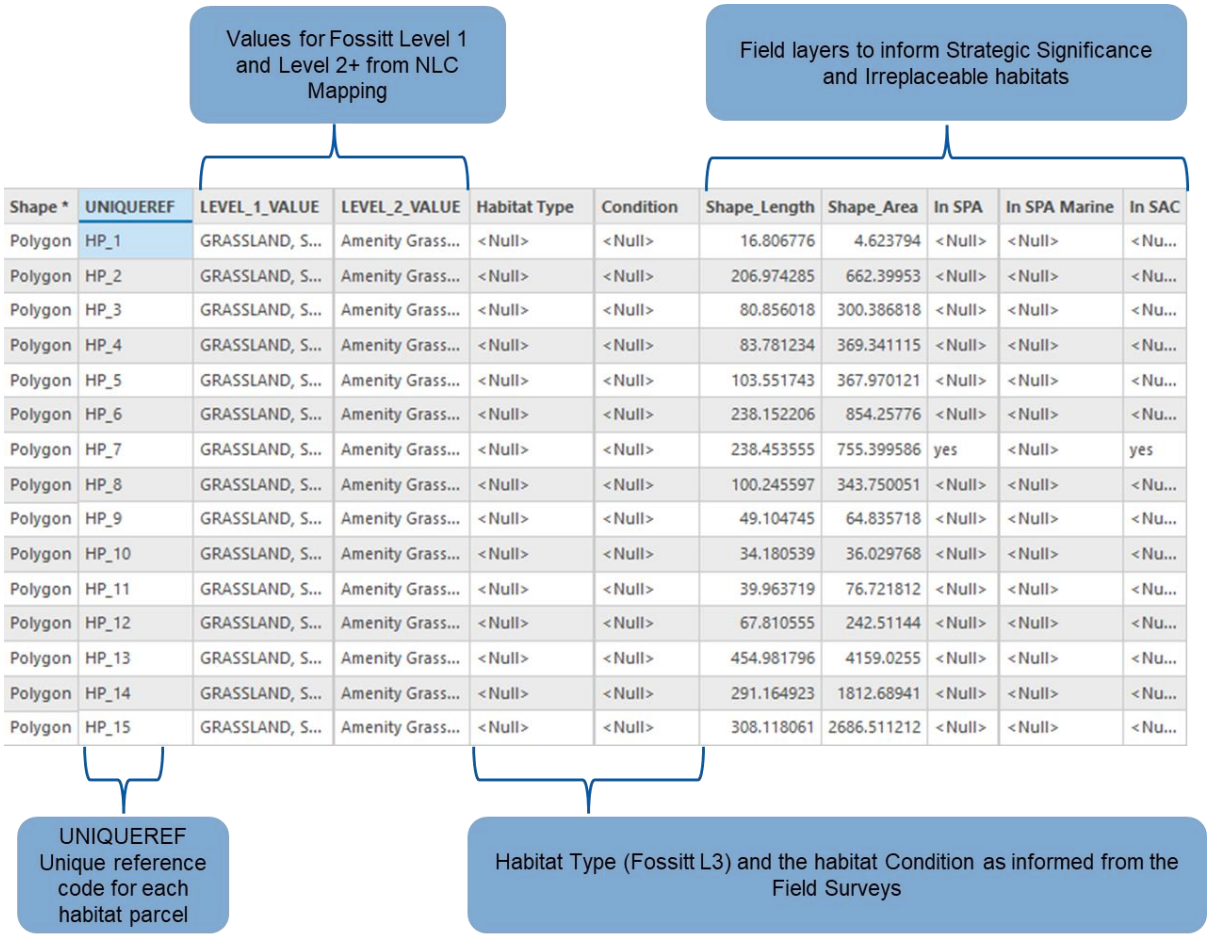
Ensure that the UNIQUEREF codes for each habitat parcel are preserved exactly as they appear in the original dataset.

These codes are essential—they link each row in your attribute table to its corresponding polygon on the map.

Any changes, deletions, or reordering of these codes may break the connection between your spatial data and the Metric calculations.

Before moving on:

- Double-check that all required fields (e.g. Habitat Type, Condition) are complete.
- Ensure consistent formatting (e.g. no extra spaces, correct capitalisation).
- Save a backup of your original GIS file before exporting or editing the table externally.



Shape *	UNIQUEREF	LEVEL_1_VALUE	LEVEL_2_VALUE	Habitat Type	Condition	Shape_Length	Shape_Area	In SPA	In SPA Marine	In SAC
Polygon	HP_1	GRASSLAND, S...	Amenity Grass...	<Null>	<Null>	16.806776	4.623794	<Null>	<Null>	<Nu...
Polygon	HP_2	GRASSLAND, S...	Amenity Grass...	<Null>	<Null>	206.974285	662.39953	<Null>	<Null>	<Nu...
Polygon	HP_3	GRASSLAND, S...	Amenity Grass...	<Null>	<Null>	80.856018	300.386818	<Null>	<Null>	<Nu...
Polygon	HP_4	GRASSLAND, S...	Amenity Grass...	<Null>	<Null>	83.781234	369.341115	<Null>	<Null>	<Nu...
Polygon	HP_5	GRASSLAND, S...	Amenity Grass...	<Null>	<Null>	103.551743	367.970121	<Null>	<Null>	<Nu...
Polygon	HP_6	GRASSLAND, S...	Amenity Grass...	<Null>	<Null>	238.152206	854.25776	<Null>	<Null>	<Nu...
Polygon	HP_7	GRASSLAND, S...	Amenity Grass...	<Null>	<Null>	238.453555	755.399586	yes	<Null>	yes
Polygon	HP_8	GRASSLAND, S...	Amenity Grass...	<Null>	<Null>	100.245597	343.750051	<Null>	<Null>	<Nu...
Polygon	HP_9	GRASSLAND, S...	Amenity Grass...	<Null>	<Null>	49.104745	64.835718	<Null>	<Null>	<Nu...
Polygon	HP_10	GRASSLAND, S...	Amenity Grass...	<Null>	<Null>	34.180539	36.029768	<Null>	<Null>	<Nu...
Polygon	HP_11	GRASSLAND, S...	Amenity Grass...	<Null>	<Null>	39.963719	76.721812	<Null>	<Null>	<Nu...
Polygon	HP_12	GRASSLAND, S...	Amenity Grass...	<Null>	<Null>	67.810555	242.51144	<Null>	<Null>	<Nu...
Polygon	HP_13	GRASSLAND, S...	Amenity Grass...	<Null>	<Null>	454.981796	4159.0255	<Null>	<Null>	<Nu...
Polygon	HP_14	GRASSLAND, S...	Amenity Grass...	<Null>	<Null>	291.164923	1812.68941	<Null>	<Null>	<Nu...
Polygon	HP_15	GRASSLAND, S...	Amenity Grass...	<Null>	<Null>	308.118061	2686.511212	<Null>	<Null>	<Nu...

Figure 4.2 - Recommended layout for fields within the attribute table of the chosen route to inform the Full Biodiversity Metric.

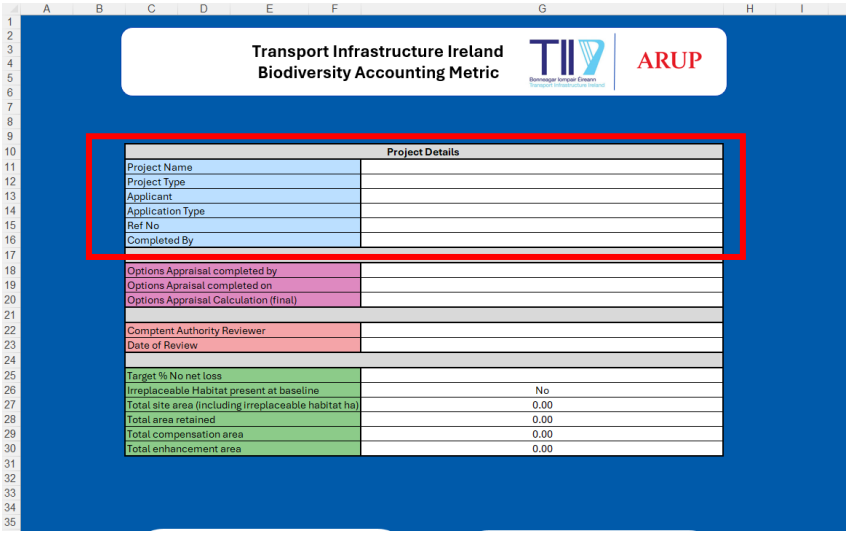
4.3 Filling in the Project Details

Purpose of this page: This page provides a standardised template for recording and assessing biodiversity metrics associated with infrastructure projects. It is designed to support consistent documentation of key project information, biodiversity impact assessments, and habitat area calculations. The template includes sections for:

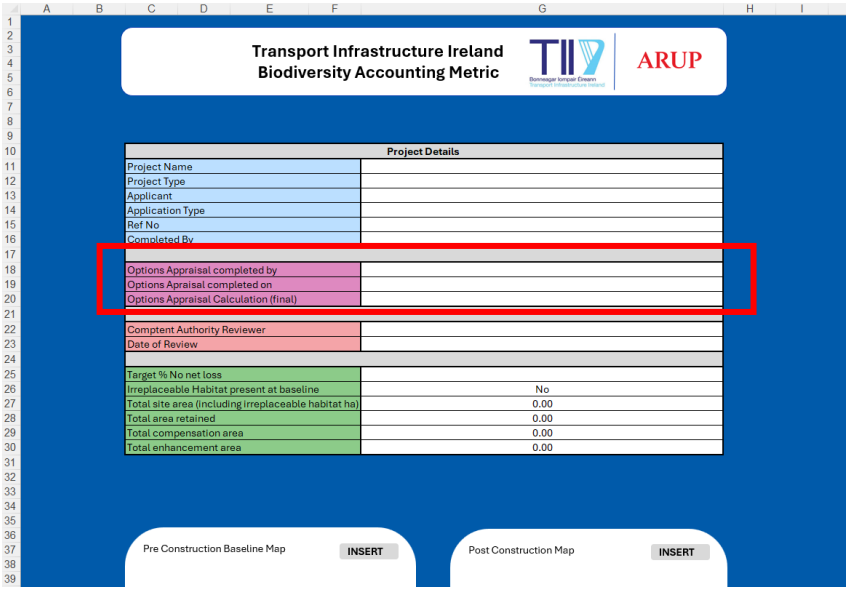
- Project identification and classification;
- Options appraisal and biodiversity unit scoring;
- Review by the competent authority;
- Habitat retention, compensation, and enhancement metrics; and
- Visual comparison of pre- and post-construction ecological conditions.

Data Entry

Upon opening the Tool, Users will see the 'project input' page.

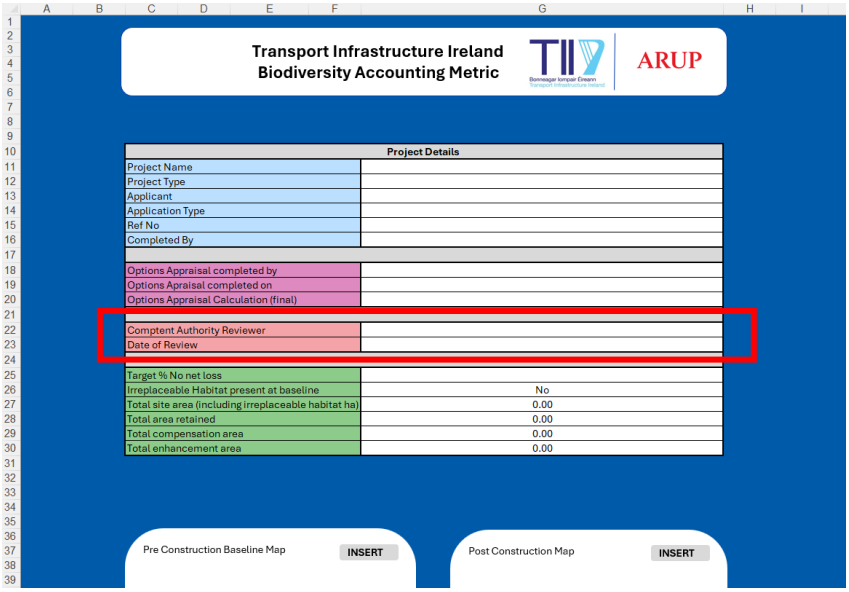


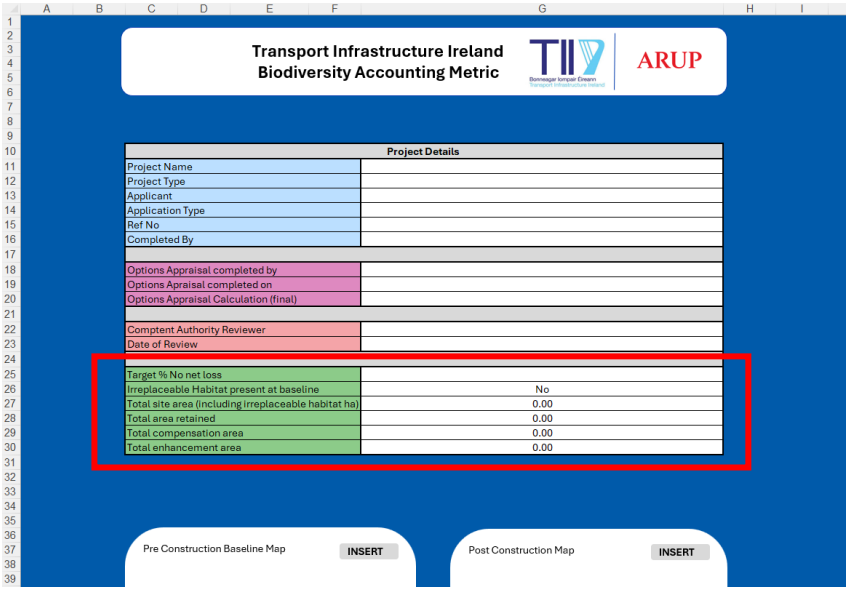
1. In the first section, input the **Project details** including:
   - **Project Name –** name of the proposed development.
   - **Type –** Greenway, road or light rail
   - **Applicant name –** Consultants or Contractor Name
   - **Application type –** as applicable to each project type, the User must determine whether the project falls under Railway Order (Transport (Railway Infrastructure) Act or Part 8 of the Planning & Development Act.
   - **Reference number –** Bespoke reference number for the proposed development.
   - **Completed by –** the individual User who has responsibility for undertaking the biodiversity metric.



2. For the **Options Appraisal** section, input:
    - **Options Appraisal completed by:** User who carried out the Options Appraisal
    - **Options Appraisal completed on:** Date it was completed by.
    - **Options Appraisal Calculation (final):** What the preliminary biodiversity units were calculated at within Options Appraisal.
3. The subsequent input must be provided by the **Competent Authority** reviewer.

This input should be completed following the finalisation of the biodiversity metric, at which point the Competent Authority will validate and approve the use of the Metric for a specific project.

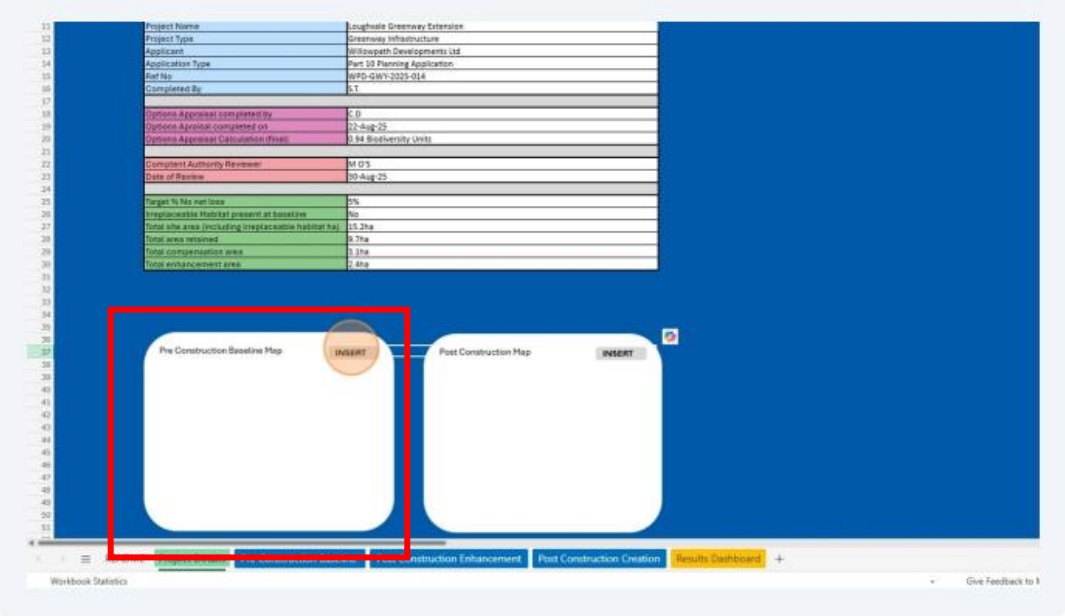




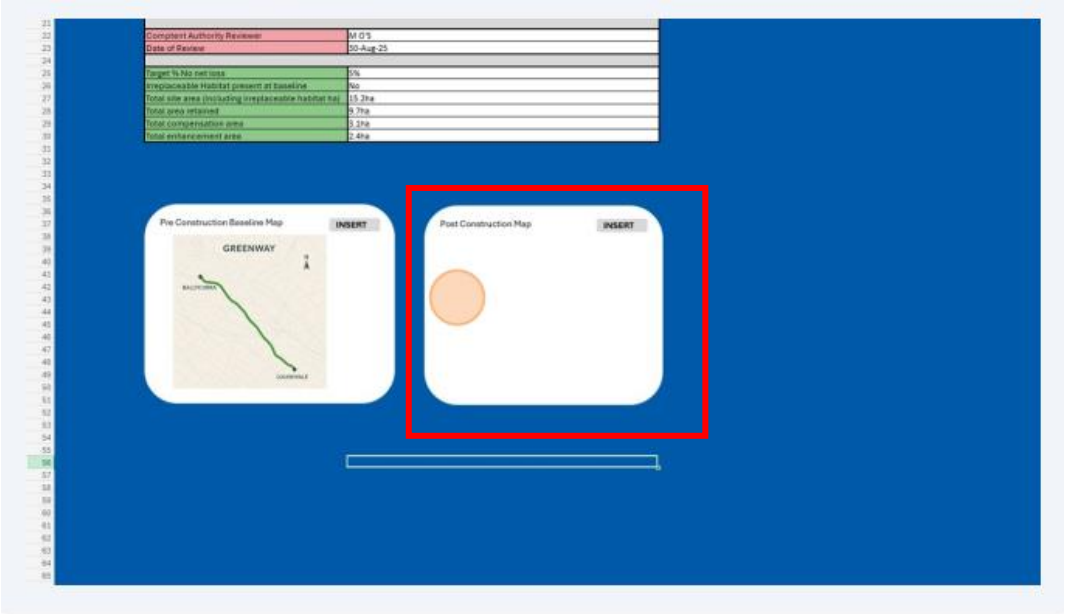
4. Upon the completion of the biodiversity metric, Users are obliged to finalise the data entry for the **Project Details** page.

The following information must be provided:

- **Target % No net loss** – The pre-determined % of no net loss aimed for the project delivery;
- **Irreplaceable Habitat present at baseline** – The total area (ha) of irreplaceable habitats calculated;
- **Total site area (including irreplaceable habitat ha)** – The total area (ha) of the proposed development;
- **Total area retained** – The total area being retailed post construction (i.e. the area not being lost/enhanced/created by the proposed development);
- **Total compensation area** – The total area being created post construction; and
- **Total enhancement area** – The total area being enhanced post construction.



5. Input your **Pre Construction baseline map**. Click 'Insert' and you will be redirected to File Explorer. Insert your map.

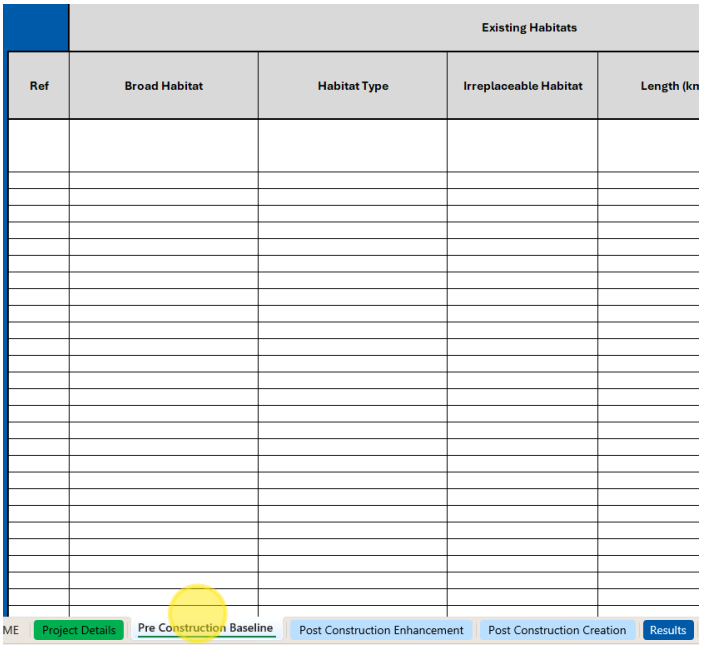


6. Input your **Post-Construction baseline map**. Click 'Insert' and you will be redirected to File Explorer. Insert your map.

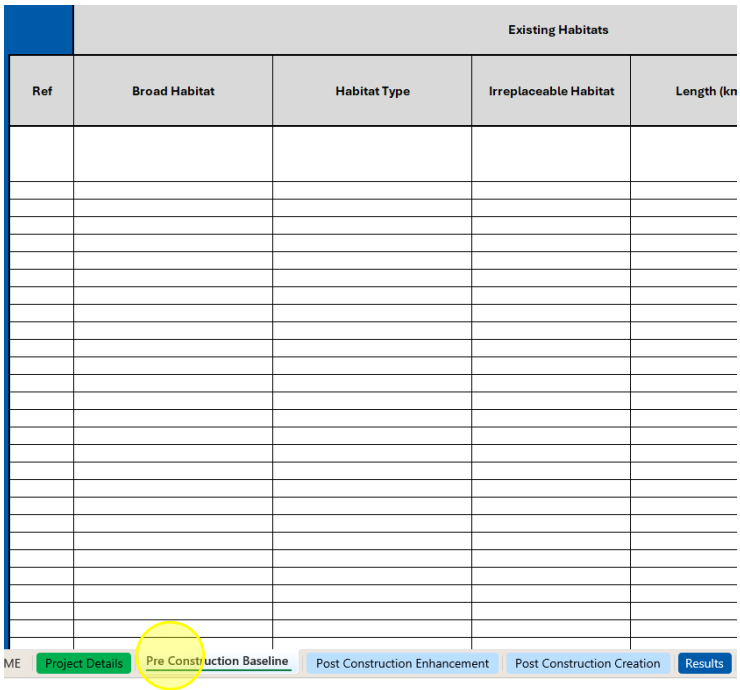
4.4 Pre Construction Baseline

Purpose of this page: The Pre Construction page is where Users establish the ecological baseline of the project area before any development takes place. It captures detailed information about existing habitats, including their type, condition, distinctiveness, and strategic significance. Users input habitat parcel data – typically from GIS or field surveys – and identify areas to be retained, enhanced, or lost. This baseline assessment is essential for calculating biodiversity units, which form the foundation for comparing future scenarios and determining whether the project achieves biodiversity net gain or no net loss.

Navigate to the Pre Construction Baseline Tab

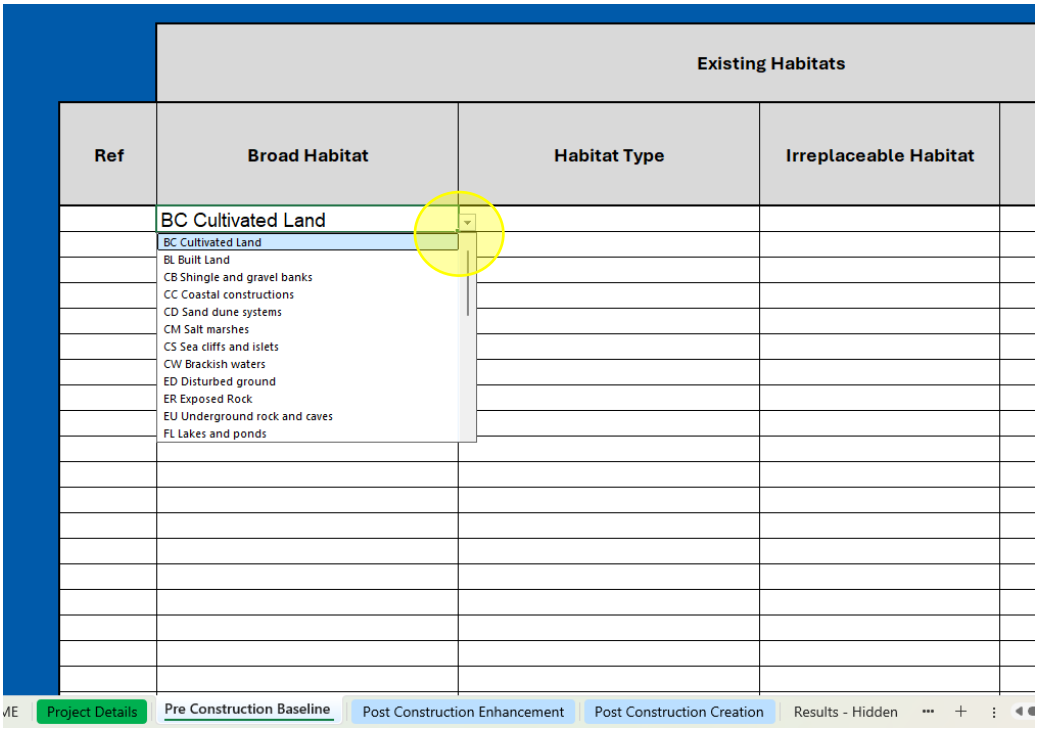


1. Select the Pre Construction Baseline tab to start the Metric



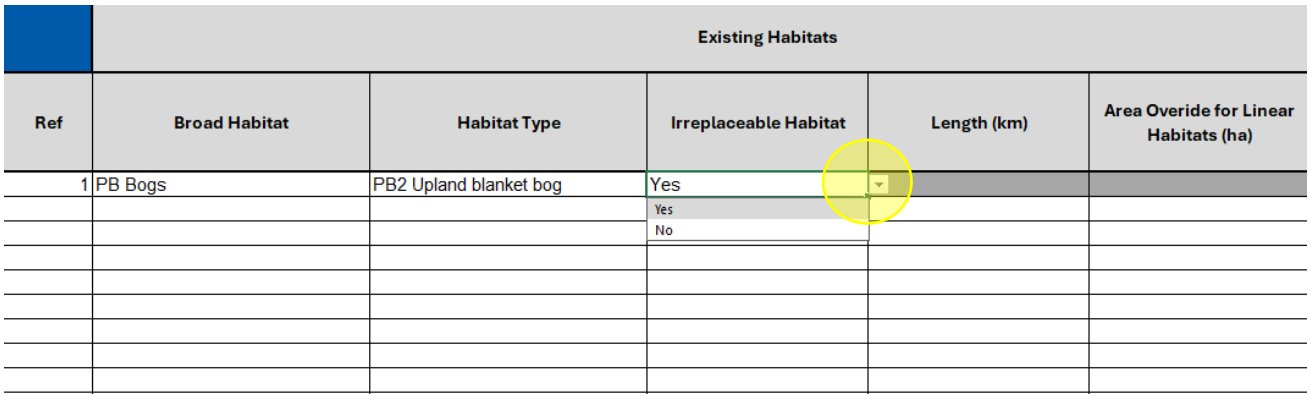
2. In the Pre Construction Baseline tab, begin by entering the unique reference ID for each habitat parcel.
   - **Where**: Column C
   - **What to do**: Paste or type the reference from your GIS or field survey data.
   - **Why**: This links each row of data to a specific mapped habitat polygon.

Broad Habitat and Habitat Type



3. Select the appropriate Broad Habitat and Habitat Type from the dropdown menus.
   - **Where**: Columns D and E.
   - **What to do**: Choose the classification that corresponds with your field data. Only the habitat types that correspond with the broad habitat type in the previous column will populate.
   - **Why**: These fields determine the broad habitat type (Fossitt level 2) and the habitat type (Fossitt level 3 or Hedgerow Appraisal System).

Irreplaceable Habitat



4. Indicate whether the habitat is irreplaceable (from the drop-down menu) and enter the area or length of the habitat.
   - **Where**: Columns F, G H and I
   - **What to do**: Select “Yes” or “No” to indicate irreplaceable habitat
   - **Why**: Irreplaceable habitats are treated differently in biodiversity accounting.

Habitat Area or Length

	Existing Habitats					
Ref	Broad Habitat	Habitat Type	Irreplaceable Habitat	Length (km)	Area Overide for Linear Habitats (ha)	Area (ha)
1	PB Bogs	PB2 Upland blanket bog	Yes			1.23

	Existing Habitats					
Ref	Broad Habitat	Habitat Type	Irreplaceable Habitat	Length (km)	Area Overide for Linear Habitats (ha)	Area (ha)
1	PB Bogs	PB2 Upland blanket bog	Yes			1.23
2	WL Linear woodland/scrub	WL2 Species Rich Native Hedgero	No	0.10		
3	FW Watercourses	FW2Depositing/lowland rivers	No		12.00	

5. Insert the size of the habitat
    - **Where**: Columns G, H and I
    - **What to do**: Enter area habitats as area (ha) to two decimal places, and linear features as length (km) to two decimal places.

      For each linear habitat entered, Users must also enter the area of that habitat on a new row, by selecting 'Area of linear habitats (no units) in columns D and E, and entering the area occupied by the linear feature in column G.

        - Note for watercourses (FW)- If the average bankfull width of a watercourse exceeds 10 metres, it should be assessed as an area-based habitat rather than a linear feature.
        - For watercourse features 10m or wider, utilise the 'Area Override for Linear Habitats (ha)'.
    - **Why**: The tool separates biodiversity units generated by linear features and those generated by area habitats. Entering the area of linear habitats ensures their area is accounted for but does not generate additional biodiversity units.

Habitat Distinctiveness

Existing Habitats					Distinctiveness		
Habitat Type	Irreplaceable Habitat	Length (km)	Area Overide for Linear Habitats (ha)	Area (ha)	Automated Distinctiveness	Manual Distinctiveness	Score
PB2 Upland blanket bog	Yes			1.23	Very High		8
WL2 Species Rich Native Hedgero	No	0.10			High	Very High	8
FW2Depositing/lowland rivers	No		12.00		High		6

The distinctiveness and corresponding score will automatically populate based on habitat type (no action required). Users can adjust the distinctiveness score by entering a 'manual distinctiveness' score. This will override the automated distinctiveness score and should only be utilised when there is evidence to demonstrate that a habitat parcel is of higher or lower distinctiveness than its automated distinctiveness score suggests.

- **Where**: Column K
- **What to do**: Select manual Distinctiveness from the drop-down in column K. The corresponding score will auto populate in column L.
    - Justification for any deviation from automated distinctiveness scores should be provided in the 'User Comments' cell.
- **Why**: In some cases, a habitat parcel may be deemed to have a higher or lower distinctiveness than the automated distinctiveness value assigned to that habitat type. In the example above, a habitat parcel of WL2 Species Rich Native Hedgerow is assigned an automated Distinctiveness value of High. The User has overridden this by entering a manual Distinctiveness value of Very High, to reflect the fact the habitat parcel contains a very high diversity of native ground flora.

Habitat Condition

Insert the condition of the habitat parcel as per the outcome of the habitat condition assessment.

- **Where**: Column M
- **What to do**: Select condition from the drop-down in column M. The corresponding score will auto populate in column N.
- **Why**: These values influence the biodiversity unit calculation.

Distinctiveness			Condition	
Automated Distinctiveness	Manual Distinctiveness	Score	Condition	Score
Very High		8	Fair	2
High	Very High	8	Good	3
High		6	Poor	1

Poor
Fair
Good

Strategic Significance

Strategic Significance						
Does the habitat have evidence of a protected species?	Multiplier addition	Is the habitat type mentioned in a corresponding CDP or BAP?	Multiplier addition	Is the habitat in proximity (<100m) to a protected site?	Multiplier addition	Outcome of Strategic Significance
Yes	0.07	Yes	0.07	Yes	0.07	1.21
No	0.00	Yes	0.07	No	0.00	1.07
Yes	0.07	No	0.00	No	0.00	1.07

Fill in the three criteria relating to strategic significance.

- **Where**: Columns O, Q and S

- **What to do**: Use dropdowns to select "Yes" or "No" to the three strategic significance questions. The 'multiplier additions' for each component of strategic significance will automatically populate on answering these questions.
    - Column N: answer ''Yes'' if there is evidence of or records of one or more protected species using the habitat for a key part of its lifecycle, as determined by a competent person. Records are considered relevant if they are dated within the last 2 years.
    - Column P: answer ''Yes'' if the habitat is formally identified in a County Development Plan, Local Area Plan, Biodiversity Action Plan, or equivalent.
    - Column R: answer ''Yes'' if the habitat lies within 100 metres of a designated site such as an SAC, SPA, NHA, pNHA, National Park, or Nature Reserve.
    - Evidence for the above be provided in the comments section of the tool.
- **Why**: These values ensure habitats importance in a local context is taken into consideration and influences the biodiversity unit calculation.

Irreplaceable Habitats or Species of National Importance Reminder

Outcome of Strategic Significance	Irreplaceable Habitats and Protected Species Reminder
1.21	⚠ Irreplaceable habitat or species of national importance identified – further action required
1.07	
1.07	⚠ Irreplaceable habitat or species of national importance identified – further action required

This serves as a reminder for the User to create suitable compensatory measures for any irreplaceable habitat impacted. It automatically appears in column U if User confirms a habitat is irreplaceable in column F **and/or** if a User confirms that there is evidence of a protected species in column O within the habitat parcel within the last 2 years.

Users are required to provide commentary in Columns AF-AG in regard to the irreplaceable habitat and/or the protected species.

Total Biodiversity Units

Total Units	103.42
	Ecological Baseline
Irreplaceable Habitats and Protected Species Reminder	Total Biodiversity Units
species of national importance	23.81
	2.57
⚠ Irreplaceable habitat or	77.04

The tool will automatically calculate baseline biodiversity units based on User inputs.

- **Where**: Column W
- **What to do**: Confirm that the value appears and matches expectations.
- **Why**: These units form the baseline for comparison with post construction scenarios.

Proposed Interventions

10.05		1.20		1.00		2.13	
Proposed Interventions							
Area retained	Length retained	Area enhanced	Length enhanced	Area to be created	Length to be created	Area lost	Length lost
1.00		0.20				0.03	
	0.05						0.10
9.00		1.00		1.00		2.00	

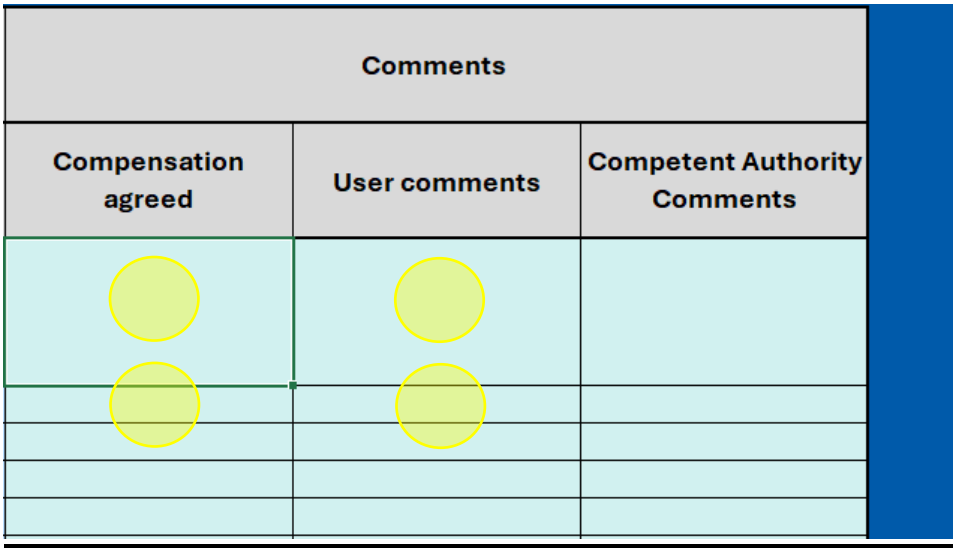
The section provides a summary of key spatial metrics based on the habitat data entered above. These values are essential for understanding the ecological baseline and for comparing against post construction outcomes.

- **Where**: Columns X (Area retained), Y (Length retained), Z (Area enhanced), AA (Length enhanced), AB (Area to be created) and AC (Length to be created).
- **What to do:**
  - Input the portion of the total habitat parcel (entered in column G, H or I) that will be retained – this means the habitat type or condition will not be impacted (positively or negatively) by the development.
  - Input the portion of the total habitat parcel (entered in column G, H or I) that will be enhanced.

- Input the portion of the total habitat parcel (entered in column G, H or I) that will be created.
- The total area/length lost automatically populates based on the area/length retained and enhanced.
- Ensure the total area/length does not exceed the initial area/length entered into columns G, H or I.

- **Why:** These figures form the foundation for biodiversity unit comparisons and are used in the Results Dashboard to assess net gain or loss.

Comments Section



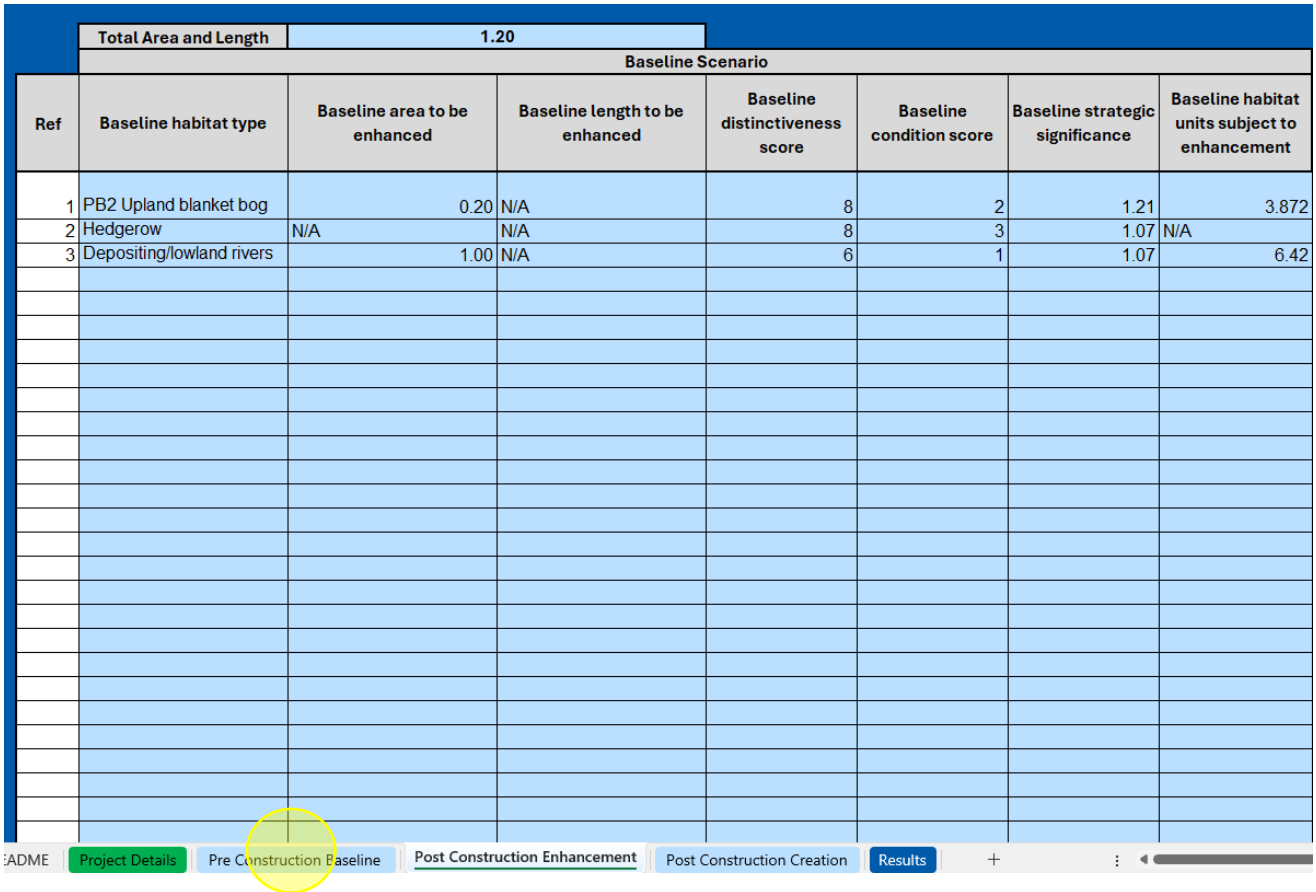
This section allows Users and reviewers to provide important context, clarifications, or justifications for each habitat parcel, especially where Users have deviated from automated scores.

- **Where**: Columns AF (Compensation agreed), AG (User comments), AH (Competent authority comments)
- **What to do:**
  - In Column AF, note if compensation has been agreed for the habitat loss or change (e.g. “Compensation agreed – Blanket bog habitat condition assessed”).
  - In Column AG, add any relevant observations or justifications from the User (e.g. habitat condition notes, data sources, deviation from automated distinctiveness, deviation from a linear habitat measure in length to area , or assumptions).
  - In Column AH, the Competent Authority can provide formal comments or approvals after reviewing the entry.
  - Tip: Keep comments concise but informative. Use this space to flag any assumptions, data limitations, or agreements made outside the tool.
- **Why:** These fields support transparency and traceability in biodiversity accounting, especially for sensitive or high-value habitats.

4.5 Post Construction Enhancement

Purpose of this page: The Post Construction Enhancement page is used to document and assess habitat areas that will be enhanced as part of the project's ecological mitigation or compensation strategy. Users input details about the Post Construction enhancement habitat type, distinctiveness, condition, and strategic significance. The page also captures spatial data, timing of interventions, and risk multipliers relating to delivery difficulty and time to target condition. These inputs are used to calculate the uplift in biodiversity units resulting from enhancement actions. This section is essential for demonstrating how the project contributes to biodiversity net gain by improving the quality and ecological value of existing habitats.

Navigate to the Post Construction Enhancement Tab



	Total Area and Length	1.20					
		Baseline Scenario					
Ref	Baseline habitat type	Baseline area to be enhanced	Baseline length to be enhanced	Baseline distinctiveness score	Baseline condition score	Baseline strategic significance	Baseline habitat units subject to enhancement
1	PB2 Upland blanket bog	0.20	N/A	8	2	1.21	3.872
2	Hedgerow	N/A	N/A	8	3	1.07	N/A
3	Depositing/lowland rivers	1.00	N/A	6	1	1.07	6.42

Link to Baseline Habitats Information

The baseline habitat reference for post construction enhancement will auto populate from the Pre Construction Baseline

	Total Area and Length	1.20					
	Baseline Scenario						
Ref	Baseline habitat type	Baseline area to be enhanced	Baseline length to be enhanced	Baseline distinctiveness score	Baseline condition score	Baseline strategic significance	Baseline habitat units subject to enhancement
1	PB2 Upland blanket bog	0.20	N/A	8	2	1.21	3.872
2	Hedgerow	N/A	N/A	8	3	1.07	N/A
3	Depositing/lowland rivers	1.00	N/A	6	1	1.07	6.42

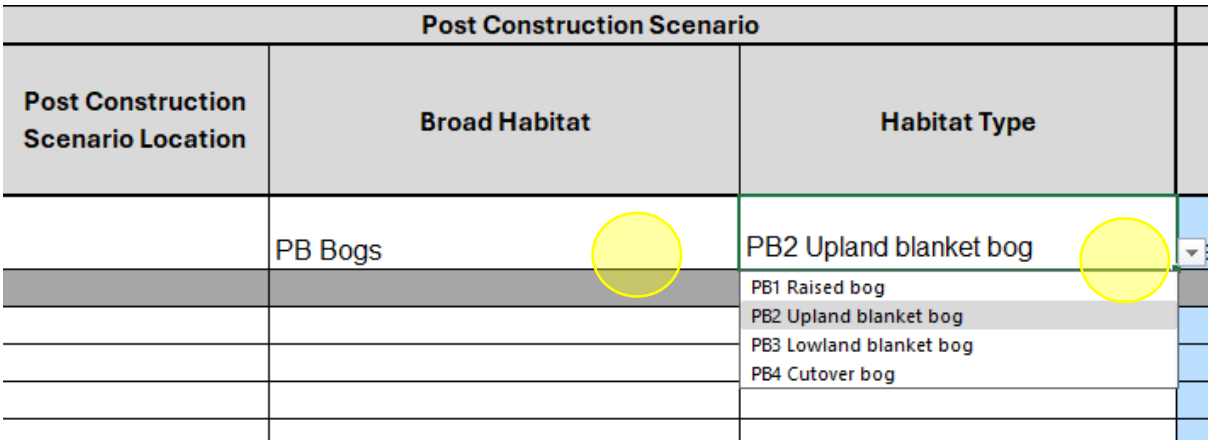
- **Where**: Columns C-J
- **What to do**: Nothing. The value will auto populate
- **Why**: This enhancement is correctly linked to the original habitat parcel in the Pre Construction Baseline tab.

Post Construction Scenario

Use the drop-down menu to select where the post construction enhancement will take place.

Post Construction Scenario		
Post Construction Scenario Location	Broad Habitat	Habitat Type
On-site		
Off-site		
N/A		

- **Where**: Column K
- **What to do**: From the drop-down menu, choose from the options “On-Site”, “Off-Site” and “N/A”
- **Why**: These inputs are used to determine the overall amount of habitat to be enhanced on-site, off-site or not to be enhanced.



- **Where:** Columns L and M
- **What to do:** From the drop-down menu, select the appropriate Broad Habitat and Habitat Type for the Post Construction Enhancement scenario**.** Only the habitat types that correspond with the broad habitat type in the previous column will populate.
- **Why:** These values define the scope and classification of the proposed enhancement.

Note: Where an irreplaceable habitat has been identified for this habitat parcel reference, it must be the same habitat type chosen in the post construction scenario. E.g. in this case, poor condition blanket bog was present in the baseline. The post construction scenario is opting for on-site enhancement of the blanket bog to improve its condition.

Distinctiveness

The distinctiveness and corresponding score will automatically populate based on habitat type (no action required). Users can adjust the distinctiveness score by entering a 'manual distinctiveness' score. This will override the automated distinctiveness score and should only be utilised when there is evidence to demonstrate that an enhanced habitat parcel will be of higher or lower distinctiveness than its automated distinctiveness score suggests.

Post Construction Scenario			Distinctiveness		
Post Construction Scenario Location	Broad Habitat	Habitat Type	Automated Distinctiveness	Manual Distinctiveness	Score
	PB Bogs	PB2 Upland blanket bog	Very High		8

- **Where:** Column O
- **What to do:** Select manual Distinctiveness from the drop-down in column O. The corresponding score will auto populate in column P. Justification for any deviation from automated distinctiveness scores should be provided in the 'User Comments' cell.
- **Why:** In some cases, a habitat parcel may be deemed to have a higher or lower distinctiveness than the automated distinctiveness value assigned to that habitat type. For example, a habitat parcel of BC1 Arable crops is assigned an automated Distinctiveness value of Low.

The User could override this by entering a manual Distinctiveness value of Moderate, to reflect the fact the habitat parcel contains areas of arable weeds amongst the crops.

Target Condition

Post construction target condition is classified and recorded in the tool in the same way as baseline habitat condition. Users should select realistic goals for the target condition of habitats to be created or enhanced.

Distinctiveness			Target Condition	
Automated Distinctiveness	Manual Distinctiveness	Score	Condition	Score
Very High		8		
			Poor	
			Fair	
			Good	

- **Where:** Columns Q and R
- **What to do:** Manually select a realistic change in the target condition post enhancement, using the drop-down menu in Column Q. A Score will then auto-populate in Column R.
- **Why:** Records the intended change to the habitat condition due to enhancement activities. Note for irreplaceable habitats, it must be equal to, or better than the base condition.

Strategic Significance

The local significance of the habitat. In the TII Biodiversity Metric, this is determined by three criteria: protected species presence, policy recognition and proximity to protected sites.

Strategic Significance							
Is the habitat likely to support protected species?	Multiplier addition	Is the habitat type mentioned in a corresponding CDP or BAP?	Multiplier addition	Is the habitat in proximity (<100m) to a protected site?	Multiplier addition	Final multiplier	Irreplaceable Habitats Reminder
Yes	0.07	Yes	0.07	Yes	0.07	1.21	⚠ Where irreplaceable habitat or species of national importance are at risk, loss must be avoided and enhancement or creation provided

Fill in the three criteria relating to strategic significance.

- **Where:** Columns S, U and W
- **What to do:**
- Use dropdowns to select “Yes” or “No” to the three strategic significance questions. The ‘multiplier additions’ for each component of strategic significance will automatically populate on answering these questions.

- **Column S:** answer ‘’Yes’’ if Users can demonstrate targeted measures to provide suitable habitat, features, or provision for a given protected species or species group.
- **Column U:** answer ‘’Yes’’ if the habitat is formally identified in a County Development Plan, Local Area Plan, Biodiversity Action Plan, or equivalent.
- **Column W:** answer ‘’Yes’’ if the habitat lies within 100 metres of a designated site such as an SAC, SPA, NHA, pNHA, National Park, or Nature Reserve.
- Evidence for the above be provided in the comments section of the tool (column AP).

- **Why:** These values ensure habitats importance in a local context is taken into consideration and influences the biodiversity unit calculation of the enhancement works.

Irreplaceable Habitats Reminder:

ıe habitat in ty (<100m) to a ːected site?	Multiplier addition	Final multiplier	Irreplaceable Habitats Reminder
	0.07	1.21	⚠ Where irreplaceable habitat or species of national importance are at risk, loss must be avoided and enhancement or creation provided

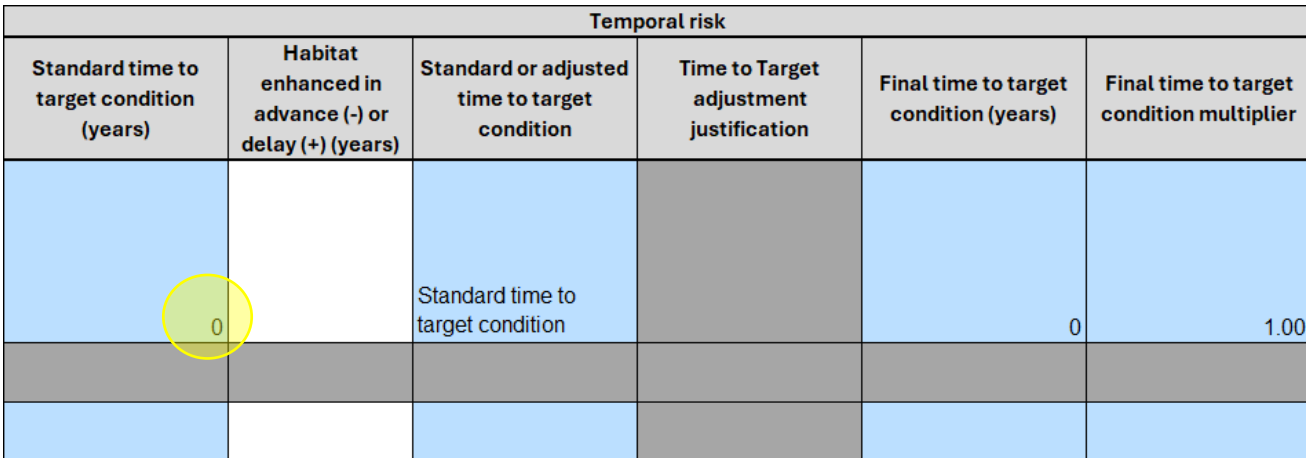
Column Z serves as a reminder for the User to create suitable compensatory measures for any irreplaceable habitat impacted. It automatically appears if User responds Yes in column S “is the habitat likely to support protected species?”.

Temporal Risk

The temporal risk multiplier represents the average time lag between the start of habitat enhancement works and the habitat reaching its target condition and distinctiveness. This is known as ‘time to target condition’. Time to target condition is measured in years.

The tool automatically applies a standard time to target condition to each habitat type which Users can adjust to account for time differences between habitat loss and compensation by selecting a response from the ‘habitat created in advance (-) or delay (+) (years)’ column.

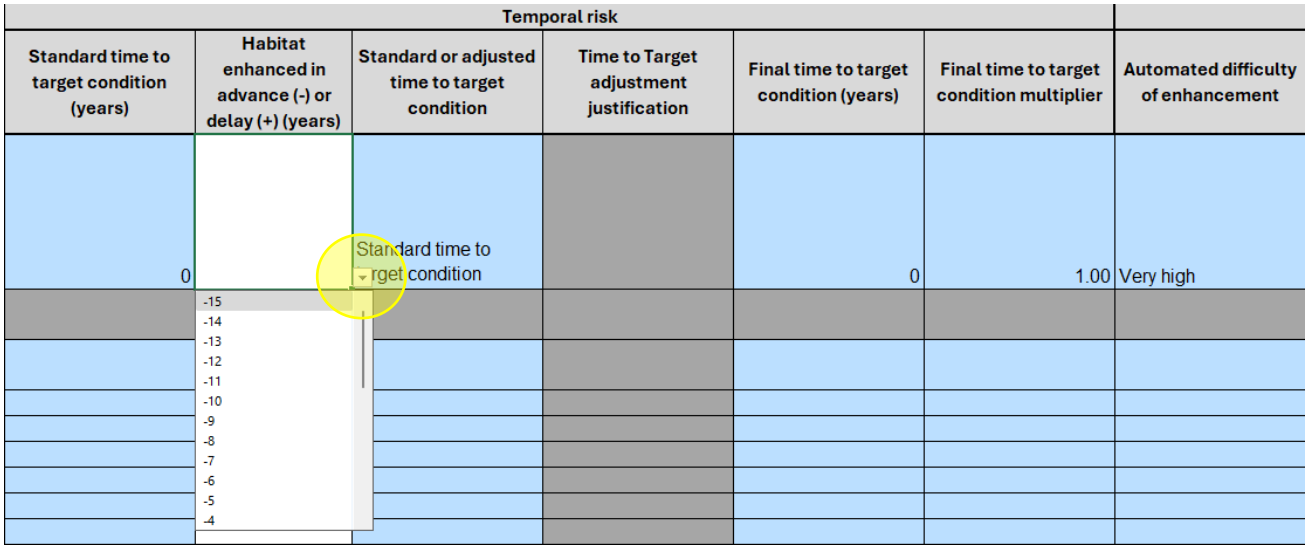
Standard time to target condition is the average time taken between starting creation or enhancement of habitats and that habitat reaching its target condition or distinctiveness.



Temporal risk					
Standard time to target condition (years)	Habitat enhanced in advance (-) or delay (+) (years)	Standard or adjusted time to target condition	Time to Target adjustment justification	Final time to target condition (years)	Final time to target condition multiplier
0		Standard time to target condition		0	1.00

- **Where:** Column AA
- **What to do:** Nothing. The standard time to target condition (in years) will automatically populate.
- **Why:** The time to target condition is determined by the previously inputted distinctiveness score.

Habitat created in advance or delay is where habitat is enhanced in advance of the project commencing (-) or after the project commences (+).



Temporal risk						
Standard time to target condition (years)	Habitat enhanced in advance (-) or delay (+) (years)	Standard or adjusted time to target condition	Time to Target adjustment justification	Final time to target condition (years)	Final time to target condition multiplier	Automated difficulty of enhancement
0		Standard time to rget condition		0	1.00	Very high
	-15					
	-14					
	-13					
	-12					
	-11					
	-10					
	-9					
	-8					
	-7					
	-6					
	-5					
	-4					

- **Where:** Column AB
- **What to do:** Insert the value for the number of years habitat will be enhanced. Where habitat is enhanced in advance of the project commencing, choose a (-). Where habitat is enhanced after the project commences, chose the (+) for the delay in implementing the enhancement.
- **Why:** To account for time differences between habitat loss and compensation.

Temporal risk					
Standard time to target condition (years)	**Habitat enhanced in advance (-) or delay (+) (years)**	**Standard or adjusted time to target condition**	**Time to Target adjustment justification**	**Final time to target condition (years)**	**Final time to target condition multiplier**
0	2	Adjusted time to target condition	Project not commencing for 2 years	2	0.93

- **Where:** Column AC, AE and AF
- **What to do:** Columns AC, AE and AF will auto populate, based on standardised times taken for each habitat to meet a given condition score.
  - If time to target condition is manually adjusted, justification for doing so must be provided in Column AD.
- **Why:** This function incentivises habitat being created or enhanced in advance of habitat losses to the project and penalises delays in habitat creation/enhancement work.

Difficulty Risk

The difficulty risk multiplier represents the uncertainty in the effectiveness of techniques to enhance habitats.

Difficulty risk				
Automated difficulty of enhancement	**Manual difficulty of enhancement**	**Delivery risk justification comments**	**Final difficulty of creation**	**Difficulty multiplier applied**
Very high			Very high	0.1
	Very high High Medium Low			

- **Where:** Column AG, AH, AI, AJ and AK
- **What to do:** The difficulty of enhancement auto populates in column AG, but can be manually changed in column AH, accounting for the site context. If manually changed, column AJ and AK will auto populate with updated difficulty risk and score.

- If difficulty of enhancement is manually adjusted, justification for doing so must be provided in Column AI.

- **Why:** Manual deviation from standard difficulty to enhance enables Users to account for how location and site context can make habitats easier or more difficult to enhance.

Enhancement Calculation

Enhanced habitats are assessed to determine the potential biodiversity gains, if their condition improves relative to the baseline.

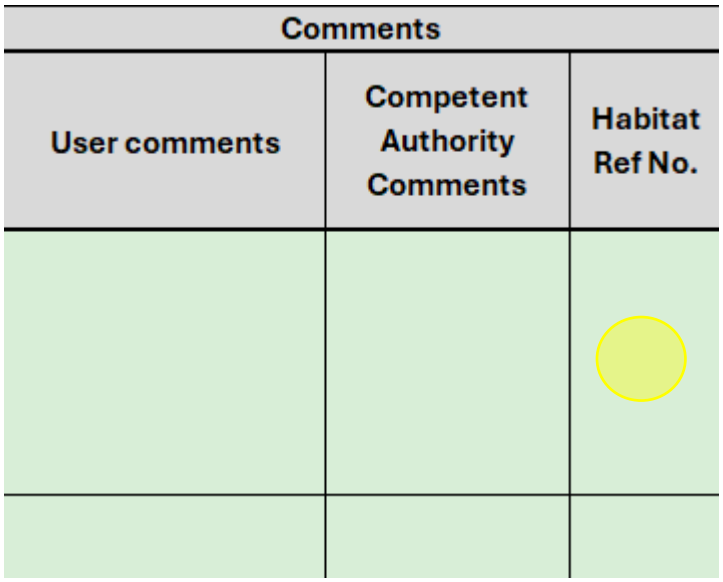
Enhancement Calculation		
Retained unit value from the baseline	**Uplifted unit value to be subjected to risk multipliers**	**Final enhanced unit value**
19.36	3.872	0.36

- **Where:** Column AL, AM and AN
- **What to do:** All cells in blue are automatically populated from the inputted information.
- **Why:** The inputted information generates the final biodiversity units for 'Total post-construction BU delivered by on-site enhancement' for the habitat.

Comments Section

Total Units	19.72	0.00			
ion	Final Units		Comments		
Final enhanced unit value	**Total post-construction BU delivered by on-site enhancement**	**Total post-construction BU delivered by off-site enhancement**	**User comments**	**Competent Authority Comments**	**Habitat Ref No.**
0.36	**19.72**				

- **Where:** Column AQ and AR.
- **What to do:** Insert any **User** or **Competent Authority** comments.
- **Why:** These fields support transparency and traceability in biodiversity accounting, especially for sensitive or high-value habitats.

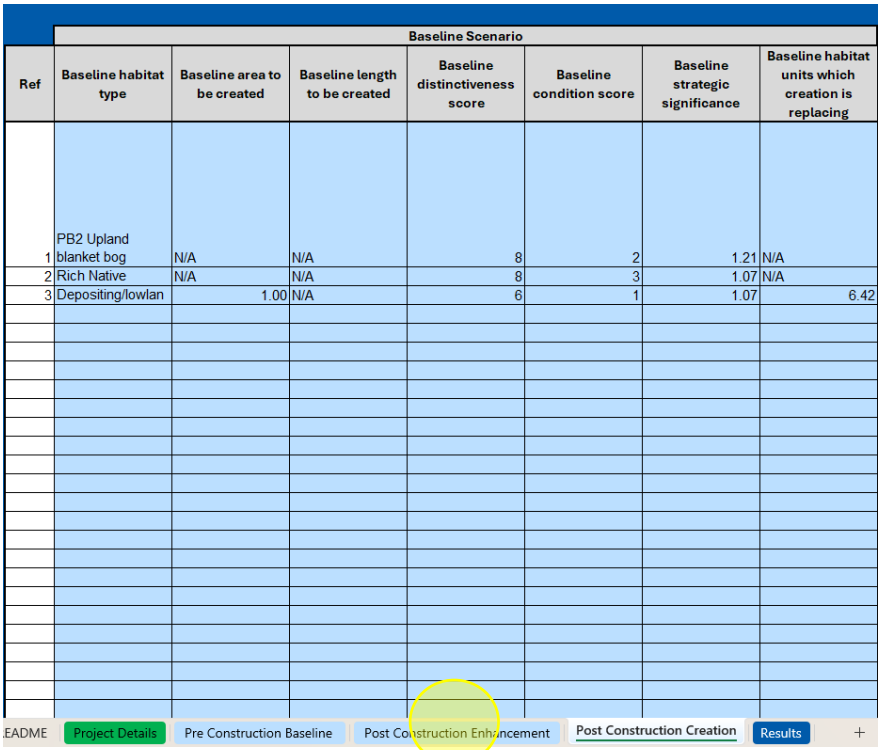


- **Where:** Column AS
- **What to do:** Provide a reference for the habitat parcel - this is to be cross referenced in Environmental Reports.

4.6 Post Construction Creation

Purpose of this page: The Post Construction Creation page is used to record and assess newly created habitats that did not exist in the pre-construction baseline. This section allows Users to input details about the type, location, and ecological characteristics of these new habitats, including their distinctiveness, condition, and strategic significance. It also accounts for the time required to reach target condition and the difficulty of creation, applying appropriate risk multipliers. These inputs are used to calculate the biodiversity units delivered through habitat creation, which contribute to the overall biodiversity net gain or compensation strategy. This page is essential for demonstrating how the project delivers new ecological value beyond what was originally present on site.

Navigate to the Post Construction Creation Tab



	Baseline Scenario						
Ref	Baseline habitat type	Baseline area to be created	Baseline length to be created	Baseline distinctiveness score	Baseline condition score	Baseline strategic significance	Baseline habitat units which creation is replacing
1	PB2 Upland blanket bog	N/A	N/A	8	2	1.21	N/A
2	Rich Native	N/A	N/A	8	3	1.07	N/A
3	Depositing/lowlan	1.00	N/A	6	1	1.07	6.42

EADME | Project Details | Pre Construction Baseline | Post Construction Enhancement | Post Construction Creation | Results | +

Select the Post Construction Creation tab.

Baseline Scenario

The post construction creation baseline allows Users to record the newly created habitats that did not exist in the pre-construction baseline.

The baseline scenario fields will auto populate from the Pre Construction Baseline.

	Baseline Scenario						
Ref	Baseline habitat type	Baseline area to be created	Baseline length to be created	Baseline distinctiveness score	Baseline condition score	Baseline strategic significance	Baseline habitat units which creation is replacing
1	PB2 Upland blanket bog	N/A	N/A	8	2	1.21	N/A
2	Rich Native	N/A	N/A	8	3	1.07	N/A
3	Depositing/lowlan	1.00	N/A	6	1	1.07	6.42

Post Construction Creation Scenario

		Total Area/Length	0.00		
Creation Scenario					
Post Construction Scenario Location	Broad Habitat	Habitat Type	Length (km)	Area Overide for Linear Habitats (ha)	Area (ha)
On-site					
Off-site					
N/A					

Use the drop-down menu to select where the post construction enhancement will take place.

- **Where**: Column K
- **What to do**: From the drop-down menu, choose from the options “On-Site”, “Off-Site” and “N/A”
- **Why**: These inputs are used to determine the overall amount of habitat to be created on-site, off-site or not to be created.

Record the type of newly created habitat.

Creation Scenario					
Post Construction Scenario Location	Broad Habitat	Habitat Type	Length (km)	Area Overide for Linear Habitats (ha)	Area (ha)
On-site	PB Bogs	PB2 Upland blanket bo			
		PB1 Raised bog			
		PB2 Upland blanket bog			
		PB3 Lowland blanket bog			
		PB4 Cutover bog			

- **Where:** Column L and M
- **What to do:** From the drop-down menu, select the broad select the appropriate Broad Habitat and Habitat Type for the Post Construction Scenario. Only the habitat types that correspond with the broad habitat type in the previous column will populate.

- **Why:** These values define the scope and classification of the habitat creation.

Record the total length or area of the newly created habitat.

Creation Scenario					
Post Construction Scenario Location	**Broad Habitat**	**Habitat Type**	**Length (km)**	**Area Overide for Linear Habitats (ha)**	**Area (ha)**
On-site	PB Bogs	PB2 Upland blanket bog			1.00

- **Where:** Column N, O or P
- **What to do:** Depending on the habitat type inputted in column K and L, either **length (km)** or **area (ha)** of the created habitat will be required.
- **Why:** Linear features (such as hedgerow) are measured in km, whilst other habitat types (such as wet heath) are measured in hectares.
    - Note for watercourses (FW) - If the average bankfull width of a watercourse exceeds 10 metres, it should be assessed as an area-based habitat rather than a linear feature.
- For watercourse features 10m or wider, utilise the 'Area Override for Linear Habitats (ha)'.

Distinctiveness

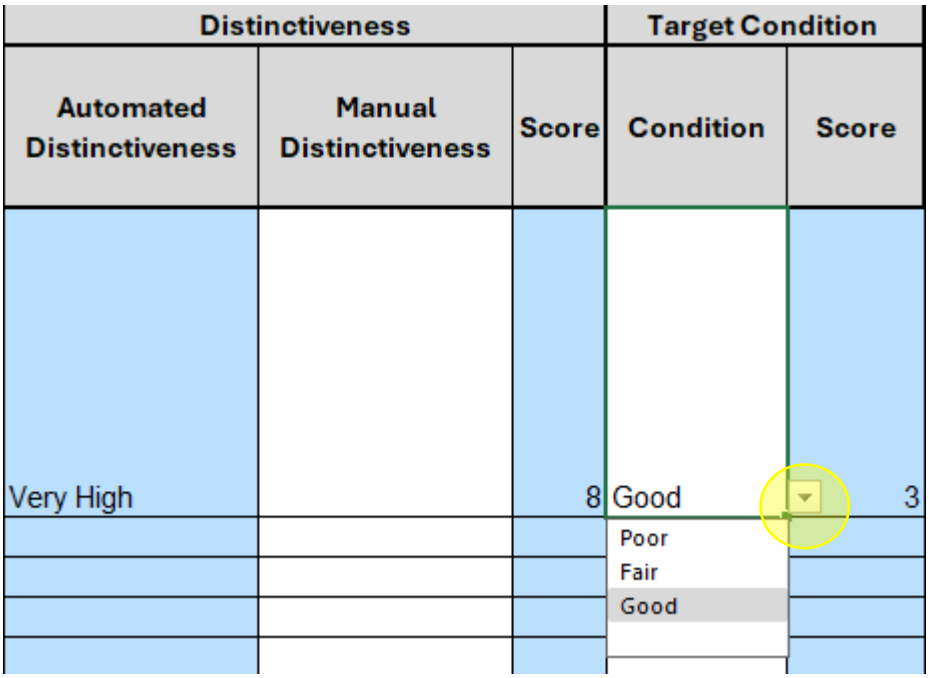
The distinctiveness and corresponding score will automatically populate based on habitat type (no action required). As per the Pre-Construction baseline, Users can adjust the distinctiveness score by entering a 'manual distinctiveness' score. This will override the automated distinctiveness score and should only be utilised when there is evidence to demonstrate that a habitat parcel is of higher or lower distinctiveness than its automated distinctiveness score suggests.

		Distinctiveness		
Area Overide for Linear Habitats (ha)	**Area (ha)**	**Automated Distinctiveness**	**Manual Distinctiveness**	**Score**
	1.00	Very High		8

- **Where:** Column Q, R and S
- **What to do:** Distinctiveness will auto populate in column Q, with a corresponding score in column S. If this needs to be correct, select manual Distinctiveness from the drop-down in column R. The corresponding score will auto populate in column S. Justification for any deviation from automated distinctiveness scores should be provided in 'User Comments' in column AQ.
- **Why:** In some cases, a habitat parcel may be deemed to have a higher or lower distinctiveness than the automated distinctiveness value assigned to that habitat type.

Target Condition

Post construction target condition is classified and recorded in the tool in the same way as baseline habitat condition. Users should select realistic goals for the target condition of habitats to be created.



- **Where:** Column T and U
- **What to do:** Manually select a target condition using the drop-down menu in Column T. The corresponding score will then auto-populate in Column U.
- **Why:** Records the target condition of created habitats.

Strategic Significance

Post construction strategic significance is classified and recorded in the tool in the same way as baseline strategic significance. The protected species component of post construction strategic significance is considered achieved if Users can demonstrate targeted measures to provide suitable habitat, features, or provisions for a given protected species or species group.

Strategic Significance						
Is the habitat likely to support protected species?	Multiplier addition	Is the habitat type mentioned in a corresponding CDP or BAP?	Multiplier addition	Is the habitat in proximity (<100m) to a protected site?	Multiplier addition	Final multiplier
No	0.00	No	0	No	0	1

- **Where:** Column V, X and Z
- **What to do:**
  - Use dropdowns to select “Yes” or “No” to the three strategic significance questions. The ‘multiplier additions’ for each component of strategic significance will automatically populate on answering these questions.
  - Column V: answer ‘’Yes’’ if Users can demonstrate targeted measures to provide suitable habitat, features, or provision for a given protected species or species group.
  - Column X: answer ‘’Yes’’ if the habitat is formally identified in a County Development Plan, Local Area Plan, Biodiversity Action Plan, or equivalent.
  - Column Z: answer ‘’Yes’’ if the habitat lies within 100 metres of a designated site such as an SAC, SPA, NHA, pNHA, National Park, or Nature Reserve.
  - Evidence for the above be provided in the comments section of the tool.
- **Why:** These values ensure habitats importance in a local context is taken into consideration and influences the biodiversity unit calculation of the creation works.

Irreplaceable Habitats Reminder:

Multiplier addition	Final multiplier	Irreplaceable Habitats Reminder
0	1.07	⚠ Where irreplaceable habitat or species of national importance are at risk, loss must be avoided and enhancement or creation provided

Column AC serves as a reminder for the User to create suitable compensatory measures for any irreplaceable habitat impacted.

Temporal Risk

The temporal risk multiplier represents the average time lag between the start of habitat creation works and the habitat reaching its target condition and distinctiveness. This is known as 'time to target condition'. Time to target condition is measured in years.

The tool automatically applies a standard time to target condition to each habitat type which Users can adjust to account for time differences between habitat loss and compensation by selecting a response from the 'habitat created in advance (-) or delay (+) (years)' column.

Standard time to target condition is the average time taken between starting creation or enhancement of habitats and that habitat reaching its target condition or distinctiveness.

Temporal risk					
Standard time to target condition (years)	Habitat created in advance (-) or delay (+) (years)	Standard or adjusted time to target condition	Time to Target adjustment justification	Final time to target condition (years)	Final time to target condition multiplier
30		Standard time to target condition		30	0.34

- **Where:** Column AD
- **What to do:** Nothing. The standard time to target condition (in years) will automatically populate.
- **Why:** The time to target condition is determined by the previously inputted distinctiveness score.

Habitat created in advance or delay is where habitat is enhanced in advance of the project commencing (-) or after the project commences (+).

Temporal risk						
Standard time to target condition (years)	Habitat created in advance (-) or delay (+) (years)	Standard or adjusted time to target condition	Time to Target adjustment justification	Final time to target condition (years)	Final time to target condition multiplier	Automated difficulty of creation
30	1	Adjusted time to target condition	Project not commencing for 1 year	30+	0.33	Very high

- **Where:** Column AE, AF and AG
- **What to do:** Insert the value for the number of years habitat will be created in column W. Where habitat is created in advance of the project commencing, choose a (-). Where habitat is created after the project commences, chose the (+) for the delay in implementing the habitat creation. Justification should be provided in column Y.
    - The final time to target condition will then auto populate in column AI.

- **Why:** This function incentivises habitat being created or enhanced in advance of habitat losses to the project and penalises delays in habitat creation/enhancement work.

Difficulty Risk

Difficulty risk				
Automated difficulty of creation	Manual difficulty of creation	Delivery risk justification comments	Final difficulty of creation	Difficulty multiplier applied
Very high			Very high	0.1

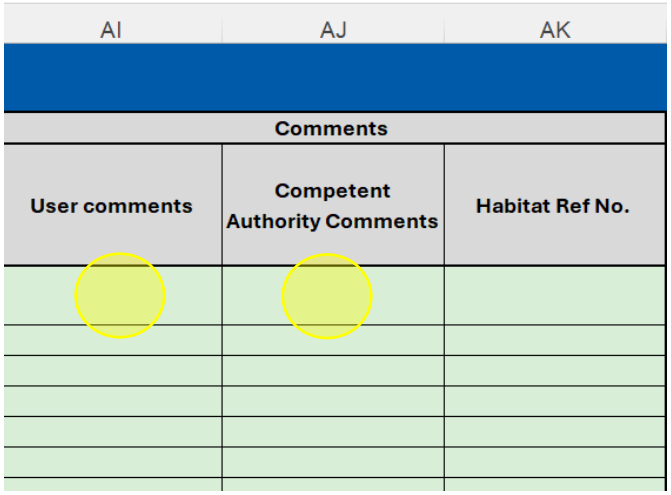
- **Where:** Column AJ - AN
- **What to do:** The difficulty of enhancement auto populates in column AJ, but can be manually changed in column AK, accounting for the site context. If manually changed, column AM and AN will auto populate with an updated difficulty risk and score.
    - If difficulty of creation is manually adjusted, justification for doing so must be provided in Column AK.
- **Why:** Manual deviation from standard difficulty to create enables Users to account for how location and site context can make habitats easier or more difficult to create.

Final Units

The biodiversity units provided by the newly created habitat are calculated automatically, based on the inputted fields.

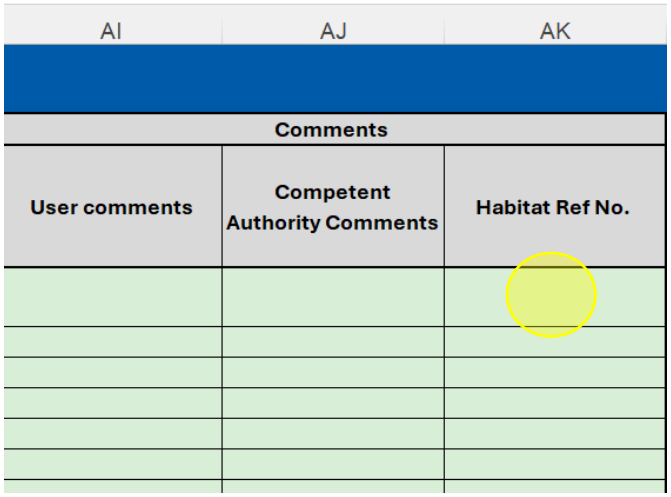
Final Units	
On-site habitat units delivered	Off-site habitat units delivered
0.85	

Comments Section



AI	AJ	AK
Comments		
User comments	Competent Authority Comments	Habitat Ref No.

- **Where:** Column AQ and AR
- **What to do:** Insert any **User** or **Competent Authority** comments.
- **Why:** These fields support transparency and traceability in biodiversity accounting, especially for sensitive or high-value habitats.



AI	AJ	AK
Comments		
User comments	Competent Authority Comments	Habitat Ref No.

- **Where:** Column AS
- **What to do:** Provide a reference for the habitat parcel - this is to be cross referenced in Environmental Reports.

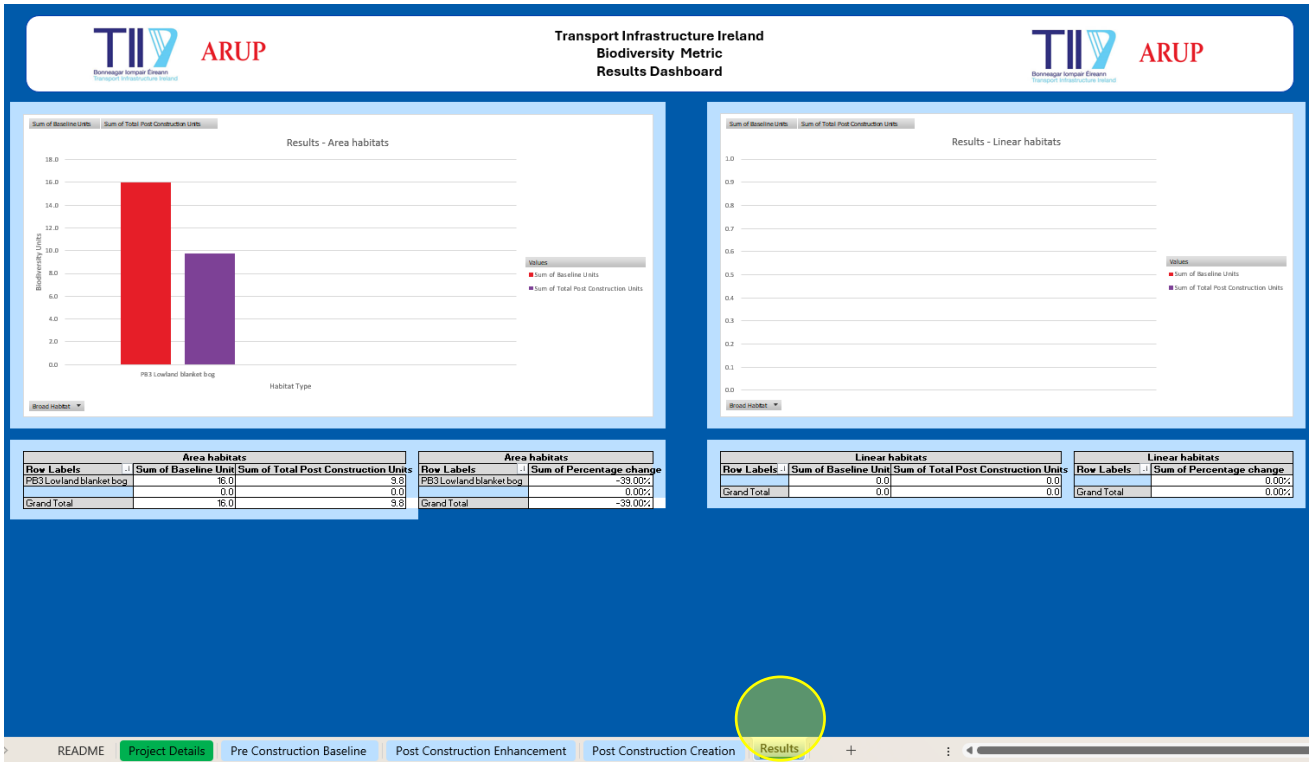
5. Results

Purpose of this Page:

The purpose of this page is to present the outputs of the Full Biodiversity Metric in both visual and tabular formats. Pivot tables summarise the baseline units for linear and area-based habitats, allowing Users to easily compare and analyse habitat data. The results tab further breaks down these figures, displaying the total baseline units alongside the sum of post-construction units for both habitat enhancement and creation. This clear overview supports robust biodiversity accounting and facilitates integration with wider environmental reporting requirements.

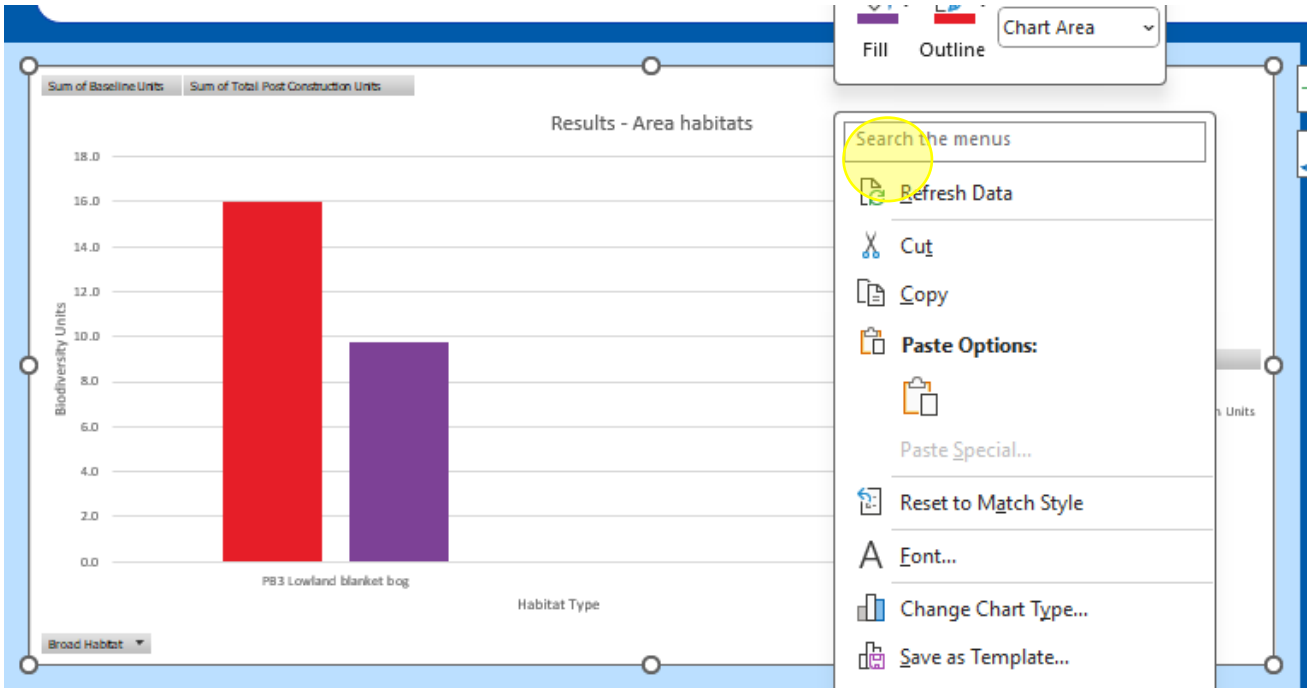
5.1 Using the Dashboard

Navigate to the 'Results' tab on the TII Biodiversity Metric.



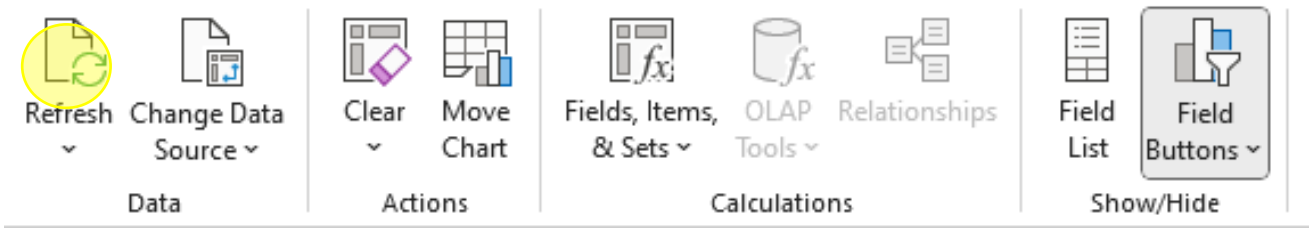
Refresh the Pivot Table

- **Where**: Either Pivot Table
- **What to do**: Right Click. Choose 'Refresh Data'
- **Why**: The pivot tables must be refreshed following any changes in any of the Pre Construction or Post Construction tabs. The Pivot table will update with the most recent inputs to the Full Biodiversity Metric.



Alternatively

- **Where**: Click on the Pivot Table
- **What to do**: Navigate up to the 'PivotChart Analyze' tab at the top of the window. Select 'Refresh All' to refresh both pivot charts at once.



In addition to the primary pivot tables described above, two further pivot tables are provided below these—both designed to illustrate the percentage change in biodiversity units for area-based and linear habitats respectively. Please note that, due to the potential size of the main habitat pivot table (especially where all habitat types in the Full Metric are represented), these additional tables are positioned further down the worksheet to prevent overlap. Users are therefore required to scroll down the tab to locate and utilise these '% Change In Biodiversity Unit' pivot tables. The process for refreshing and interacting with these tables is exactly the same as outlined previously: simply right-click and select 'Refresh Data', or use the 'PivotChart Analyze' tab to 'Refresh All'.

5.2 Integrating your Results into Environmental Reporting

The output from the Options Appraisal Toolkit and Full Biodiversity Metric Toolkit must be incorporated into the various environmental reports required for a linear infrastructure project. Guidance on incorporating the outputs of both Toolkits is suggested below, and Users are strongly advised to consult the TII Biodiversity Impact Assessment Standard (in prep, 2025) for additional guidance, and to regularly check the TII website for the most up-to-date information and requirements.

- **Options Appraisal Toolkit** - Results from the Options Appraisal Toolkit, used in assessing Route Options for projects, should be included within any scoping documents. This serves to accurately reflect the decision-making process undertaken. In particular, summary tables detailing the habitats and biodiversity units calculated for each route should be appended. Incorporating these findings into the relevant environmental reports not only strengthens the evidence base but also ensures transparency and comprehensiveness in documenting biodiversity considerations.
- **Full Biodiversity Metric Toolkit** - Findings generated by the Full Biodiversity Metric Toolkit should be incorporated into the EIAR, EcIA and AA where relevant. These reports should clearly reference the number and area of habitats lost, retained, enhanced, and created throughout the project lifecycle. Any justification for changes to habitat distinctiveness ratings, and for instances where irreplaceable habitats are lost, enhanced, or created, must be fully documented and explained. Reports should include the total biodiversity units calculated at baseline, as well as those associated with habitat creation and enhancement. Reference to the supporting pivot tables may be made to provide further detail and transparency in the quantitative assessment. This approach ensures that all biodiversity impacts and improvements are robustly recorded, substantiated, and integrated into the overall assessment and reporting framework.

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