Monitoring Progress in Expenditure Towards Biodiversity Targets: Development Phase

Final Report

The Office for Environmental Protection

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Disclaimer

Document evolution

Draft Report	27/03/2025	Reviewed by Ece Ozdemiroglu and Ian Dickie
Final Report	17/06/2025	Reviewed by Ece Ozdemiroglu

This report is based on eftec's Version 3 – November 2021 report template.

Non-technical summary

This study has developed an evidence base to support the Office for Environmental Protection (OEP) in their assessment of the Government's spending towards achieving goals and targets in the Environmental Improvement Plan (EIP23) (2023). The following evidence on expenditure towards biodiversity-related goals in England is collated:

- The need for expenditure as expressed in published government impact assessments (e.g., for statutory targets).
- The budgeted expenditure (i.e., committed and/or planned) as found in policy or programme strategies, and public commitments on future funding streams.
- The actual expenditure as found in annual reports and statistics (e.g., England Biodiversity Funding indicator).

The evidence is categorised and used to produce estimated expenditure Needs, Budget and Actuals for biodiversity related goals and targets in-year and over time. Estimates reflect the current state of evidence supporting Government decision-making. They are used to develop a tracker to compare estimated expenditure types (need, budget and actuals) to government statistics, both in-year and over time.

The gaps in the evidence base continue to make the task of tracking spending, and providing meaningful insights on the sufficiency of expenditure, a challenging one. This technical report summarises the approach taken to building the Database and providing OEP with results on biodiversity spending in England by Government.

Approach

The **purpose** defines 'the outcomes' in scope. EIP23 goals and targets have been screened so that expenditure from relevant actors, activities and actions reflect:

- Outcomes directly related to the Environment Act (2021) species abundance targets and overlapping targets and commitments in the EIP23 in England; and
- Biodiversity-related expenditure to achieve domestic targets in-year and over time.

Therefore, goals and targets that are indirectly linked to biodiversity outcomes (i.e., where biodiversity is a co-benefit) are out of scope.

This study assessed expenditure towards eight of the EIP23 goals, covering 23 targets:

EIP23 area	EIP23 goals	Number of targets in scope[1]
The apex goal	Goal 1: Thriving plants and wildlife	11
Improving environmental quality	Goal 2: Clean air	2
	Goal 3: Clean and plentiful water	4
	Goal 4: Managing exposure to chemicals and pesticides	1
Improving our use of resources	Goal 5: Maximise our resources, minimise our waste	-
	Goal 6: Using resources from nature sustainably	2
Improving our mitigation of climate change	Goal 7: Mitigating and adapting to climate change	-
	Goal 8: Reduced risk of harm from environmental hazards	1
Improving our biosecurity	Goal 9: Enhancing biosecurity	1
Improving the beauty of nature	Goal 10: Enhancing beauty, heritage and engagement with the natural environment	1
	Total targets	**23**

Priority was given to collection of expenditure evidence from public sector organisations and environment NGOs where a clear attributable link to biodiversity-related outcomes could be aligned to an EIP23 goal. The following cross-cutting criteria are also applied:

- **Timing** of the target achievement periods as stated in the EIP23, as well as expenditure period (i.e., start and end dates). Evidence has been collected from publications up to 31 December 2024, prioritising previously compiled evidence to build on existing reviews and learnings. Expenditure needs, budgets and actuals are estimated for each goal in the progress reporting period (2024/25) and forecasted across three time periods: 2024-2030, 2030-2042 and 2042-2050.
- **Environmental objectives** of the targets in scope reflect both environmental biomes and environmental features.
- **How much** is spent, is limited to domestic expenditure activities and actions in England.

The **type of expenditure** can reflect a combination of direct[1] or indirect[2] expenditure, as well as one-off and/or ongoing expenditure on actions that support the maintenance or enhancement of biodiversity.

Outputs

This study is the first step in establishing a way to track biodiversity spending over time in England,

[1] Expenditure on activities that restore, maintain, or enhance nature.
[2] Reflects activities such as monitoring that are required to support direct spending actions.

as well as identify evidence gaps. The following outputs are available in the accompanying Excel™ workbook (INS307-12-BDExpenditure-Workbook-Final-Jun2025:

- Biodiversity Expenditure Database, which collates and synthesises evidence reviewed.
- Biodiversity Expenditure Needs Catalogue of estimated expenditure Need, budget and actual by EIP23 goals; and
- Biodiversity Expenditure Tracker to compare estimated expenditure Need, budget and actual expenditure to England Biodiversity Funding indicator (Defra, 2024).

The Excel workbook provides a structure to collate the amounts, timing, overlaps between relevant goals, and other key information to analyse biodiversity spending evidence. The structure includes automated calculations to enable consistent calculation, addition of new evidence and updating the assumptions. Therefore, the workbook can be used to track the level of actual, budgeted and needed biodiversity expenditure over time.

Findings

The evidence presented in the Biodiversity Expenditure Needs Catalogue estimates an expenditure Need of around £20 billion in 2024/25 but estimated budgeted and actual expenditure of £9 billion and £7 billion respectively across the eight goals.

The estimated Need, Budget and Actual expenditure across goals do not show a discernible pattern or trend, in-year nor overtime. Comparisons in the data are dependent on the scope of the evidence sources themselves and consistency in expenditure reporting. Greater clarity would improve the robustness of interpretation of these results.

The Biodiversity Expenditure Tracker shows that estimated Actual expenditure on biodiversity is seven times higher than the reported biodiversity funding indicator in England (Defra, 2024). Although this finding indicates a potential underestimation of Government expenditure, this is not a conclusive finding given the variation in the methodological scope and coverage of data collected.

The Catalogue and the Tracker results are driven by the availability and quality of evidence, and the evidence selection hierarchy implemented (e.g., prioritise high-medium confidence evidence). Ninety-three references were reviewed, however only 28 provided evidence that was suitable for selection and analysis for goal-level calculations.

The Database includes a range of Government impact assessments and other policy documents, spending announcements, and annual reports. These source documents have different scopes, uses and timing and are developed under different government administrations with different environmental policy priorities. They also have a range of limitations in how they describe budgets (e.g., not specifying timescales). The comparability between documents is inhibited by these inconsistencies in the evidence, and the complexity of overlaps between different policy

areas contributing to biodiversity targets (e.g., water industry regulation and wetland habitat conservation).

The results show that evidence on expenditure is unevenly spread across different goals and varies in the amount of detail available. This makes it difficult to attribute expenditure to a specific EIP23 goal or target and quantify overlaps between them. Nevertheless, some synergies between expenditure towards different goals have been possible to identify qualitatively. For example, some expenditure on Goal 3 (Clean and plentiful water) can contribute to achieving targets under Goal 6 (Using resources from nature sustainably), and Goal 8 (Reduced risk of harm from environmental hazards).

The key limitations in the evidence identified during the course of the work include: (i) a lack of clarity on the flow of money between organisations who fund biodiversity focused actions and those who implement them, as well as the source of the data reported, (ii) a lack of data on: marine and coastal biomes; Goal 4 (chemical status) related expenditure; and preventing future invasive species impacts; and (iii) the Trackers scope and ability to monitor expenditure, given the lack of access to a breakdown of England biodiversity funding indicator.

Overall, the evidence on the current amount, location and the actions funded to achieve biodiversity outcomes and other EIP23 goals has significant uncertainties. Looking ahead, it is difficult to forecast expenditure over the three assessment periods – as it is unknown whether the current funding streams will continue. As such, results reflect conservative assumptions on future expenditure and are expected to improve as the Database is updated to reflect revised and/or new Government commitments.

Recommendations

The main recommendations for further work relate to expanding the breadth and depth of evidence used, improving future spending evidence from government, and future use of the Database:

- The Database could be further expanded beyond what could be analysed with the resources for this project and the available evidence up to 31 December 2024 (which was prior to a revision of the EIP23 and the Environment Act Targets, and the 2025 spending review);
- Clarify how policies work together to achieve biodiversity targets, to avoid duplication of effort, both spatially and by issue;
- Encourage more consistent reporting of spending in the Defra family, so it can be more readily incorporated into the Database; and
- Continue use of the Database and engage Defra and JNCC on biodiversity spending evidence.

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Abbreviations & Acronyms

AES	Agri-Environment Scheme
ALB	Arm's Length Body
APR	Annual Progress Report
BNG	Biodiversity Net Gain
CBD	Convention on Biological Diversity
CCC	Climate Change Committee
Defra	Department for Environment, Food and Rural Affairs
DESNZ	Department for Energy Security and Net Zero
DfT	Department for Transport
EA21	Environment Act 2021
EAC	Environment Audit Committee
EIP23	Environmental Improvement Plan 2023
FCERM	Flood and Coastal Erosion Risk Management
GDP	Gross Domestic Product
GES	Good Environmental Status
GFI	Green Finance Institute
INNS	Invasive Non-Native Species
IUCN	International Union for Conservation of Nature
JNCC	Joint Nature Conservation Committee
MHCLG	Ministry of Housing, Communities & Local Government
MPA	Marine Protected Area
NbS	Nature-based Solutions
NBSAP	National Biodiversity Strategy and Action Plan
NECR	National Emissions Ceiling Reductions
NFM	Natural Flood Management
eNGO	Environment Non-Governmental Organisation
OEP	Office for Environmental Protection
PV	Present Value
RBMP	River Basin Management Plan
TOTEX	Total Expenditure

WFD	Water Framework Directive
WWF	World Wide Fund

1. Introduction

This is the technical report of a study commissioned by the Office for Environmental Protection (OEP) to develop an approach to monitor progress in expenditure towards biodiversity targets. In this Section the background, objectives and report structure are presented.

1.1 Background

As part of the (*Environment Act 2021*, 2021) (EA21), the Government must prepare Annual Progress Reports (APRs) on the implementation of the Environmental Improvement Plan (Defra, 2023a) (EIP23). The EIP23 has 10 goals, each with a set of targets that deliver environmental outcomes. The Government APRs reflect in-year progress towards any of the statutory EA21 targets, and other target commitments in the EIP23.

Part of the OEP's remit is to provide an independent assessment of the Government's progress. This OEP progress report uses the Government APR, and other publicly available data and reports to populate a set of indicators to identify past trends, progress, and overall prospects of meeting the EIP23 goals and targets.

A key limiting factor when preparing the OEP progress report is the lack of organised information on the scale of action and expenditure delivered and committed in general and towards a specific EIP23 goal and its targets. This information gap hinders a comprehensive and systematic assessment of the quantity expended, and its alignment to the EIP23 goals. This makes tracking progress and providing meaningful insights challenging, on whether budgeted and actual expenditure is sufficient to achieve the outcomes of the EIP23 defined by an estimated expenditure need. The difference between budgeted and actual expenditure, and the expenditure need would give an indication of potential in-year shortfalls, whilst tracking over time provides insight on future resource requirements and potential re-allocations to meet EIP23 outcomes.

There is a need to develop an approach that will enable the OEP to collect, aggregate and select relevant expenditure data to monitor progress. To address this need, the OEP is seeking to understand the degree to which progress in the annual reporting period 2024/25, and subsequent reporting periods is aligned with the investment requirements for achieving targets under Goal 1 in the EIP23, in particular the interim and long-term species abundance targets.

1.2 Objectives of this study

The overarching objective of this study is to provide the OEP with the capability to assess whether expenditure on biodiversity is aligned to the expenditure needs for achieving direct biodiversity outcomes, both in-year and cumulatively. This study is the first step (i.e., development phase) in establishing a structure and identifying existing evidence gaps, to create that capability. The outputs from this study will be used to inform the OEP's progress reporting.

This study focuses on biodiversity targets (i.e., the EIP23 apex goal: Thriving Plants and Wildlife) and expenditure that is attributable to direct biodiversity outcomes – in particular the EA21 statutory targets on first halting and then reversing the decline in species abundance. Expenditure on actions to maintain and/or enhance biodiversity (habitat, species or both), have been included in the database. The study

provides data and a workbook structure for screened in EIP23 goals and targets, including:

- **A biodiversity expenditure database (henceforth the Database)** that records evidence against a set of agreed characteristics to calculate the Need, Budget and Actual spending.
- **A biodiversity expenditure needs catalogue (henceforth the Catalogue)** of spending requirements to achieve screened in EIP23 target outcomes. The catalogue provides estimates of annual and total costs over time.
- **A biodiversity expenditure tracker (henceforth the Tracker)** to help the OEP monitor and independently assess government's reported expenditure against estimated EIP23 goals expenditure Need, Budget and Actual.

To develop the Catalogue and the Tracker, expenditure evidence is reviewed, synthesised, aggregated and attributed to EIP23 goals and targets where direct biodiversity outcomes are the primary motivation for expenditure decisions (including the need, allocated budgets and actual spending). Although, this review has made use of compiled sources and is therefore not a systematic evidence review.

The study is an initial assessment of the availability and relevance of expenditure evidence. The sources explored include government reporting (e.g., England Biodiversity Indicators (Defra, 2024b)) and similar previous assessments (e.g., (GFI, eftec, and Rayment Consulting Services, 2021)). The relevance is judged against the goals and targets of EIP23 and EA21 (*Environment Act 2021*, 2021).

1.3 Structure of this report

This **technical report** presents methodology statements, key findings, priority evidence gaps, and recommendations. The technical report is accompanied by a **non-technical summary** that provides an overview of key findings, their implications, and recommendations. The summary will be written for a broader audience and for publication on the OEP website.

The technical report is organised into the following sections:

- Section 2: Describes the conceptual approach and scope of the study for selecting evidence, estimating biodiversity expenditure and the Excel Workbook structure.
- Section 3: Presents data availability and results in the Biodiversity Expenditure Catalogue and Biodiversity Expenditure Tracker.
- Section 4: Discusses the implications of the availability and quality of data and, gaps and uncertainties in calculations.
- Section 5: Provides summary of findings and recommendations for future work and areas of improvement.

The report includes the following appendices:

- Appendix 1: Screening of EIP23 goals and targets in relation to the study scope.
- Appendix 2: Study scope and selection criteria.
- Appendix 3: Bibliography of the Biodiversity Expenditure Database.

- Appendix 4: Method statements on estimates of biodiversity expenditure for each Goal, including assumptions and data used.
- Appendix 5: Overview and guidance on the Excel Workbook.
- Appendix 6: Supporting evidence for data gaps and uncertainties.

2. Approach

This section sets out the conceptual and analytical approach to the study. It summarises the evidence collection and selection, estimation methods and introduces the Excel Workbook structure. Further details across these sub-sections are provided in accompanying appendices.

2.1 Conceptual approach

Figure 2.1 shows the conceptual approach that defines the purpose and type of evidence to inform the analytical approach (teal boxes A – D) and a set of cross-cutting parameters (dark blue box). The purpose and evidence on the expenditure needed defined top-down to support defining the study scope. Evidence on budgets and actual spending are defined using a bottom-up perspective, as this requires multiple evidence sources across each stage in the analytical approach to identify expenditure across who (A. Spender), on what (B. Activity) and for what (C. Action). In combination, the evidence collated creates the Database, with estimated Need, Budget, and Actual expenditures by EIP23 goal reported in the Catalogue and the Tracker.

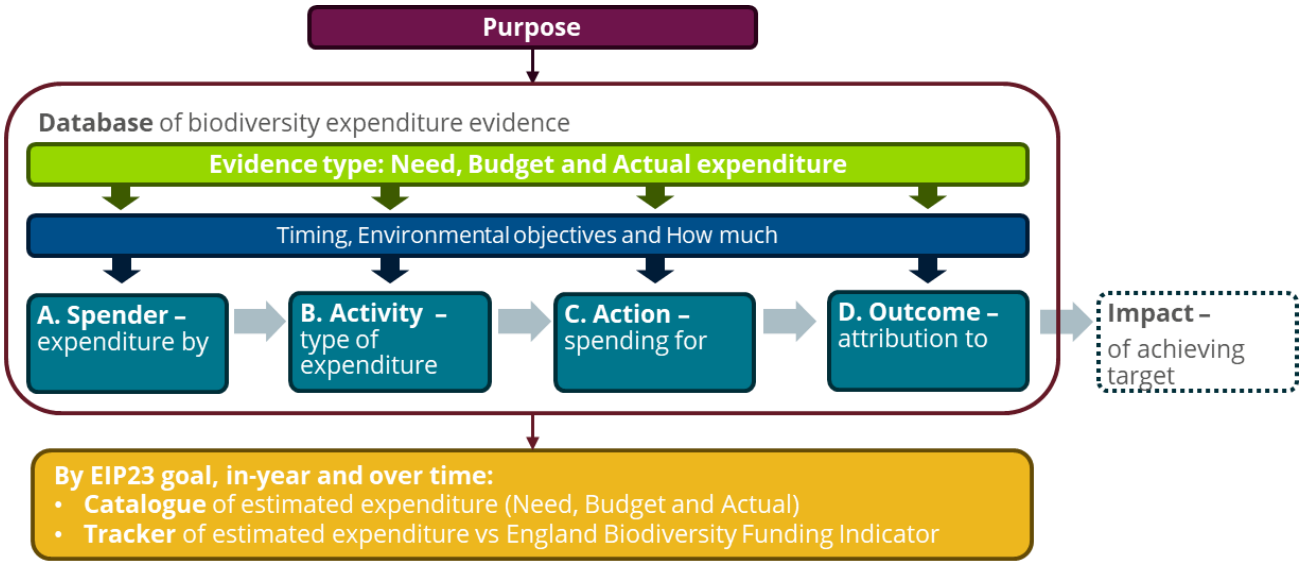

Figure 2.1: Overview of conceptual approach

Commentary or measurement about efficiency and effectiveness of spending, outputs and impacts (e.g., area protected, number of nature-based solution projects implemented) is out of scope for this study. The expenditure estimated in the Catalogue should have the intention to materially[3] and directly contribute to the 2030 and/or 2042 Species Abundance targets under the EA21.

The rest of this section provides an overview of key terms, definitions and typologies that are used throughout the study to select and categorise evidence.

[3] 'Material improvement' is not defined here, as the emphasis is on committed expenditure (i.e., intention) rather than the output or outcome of spending. However, materiality is mentioned as part of establishing the contribution to achieving the species abundance targets.

2.1.1 Purpose

The study focuses on biodiversity targets (i.e., EIP23 apex goal), with a focus on the two EA21 biodiversity targets on species abundance:

1. By the end of 2030, we will halt the decline in species abundance
2. By the end of 2042, we will increase species abundance so that it is greater than in 2022 and at least 10% greater than in 2030.

Assessment of expenditure (both the Catalogue and Tracker) is based on the likely contribution of spending to achieving these two targets[4]. The scope of the analysis is therefore aligned to their coverage, with respect to environmental objectives. This has been used as a guiding principle for the screening of EIP23 goals and targets (see Section 2.2.4 and Appendix 1), as expenditure on other targets are expected to contribute to achieving these species abundance targets.

As shown in Figure 2.1, the **'purpose'** defines the 'outcome' in scope, in particular the level of attribution and the expenditure from relevant actors, activities, and actions that are reflected in the Catalogue and Tracker. Therefore, the 'purpose' which supports overall selection of evidence must reflect:

- Outcomes directly related to EA21 species abundance targets and overlapping targets and commitments in the EIP23 in England; and
- Biodiversity-related expenditure to achieve domestic targets in-year and over time.

Therefore, goals and targets that are indirectly linked to biodiversity outcomes (i.e., where biodiversity outcomes are a co-benefit) are out of scope. For example, EIP23 goals related to climate change are not in scope, as targets are driven by the Government's Net Zero commitments, which do deliver biodiversity outcomes over time, but these are not the primary motivation for expenditure. Similarly, there is an emphasis at this stage to focus on domestic targets, therefore expenditure that contributes to international biodiversity commitments (e.g., under 'Using resources from nature sustainably') are also out of scope. However, the Database has been designed and structured to support future analysis and revisions (see Section 2.5).

2.1.2 Cross-cutting criteria

Timing in this study is an important distinguishing factor as it relates to the assessment period, the goals and the flow of expenditure itself. All of which need to be defined consistently to ensure that relevant evidence is collected and is comparable over time. This includes:

- **Outcome timing:** Defined by the goals and targets, as stated in the EIP23 and EA21, with targets achievement periods ranging from 2020 (not achieved) up to 2063.
- **Reporting period:** Expenditure needs and commitments are identified in this assessment for the reporting periods 2024 ("Progress reporting period"), 2025-2030 ("Short-term period"), 2030-2042

[4] Note although intention is to disaggregate expenditure by target, where this is not feasible expenditure will be attributed to the Goal as a whole. Commentary to what extent this has been feasible is provided in Section 3, with implications discussed in Section 4.

("Medium-term period") and 2043-2050 ("Long-term period"). For practicality, evidence has been collected from publications up to 31 December 2024. This ensures that the Database, Catalogue and Tracker cover the next progress reporting period (1 April 2024 to 31 March 2025) using the best publicly available evidence.

- **Expenditure period** (i.e., start and end date) and periodicity of payments. Should cover both annual (i.e., in-year) and total (i.e., over set of years).

Figure 2.2 shows the outcome timings for a selection of targets, including the two species abundance targets and how these relate to the study reporting period (2024 – 2050). This is to say that targets that have not been achieved (e.g., Marine GES) or have outcomes beyond the reporting period (e.g., WFD chemical status) are still in scope for this study, as to achieve these outcomes actions should be taken sooner rather than later.

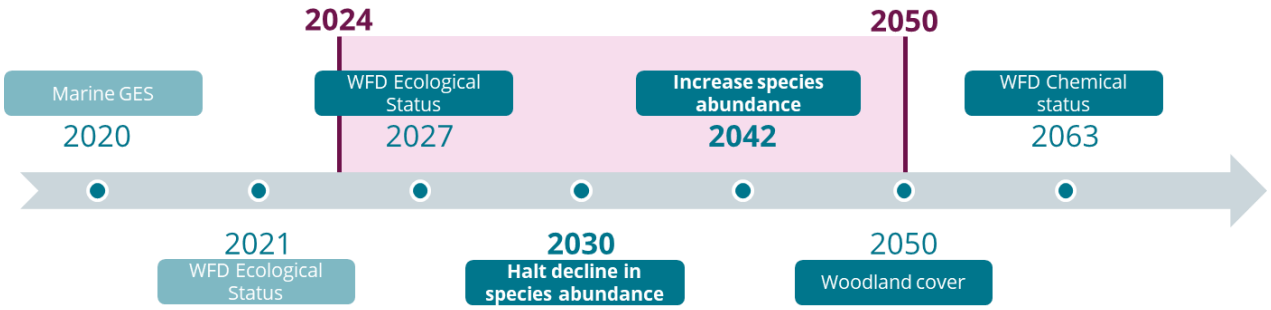

Figure 2.2: Illustrative timings for selected targets, study reporting period shown in purple

Environmental objectives of the targets reflect both environmental biomes (i.e., where the outcome is expected to occur) and environmental features (i.e., what the outcome is expected to change). Which environmental objectives are in scope are defined by the EIP23 targets, which includes:

- **Environmental biomes:** EIP23 targets can cover terrestrial (land-based), freshwater (inland waters and riparian zone) or marine and coastal (offshore, inshore, and intertidal zone). Targets can cover multiple biomes (e.g., species abundance target) making attribution of expenditure to a biome unlikely. Note that the EA21 species abundance targets do not materially cover marine ecosystems. However, targets and commitments related to marine and coastal biomes are in scope as some overlap is expected (e.g., Water Framework Directive transitional and coastal waterbodies) and as a means of identifying evidence gaps.
- **Environmental features:** EIP23 targets specify types of environmental features that the outcome(s) relate to, namely, habitats, species, and/or protected sites. Where available, evidence has been categorised against these feature types, noting that both targets and expenditure can relate to multiple features (e.g., targets that relate to protected sites can also focus on habitats within those areas).

The extent to which attributable expenditure from actions (see 2.2.3) is consistent with the targets environmental objectives, and where there are gaps in evidence, is considered in Section 4.

How much: Evidence on relevant expenditure is limited to domestic expenditure, activities, and actions (i.e., spending by the English government to achieve EIP23 targets in England). As such, wider global

commitments reflected in the EIP23 (e.g., global forest loss) are outside of scope.

Values (in £-terms) are reported as stated in the evidence, this includes recording types of values (in-year vs total, annual, averages or present values) as well as their purpose in the context of this study (i.e., actual spending and/or budgets vs required (see Section 2.1.3 for further definitions). The extent to which evidence is then extrapolated and/or attributed to an EIP23 goal and target(s) in scope, as well as overlap with Goal 1 targets is recorded separately as part of the analysis.

2.1.3 Evidence type

The study refers to 'expenditure' to capture spending by relevant agencies and authorities on achieving the EIP23 goals and targets attributable to direct biodiversity outcomes. This aligns to the public spending terminology to cover investment (e.g., capital expenditure) as well as resource expenditure.

Actual expenditure and budgeted expenditure are compared to the Need over time. This is in line with the approach set out in (GFI, eftec, and Rayment Consulting Services, 2021), and for this study is defined as follows:

- **Need (i.e., required expenditure)** could be paid for by public, private, third sectors and/or investors. To calculate the need (from any source), the actions to achieve the targets, and how much it will cost to implement them must be identified. This is defined in line with published impact assessments (e.g., for EA21 targets).
- **Budgets (i.e., committed and/or planned expenditure)** are the public sector and third sector commitments set to meet the EIP23 goals and targets. This includes budgets to meet legal requirements and/or public commitments, as well as spending commitments made since the new Government took office in July 2024.
- **Actual expenditure** refers to spending to date (in the reporting period and previous years) towards the EIP23 goals and targets. This sourced from annual reports and statistics (e.g., England Biodiversity funding (Defra, 2024b)).

Compiled evidence will distinguish between announced spending plans (which can repeat commitments) from actual spending to avoid double-counting and identify additional commitments. Further details on this and other characteristics is provided in Section 2.3.

2.2 Analytical approach

This section goes through the stages of analysis shown in Figure 2.3. In doing so, it defines and sets the scope across each stage (A – D) that evidence is collected and synthesised against. In combination, this provides an understanding of how money flows from spenders to activities and actions that are attributable to the EIP23 targets and commitments. Further details on each stage are described below.

Figure 2.3: Stages of analysis *(adapted from GFI, eftec and Rayment Consulting Services (2021)).*

2.2.1 A. Spender – expenditure by

In line with the OEP's remit and England's Biodiversity funding indicator (Defra, 2024b), significant expenditure from public sector[5] and environmental non-governmental organisations (eNGOs)[6] are considered in this study. This includes but is not limited to national government departments (e.g., Defra), local government (e.g., local authorities)[7], regulators (e.g., Ofwat) and arm's length bodies (e.g., JNCC, Forestry Commission, Environment Agency). This is primarily aligned to agencies included in Defra's (2024) Biodiversity Funding indicator for England to support comparison in the Tracker and against estimated Need but could include evidence from actors not explicitly captured in the current methodology (e.g., MHCLG, DESNZ).

Further categorisation of expenditure by spender may be possible to distinguish financial flows from government departments to arm's length bodies and other actors (e.g., water companies, farmers) to illustrate the funding route. Where this funding route is clearly documented it has been recorded, and where 'not specified' an explanation has been provided.

Although the Government's Green Finance Strategy (HM Government, 2023) has a target to grow private annual private investment in nature recovery in England[8] – this is an input target based on investment going into nature recovery. The interaction between Government actions to motivate more expenditure from private sector to replace public spending (e.g., the example in Box 2.1) cannot be assessed in this study. Therefore, further research into funding from the private sector is beyond the study scope.

2.2.2 B. Activity – type of expenditure

The types of spending considered are aligned to GFI et al. (2021) and Defra (2024b). These reflect broad categories and with multiple combinations possible, including:

- **Direct expenditure on biodiversity** such as spending on activities that restore, maintain, or enhance nature.
- **Indirect expenditure on biodiversity** such as technical assistance to monitor and evaluate the targets, training, research, and development. This is included within scope as it is required to support direct spending actions.
- **One-off and/or ongoing expenditure**[9] – one-off, such as capital expenditure, and ongoing such as operational or maintenance costs. This could include an assessment of external factors and future

[5] Public organisations in Defra (2024) include Defra, Environment Agency, Forestry Commission, National Lottery Heritage Fund, Highways Agency, Joint Nature Conservation Committee, Royal Botanical Gardens Kew, Landfill Tax Credit Scheme, Met Police Wildlife Crime Unit, Ministry of Defence, Natural England and The Big Lottery Fund.

[6] eNGOs in Defra (2024) include Amphibian and Reptile Conservation Trust, Badger Trust, Bat Conservation trust, British Association for Shooting and Conservation, British Trust for Ornithology, Buglife, Bumblebee Conservation Trust, Butterfly Conservation, ClientEarth, Freshwater Habitats Trust, Game & Wildlife Conservation Trust, Hawk and Owl Trust, The Mammal Society, Marine Conservation Society, MARINElife, National Trust, Plantlife, People's Trust for Endangered Species, The Rivers Trust, RSPB, Salmon & Trout Association, The Shark Trust, Whale and Dolphin Conservation, Wildfowl & Wetlands Trust, The Woodland Trust, WWF – UK, Zoological Society of London (ZSL), Royal Society of Wildlife Trusts, Norfolk Wildlife Trust, Essex Wildlife Trust, Wildlife Trust for Bedfordshire, Cambridgeshire & Northamptonshire, The Lancashire Wildlife Trust, Yorkshire Wildlife Trust, Dorset Wildlife Trust, Surrey Wildlife Trust, Hampshire & Isle of Wight Wildlife Trust, Berks, Bucks & Oxon Wildlife Trust, Devon Wildlife Trust, Scottish Wildlife Trust, Warwickshire Wildlife Trust and Wiltshire Wildlife Trust.

[7] England Biodiversity indicator on funding notes that spending on local nature reserves and nature conservation by local authorities is not currently included (Defra, 2024b).

[8] Raise £500 million per year by 2027, and £1 billion a year by 2030.

[9] Defra (2024b) indicator on Funding for Biodiversity is noted to exclude operational costs.

trends such as changes in the environment, climate change and population pressures.

In practice, some expert judgment or reasonable assumptions have been applied to distinguish between direct or indirect spending on biodiversity as well as the relative contribution of expenditure to achieving the Species Abundance targets (e.g., treatment of agri-environment schemes).

Assumptions made on future trends are recorded in the Database reflecting where quantified adjustments have been made (e.g., climate change uplift factors, proportion of estimated annual spend occurs in future years), however an assessment of the quality of these assumptions is beyond the scope of this study.

2.2.3 C. Action – spending for

Expenditure with the intention to contribute to the delivery of each outcome is reported. This includes payments for actions such as:

- Maintenance actions, including reduction (e.g. of invasive species or harmful pollutants), protection and conservation; and
- Enhancement actions, including restoration.

The scope includes expenditure on green or blue, green-grey or blue-grey infrastructure through nature-based solutions (NbS) which can overlap with the above 'actions', where the spending primarily results in a direct biodiversity outcome (in line with IUCN definition of NbS).

Note this does not cover emerging issues, as they are not reflected in the EIP23 goals and targets, nor does it fully address a deteriorating baseline. Therefore, spending to reduce some pressures on nature (e.g., noise pollution, recreational disturbance) or maintaining current risk management (e.g., grey FCERM assets[10]) are excluded. Expenditure in or for nature markets is not captured, due to uncertainty in how markets can deliver for nature (e.g., introduction of biodiversity net gain and its contribution to species abundance target) and the different roles that government plays in different markets – this is discussed further in Box 2.1.

Box 2.1: Nature markets and biodiversity-related outcomes

Nature markets are seen as a potential new mechanism to increase finance for nature recovery. However, there is uncertainty about how current markets can deliver for nature.

There are two compliance markets, where participation is mandatory, but their scale is limited by the activities they apply to and their regulations:

- Biodiversity Net Gain (BNG) – the majority of BNG spend is for compensation- 90% of spend is to maintain status quo. Just 10% is for 'gain' and therefore supporting the target on creation of wildlife-rich habitats. Although established in law in February 2024, the full market is not yet developed: predictions suggest the BNG Market could channel £20-30 million of spending into nature gain.
- Nutrient neutrality – is similarly a compensation approach, but the aim it to achieve neutrality, not gain.

[10] Some of this expenditure is reflected in results of the 'Survey of Environmental Protection Expenditure' (ONS, 2024) which is collected for businesses. Last release from ONS states they are pausing release, with data for 2023 not collected or published.

Voluntary markets are not constrained by regulation but also have no regulatory driver. They have potential to scale up, if drivers are strengthened, but their connection to nature recovery is less certain:

- The Woodland carbon code is the largest voluntary nature market, but the connection between additional carbon sequestration in woodlands and nature recovery is less certain, as different types of afforestation qualify for the scheme.
- The Peatland code carbon market is smaller, but links more closely to habitat restoration (for peatland).
- Voluntary catchment markets exist in many forms, enabling water companies to pay farmers to reduce water pollution risks. There is no systematic data on their scale in England, but a scheme running since 2015 in Poole harbour has enabled over £1m of investment.

Efforts to development further markets (e.g. through Codes for Saltmarsh and Agro-forestry, and natural flood management actions) are ongoing, so it is too early to assess their potential.

2.2.4 D. Outcome – attribution to goals and targets

The structure of the EIP23 has Goal 1 as its 'Apex Goal' – meaning that all other goals will support achieving it. Therefore, part of screening goals and targets in scope for this study is dependent on the 'purpose previously defined and scope of analysis agreed in Stages A – C. The stages of analysis and study scope is shown in Figure 2.4.

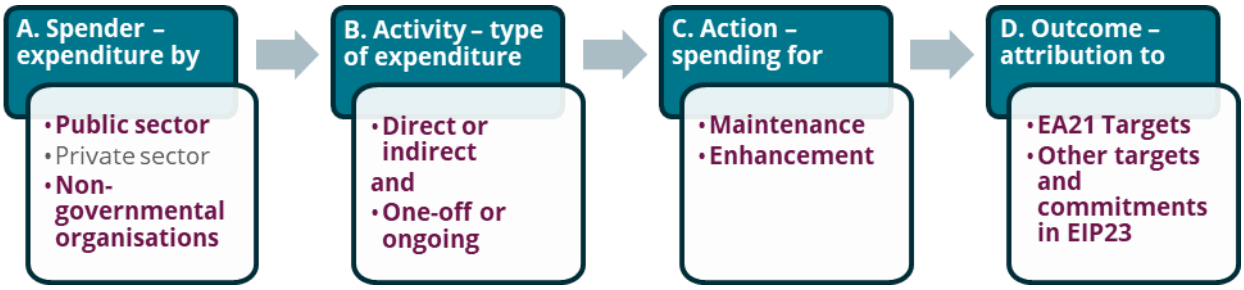

Figure 2.4: Stages of analysis with bold purple indicates study scope

Table 2.1 summarises the EIP23 goals and the number of targets (from the EA21 and other commitments) in scope. The screening of goals and targets was completed in collaboration with the OEP. A full list of EIP23 targets and commitments screened in is shown in Appendix 1.

Of the 54 targets and commitments, 23 falls within the scope of this study. Goal areas have been excluded based on their relevance to direct biodiversity outcomes (e.g., Goal 5) as well as whether actions and associated expenditure are England specific (e.g., international commitments in Goal 6 are out of scope). The aim of the study is to quantitatively assess expenditure for each target, where this is not possible a qualitative assessment will be undertaken to identify key dependencies. It should be noted that although Goal 5 is scoped out, climate change is often considered within the plans and investment in other goal areas. The difference here is that targets within the EIP23 focus on achieving Net Zero targets which will benefit biodiversity (impact) but is not the motivation for expenditure on mitigation activities.

Alignment of expenditure data to goals and/or targets reflects the motivation for spending and is given a confidence rating (e.g., high, medium, low). This reflects the confidence in the alignment of the evidence to the study scope. Assessment of overlaps (between targets within a goal, between targets across goals and Goal 1 targets) are reported separately and inform adjustments for double-counting and relative

attribution.

Table 2.1: Summary of EIP23 goals and targets in scope

EIP23 area	EIP23 goals	Number of EA21 targets	Number of other targets and commitments in EIP23	Number of targets in scope[1, 2]
The apex goal	Goal 1: Thriving plants and wildlife[3]	6	5	11
Improving environmental quality	Goal 2: Clean air	2	3	2
	Goal 3: Clean and plentiful water	4	4	4
	Goal 4: Managing exposure to chemicals and pesticides	-	5	1
Improving our use of resources	Goal 5: Maximise our resources, minimise our waste	1	4	-
	Goal 6: Using resources from nature sustainably	-	4	2
Improving our mitigation of climate change	Goal 7: Mitigating and adapting to climate change	-	4	-
	Goal 8: Reduced risk of harm from environmental hazards	-	3	1
Improving our biosecurity	Goal 9: Enhancing biosecurity	-	4	1
Improving the beauty of nature	Goal 10: Enhancing beauty, heritage and engagement with the natural environment	-	5	1
	Total targets	**13**	**41**	**23**

Table notes:
[1] Refers to wider targets and commitments underpinning the species abundance targets, where delivery and investment is likely to be directly relevant. This includes international commitments for biodiversity in England.
[2] Overlap with species abundance target informed by screening from OEP and (GFI, eftec, and Rayment Consulting Services, 2021) assessment of potential overlaps.
[3] Counts includes the two species abundance targets for completeness.

2.3 Evidence collection and selection

The **evidence collected** for this study reflects known sources across the OEP, eftec project experience and other known publications (e.g., policy reports). All evidence is extracted from publicly available and accessible documents. Some evidence gaps in expenditure are expected and can be filled through target research, historical estimates, or simple scaling methods (e.g., using assumed unit costs) and assumptions (e.g., 2023 spend is representative of future years).

The **evidence selection** process has prioritised previously compiled evidence to build on existing reviews and learnings. This includes evidence that informed the 25 Year Environment Plan (25YEP) (Defra, 2018)

and EIP23 (Defra, 2023a), and any new expenditure estimates since its publication. Therefore, 'core' evidence sources have been agreed with the OEP to include:

- GFI, eftec, and Rayment Consulting Services (2021) The Finance Gap for UK Nature Database
- eftec and ICF (2021) Costs and Benefits of England's Biodiversity Ambitions
- HM Treasury (2024) reports on Government Green Financing allocations
- Government policy documents and impact assessments (including supporting documents) where available.

Selection criteria have been applied following the stages of analysis described in Section 2.2, with further details in Appendix 2. The full list of evidence reviewed (i.e., bibliography) is in Appendix 3, and reflects what references have been carried through to the Database and have been used to estimate biodiversity-related expenditure for each Goal.

The evidence list reflects references in the GFI Database (GFI, eftec, and Rayment Consulting Services, 2021), government statistics and impact assessments. Of the 45 unique sources in the GFI Database, 36 relate to England. These are used as primary sources and cross-checked with the eftec and ICF (2021) costs for biodiversity targets, as well as any potential updates (e.g., annual reports) and relevance to the study scope. This is in addition to the six impact assessments for Environment Act targets (Defra, 2022e, 2022d, 2022a, 2022c, 2022g, 2022f, 2022h), pilot Highly Protected Marine Areas (Defra, 2022b), and River Basin Management Plan impact assessments and updates (Environment Agency, 2015, 2022).

Government statistics on UK and England Biodiversity expenditure indicators (Defra, 2024b; JNCC, 2024) are also included. Evidence for England has been prioritised; however national or sub-national expenditure could be used to fill in gaps if needed. Defra's Agricultural Statistics (Defra, 2024a) are included in the list as a way of sense-checking analysis on agri-environment scheme funding and its contribution to species abundance targets[11].

2.4 Estimating biodiversity expenditure

Evidence has been categorised by EIP23 Goal and Target(s) in scope (see Appendix 1) where one source can provide evidence or support assessment of multiple goals. To enable aggregation across EIP23 goal areas and targets, as well as estimating annual (i.e., progress reporting period) and extrapolations over time, there is a need to establish an evidence 'hierarchy' that sets which expenditure data points are used or prioritised over others in the Database. Factors considered are:

- **Relevance rating and alignment to primary Goal and targets within that Goal:** Each data point in the Database is aligned to a primary Goal, reflecting alignment of scope, and coverage of biodiversity-related outcomes, location and time. This reflects the expenditure item and supports identifying relevant targets within that Goal. Confidence in the alignment is given a rating of high, medium or low. This informs the confidence given to the evidence itself (supporting selection) and any calculations (supporting interpretation of results).

[11] Defra (2024) England funding indicator includes this within total public expenditure, however the dataset available does not disaggregate by spending type nor spending authority.

- **Quality of data:** To support analysis, not only on actual, budgeted and needed expenditure for the Tracker, but also to assess timescales and support extrapolation over the analysis period. A confidence rating will be provided for each data point to communicate the level of robustness and its implications for decision-making.
- **Aggregation and risk of double counting:** Which could occur when spending sources are used from both the supplying authority (e.g., Defra) and delivery agency (e.g., Environment Agency). Suggest prioritising evidence from a single reference point first (e.g., GFI Database) and then adding secondary sources to either fill gaps or revise inputs.
- **Attribution risks:** When budgetary data is not sufficiently granular to identify which policy target spending is aligned with. In these instances, the attribution to the Species Abundance targets will remain unknown, however total spend will be recorded and key dependencies assessed qualitatively.

The Database shows which expenditure data points are carried through to calculations, with justification provided to explain 'why not'. The following reasons were used to guide evidence selection for the analysis:

- Prioritising evidence across Need, Budget and Actual that comes from the same reference so there is consistency in reporting and assumptions made.
- Prioritising evidence that has 'high' or 'medium' alignment to the Primary Goal, with respect to scope, coverage and timing:
    - Evidence that is representative of England, defaulting to UK or GB where possible. Where this is the case, data is pro-rata adjusted to England using land area to adjust figures, unless better evidence is available (e.g., Ofwat TOTEX figures to divide between English and Welsh water companies).
    - Prioritising evidence that reflects 'biodiversity-related expenditure' from the outset, rather than 'nature-related expenditure' as a whole (e.g., Total FCERM vs NFM expenditure) – minimises the need for additional bespoke adjustments in the evidence
- Prioritising using Total or Annual cost estimates where time periods are specified, rather than Present Values (PVs) or unspecified timings.
- Actively selecting the latest evidence, rather than defaulting to evidence used in previous assessments (e.g., GFI) as the Database captures updated documents to support the analysis (e.g., revised assessment of invasive species direct costs (Eschen *et al.*, 2023) and Ofwat determinations (2025)).

An exception to this is for the Need, where maintaining alignment to Government impact assessments is priority. For example, Rayment (2021) is updated modelling of the ICF and eftec (2021) inputs that feature in the Biodiversity Targets impact assessment (Defra, 2022g). Therefore, in this instance, even though Rayment (2021) reflects updated modelling and assessment of expenditure to achieve targets, the Biodiversity Targets impact assessment captures the Government's current understanding of the Need and what OEP should be reporting and tracking against.

The analysis of expenditure evidence follows Government best practice on economic appraisal (HM Treasury, 2022) as required (e.g., time period of assessment, inflation adjustments). For each Goal, the

following is detailed within the analysis worksheets:

- Estimated Need, Budget and Actual expenditure for targets within the Goal, and as total for the Goal.
- Overlaps between targets are accounted for as a minimum in qualitative terms, reflecting areas of potential double-counting within the primary Goal and between goals. Quantitative adjustments for overlaps have not been made separately, but rather reflects the evidence selected (e.g., where evidence has already adjusted for double-counting, rather than a bespoke adjustment).
- Converting evidence to study time periods (e.g., year scalars), as well as estimating annual averages from total costs (i.e., annual average cost) and/or present value estimates (i.e., equivalent annual value). As before these adjustments are made on a case-by-case basis, reflecting the evidence selected – where possible annual averages are prioritised, however this should be balanced with coverage (e.g., in cases where not using a figure result in a target or Goal being underestimated).
- Attribution of evidence to relevant time periods. There is significant variation in the time periods over which relevant expenditure has been calculated. Different assumptions are required to allocate different cost types to different years of analysis, depending on (a) the timescale relevant to the expenditure; and (b) the nature of the cost (e.g., one-off versus ongoing). The general principles underlying expenditure profiling and attribution to the relevant time period are outlined in Appendix 4.
- Proportional adjustments where evidence is available, such as adjusting UK estimates to reflect England (e.g., England's contribution to air quality emissions as proxy for burden of cost) and/or total budget allocations to account for the proportion that is biodiversity-related (e.g., FCERM programme spend that is for natural flood management).
- Expenditure is estimated as a range (low, central and high) subject to data availability, with central estimates reported as default. Assumptions are used consistently so results can be compared across the estimated expenditure for the Need, Budget and Actual.

Disaggregation to target-level is not possible in all instances but an alignment system is used to show the relevance of each expenditure data point to the goals/targets[12]. The categorisation and assessment of both funding authority (i.e., who) and attribution to policy targets (i.e., outcome) is recorded and applied in the Database. Care has been taken to account for spending that contributes to multiple goals and/or targets to ensure interpretation of evidence is consistent to handling co-benefits whilst avoiding double-counting.

2.5 Excel workbook structure

The Excel Workbook (INS307-12-BDExpenditure-Workbook-Final-Jun25) has user notes, a flow diagram of the information across worksheets, and a contents list describing each tab. Clear structures and fixed functionality ensure consistent treatment of different data points, with sources referenced and linked. This enables the use of 'simple' formulas such as lookup functions to pull evidence between worksheets. Background data such as GDP deflators (HM Treasury, 2025) and scalars (e.g., time periods, units) are in separate 'background' worksheets, so they are consistently used across datasets, and only need to be updated in one place. The workbook structure and design prioritise ease of use and transparency, so that

[12] Same approach used in The Finance Gap for UK Nature Database (GFI et al., 2021).

future updates and revisions are possible (see Appendix 5 for guidance).

The aim is for the Catalogue and Tracker (i.e., study outputs) to be linked, with the Database serving as a central update point in future versions. Therefore, there are distinct input, calculation, and output worksheets. The Database (i.e., input) holds the evidence reviewed, in line with the scope and categories defined in the Sections 2.1 and 2.2, including aligning expenditure to goals and targets and attribution to Goal 1 and inflation adjustments.

Selected evidence from the Database feeds through to calculations worksheets per Goal, with target level analysis completed where feasible. The calculation worksheets synthesise and aggregate the selected evidence, based on the categorisation of spender (A), activity (B), action (C) and outcome (D). The estimated expenditure Needs, Budget and Actuals are then reported in the Catalogue. Building on the Catalogue, the Tracker looks at in-year and cumulative spending across goals and targets and provide a comparison to Defra's 'Funding for Biodiversity' statistics (Defra, 2024b).

3. Results

This section provides a summary of available evidence reflecting sources reviewed and expenditure available for analysis.

3.1 Biodiversity expenditure database

Table 3.1 shows the distribution of evidence across the different goals and expenditure types recorded in the Database. This serves as primary input for the Catalogue and Tracker, note that not all evidence in the database is selected for the Catalogue. Therefore, the Database serves as a data collation point, with synthesis and aggregation occurring as part of developing the Catalogue and Tracker. Although targets under Goal 5 and 7 were scoped out of this study (as detailed in Appendix 1), it should be recognised that some related literature has been reviewed (e.g., from Climate Change Committee).

Table 3.1: Number of sources and data points by goal by evidence type in the Database

EIP23 area	EIP23 goals	Targets in Scope	No. of sources[1]	No. of data points	Evidence type (data points)		
					Need	Budgets	Actual
The apex goal	Goal 1: Thriving plants and wildlife	Y	24	194	106	15	73
Improving environmental quality	Goal 2: Clean air	Y	4	64	6	41	17
	Goal 3: Clean and plentiful water	Y	7	109	77	26	6
	Goal 4: Managing exposure to chemicals and pesticides	Y	-	-	-	-	-
Improving our use of resources	Goal 5: Maximise our resources, minimise our waste	N	-	-	-	-	-
	Goal 6: Using resources from nature sustainably	Y	4	8	6	2	-
Improving our mitigation of climate change	Goal 7: Mitigating and adapting to climate change	N	-	-	-	-	-
	Goal 8: Reduced risk of harm from environmental hazards	Y	9	31	3	12	16
Improving our biosecurity	Goal 9: Enhancing biosecurity	Y	6	65	33	9	23
Improving the beauty of nature	Goal 10: Enhancing beauty, heritage and engagement with the natural environment	Y	5	16	3	3	10
			No. of data points	**487**	**234**	**108**	**145**

Table notes:
[1] Count of unique sources by goal, as one source can provide evidence for multiple goals and evidence types. A total of 93 sources were examined and 46 were recorded into the Database.

As part of defining the Need, it proved challenging to disaggregate and attribute the funding contribution from public sector, eNGOs and other actors. Most significantly to this study, uncertainty in the attribution of expenditure towards Goal 1 was identified due to the lack of quantifiable evidence of how certain activities can impact biodiversity, as explained in Water UK, (2016) and Committee on Climate Change (CCC) (2020) reporting.

This was particularly prevalent in governmental documents, such as impact assessments. For example,, in impact assessments for the Environment Act (Defra, 2022e, 2022c, 2022h) costs were attributed to sectors contributing to the problem based on the polluter pay principle (i.e., proxy for 'who delivers actions'), but acknowledging that how measures would be funded remains subject to how policies are implemented. However, the research by eftec and ICF (2021) into UK spending on biodiversity quantified the historical proportion of spend which originated from public, private and eNGO sources. These figures are quoted in the related government impact assessments to provide estimates of future spend required from each sector.

Similarly evidence tagged as 'actual spending' such as annual reports (Natural England, 2023) and government statistics (Defra, 2024a, 2024b) report lump sums (e.g., total grant-in aid). They provide little detail on what actions or programmes this expenditure contributes to. This results in high-level categorisation of evidence against activities (B) and actions (C), which can increase the risk of double-counting with other source types. Caution is therefore required when pulling data points together to analyse expenditure at the Goal level.

Identification of overlaps for each data point in the Database is recorded to reflect where a data point captures expenditure across multiple targets within a Goal and if expenditure overlaps with targets across other goals. The latter is further categorised to reflect whether the overlap across goals is explicit in the evidence, an assumed overlap (e.g., based on action description) or not explicit. The assumed overlaps are based on expert judgment where all EIP23 goals and targets have been linked to Goal 1 targets[13]. The Database identifies overlaps between Goal 1 (as the Primary Goal) and all other goals in scope, and vice-versa (i.e., at least 1 data point across the other goals identifies Goal 1 as a secondary goal). There is also evidence indicating that expenditure on Goal 3 overlaps with Goal 4, 6, 8 and 9.

Although the presence of overlaps between targets across goals are identifiable, it is not always clear how much or to what extent spending to achieve a specific target (e.g., wildlife habitat restoration) contributes to another. For example, Glover (2019) emphasized that peatland restoration spend can contribute to multiple targets depending on the motivation and suggested that there are significant overlaps between the landscape, habitat creation and woodland creation targets which are difficult to separate. This is echoed in Defra (2024b) with an explanation that spending is often designed to meet more than one policy objective and that attribution to biodiversity can be estimated by relevant experts but they must take into account issues such as the quality of conservation measures and the original intentions of the expenditure, which may be subject to opinion.

Furthermore, there are inconsistencies between sources on which activities contribute directly to

[13] See 'Identifying overlaps between goals and targets' tab in the accompanying workbook. Row 58 – 70 shows the assumed links (i.e., where it is expected an overlap in expenditure could occur) to support guiding judgment used in the categorisation of evidence in the Database.

biodiversity outcomes. Defra (2024b) stresses the importance of indirect actions to support the direct activities and suggests that this link causes some reporting inconsistencies as "it is necessary to exercise judgment as to when an item should be included or not" (p.10). To enable the analysis in this study, expert judgment has been used and therefore evidence selection (based on the aforementioned evidence hierarchy) is crucial. To what extent and where expert judgment has been used to collate evidence for England's indicator is largely unclear, which impacts the interpretation of results in the Tracker (see Section 3.3).

Multiple data sources were scoped out due to incompatible reporting of data such as:

- Reporting or estimating some actions in only benefits and/or net benefits terms (Sky Ocean Rescue and WWF, 2020; Natural England, 2023);
- Only quantifying the avoided costs (e.g., health benefit forgone by not undertaking abatement measures), rather than the costs or expenditure Need to achieve a target (Defra, 2010); and
- Reporting expenditure per hectare rather than an applied assessment (CCC, 2020; Agrii, 2024; Defra and Rural Payments Agency, 2024, 2025).

In principle, the evidence listed above as incompatible is useful – in particular for assessments where outputs (e.g., area of habitat restored or created) are required and where impacts (e.g., natural capital benefits) are estimated. However, these aspects are beyond the scope of this assessment.

Evidence gaps

Evidence gaps identified through this analysis include:

- Evidence on spending related to the marine environment is a known gap, therefore the majority of evidence available for the analysis relates to terrestrial and freshwater targets. Further analysis of marine evidence beyond what was already known to the project team was beyond the scope of this study. This impacts the reporting of Goal 1 expenditure (including, MPA condition and Marine GES targets). This largely reflects general assumptions on marine expenditure, for example in the Overarching Environment Act impact assessment it was stated that costs for the Marine Protected Areas (MPA) targets have not been assessed separately as it is assumed that costs of achieving the target are not additional to current actions (Defra, 2022e).
- There is a lack of data for the WFD Chemical Status Target in Goal 4 (managing exposure to chemicals and pesticides). Although some evidence includes 'groundwater chemical status' in the analysis (e.g., RBMP impact assessments), there is no explicit mention of surface water chemical status. In the reviewed impact assessments, it is in some cases explicitly stated that surface water chemical status is excluded from the analysis. This can be attributed to the high uncertainty in scale and potential cost of the measures that might be required as detailed in WFD and RBMP impact assessments (Defra, 2005; Environment Agency, 2015, 2022). With that said, there is an assumed recognition that achieving the WFD Ecological Status target (Goal 3) will support the chemical status target, alongside other targets in Goal 3 (e.g., wastewater, abandoned metal mines).
- There is little evidence that directly links to Goal 6 targets on fisheries stock (Marine GES indicator) and sustainable soils. For the most part, sustainable soils are identified as a secondary target to expenditure related to Goal 1 nature-friendly farming outcomes because funding sources (e.g., agri-

environment schemes) overlap. Similar assumption can be made when disentangling expenditure related to achieving Marine GES (under Goal 1) vs the fisheries stock indicator (under Goal 6). Even though, there are data points related to Goal 6 for the 'Need' and 'Budget', these figures are treated with caution as the evidence base itself is partial.

- Evidence supporting Goal 10 targets reflect references identified by the project team and OEP experts. For the most part, Goal 10 outcomes are likely to be achieved through expenditure for other goals (e.g., Wildlife-rich habitat restoration under Goal 1 supports peatland restoration in national parks). This is an area for further review (e.g., annual reports and accounts of National Park Authorities), however disentangling spending at landscape scale or for heritage from other Goals is a challenge.

3.2 Biodiversity expenditure needs catalogue

As shown in Table 3.1, the Excel workbook (INS307-12-BDExpenditure-Workbook-Final- Jun25) records over 482 data points on biodiversity expenditure needs, allocated across 7 of the 8 EIP2023 goals in scope. Almost half of these data points relate primarily to Goal 1, while one goal only has eight data points (Goal 6) and one has none (Goal 4). Table 3.2 and Table 3.3 provide initial estimates of the Need, Budget and Actual expenditure for the progress reporting period and short-term reporting period. Evidence captured in the Database reflects publications released up to 31 December 2024, and therefore partially captures the 2024/25 evidence base. In absence of reported evidence for the 2024/25 period, the previous assessment period (2023/24) has been used.

The Catalogue provides an overview of available evidence by targets (where possible) and by Goal. These estimates are indicative of Need, Budget and Actual expenditure both in-year and over time, whilst being robust enough to support the OEP's progress reporting objectives. Using attributions of spending across the goals, the Workbook calculates the annual and total expenditure estimates across the goals to achieve the biodiversity ambitions of the EIP23 by 2042. Estimated ranges (high, central and low) are provided across Need, Budget and Actual where evidence allows.

In Table 3.2 and Table 3.3, overlaps in expenditure between goals have been assessed qualitatively, with quantitative adjustments not feasible unless already reflected in evidence within the Database (e.g., Defra (2022d) states that double-counting between the woodland cover and wildlife-rich habitat targets are accounted for in modelling from eftec and ICF (2021)). At the Goal level, any double-counting between targets within a Goal is reported as either expenditure contributing to multiple targets (i.e., simple sum) or deducted where feasible. Consistent with previous impact assessments, it is not possible to disaggregate expenditure between the two species abundance targets (i.e., what supports stopping decline vs recovery). An overview of the quantified overlaps (i.e., sum of expenditure by primary goal that overlaps with other secondary goals) is reported separately in the analysis workbook for estimated expenditure Need in the short-term reporting period (2025-2023)[14].

The analysis does not attempt to attribute expenditure to these goals but rather identifies the presence of an overlap in the Catalogue. Through selection and aggregation in the calculations, it is clear that

[14] See 'Identifying overlaps between goals and targets' tab, Rows 19 – 32. Note estimated expenditures cannot be summed across rows to produce a total as some evidence sources selected overlap multiple goals.

expenditure on actions with direct biodiversity outcomes in one goal area, contributes to the achievement of another. This is the case in particular for Goal 1 expenditure, which was expected for the Apex Goal – but also Goal 3. It is unclear whether the full extent of interlinkages between EIP23 goals and targets, and expenditure is understood – and therefore these results may represent an underestimate in how far current levels of allocated resources and spending go.

Within the Goal calculation worksheets confidence is reported based on the selected evidence, therefore is often reported as a range for the estimated expenditure for a given target (i.e., across a row) and estimated expenditure for the goals Need, Budget and Actual (i.e., across a column). The latter is reported as part of the method statements in Appendix 4. Summary statistics on the number of data points that have a 'low confidence' rating in the Database and the proportion of total estimated expenditure by evidence type with low confidence are also captured in the Workbook.

In aggregate, as a result of the evidence hierarchy (see Section 2.4), the majority of evidence selected are either of high or medium confidence rating. Although low confidence evidence has been used in some instances, this is to avoid under-representing and under-estimating expenditure for a set of goals. Over the two reported time periods (2024/25 and 2025-2030), the proportions of total estimated expenditure based on low confidence evidence is:

- Between 0.2% and 0.4% of total estimated Need, respectively.
- Approximately 3% of total estimated Budget, giving it the highest proportion of low confidence expenditure in both reporting periods.
- Less than 0.1% of the estimated total Actual expenditure.

Significant uncertainty at the Goal level is discussed in Section 3.4. There was insufficient evidence to disaggregate expenditure to targets within a Goal.

Estimates in the Progress Reporting Period (Table 3.2) indicate that Budget and Actual expenditure across the EIP23 goals is similar (£9 billion and £7 billion, respectively), however the expenditure Need in the same period is triple the Actual and double the Budget expenditure in the same period. Estimates for the Short-term Assessment period shows a similar pattern, however the discrepancy between the expenditure Need and the Budget or forecasted 2025-2030 expenditure varies by a factor of 1.3 and 1.4, respectively. Estimated expenditure across the Need, Budget and Actual is primarily driven by evidence available on Goal 3 expenditure (e.g., 86% and 73% of total estimated Need in the two reporting periods), followed by expenditure for Goal 1 (e.g., 11% and 22% of total estimated Need). However, rather than reflecting Government's allocation of resources in the case of Budget and Actual expenditure and/or their priorities as part of the Need – it primarily reflects the state of the evidence. Both in terms of what has been selected in line with the evidence hierarchy, as well as the data points available in the Database.

The results presented in Table 3.2 and Table 3.3 reflect the difficulty in comparing across estimated Needs, Budgets and Actual expenditure, which limits the ability to draw conclusions from comparing these figures between goals. There is therefore a question about how to report the data given that there are clear inconsistencies between the sources (e.g., where the Budget exceeds the Need). A number of factors can be identified that lead to the difference in the relative size of the estimated Need, Budget and Actual expenditure, so that they do not move in proportion, within a reporting period nor over time. For example:

- Goal 1 Budget is forecasted to be lower as the Database has captured funding from the Nature for Climate Fund, which comes to an end in 2025. Whether this funding source is continued or replaced by another programme is uncertain and is not reflected in forecasted budgets reported in Table 3.3. This reflects an underlying assumption applied across the available evidence, whereby future expenditure is forecasted where the Database provides a reasonable estimate and/or commitment to know it will continue. There are no additional forecasting assumptions (e.g., current expenditure is representative of future expenditure).
- Goal 2 data sources from HM Treasury (2024) and Defra and DfT strategy (2017) give figures with more than one order of magnitude difference, which inhibits interpretation of Need, Budget and adequacy of spend in relation to nature or biodiversity. There is low confidence in the Need as figures are not being adequately sub-divided between goals and targets in the data sources used, which inhibits the distinction of expenditure for air quality improvements in general (e.g., through introduction of electric vehicles or cycle and walking programmes) and those that reflect biodiversity targets (e.g., protected sites). This would require more granular (e.g., target-level expenditure) and/or spatially explicit evidence (e.g., expenditure items for vegetation or for protected sites).
- Goal 3 has a relatively comprehensive evidence base, reflecting a long-standing process of assessing Budget and Actual expenditure for regulatory reporting. However, there is uncertainty in whether the future Need is adequately modelled. Estimated expenditure in-year and in the Short-term assessment period are the primary drivers of total expenditure estimates (i.e., 'highest' % contribution of total expenditure), but this reflects the quality and consistency in the evidence base. Where information is largely quite complete and there is a legacy and standardised reporting of Actual, Budget and Need for regulatory purposes, and that the evidence is regularly updated/reviewed.
- Despite the comprehensiveness of the Goal 3 evidence, it was not possible to disaggregate Budget and Actual expenditure to specific targets. For the Need, the water target impact assessment (Defra, 2022g) allowed this more readily. However, was not possible for Goal 1 (multiple targets in scope) as the majority of expenditure would support multiple targets.

These trends, or lack of pattern across the Database feed into the Catalogue, showcasing the difficulty in making meaningful interpretations on partial evidence within a Goal or in aggregate across goals. This is likely a result of different information generated for different reasons, including that the scope for which figures are generated are not aligned.

Table 3.2: Estimated expenditure in Progress Reporting Period (2024/25), £ million (2024 prices)

EIP23 area	EIP23 Goal	Estimated Expenditure Need	Estimated Budgeted Expenditure	Estimated Actual Expenditure
The apex goal	Goal 1: Thriving plants and wildlife	2,204	245	927
Improving environmental quality	Goal 2: Clean air	41	264	2
	Goal 3: Clean and plentiful water	17,456	8,844	6,238
	Goal 4: Managing exposure to chemicals and pesticides	-	-	-
Improving our use of resources	Goal 5: Maximise our resources, minimise our waste	-	-	-
	Goal 6: Using resources from nature sustainably	90	6	-
Improving our mitigation of climate change	Goal 7: Mitigating and adapting to climate change	-	-	-
	Goal 8: Reduced risk of harm from environmental hazards	43	73	98
Improving our biosecurity	Goal 9: Enhancing biosecurity	4	1	16
Improving the beauty of nature	Goal 10: Enhancing beauty, heritage and engagement with the natural environment	390	8	68
Total in-year expenditure		**20,228**	**9,442**	**7,349**
% of estimated expenditure with low confidence		**0.2%**	**2.9%**	**<0.1%**

Table 3.3: Estimated expenditure in Short-term Assessment Period (2025 – 2030), £ million (2024 prices)

EIP23 area	EIP23 Goal	Estimated Expenditure Need	Estimated Budgeted Expenditure	Estimated 2025-2030 Expenditure
The apex goal	Goal 1: Thriving plants and wildlife	11,020	72	4,554
Improving environmental quality	Goal 2: Clean air	204	1,038	9
	Goal 3: Clean and plentiful water	36,932	37,165	31,192
	Goal 4: Managing exposure to chemicals and pesticides	-	-	-
Improving our use of resources	Goal 5: Maximise our resources, minimise our waste	-	-	-
	Goal 6: Using resources from nature sustainably	448	30	-
Improving our mitigation of climate change	Goal 7: Mitigating and adapting to climate change	-	-	-
	Goal 8: Reduced risk of harm from environmental hazards	216	145	488
Improving our biosecurity	Goal 9: Enhancing biosecurity	20	5	80
Improving the beauty of nature	Goal 10: Enhancing beauty, heritage and engagement with the natural environment	1,948	-	287
Total estimated 2025 – 2030 expenditure		**50,788**	**38,455**	**36,610**
% of estimated expenditure with low confidence		**0.4%**	**2.8%**	**<0.1%**

3.3 Biodiversity expenditure tracker

The Database structure records, on an annual basis, biodiversity investments in the reporting period, and compares it with the expenditure requirements set out in the Catalogue. This structure can be applied consistently in consecutive years giving a Tracker that will enable the OEP to independently assess government's reported expenditure against EIP23 delivery objectives. The Tracker in the accompanying workbook compares estimated in-year expenditure Need, Budget and Actual against the England biodiversity funding indicator (Defra, 2024b).

The usefulness of the Tracker depends on whether it can confidently compare to Total Biodiversity Expenditure as reported in Government statistics. As mentioned, robust disaggregation across goals and/or targets is not feasible with the information available in the public domain. Table 3.4 indicates that total Actual expenditure in 2024/25 is estimated to be seven times higher than reported biodiversity funding in England (Defra, 2024b). This appears to indicate that potentially Government is underestimating expenditure attributable to biodiversity. However, it was not possible to identify the reason for this

discrepancy. Although a method statement is available for Defra's biodiversity funding indicator, it is unclear what figures make up the total funding reported and to what extent this is representative of the overall funding attributed to biodiversity outcomes in England (i.e., has majority of expenditure been captured across agencies, actions etc). Based on this, it seems the scope of the evidence collected and included for this study differs to the England indicator, therefore any comparison that is currently possible (e.g., total) is limited by consistency in scope.

Based on understanding of gaps between Need, Budget and Actual expenditures, a further development in the functionality of the Tracker would be to add identified shortfalls to future expenditure Needs. In principle where a shortfall is identified in current spending against Needs, the value could be allocated to future years, allowing the tracker to reflect any accumulation of expenditure shortfalls over time. This would be best applied on 'aggregate' expenditure estimates (i.e., aggregate across goals) – however questions to resolve before such an approach was applied include:

- Is the data there (i.e., can capital expenditure be identified)? The Database classifies data points by expenditure type, identifying whether recorded expenditure refers to one-off and/or on-going expenditure. Functionality could be added to the Workbook to only include capital expenditure items in the Tracker and/or carry forward any potential shortfalls in this allocated expenditure. This would be consistent with HM Treasury reporting of allocated resources between periods, whereby any underspend in the current period is carried over to the next period (HM Treasury, 2024).
- Is there sufficient data on future expenditure Need? The Catalogue aims to estimate expenditure in-year and across three reporting periods (2025-30, 2031-2042, 2043-50) however, there is limited evidence on expenditure after 2030, including data points that support forecasting future expenditure Needs. Therefore, the conservative forecasting assumptions applied makes it difficult to capture the increasing spending need due to current shortfalls.
- Can estimates be reported in a different way? For example, shortfall in expenditure primarily relates to capital spend, therefore would reporting a shortfall or potential underspend as a cumulative figure across goals (e.g., 2025-2030) support better communication of results. Reporting in cumulative terms would then avoid trying to model future expenditure using incomplete evidence.

Table 3.4: Comparing estimated in-year expenditure with England biodiversity funding indicator, £ million, 2024/25 (2024 prices)

EIP23 area	EIP23 Goal	Estimated Expenditure Need	Estimated Budgeted Expenditure	Estimated Actual Expenditure	England Funding for Biodiversity (Defra, 2024)
The apex goal	Goal 1: Thriving plants and wildlife	2,204	245	927	
Improving environmental quality	Goal 2: Clean air	41	264	2	
	Goal 3: Clean and plentiful water	17,456	8,844	6,238	
	Goal 4: Managing exposure to chemicals and pesticides	-	-	-	
Improving our use of resources	Goal 5: Maximise our resources, minimise our waste	-	-	-	
	Goal 6: Using resources from nature sustainably	90	6	-	
Improving our mitigation of climate change	Goal 7: Mitigating and adapting to climate change	-	-	-	
	Goal 8: Reduced risk of harm from environmental hazards	43	73	98	
Improving our biosecurity	Goal 9: Enhancing biosecurity	4	1	16	
Improving the beauty of nature	Goal 10: Enhancing beauty, heritage and engagement with the natural environment	390	8	68	
	Total in-year expenditure	**20,228**	**9,442**	**7,349**	**1,065**

3.4 Gaps and uncertainties

The results described above highlight that there are several gaps and uncertainties arising at both the evidence collection and analysis stages. Their treatment and resolution have often involved expert judgment or additional assumptions being applied. The structure of the Workbook ensures that this is recorded transparently (e.g., reason to select a data point, bespoke adjustments to evidence).

Baseline evidence: As this study aims to track total expenditure, evidence recorded in the Database should reflect 'total' values rather than 'marginal' values to enable monitoring over time – this ensures that the type of data recorded is consistent within the Database. This includes distinguishing current expenditure (e.g., already committed for a given period) from future expenditure (e.g., future commitment or future budget). Therefore, the Database supports establishing an understanding of 'the current state of the world', reflecting relevant expenditure evidence for the assessment time period. Historical trends in expenditure are not directly captured in the Database as this was beyond the scope of this study but can be included to

support future profiling of expenditure for the Catalogue and capturing potential areas of underspend and/or allocation.

As the expenditure Need has largely been defined by government impact assessments, the scope of expenditure is consistent with the defined scenario and total expenditure. Note however, that the counterfactual total expenditure reported in government impact assessments have not been included in the Database in this iteration, this could be added in future as needed.

Meanwhile, for Budget and Actual expenditure evidence there are some instances where additionality between Government commitments has not been clear. This is a result of how expenditure is reported, and whether links to previous announcements are made and/or if the same figures have been reported across evidence sources and not cross-referenced. Therefore, additional effort can be required to determine whether two data points are additive. Making this distinction becomes more important as part of updating the Database for future reporting periods (i.e., distinguishing new or revised announcements) and in light of changes to government resource allocations.

Evidence available for Goal 2 (Clean Air): There is uncertainty in how Air Quality targets in scope are going to be met (e.g., the pathway for National Emissions Ceiling Regulations). This also reflects the nature of the evidence available to assess targets within Goal 2, where the majority of available evidence relates to wider air quality reduction programmes (e.g., electric vehicles, cycling and walking schemes) which support achieving the full suite of targets in Goal 2. How and to what extent these programmes are motivated by biodiversity outcomes separately to human health outcomes is largely unknown.

Within the Database this uncertainty is captured in the confidence in the alignment of evidence to the Primary Goal. All data points available for Goal 2 have a low confidence rating in its alignment to Goal 2 and the targets in scope in this study. This low confidence carries through to estimated expenditure Need, Budget and Actual for Goal 2 and reported in Section 3.2 – in absence of this evidence, an estimate for Goal 2 would not be feasible. This is an area that would benefit from further review by OEP policy experts to identify relevant literature and/or work through assumptions on adjustments.

Low confidence or lack of evidence for other Goals: Additionally, whilst only a small percentage of the total expenditure calculated across the two time periods for Goal 6 is rated as low confidence, it applies to 100% of the progress reporting period and short-term period Budgeted expenditure. Similarly to Goal 2, all evidence for Goal 6 Budgeted expenditure is rated as low confidence in its alignment to Goal 6, meaning that without the inclusion of a low confidence figure, there would be no estimated expenditure. The remaining goals have been calculated using evidence with medium to high confidence.

Assumptions and adjustments: To enable analysis of the expenditure Need, Budget and Actual expenditure for a Goal, some of the evidence selected in the Database required additional assumptions and adjustments to align with the project scope. This primarily included annualising reported figures (e.g., if reported as Present Values, or Total expenditure over a reporting period) and adjusting expenditure to reflect expenditure related to England. The details of these assumptions, and extent to which they have been applied in the Goal calculations are provided in Appendix 4. In most cases, default assumptions are made consistently across data points (e.g., area-based factors to scale expenditure to England vs Great Britain).

A significant gap has been identifying a proportion of total expenditure that is driven by achieving direct biodiversity outcomes. A bespoke adjustment factor has been applied in estimates for Goal 2 and Goal 8, where evidence in the Database capture total expenditure on achieving Air Quality goals or expenditure for FCERM, respectively. Although relevant to achieving EIP23 goals, the full value is not motivated by direct biodiversity outcomes. These assumptions are based on best available evidence (e.g., historic reporting of natural flood management as a proportion of total FCERM budget) and can be refined in future iterations.

Time period allocation and forecasting: Not all evidence has clearly reported and/or stated start and end periods. The Database allows the user to enter 'not specified', whilst the calculation worksheets apply automated assumptions if evidence is selected to support analysis. The following assumptions allow the recorded information in the Database to be applied robustly, rather than relying on modelled assumptions:

- Where start and end years are **given**, these are used as appropriate. Therefore, limitations of the data are accepted (e.g., if evidence on expenditure up to 2042 is not available, the calculation worksheets display 'No Data').
- Where start or end years are **'not specified', and data reflects an annual or total cost**, it is assumed representative of current parliamentary period and can be used to estimate expenditure in the current progress reporting period (i.e., 1 year) and short-term assessment period (2025-2030).
- Where data is **only available for 1-year and is not a 'one-off'** expenditure (e.g., Defra grant in-aid to the Environment Agency), it is assumed this is reflective of the current parliamentary period and can be used to estimate expenditure in the current progress reporting period (i.e., 1 year) and short-term assessment period (2025-2030).

These approaches reflect the evidence available in the Database, where budgetary evidence is lacking, and minimises the use of additional modelling, ultimately these are conservative assumptions for forecasting. As such, expenditure past 2030 is only reported where there is a reasonable source for it in the Database (e.g., impact assessments, committed budgets). Given the lack of relevant information, extrapolating the data beyond 2030 would largely show the same results as for the 2025-2030 period, and would be the product of extrapolation assumptions rather than real evidence. With that said, this is an area where future evidence is expected to be made available, through Spending Review, departmental and/or policy budgets and action plans.

4. Discussion

This section provides commentary on the availability and quality of expenditure evidence and gaps and uncertainties in calculations.

4.1 Comparison to previous assessments

This section reviews required spend as reported and estimated in the GFI's assessment of the UK nature finance gap (GFI, eftec, and Rayment Consulting Services, 2021). Although in principle this study is similar to this previous assessment, there are contextual differences that result in expenditure estimates varying between the two studies. This includes the timing of and policy development since the GFI assessment was undertaken, most notably publication of Environment Act target impact assessments.

The GFI assessment of the UK nature finance gap provided a foundation for assessing the required and committed expenditure on nature-related outcomes and making the supporting evidence on the finance gap publicly available. This work later helped to inform the Environment Act Targets Overarching Impact Assessment (Defra, 2022e) by providing an estimate of the necessary governmental contribution to biodiversity funding.

Table 4.1 shows the required spend (referred to as the Need in this work) from the GFI assessment across five nature-related outcomes which are comparable to targets which are in scope in this report.

Table 4.1: GFI, eftec, and Rayment Consulting Services (2021) central estimates for 2022-32 expenditure on selected nature-related outcomes compared to eftec (2025), £ million (2024 prices)

Nature-related Outcome in GFI (2021)	Associated EIP23 goal	Location	GFI et al. (2021) Required Spend (2022-32)	eftec (2025) Expenditure Need (2025-2030)
Clean Water	Goal 3	England	9,324	36,932
Protect and/or restore biodiversity	Goal 1	England	15,810	11,020
Reduce flood risk through natural flood management	Goal 8	England	577	216
Improve bio-resource efficiency	Goal 6	England	4,743	448
Enhance biosecurity	Goal 9	UK	2,363	20
Improve access and engagement with natural environment	Goal 10	England	13,904	1,948

Notable differences in the methodological approaches of the GFI assessment and this study, which could explain some discrepancies in the comparison of the data, include but are not limited to:

- **Nature vs biodiversity outcomes:** For the GFI assessment, outcomes were defined based on 25YEP and captures nature-related outcomes, this study is more directly linked to EIP23 targets and

outcomes, focusing on biodiversity-related expenditure. Not all nature-related expenditure is assumed to be biodiversity-related. For example, for "Improve access and engagement with natural environment", GFI looks at all aspects of the goal including access to nature, whereas this project scoped out multiple Goal 10 targets due to being low priority and a lack of target deadlines. This rationalises the large discrepancy between the GFI database estimate for the required spend and this study's estimate for the Need on this goal.

- **Geographic scope:** This study has a more limited scope, focusing on public sector and eNGO expenditure by English agencies to achieve biodiversity-related outcomes in England. For example, the large discrepancy between the GFI database and this study's estimate for biosecurity expenditure Need can partly be attributed to these geographic differences. Whilst both projects use some similar evidence such as the House of Commons Invasive Species report (Environmental Audit Committee (EAC), 2020) and the Invasive Species Rapid Response Working Group (Invasive Species Rapid Response working group, 2018), this project adjust figures to represent only England spend compared to the GFI database including all GB and UK expenditure. For example, the GFI database includes the Gunn et al. (2007) data source which accounts for over £2 billion in required expenditure but is out of scope for this project.
- **Evidence type scope:** The GFI assessment analysed spending required (redefined as the Need in this study) and committed (redefined as the Budget in this study). The GFI assessment's database does not provide an explicit estimate of 'Actual' expenditure but rather uses data sources for budget allocations as representative of actual expenditure. This means actual expenditure may be overestimated, if there is underspend.
- **Inclusion of government impact assessments:** As the GFI database supersedes the Environment Act (*Environment Act 2021*, 2021) definition of 'required' and evidence used to assess it is modelled or based on previous analysis. This study uses the Environment Act Impact Assessments to define the expenditure 'Need' for the relevant Goals, reflecting Government's latest thinking and the 'Need' the OEP is tracking.

  The GFI assessment used the Environment Agency's River Basin Management Plan (Environment Agency, 2015) to help capture required spend for goal 3. Since the GFI database was created, there has been an updated version, therefore there is additional estimated expenditure Need captured in this study from the updated river basin management plan (Environment Agency, 2022). This project also uses evidence on the water targets from the Environment Act Impact Assessments (Defra, 2022g) which were also published after the GFI work.
- **Time period allocation and forecasting:** Assessment time periods vary; however key difference is in how evidence is projected over these assessment periods. The GFI database projects average expenditure across the assessment periods (i.e., 2022-32, 2022-42, 2022-52). This study takes a more conservative approach, using the stated time periods within the reference and limiting any projections to be within the short-term assessment period (2025-30), see Appendix 4 for further details on time profiling assumptions used.

  Furthermore, the GFI database uses an "optimistic spending assumption" that the spending continues beyond the commitment period reported in the data, whereas this project does not extend further than is reported in the literature.

Although on the surface these assessments appear similar – the difference in study scope and type of

evidence included does not facilitate direct comparisons in figures.

4.2 Availability and quality of data

Table 4.2 provides an overview of the evidence reviewed, synthesised and aggregated across the Workbook. Less than a third of references reviewed provided evidence that was selected for Goal-level calculations, with 35% of the data points in the Database used in Goal calculations and reported in the Catalogue. This reflects the quality of data and level of reporting on biodiversity expenditure, which was aligned to the EIP23 goals and the application of the evidence selection hierarchy. Note selection for the Goal calculations and consequently the Catalogue, has taken a conservative approach.

Table 4.2: Summary of references and data points in the Database and the Catalogue

Counts of	Total	Included in the Database	Selected for the Catalogue
References	93	45	28
Data points	482 (minimum)	482	168

The following observations on the coverage and quality of evidence illustrate the challenges in compiling and interpreting the database. Disaggregation issues and inconsistencies in reporting were identified during the synthesis of the evidence, and the resulting gaps and uncertainties are detailed in Appendix 6:

- Access to the breakdown of the England biodiversity funding indicator (Defra, 2024b). The funding indicator dataset provides a total estimate for Public Sector and eNGOs, with a method statement describing the actors (e.g. ALBs, NGOs) reflected as well as listing programmes and activities. However, to support monitoring and/or tracking having a cross-tabulation of this evidence would be useful. It would also minimise effort required to collate evidence on an annual basis, and avoid double-counting (e.g., reviewing ALB annual reports and/or programme specific reports).
- The Database highlights the lack of clarity on how money flows between public sector, eNGOs and other actors. This makes double-counting between evidence sources a high risk, and/or reflects a trade-off in how evidence is selected to support calculating biodiversity expenditure Need, Budget and Actuals.
- Lack of evidence on targets related to marine and coastal biomes reaffirms that this is a recognised evidence gap and requires further consideration in impact assessments and budgets. A breakdown by biome (e.g., terrestrial vs freshwater vs marine and coastal) of the England biodiversity funding indicator would be useful to get a better understanding of the state of evidence, and/or where it is reported. In particular, the extent to which public sector resources (e.g., Defra, he Environment Agency) are allocated to marine-based actions in relation to achieving EIP23 targets such as marine Good Ecological Status in Goal 1 and Goal 6.
- With respect to WFD targets (ecological and chemical status) it appears that evidence on the Need and Budget, and as default Actual spending going towards the 2063 target is unknown and/or unreported. However, it is acknowledged that achieving the WFD ecological status target in 2027 will contribute towards this outcome.

- An important gap in expenditure data is on INNS prevention and/or eradication. Evidence so far reflects an emphasis on addressing established INNS, rather than future prevention.

In light of these issues, there were challenges in selecting the most relevant evidence for the analysis – an example is provided in Box 4.1.

Box 4.1: Example data selection – Nature for Climate Fund

In some cases, expenditure on specific actions, projects or funds have been reported in multiple sources. The Nature for Climate Fund is a clear example of where expenditure is reported by multiple agencies, but with varying figures.

The total expenditure on the fund was reported as:

- £640 million in Natural England's Annual Report and Accounts (Natural England, 2023) and Nature for People, Climate and Wildlife (Defra, 2021)
- £650 million in the Independent Assessment of UK Climate Risk (Committee on Climate Change (CCC), 2021)
- £750 million in a government pledge by Defra and Forestry Commission (2023).

Similarly, the proportion of expenditure on peatland restoration was reported as:

- £50 million in the England Peat Action Plan (UK Government, 2021) and Nature for People, Climate and Wildlife (Defra, 2021)
- £55 million in Natural England's Annual Report and Accounts (Natural England, 2023).

In these instances, only the most recent figures reported were included in the calculations to avoid double-counting or using outdated information.

The quality and availability of data reflects the state of evidence informing Government decision-making, and the degree to which evidence can be aligned to EIP23 goals and targets. The Database illustrates that evidence reviewed and collected can always be aligned to an EIP23 Goal, but whether that expenditure data point can be linked to a single target or set of targets is not straightforward. Equally, an added complicating factor has been whether evidence includes expenditure related to targets not in scope of this study (e.g., Goal 2). These challenges are partially attributed to the study purpose defined in Section 2.1.1, where expenditure is limited to direct biodiversity outcomes. As the study focuses on establishing a structure to enable analysis, the accompanying Excel Workbook has been designed to allow for changes in scope in future iterations – therefore guidance in Appendix 5 remains applicable even if scope and selection criteria change.

Figure 4.1 illustrates the amount of evidence collected and selected to estimate biodiversity expenditure Need in the Progress Reporting Period (2024/25). Note that overall, evidence selected and used in the analysis has medium to high confidence in alignment to the relevant Goal, with the exception of Goal 2 where confidence in alignment is low. The figure below illustrates that there is a lot of variation in the data available to support estimating expenditure, for example estimated biodiversity expenditure Need for Goal 3 is approximately £17 billion and is comprised of 17 data points across four references, whilst Goal 1 expenditure Need uses 19 data points from three references but produces a significantly lower estimate (£2 billion). There is limited discernible pattern when looking at the relationship between number of

references, data points and estimated expenditure.

Further review or revisions to the evidence base should reflect the upcoming Spending Review, revisions to the EIP, and assessments of budgetary needs. The Database highlights that there is a lack of budget references which results in uncertainty in future funding and indicates a lack of steady funding across many goal areas, whether for organisations or programmes.

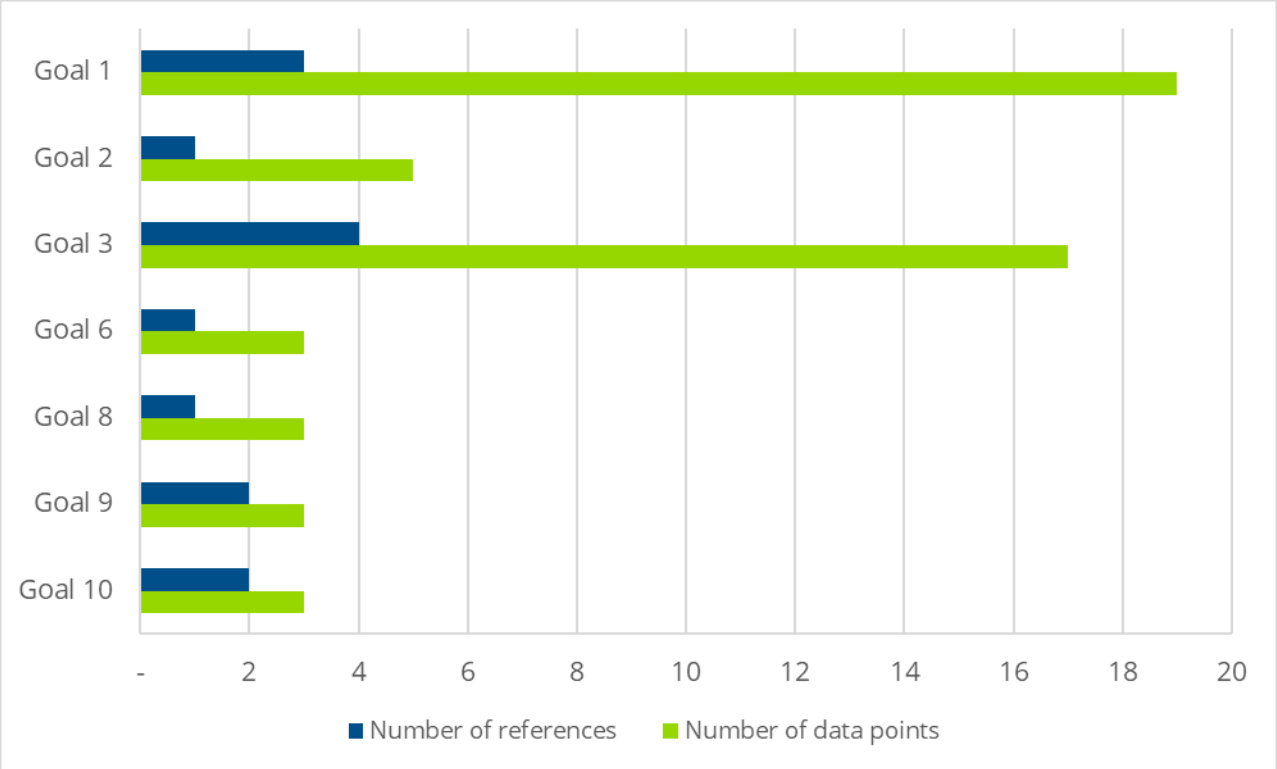

Figure 4.1: Assessment of evidence selected to estimate expenditure Need in Progress Reporting Period (2024/25)

4.3 Comparability of estimated expenditure need, budget and actual

The analysis reports estimate of biodiversity expenditure in the Catalogue across three dimensions: primary Goal, evidence type, reporting time period. As a minimum, the structure allows recording, reporting and tracking of actions and overall investment in a goal area. What is limited, due to how evidence is currently reported, is tracking at the target-level. Where possible, the Database and Goal calculation worksheets show estimated expenditure for a target, but this reflects clear reporting within the underlying references.

Differences in the comprehensiveness of reporting across evidence type, also limits comparability between the Need, Budget and Actual expenditure. This occurs even at the aggregate level for a Goal, where Goal 3 seems to have the most comprehensive and consistently reported reference base. This reflects a legacy of reporting and regulation of the water sector in general. Other EIP23 goal areas do not appear to have this, even in more recent government reports there is a lack of reporting the purpose of expenditure and how it links to overall policy objectives. This has made not only aligning evidence to a primary Goal difficult but

also inhibits understanding of potential overlaps in expenditure or contributory expenditure for secondary goals.

The differences in estimated Need, Budgets and Actual expenditure reflect the available evidence in the Database, so do not capture the full reality of what is spent and future resource allocations. The Database does reflect that there is a lack of evidence on committed future expenditure and/or budgets, and uncertainty in future funding (e.g., continuation of the Nature for Climate Fund, which supports delivery of actions against a set of EIP23 targets). This is consistent with the OEP's 2023/24 annual progress report, where assessment of progress is limited due to data availability and lack of delivery planning information.

As explained in Section 3.4, the uncertainty in future funding streams is illustrated through the approach taken to forecast future funding over the short-, medium- and long-term reporting periods. Whereby, current funding streams are not assumed to continue over time, but rather future expenditure reflects stated start and end periods in the reference. It is expected that as new evidence is added to the Database (e.g., from Spending Reviews, updated strategy documents) these forecasts will be reflective of allocated and committed budgets in the future – enabling more robust comparison between the estimated Need and Budget.

In the short-term, an option to help further interpretation of the Catalogue would be to set rules capping estimated expenditure in the Goal Calculation worksheets to ensure that:

- Budget is less than or equal to Need;
- Actual is less than or equal to Budget; and
- These rules would be subject to adjustment if an evidence source for Budget or Actual has higher confidence than the other sources – in which case data could be aligned to the source where confidence is higher.

An example of the logic of these 'rules' are shown in the Goal 9 Calculation worksheet in the Final Workbook submitted alongside this report. Ultimately, whether results are adjusted (e.g., through capping rules) will depend on the conclusions and monitoring need from the OEP.

5. Conclusion and recommendations

This section summarises the conclusions drawn from the Database, Catalogue and Tracker, with more detail presented in Sections 3 and 4. Recommendations to improve the data, its interpretation and uses by the OEP are also provided.

5.1 Summary of findings

This study provides an approach and analysis structure to collect, synthesise and aggregate evidence on expenditure on achieving selected EIP23 goals and targets. The expenditure evidence summarised in the Database and presented in the Catalogue and Tracker reflects outcomes directly related to EA21 species abundance targets, overlapping targets and commitments in the EIP23 in England, and biodiversity-related expenditure to achieve domestic targets in-year and over time.

The study outputs represent the first step in establishing a functional Excel workbook and structure to report expenditure evidence. It identifies existing evidence gaps which influence the interpretation of results in the Catalogue and Tracker. Recommendations are provided (see Section 5.2) to improve the workbook's functionality, and how evidence is reported by public bodies to support reporting, monitoring and tracking biodiversity expenditure over time.

Findings from the Biodiversity Expenditure Database include:

- Availability and quality of data is variable across the EIP32 goals in scope. The Database is composed 47 references, of which 28 provide evidence that was selected for Goal level spending calculations. This reflects the quality of data and level of reporting on expenditure on direct biodiversity outcomes that was aligned to the EIP23 goals and the application of the evidence selection hierarchy in this study. Note selection of evidence for the Goal calculations and consequently the Catalogue, has taken a conservative approach.
- Expenditure overlaps between goals have been identified but not accounted or adjusted for. The Excel workbook includes an alignment system used to show the expected relevance of each expenditure to multiple EIP23 goal, as well as the coverage of these overlaps in the Database. The Database indicates where spending on primary goals contribute to secondary goals, most notably expenditure attributed to EIP23 Goal 1 and Goal 3.
- Further, there are few instances where expenditure can be attributed to a single target, rather than a set of targets within a goal (e.g., Goal 1 species abundance targets) or between targets (e.g., overlaps between Goal 1 targets and other goal targets). This reflects how figures are reported in the references reviewed, and that expenditure on one action can serve multiple goals/targets.

In aggregating data points from the database into the Biodiversity Expenditure Needs Catalogue the following challenges inhibit the conclusions that can be drawn:

- Estimated expenditure in the Catalogue indicates where expenditure in one goal is likely to support multiple targets within it and/or contributes to at least one target in another goal.
- Estimated expenditure for the Progress Reporting period and over time reveals a lack of discernible pattern across Need, Budget, and Actual expenditure that limits the ability to draw conclusions on

expenditure between goals. This reflects weaknesses in the underlying evidence on how much is being spent now and planned future spending. The results indicate that there is uncertainty in not only future funding, but that current funding sources are not steady in many goal areas.

- There are trends in some expenditure areas in the Database, but some expenditures lack a clear pattern over time, and evidence within a Goal or in aggregate across goals is often partial. This makes meaningful interpretations of spending patterns in the Catalogue difficult. There are actions and programmes aimed at delivering biodiversity outcomes for which it is unclear how much is spent, where and for what.

The usefulness of the Tracker depends on whether it can confidently compare to Total Biodiversity Expenditure as reported in Government statistics. Results in Section 3.3 shows a discrepancy in estimated Actual expenditure in this study and that reported in Defra (2024). However, the reason for this could not be identified from evidence available for this work and requires further review of methods and underlying data used in Defra (2024).

There is scope to improve the quality of the Tracker and further improve its functionality. For example, in considering how identified shortfalls in expenditure should be treated.

The data availability and quality on expenditure reflects the current state of evidence supporting Government decision-making. The results described above highlight that there are several gaps and uncertainties arising at both the evidence collection and analysis stages. Although this has required a degree of expert judgment or additional assumptions, the estimated values are based on evidence with a medium-high confidence.

The structure of the Workbook allows new evidence to be added to the Database, selected for the Catalogue and compared in the Tracker. This process works for different types or levels of information (e.g., programme or fund, organisation budget or annual reports). It supports future updates to improve the breadth and depth of evidence recorded in the Database, whilst enabling improvements to functionality to be targeted and prioritised against more consistent reporting of current and planned expenditure levels.

5.2 Recommendations

The main recommendations for further work relate to expanding the breadth and depth of current evidence used, improving future spending evidence from government, and future use of the Database.

Improve the breadth of evidence across the EIP23 goals and targets.

The Database reflects what could be analysed with the resources for this project and the available evidence up to 31 December 2024, prior to a revision of the EIP23 and the Environment Act Targets. So, it is recommended that:

- Further review or revisions to the evidence base should reflect both updates to existing evidence and new evidence in the 2025 Spending Review statement and assessments of budgetary needs.
- Key sources of spending evidence should be kept up to date. For example, keeping of Goal 1 expenditure Needs (Rayment, 2021) up to date would be useful to ensure consistent reporting or assessment of Need to Target.

- Evidence from policy evaluation (i.e., ex post assessments, value for money) on the effectiveness of spending and other policy actions towards achieving biodiversity targets should be used to adjust spending targets accordingly. Evaluation approaches should specify the requirement for relevant evidence to enable this.
- The scope of the Database and catalogue could be expanded to include private sector spending and government actions to enable it. Although beyond the scope of this study, private sector expenditure is being reported by HM Treasury (2024).

Improve the depth of evidence within an EIP23 goal.

There is a need to clarify how policies work together to achieve biodiversity targets, to avoid duplication of effort, both spatially and by issue. To do this it is recommended that:

- Encourage clearer reporting, by public sector agencies, on strategic objectives, purpose and scope of spending.
- Better identify how spending evidence relates to EIP23 goals and their targets, reporting on 'strategic objectives' such as how policy or programmes link to EIP23 goals. For example, Defra and arm's length bodies can be clearer in annual reports and strategy documents on how policies work together to avoid duplication of effort, both spatially and by issue, as well as how spending on one issue contributes to or supports other goals.
- Map policy and programmes to identify what spending is key for the EIP23, and which goals they relate to (and targets if possible). This should identify how funds are allocated and why, and also whether funding is supporting multiple goals. Mapping can be carried out from the point of view of policy objectives, and in terms of the spatial location and targeting of expenditure.
- Review known policies, schemes and programmes to identifying which are or are not captured in the Database and then develop more detailed spending evidence related to them. For example, ICF (2023) identified policy schemes and programmes that are linked to Goal 1 through a mapping exercise. This type of policy mapping could be used to perform targeted evidence searches on known gaps, prioritisation of regularly reported evidence (e.g., programme level strategy documents and/or annual reports), and be repeatable for other goals. HM Treasury (2024) Green Finance Programme Allocation report is a good example of what this could look like, whilst being more explicit on the alignment to the EIP23 goal areas that programmes are supporting.
- Review and refine alignment of goals and targets, to identify how achieving one target can support the achievement of another – either in part (e.g., how WFD ecological target supports WFD chemical status target) or in full (e.g., interlinkages between Statutory targets with same deadline). This would further enable categorisation of the nature of this relationship, and whether expenditure has a direct or indirect effect on the target outcomes.
- In future iterations, there is potential to expand the scope of the current review to move beyond 'direct biodiversity outcomes' in order to include EIP23 targets within a Goal that it indirectly contributes to achieving. This would, for example, enable additional evidence under Goal 2 to be included in the evidence base and reduce the need for additional assumptions.

Improve analysis through evidence collection, selection and estimation approaches

To encourage more consistent reporting of spending in the Defra family, so it can be more readily incorporated into the Database, it is recommended that:

- Recommend ways for the Defra family to increase consistency in reporting of expenditure data, such as stating time periods and type of value. Lack of time period reporting (i.e., start and end dates of expenditure items) has resulted in conservative assumptions made to forecast the Short-term Need, Budget and Actual, each of which create additional uncertainty in the analysis.
- The OEP could use the analytical structure of the database to create a simple Data Request template to update the results. Section 2 and Appendix 4 outline the conceptual and analytical approach to calculating biodiversity-motivated expenditure in England, including the assumptions necessary to transform the raw underlying costs data. The information could be converted into an excel data request (or a simple questionnaire/list) to share across the relevant government bodies (e.g., HM Treasury, JNCC, Defra, Natural England, Environment Agency). This would have the benefit of: (a) consistently collecting the most relevant expenditure on a programmatic scale; (b) minimising risks of double counting; and (c) is relatively low cost (subject to cross-departmental support).
- The difference between negative impacts (e.g., dis-benefits), expenditure (i.e., costs) and avoided costs (i.e., benefits) should be made clearer within government impact assessments. Especially if expenditure information is not explicitly included.
- Follow-up with relevant evidence source leads, such as publishing department(s) or programme leads to refine categorisation of evidence in the Database. This can help with:
    - Managing and mitigating risk of double-counting,
    - Distinguishing between resource expenditure and capital expenditure, and
    - Identifying where expenditure is truly additional to previously reported figures (e.g., one-off announcements not stating how it supports previous budgetary announcements).

Continue to use the Database.

To continue to use the Database to collate information and inform policy implementation, and engage Defra and JNCC on spending evidence, it is recommended that:

- The OEP could share the Database structure with Defra and JNCC to encourage systematic and structured recording of expenditure towards EIP23 goals and targets. This would also support Defra's progress reporting against the CBD targets (or other Multilateral Environmental Agreements), in particular tracking against Targets 18 (reducing harmful incentives and scaling up positive incentives for biodiversity) and 19 (mobilise financial resources to implement the UK National Biodiversity Strategy and Action Plan (NBSAP).
- The OEP should advocate for cross-departmental collaboration and data sharing. There are a range of needs from the same evidence and data generated by this report (and underlying evidence sources) by multiple government bodies (e.g., HM Treasury, Defra, and its ALBS (e.g., JNCC, Environment Agency)). This emphasises the need for strengthened collaboration, to ensure that statistics are comparable, differences well understood, and that evidence is generated in cost -

effective manner and used appropriately (i.e., the same statistics not created twice or used incorrectly).

- The OEP can use collected evidence for further modelling and scenario analysis, such as of medium-term and long-term expenditure Need and Budget. The Database sets up a structure to undertake this modelling exercise, which would help OEP understand and asses prioritise key spending evidence gaps. For example, (a) the impact of linking expenditure between the goals (i.e., to what extent do assumptions around the overlaps reducing the overall Need or Budget for biodiversity-motivated expenditure); and (b) those scenarios where the budget and actual expenditure is commensurate with the need over the necessary timescales.

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Appendix 1 – EIP23 goals and targets in scope

Appendix Table 1 : Screening of EIP23 goals and targets

EIP23 area	EIP23 goal	Target type	Target description	Scoped In
The apex goal	Goal 1: Thriving plants and wildlife	EA21	By the end of **2030**, we will halt the decline in species abundance (2030 species abundance target).	Y
		EA21	By the end of **2042**, we will increase species abundance so that it is greater than in 2022 and at least 10% greater than in 2030 (long-term target to reverse the decline of species abundance).	Y
		EA21	By the end of **2042**, we will improve the Red List Index for species extinction compared to 2022 levels (long-term species extinction risk target).	Y
		EA21	By the end of **2042**, we will restore or create in excess of 500,000 hectares of a range of wildlife-rich habitats outside protected sites, compared to 2022 levels (long-term wildlife-rich habitat restoration or creation target).	Y
		EA21	By the end of **2050** at least 16.5% of all land in England is covered by woodland and trees outside woodland (2050 target for woodland and trees outside woodland).	Y
		EA21	Ensure that 70% of designated features in marine protected areas (MPAs) are in favourable condition by **2042**, with the remainder in recovering condition (target for the condition of protected features in relevant MPAs).	Y
		Other targets or commitments	Restore 75% of protected sites to favourable condition by **2042**.	Y
		Other targets or commitments	65–80% of landowners and farmers adopting nature-friendly farming on at least 10–15% of their land by **2030**.	Y
		Other targets or commitments	Take the necessary measures to achieve or maintain good environmental status of marine waters within the marine strategy area (deadline passed on 31 December **2020**)	Y
		Other targets or commitments	Ensure that by **2030** at least 30 per cent of areas of degraded terrestrial, inland water, and marine and coastal ecosystems are under effective restoration	Y

		Other targets or commitments	Ensure and enable that by **2030** at least 30 per cent of terrestrial and inland water areas, and of marine and coastal areas, are effectively conserved and managed through ecologically representative, well-connected and equitably governed systems of protected areas and other effective area-based conservation measures	Y
Improving environmental quality	Goal 2: Clean air	EA21	By the end of December 2040, the annual mean level of PM2.5 in ambient air must be equal to or less than 10 µg/m³ (annual mean concentration target for PM2.5).	N
		EA21	At least a 35% reduction in population exposure to PM2.5 by 31 December 2040 compared to the 2016–2018 baseline period (population exposure reduction target for PM2.5).	N
		Other targets or commitments	Legal emission reduction targets for five damaging pollutants by **2030** relative to 2005 levels: Reduce emissions of nitrogen oxides by 73%; Reduce emissions of sulphur dioxide by 88%; Reduce emission of PM2.5 by 46%; Reduce emissions of ammonia by 16%; Reduce emissions of non-methane volatile organic compounds by 39%.(National Emission Ceilings Regulations emission reduction commitments).	N
		Other targets or commitments	Legal concentration limits for a number of other key pollutants. (Air Quality Standards Regulations limits, targets and long-term objectives - 12 pollutants to protect human health and vegetation).	Y
		Other targets or commitments	Reduce damaging deposition of reactive forms of nitrogen by 17% over England's protected priority sensitive habitats by **2030** (Clean Air Strategy).	Y
Improving environmental quality	Goal 3: Clean and plentiful water	EA21	Reduce nitrogen (N), phosphorus (P) and sediment pollution from agriculture into the water environment by at least 40% by **2038** compared to a 2018 baseline (agriculture water target).	Y
		EA21	Reduce phosphorus loadings from treated wastewater by 80% by **2038** against a 2020 baseline (wastewater target).	Y
		EA21	Halve the length of rivers polluted by harmful metals from abandoned mines by **2038**, against a baseline of around 1,500km (abandoned metal mines water target).	Y
		EA21	Reduce potable water demand in England per head of population by 20% from the 2019/2020 baseline reporting figures by 31 March **2038** (water demand target).	N
		Other targets or commitments	Each body of surface water to achieve or maintain good ecological status or potential by **2021** or the revised objective date of **2027** for 77% of surface waters.	Y

		Other targets or commitments	[By **2050**] water companies will only be permitted to discharge from a sewer overflow where they can demonstrate that there is no local adverse ecological impact.	N
		Other targets or commitments	Water companies to cut leaks by 50% by 2050. We will reduce leakage by 20% by 31 March 2027 and 30% by March 2032.	N
		Other targets or commitments	Ensure that all bathing waters are classified at least as 'sufficient' (deadline passed at the end of the bathing season in **2015**).	N
Improving environmental quality	Goal 4: Managing exposure to chemicals and pesticides	Other targets or commitments	Substantially increase the amount of persistent organic pollutants (POPs) material being destroyed or irreversibly transformed by **2030**, to make sure there are negligible emissions to the environment.	N
		Other targets or commitments	Seek to eliminate the use of polychlorinated biphenyls (PCBs) by **2025**.	N
		Other targets or commitments	Reduce land-based emissions of mercury to air and water by 50% by **2030**.	N
		Other targets or commitments	At UN Nature Summit COP15, through the Kunming-Montreal Global Biodiversity Framework, we agreed to contribute to the global target of reducing pollution risk by 2030. (Reduce the overall risk posed by pesticides and highly hazardous chemicals by at least half in line with Kunming-Montreal Global Biodiversity Framework Target 7.)	N
		Other targets or commitments	Each body of surface water (other than an artificial or heavily modified water body) to achieve or maintain good surface water chemical status by **2063** (extended from 2021) (Water Framework Directive Regulations).	Y
Improving our use of resources	Goal 5: Maximise our resources, minimise our waste	EA21	By the end of 31 December 2042, the total mass of residual waste for the calendar year **2042** does not exceed 287kg per head of population in England (the residual waste long-term target).	N
		Other targets or commitments	Eliminate avoidable waste by **2050** and double resource productivity by **2050** (25YEP).	N
		Other targets or commitments	Explore options for the near elimination of biodegradable municipal waste to landfill from 2028.	N

		Other targets or commitments	Eliminate avoidable plastic waste by 2042.	N
		Other targets or commitments	Seek to eliminate waste crime and illegal waste sites by **2042**, prioritising those of highest risk.	N
Improving our use of resources	Goal 6: Using resources from nature sustainably	Other targets or commitments	Halt and reverse forest loss and land degradation globally by **2030**.	N
		Other targets or commitments	Take the necessary measures to achieve or maintain good environmental status of marine waters within the marine strategy area (deadline passed on 31 December **2020**) – specifically the descriptor that populations of all commercially exploited fish and shellfish are within safe biological limits (Marine Strategy Regulations 2010 and Marine Strategy).	Y
		Other targets or commitments	Deliver a sustainable, nature positive, affordable food system that provides choice and access to high quality products.	N
		Other targets or commitments	Through our new farming schemes, bring at least 40% of England's agricultural soil into sustainable management by **2028**, and increase this to 60% by **2030**.	Y
Improving our mitigation of climate change	Goal 7: Mitigating and adapting to climate change	Other targets or commitments	A UK-wide legally binding target of net zero emissions by **2050**, including carbon budgets 4, 5, and 6 from 2023 to 2037; and our 2030 Nationally Determined Contribution.	N
		Other targets or commitments	Produce a UK Climate Change Risk Assessment to identify risks, followed by a National Adaptation Programme to address those risks every five years.	N
		Other targets or commitments	Under the Montreal Protocol we are committed to phasing out the production of ozone-depleting substances; under the Kigali amendment, we are committed to reducing HFC consumption by 85% by **2036**.	N
		Other targets or commitments	Under the Paris Agreement, we are committed to limiting global warming to well below 2 degrees Celsius compared to pre-industrial levels, and aiming for 1.5 degrees under our presidency of the UN Climate Summit COP26.	N
Improving our mitigation of	Goal 8: Reduced risk of harm from	Other targets or commitments	Better protect 100,000 properties from flooding and coastal erosion by **2024**, and 336,000 by **2027**.	N

climate change	environmental hazards	Other targets or commitments	Maintain at least 94% of major flood and coastal erosion risk management assets fit for their designed purpose, through to March **2025**. Our long-term aim is for this to reach 98%.	N
		Other targets or commitments	Double the number of government-funded projects to reduce flooding and coastal erosion through nature-based solutions to 260 projects by **2027**.	Y
Improving our biosecurity	Goal 9: Enhancing biosecurity	Other targets or commitments	Reduce the number of establishments of invasive non-native species by at least 50% in **2030**, compared to levels seen in 2000, supporting delivery of the convention on biological diversity global target on invasive alien species.	Y
		Other targets or commitments	Upholding high health standards to trading partners: Ensure at least 97% of export health certificates (EHCs) and licences are issued correctly within agreed timeframes to support safe and secure trade.	N
		Other targets or commitments	Invest in our Science Capability in Animal Health programme at Weybridge.	N
		Other targets or commitments	Progress on freedom from bovine tuberculosis: Achieve official bovine tuberculosis free status for England by 2038.	N
Improving the beauty of nature	Goal 10: Enhancing beauty, heritage and engagement with the natural environment	Other targets or commitments	Everyone should live within 15 minutes' walk of a green or blue space.	N
		Other targets or commitments	Make the England Coast Path fully walkable by the end of 2024.	N
		Other targets or commitments	Deliver a new National Trail along the route of the Coast to Coast path by 2025.	N
		Other targets or commitments	Continue to work with navigation authorities as appropriate, recognising the value of access to blue space, particularly within inner city environments. For example, announcing future funding for the Canal and River Trust to support local access improvements and awareness.	N
		Other targets or commitments	Conserve and enhance the natural, geological and cultural diversity of landscapes, and protect the historic and natural environment for the benefit and enjoyment of future generations.	Y

Appendix 2 – Study scope and selection criteria

Appendix Table 2 provides a breakdown of how the conceptual approach (shown in Figure 2.1) and study scope is defined and how that informs the evidence selection criteria.

Appendix Table 2 : Breakdown of study scope and selection criteria

Diagram dimension	Questions	Study scope as defined in Section 2	Evidence selection criteria	Scope implication for this study
Top-down	Purpose	Outcomes directly related to EA21 Species Abundance targets and overlapping targets and commitments in the EIP23, in England. Biodiversity-related expenditure to achieve domestic targets in-year and over time.	• Does target/commitment directly link to Biodiversity Outcomes? • Is it an English Target? • All EIP23 Goal 1 'Apex Goal' targets screened in • Is motivation for expenditure clearly directly linked to achieving Biodiversity Outcomes through EA21 and/or EIP23 targets?	• Goals and targets that are clearly indirectly linked to Biodiversity Outcomes (i.e., where biodiversity outcome is a co-benefit) are out of scope. • Wider global commitments outside England or the UK are outside of scope. • Not all nature-related expenditure in scope • Spend on activity that is not clearly directly related to biodiversity will be screened out
Cross-cutting	How much	£-value, as stated in evidence source - noting whether: In-year vs total; Actual spending vs committed/planned expenditure Extent to which evidence is then extrapolated and/or attributed to EA21 Species Abundance targets will then be recorded separately as part of analysis.	• Undiscounted rates where data is available • Adjustments will be made for consistency across the data	N/A
Cross-cutting	Timing	Time period (i.e., start and end date) and periodicity of payments. Should cover both annual (i.e., in-year) and total (i.e., over set of years). Spending needs will be identified for the	Where available data and information allows, spending needs will be identified for the: • Short term (2024 – 2030) • Medium term (2030 – 2042) • Long term (2042 – 2050)	N/A

Diagram dimension	Questions	Study scope as defined in Section 2	Evidence selection criteria	Scope implication for this study
		medium term (2024-2030) and long-term (2030-2042, 2042-2050).	For practicality, evidence collected will reflect publications up to 31 December 2024. This will ensure that the database and tracker cover the next progress reporting period (1 April 2024 to 31 March 2025) using the best publicly available evidence.	
Cross-cutting	Environmental Objective	• Environmental biome: Terrestrial, freshwater, marine & coastal environments • Environmental feature: Habitats, species and/or protected sites The Marine environment is included insofar it relates to the Species Abundance targets (e.g., through marine GES).	• Does spending relate to outcomes in environmental biomes in scope for the relevant Goal/Target? • Does spending relate to environmental features in scope for the relevant Goal/Target?	N/A
Evidence type	Budget	Relevant actors announced expenditure related to meeting the EIP23 goals - reflects allocation or allocated resource. This includes but not limited to: • Budgets to meet legal requirements and/or public commitments • Spending commitments made since the new Government took office in June 2024 • Grant-in-aid (e.g., from Defra to ALBs), monies allocated to funding programmes and schemes (e.g., AES).	For relevant actors: • Budget or business plans, • Announcements and commitments Important to distinguish time (e.g., future spend vs current spend), additionality (e.g., new announcement/commitment)	N/A
Evidence type	Actual expenditure	Refers to current spending (e.g., in the reporting period and previous years as relevant) against the biodiversity-related EIP23 goals and targets. This is expected to be sourced from annual reports, annual accounts	For relevant actors: • Annual reports and/or accounts • Official statistics	• Detailed analysis of spending efficiency is out of scope.

Diagram dimension	Questions	Study scope as defined in Section 2	Evidence selection criteria	Scope implication for this study
		and official statistics. This includes grant-in-aid (e.g., from Defra to ALBs), funding allocated from programmes and schemes (e.g., AES), use of fees and fines (e.g., rod licenses).	Important to distinguish time (e.g., future spend vs current spend), additionality (e.g., new announcement/commitment)	
A. Spender - expenditure by	Who (whose money)	Reflects whose money: • Public sector - national and local government, regulators, arm's length bodies • Environmental non-governmental organisations (as defined by Defra Biodiversity funding indicator). Primarily aligned to Defra (2024) Biodiversity Funding indicator for England to support comparison in Tracker and against defined 'Need', but could include evidence from actors not explicitly captured	• Are actors English public sector or eNGOs? • Are actors included in Defra (2024) Biodiversity Funding Indicator?	• Funding from private sector organisations (e.g., business revenues that are re-invested) are out of scope. Private sector affects the public target (if Govt can motivate more from private sector, then it can spend less) • Defra (2024) Biodiversity Funding Indicator notes that spending on local nature reserves and nature conservation by local authorities is not currently included, this is a known gap that is outside of project scope without further research (i.e., compiling sources). • Review of budgets/expenditure evidence from non-environmental organisations is out of scope.
B. Activity	Type of Expenditure	Combination of: • Direct (i.e., on actions) OR indirect (i.e., supporting delivery of actions) expenditure AND • One-off (e.g., capital costs) OR ongoing costs (e.g., operational or maintenance costs) Expect evidence to report expenditure types in different forms (e.g., as lump sum vs	• Can expenditure be attributed to direct Biodiversity-related outcomes? • Include the direct: direct means spending linked to target: this goes in in database. • Indirect criteria of relevance: Can contribution to Goal 1 targets be quantified? • Is there a way (i.e. using some relevant information) of directing the spend to help biodiversity targets?	• Related to efficiency and effectiveness of spending - cannot assess whether (or follow) if allocated expenditure was spent in or towards environments as intended.

Diagram dimension	Questions	Study scope as defined in Section 2	Evidence selection criteria	Scope implication for this study
		disaggregated), therefore expect multiple combinations to be possible.	• No: There is a link, but no data so identify link to relevant targets qualitatively (as a Yes/ No)	
B. Activity	Who (who disburses)	Reflects who disburses/distributes money includes but is not limited to: • Public sector - national and local government, ALBs • Private sector - water companies, land managers • Environmental non-governmental organisations - RSPB, BugLife Who disburses can also be the same organisation as source of money and receives payment (i.e., criteria under 'A. Whose money' and 'C. Who delivers')	• Are Public Sector and eNGO actors included in Defra (2024) Biodiversity Funding Indicator?	• Defra (2024) Biodiversity Funding Indicator notes that spending on local nature reserves and nature conservation by local authorities is not currently included, this is a known gap that is outside of project scope without further research (i.e., compiling sources).
C. Action	Spending for	Spending with the intention to contribute to the delivery of each outcome will be reported (e.g., introduction of biodiversity net gain and its contribution to species abundance target). This includes payments for actions such as: • Maintenance actions, including Reduction, Protection and Conservation • Enhancement actions. including Restoration Would include expenditure on green or blue, green-grey or blue-grey infrastructure through nature-based solutions (which can overlap with the above 'actions') where the spending primarily results in a direct biodiversity outcome (in line with IUCN definition of NbS).	• Does expenditure have the intention to materially (i.e., directly) contribute to the 2030 and/or 2042 Species Abundance targets under the EA21 (linked back to 'Purpose')? • Does it relate to green, blue or green-grey or blue-grey solutions?	• Does not cover emerging issues that are not covered in the list of goals and targets (although Tool will have flexibility to amend/revise these), nor does it fully address deteriorating baseline. • Outputs from expenditure, nor detailed analysis of spending effectiveness (e.g., of outputs) and spending negatively affecting targets are out of scope. • Expenditure on grey assets (e.g., maintenance of FCERM infrastructure) is excluded.

Diagram dimension	Questions	Study scope as defined in Section 2	Evidence selection criteria	Scope implication for this study
C. Action	Who (who delivers)	Who delivers the action (i.e., receives payment), includes but is not limited to: • Public sector – e.g., national and local government, ALBs • Private sector – e.g, water companies, land managers • Environmental non-governmental organisations – e.g., RSPB, BugLife Who delivers can also be the same organisation that pays (i.e., criteria under 'A. Whose money' and 'B. Who disburses')	• Is the organisation funding the action also carrying out the action? • No: who delivers the action? • Include private sector as long as whose money/ who distributes are Public Sector/ eNGO	N/A
D. Outcome	Attribution to	Actual spending and committed/planned spending that is directly attributed to biodiversity outcomes related to achieving EA21 and other targets and commitments in the EIP23.	• Allocation using selection criteria from the Environmental Objective	N/A
D. Outcome	Outcome timing	• Medium and/or long-term target dates defined in the EIP23.	• 2030 and 2042 targets • Facilitate extrapolation up to 2050	N/A

Appendix 3 – Database bibliography

Appendix Table 3 presents the full list of evidence reviewed (i.e., bibliography). It reflects what references that are recorded in the Database (i.e., provide a data point) and whether a referenced data point has been selected to estimate biodiversity-related expenditure as part of the Catalogue (i.e., linked to Goal calculations). Details on why data points have been selected for the Catalogue are in Section 2.4.

Appendix Table 3 : Biodiversity expenditure bibliography and selection as input to Catalogue

Long reference	In Database?	Selected for Catalogue?
Agrii (2024) 'Building a soil management plan for SFI', *SAM1 SFI - Soil Management Plans*. Available at: https://www.agrii.co.uk/sustainable-farming/sfi/soil-health/sam1-sfi-soil-management-plan/#:~:text=Under%20the%20Sustainable%20Farming%20Incentive%2C%20you%20can%20be%20paid%20for,of%20once%20every%20five%20years.	N	N
Committee on Climate Change (CCC) (2020a) *Economic impacts of Net Zero land use scenarios*. Available at: https://www.theccc.org.uk/wp-content/uploads/2020/01/Economic-impacts-of-Net-Zero-land-use-scenarios-Vivid-Economics.pdf.	Y	N
Committee on Climate Change (CCC) (2020b) *Land use: Policies for a Net Zero UK*. Available at: https://www.theccc.org.uk/publication/land-use-policies-for-a-net-zero-uk/.	Y	N
Committee on Climate Change (CCC) (2021) *Independent Assessment of UK Climate Risk*. Available at: Independent-Assessment-of-UK-Climate-Risk-Advice-to-Govt-for-CCRA3-CCC.pdf.	Y	N
Committee on Climate Change (CCC) (2023) *Investment for a well-adapted UK*. Available at: https://www.theccc.org.uk/publication/investment-for-a-well-adapted-uk/.	N	N
Defra (2005) *Water Framework Directive – Article 5 economic analysis*. Available at: https://webarchive.nationalarchives.gov.uk/ukgwa/20080306090528/http://www.defra.gov.uk/environment/water/wfd/economics/index.htm#eco (Accessed: 27 January 2025).	Y	N
Defra (2010) *Transposition of the Air Quality Directive (2008/50/EC)*. GOV.UK. Available at: https://www.legislation.gov.uk/ukia/2010/133/pdfs/ukia_20100133_en.pdf.	N	N
Defra (2015) *The Great Britain Invasive Non-native Species Strategy*. Available at: https://webarchive.nationalarchives.gov.uk/ukgwa/20221018191152/https://www.gov.uk/government/publications/the-great-britain-invasive-non-native-species-strategy.	N	N

Long reference	In Database?	Selected for Catalogue?
Defra (2018a) *Biodiversity net gain- Impact Assessment*. GOV.UK. Available at: https://consult.defra.gov.uk/land-use/net-gain/supporting_documents/181121%20%20Biodiversity%20Net%20Gain%20Consultation%20IA%20FINAL%20for%20publication.pdf.	N	N
Defra (2018c) *Transposition of the National Emissions Ceiling Directive*. GOV.UK. Available at: https://www.legislation.gov.uk/ukia/2018/37/pdfs/ukia_20180037_en.pdf.	Y	Y
Defra (2018d) *Tree Health Resilience Strategy*. GOV.UK. Available at: https://www.gov.uk/government/publications/tree-health-resilience-strategy-2018.	Y	N
Defra (2019) *Clean Air Strategy 2019*. GOV.UK. Available at: https://assets.publishing.service.gov.uk/media/5c3b9debe5274a70c19d905c/clean-air-strategy-2019.pdf.	Y	Y
Defra (2021) Nature for people, climate and wildlife. GOV.UK. Available at: https://www.gov.uk/government/publications/nature-for-people-climate-and-wildlife/nature-for-people-climate-and-wildlife#england-peat-action-plan (Accessed: 15 April 2025).	Y	N
Defra (2022a) Annex I HPMA consultation, Impact Assessment. Available at: https://consult.defra.gov.uk/natural-environment-policy/consultation-on-environmental-targets/ (Accessed: 27 January 2025).	N	N
Defra (2022b) Pilot Highly Protected Marine Areas: de minimis assessment. Available at: https://www.gov.uk/government/publications/highly-protected-marine-areas/pilot-highly-protected-marine-areas-de-minimis-assessment (Accessed: 27 January 2025).	N	N
Defra (2022c) The Environment Act – Air Quality, Detailed evidence report. Available at: https://consult.defra.gov.uk/natural-environment-policy/consultation-on-environmental-targets/. (Accessed: 27 January 2025).	N	N
Defra (2022d) The Environment Act – Air Quality, Impact Assessment. Available at: https://consult.defra.gov.uk/natural-environment-policy/consultation-on-environmental-targets/ (Accessed: 27 January 2025).	N	N
Defra (2022e) The Environment Act – Biodiversity Marine Target, Detailed evidence report. Available at: https://consult.defra.gov.uk/natural-environment-policy/consultation-on-environmental-targets/. (Accessed: 27 January 2025).	N	N
Defra (2022f) The Environment Act – Biodiversity Marine Target, Impact Assessment. Available at: https://consult.defra.gov.uk/natural-environment-policy/consultation-on-environmental-targets/. (Accessed: 27 January 2025).	N	N
Defra (2022g) The Environment Act – Biodiversity Terrestrial Targets, Impact Assessment. Available at: https://consult.defra.gov.uk/natural-	Y	Y

Long reference	In Database?	Selected for Catalogue?
environment-policy/consultation-on-environmental-targets/ (Accessed: 27 January 2025).		
Defra (2022h) The Environment Act – Biodiversity Terrestrial and Freshwater Targets - Detailed evidence report. Available at: https://consult.defra.gov.uk/natural-environment-policy/consultation-on-environmental-targets/. (Accessed: 27 January 2025).	N	N
Defra (2022i) The Environment Act – Overarching Impact Assessment for proposed Environment Act (2021) targets (Consultation Stage). Available at: https://consult.defra.gov.uk/natural-environment-policy/consultation-on-environmental-targets/ (Accessed: 27 January 2025).	Y	N
Defra (2022j) The Environment Act – Resource Efficiency and Waste Reduction Targets, Detailed evidence report. Available at: https://consult.defra.gov.uk/natural-environment-policy/consultation-on-environmental-targets/. (Accessed: 27 January 2025).	N	N
Defra (2022k) The Environment Act – Resource Efficiency and Waste Reduction Targets, Impact Assessment. Available at: https://consult.defra.gov.uk/natural-environment-policy/consultation-on-environmental-targets/ (Accessed: 27 January 2025).	N	N
Defra (2022l) The Environment Act – Water Targets, Detailed evidence report. Available at: https://consult.defra.gov.uk/natural-environment-policy/consultation-on-environmental-targets/. (Accessed: 27 January 2025).	N	N
Defra (2022m) The Environment Act – Water Targets, Impact Assessment. Available at: https://consult.defra.gov.uk/natural-environment-policy/consultation-on-environmental-targets/ (Accessed: 27 January 2025).	Y	Y
Defra (2022n) The Environment Act – Woodland Cover Targets, Detailed evidence report. Available at: https://consult.defra.gov.uk/natural-environment-policy/consultation-on-environmental-targets/. (Accessed: 27 January 2025).	N	N
Defra (2022o) The Environment Act – Woodland Cover Targets, Impact Assessment. Available at: https://consult.defra.gov.uk/natural-environment-policy/consultation-on-environmental-targets/ (Accessed: 27 January 2025).	Y	Y
Defra (2023a) *25 Year Environment Plan Annual Progress Report. April 2022 to March 2023*. GOV.UK. Available at: https://www.gov.uk/government/publications/25-year-environment-plan-progress-reports.	N	N
Defra (2023c) *Funding for Flood and Coastal Erosion Risk Management (FCERM)*. GOV.UK. Available at: https://www.gov.uk/government/statistics/funding-for-flood-and-coastal-erosion-risk-management-in-england/funding-for-flood-and-coastal-erosion-risk-management-fcerm-march-2023-updated-05102023#updates-to-this-publication.	Y	Y

Long reference	In Database?	Selected for Catalogue?
Defra (2023d) *Plan for Water: our integrated plan for delivering clean and plentiful water*. GOV.UK. Available at: https://www.gov.uk/government/publications/plan-for-water-our-integrated-plan-for-delivering-clean-and-plentiful-water.	N	N
Defra (2023e) *Storm overflows discharge reduction plan*. GOV.UK. Available at: https://www.gov.uk/government/publications/storm-overflows-discharge-reduction-plan.	N	N
Defra (2023f) *The Great Britain Invasive Non-native Species Strategy*. Available at: https://www.gov.uk/government/publications/the-great-britain-invasive-non-native-species-strategy.	N	N
Defra (2024a) *Agriculture in the UK 2023*. Defra. Available at: https://www.gov.uk/government/statistics/agriculture-in-the-united-kingdom-2023#full-publication-update-history (Accessed: 27 January 2025).	Y	
Defra (2024b) *England Biodiversity Indicators – Funding for Biodiversity*. Available at: https://www.gov.uk/government/statistics/england-biodiversity-indicators/15-funding-for-biodiversity--2 (Accessed: 27 January 2025).	Y	Y
Defra (2025) *Biodiversity net gain statutory credits: annual report 2024 to 2025*. GOV.UK. Available at: https://www.gov.uk/government/publications/biodiversity-net-gain-statutory-credits-annual-report-2024-to-2025/biodiversity-net-gain-statutory-credits-annual-report-2024-to-2025.	N	N
Defra and DfT (2017) *UK plan for tackling roadside nitrogen dioxide concentrations - detailed plan*. GOV.UK. Available at: https://assets.publishing.service.gov.uk/media/5a81d37540f0b623026995e7/air-quality-plan-detail.pdf.	Y	Y
Defra and Forestry Commission (2019) 'Government launches new scheme to boost tree-planting', *GOV.UK*. Available at: https://www.gov.uk/government/news/government-launches-new-scheme-to-boost-tree-planting.	N	N
Defra and Forestry Commission (2023) 'Government pledges to boost Britain's access to nature ahead of COP28', *GOV.UK*. Available at: https://www.gov.uk/government/news/government-pledges-to-boost-britains-access-to-nature-ahead-of-cop28.	Y	Y
Defra and Marine Management Organisation (2019) '£15.4 million funding boost for English fishing industry', *GOV.UK*. Available at: https://www.gov.uk/government/news/154-million-funding-boost-for-english-fishing-industry.	Y	Y
Defra and Natural England (2019) *Biodiversity net gain and local nature recovery strategies*. GOV.UK. Available at: https://www.gov.uk/government/consultations/biodiversity-net-gain-updating-planning-requirements..	Y	N
Defra and Rural Payments Agency (2024) *CSAM1: Assess soil, produce a soil management plan and test soil organic matter*. GOV.UK. Available at: https://www.gov.uk/find-funding-for-land-or-farms/csam1-assess-soil-produce-a-soil-management-plan-and-test-soil-organic-matter#.	N	N

Long reference	In Database?	Selected for Catalogue?
Defra and Rural Payments Agency (2025) *SFI scheme information: expanded offer for 2024 (currently closed to new applications)*. GOV.UK. Available at: https://www.gov.uk/government/publications/sustainable-farming-incentive-scheme-expanded-offer-for-2024/sfi-scheme-information-expanded-offer-for-2024.	N	N
Defra, Welsh Government, Scottish Government, and Defra NI (2023) *United Kingdom National Air Pollution Control Programme*. GOV.UK. Available at: https://www.gov.uk/government/publications/air-quality-revised-uk-national-air-pollution-control-programme.	N	N
Earth Trust, Intelligent Health, The Centre for Sustainable Healthcare, The Wildlife Trusts, UK Health Alliance on Climate Change, and Wildlife and Countryside Link (2023) 'Policy proposals to further boost nature and health'. Available at: https://www.wcl.org.uk/docs/Letter_to_SoS_nature_and_health_16.01.24.pdf.	N	N
eftec, ABPmer, Countryscape, and Sky Ocean Rescue (2018) *North Devon Marine Protected Areas Cost Evaluation: Final Report.* eftec. Available at: https://ukseasproject.org.uk/cms-data/reports/North%20Devon%20Marine%20Protected%20Areas%20Cost%20Evaluation%20-%20%20Final%20Report.pdf.	Y	N
eftec and ICF (2021) *Costs and Benefits of England's Biodiversity Ambitions*. Report for Defra. Available at: https://randd.defra.gov.uk/ProjectDetails?ProjectId=20607 (Accessed: 27 January 2025).	Y	N
eftec, Parks Alliance, and Parks Action Group (2019) *Using Natural Capital Accounting in the Business Case for Parks*. eftec.	N	N
Environment Agency (2015) *Impact assessment for the updated river basin management plans (2015): evidence base*. Available at: https://www.gov.uk/government/collections/river-basin-management-plans-2015#update-to-the-rbmps.	Y	Y
Environment Agency (2020) *National Flood and Coastal Erosion Risk Management Strategy for England*. GOV.UK. Available at: https://www.gov.uk/government/publications/national-flood-and-coastal-erosion-risk-management-strategy-for-england--2.	Y	N
Environment Agency (2021) *Long-term investment scenarios (LTIS) 2019*. GOV.UK. Available at: https://www.gov.uk/government/publications/flood-and-coastal-risk-management-in-england-long-term-investment/long-term-investment-scenarios-ltis-2019.	Y	N
Environment Agency (2022) *Investment requirements for England's river basin management plans*. GOV.UK. Available at: https://www.gov.uk/government/publications/investment-requirements-for-englands-river-basin-management-plans/investment-requirements-for-englands-river-basin-management-plans#investment-needed-to-protect-and-improve-the-water-environment.	Y	Y
Environment Agency (2024) *Environment Agency Annual report and accounts for the financial year 2023 to 2024*. Available at: https://www.gov.uk/government/publications/environment-agency-annual-report-and-accounts-2023-to-2024.	Y	Y
Environmental Audit Committee (EAC) (2019) *Invasive species*. House of Commons. Available at: https://committees.parliament.uk/work/2607/invasive-species-inquiry/publications/.	Y	Y

Long reference	In Database?	Selected for Catalogue?
Environmental Audit Committee (EAC) (2020) *Invasive species: Government response to the Committee's First report of Session 2019*. House of Commons. Available at: https://committees.parliament.uk/work/2607/invasive-species-inquiry/publications/.	N	N
Eschen, R., Kadzamira, M., Stutz, S., Ogunmodede, A., Djeddour, D., Shaw, R., Pratt, C., Varia, S., Constantine, K. and Williams, F. (2023) 'An updated assessment of the direct costs of invasive non-native species to the United Kingdom', *Biological Invasions*, 25(10), pp. 3265–3276. Available at: https://doi.org/10.1007/s10530-023-03107-2.	Y	Y
Forestry Commission (2023a) *Regional woodland restoration innovation fund (currently closed)*. GOV.UK. Available at: https://www.gov.uk/guidance/regional-woodland-restoration-innovation-fund#:~:text=The%20fund%20is%20currently%20closed,closed%20on%2015%20May%202023.	N	N
Forestry Commission (2023b) *Woods into Management Forestry Innovation Funds*. GOV.UK. Available at: https://www.gov.uk/government/collections/woods-into-management-forestry-innovation-funds.	Y	Y
Forestry Commission (2024) *Annual Report and Accounts 2023-24*. GOV.UK. Available at: https://www.gov.uk/government/publications/forestry-commission-annual-report-and-accounts-2023-to-2024.	Y	Y
Friends of the Earth (2020) *England's green space gap*. Friends of the Earth. Available at: https://policy.friendsoftheearth.uk/sites/default/files/documents/2020-10/Green_space_gap_full_report_1.pdf.	N	N
Glover, J. (2019) *Landscapes Review- Final Report.* Derbyshire. Available at: https://www.gov.uk/government/publications/designated-landscapes-national-parks-and-aonbs-2018-review.	Y	Y
Green Finance Institute (2024) *Financing Natural Flood Management*. Available at: https://hive.greenfinanceinstitute.com/wp-content/uploads/2024/04/GFI-Financing-NFM-Full-Report.pdf (Accessed: 23 April 2025).	Y	Y
HM Treasury (2023) *UK Government Green Financing: 2021 to 2023 reports*. Available at: https://www.gov.uk/government/publications/uk-government-green-financing.	N	N
HM Treasury (2024) *UK Government Green Financing: Allocation Report 2024*. GOV.UK. Available at: https://www.gov.uk/government/publications/uk-government-green-financing-allocation-report-2024.	Y	Y
Infrastructure and Projects Authority and HM Treasury (2020) *Analysis of the National Infrastructure and Construction Procurement Pipeline 2020/21*. GOV.UK. Available at: https://www.gov.uk/government/publications/national-infrastructure-and-construction-procurement-pipeline-202021.	N	N
Institute for Government (2021) *Common Fisheries Policy*. Institute for Government. Available at: https://www.instituteforgovernment.org.uk/.	Y	N

Long reference	In Database?	Selected for Catalogue?
Invasive Species Rapid Response working group (2018) *Supplementary written evidence submitted by DEFRA*. Defra. Available at: https://committees.parliament.uk/writtenevidence/104612/html/.	Y	Y
JNCC (2024) *UK Biodiversity Indicators 2024. Expenditure on UK and International biodiversity.* Available at: https://jncc.gov.uk/our-work/ukbi-biodiversity-expenditure/ (Accessed: 27 January 2025).	N	N
Kaminski, I. (2016) 'Government commits £15m to natural flood management', *The Guardian*. Available at: https://www.theguardian.com/environment/2016/nov/25/government-commits-15m-to-natural-flood-management.	Y	N
Marine Conservation Society (2020) 'Submission to HM Treasury from the Marine Conservation Society on funding for the marine environment through the Comprehensive Spending Review 2020'.	N	N
National Infrastructure Commission (2018) *National Infrastructure Assessment*. National Infrastructure Commission. Available at: https://nic.org.uk/studies-reports/national-infrastructure-assessment/national-infrastructure-assessment-1/.	N	N
National Infrastructure Commission (2023) *Second National Infrastructure Assessment*. National Infrastructure Commission. Available at: https://nic.org.uk/studies-reports/national-infrastructure-assessment/second-nia/.	N	N
Natural England (2023) *Natural England annual report and accounts 2022 to 2023*. GOV.UK. Available at: https://www.gov.uk/government/publications/natural-england-annual-report-and-accounts-2022-to-2023.	Y	Y
Ofwat (2019) *PR19 final determinations: Securing cost efficiency technical appendix*. Ofwat. Available at: https://www.ofwat.gov.uk/publication/pr19-final-determinations-securing-cost-efficiency-technical-appendix/.	N	N
Ofwat (2021) 'PN 13/21: Water sector to plunge £2.8 billion into the green recovery', *Ofwat*. Available at: https://www.ofwat.gov.uk/pn-13-21-water-sector-to-plunge-2-8-billion-into-the-green-recovery/.	N	N
Ofwat (2025) *PR24 final determinations: Expenditure allowances*. Ofwat. Available at: https://www.ofwat.gov.uk/publication/pr24-final-determinations-expenditure-allowances/.	Y	Y
O'Neil, J. (2024) 'Is agroforestry right for your farm? New funding to help plan and establish agroforestry systems', *Forestry Commission*. Available at: https://forestrycommission.blog.gov.uk/2024/08/14/is-agroforestry-right-for-your-farm-new-funding-to-help-plan-and-establish-agroforestry-systems/.	N	N
Oreska, M.P.J. and Aldridge, D.C. (2011) 'Estimating the financial costs of freshwater invasive species in Great Britain: a standardized approach to invasive species costing', *Biological Invasions*, 13(2), pp. 305–319. Available at: https://doi.org/10.1007/s10530-010-9807-7.	N	N
Rayment, M. (2021) *Model to assess the financial needs to meet Biodiversity related targets and policy commitments in the UK.*	Y	Y

Long reference	In Database?	Selected for Catalogue?
Rural Payments Agency, Defra, Forestry Commission, and Natural England (2023) *Woodland Management Plan grants 2023: Countryside Stewardship*, *GOV.UK*. Available at: https://www.gov.uk/government/publications/woodland-management-plan-grants-2023-countryside-stewardship.	N	N
Sky Ocean Rescue and WWF (2020) *The value of restored UK seas, Final Report for WWF*. Norfolk. Available at: https://www.wwf.org.uk/sites/default/files/2021-01/Value%20of%20restored%20UK%20seas%20summary.pdf.	Y	Y
The Charter for Parks (2019) *Our Parks…*, *The Charter for Parks*. Available at: https://parkscharter.org.uk/.	N	N
UK Government (2021) *England Peat Action Plan*. GOV.UK. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1010786/england-peat-action-plan.pdf.	Y	Y
UK Parliament (2024) *Urban Green Spaces*, *Committees*. Available at: https://committees.parliament.uk/work/7932/urban-green-spaces/publications/.	N	N
Vivid Economics and Willmore, B. (2020) *Levelling Up and Building Back better Through Urban Green Infrastructure: An Investment Options Appraisal*. Vivid Economics. Available at: https://nt.global.ssl.fastly.net/binaries/content/assets/website/national/pdf/urbangreen-infrastructure-investment-appraisal-2020-report.pdf.	N	N
Water UK (2016) *Water resources long term planning framework (2015-2065).* Available at: https://www.water.org.uk/wp-content/uploads/2018/11/WaterUK-WRLTPF_Final-Report_FINAL-PUBLISHED-min.pdf.	N	N
Wildlife and Countryside Link (2020) *Prevention is better than cure: A diagnosis of the state of UK invasive species biodiversity.* Wildlife and Countryside Link. Available at: https://www.wcl.org.uk/prevention-is-better-than-cure-2020.asp.	Y	N
Williams, F., Eschen, R., Harris, A., Djeddour, D., Pratt, C., Shaw, R., Varia, S., Godwin, J., Thomas, S. and Murphy, S. (2010) *The Economic Cost of Invasive Non-Native Species on Great Britain*.	Y	N
WWF (2020) 'WWF Comprehensive Spending Review Response.' Available at: https://www.wwf.org.uk/sites/default/files/2020-09/Final%20WWF%20CSR%20submission_.pdf.	Y	Y

Appendix 4 – Method statements for goals in Scope

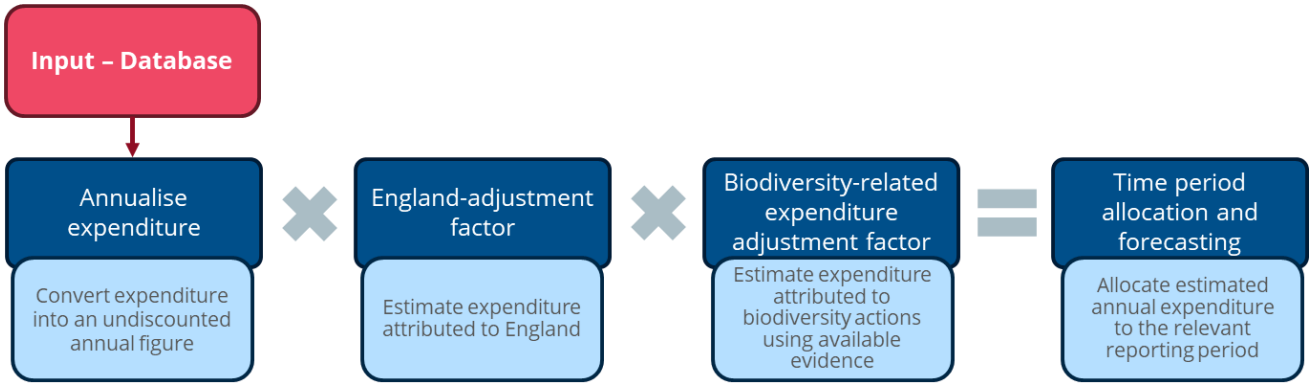
This appendix provides details on the methods used to estimate biodiversity expenditure for each goal. Where data allows target level analysis has been completed, with the aim to maintain granularity of data collected (e.g., differences across sources of expenditure). The intention is to accompany the Excel Workbook (INS307-12-BDExpenditure-Workbook-Final-Jun25) so future users have an understanding of what has and/or has not been accounted for.

To support alignment with the Excel Workbook, referencing used in this Appendix matches short-hand references in Appendix 3.

A4.1 Assumptions and adjustments

This section describes assumptions and adjustments made across **Goal calculation worksheets**. Default assumptions have been incorporated to automation the analysis. Where an adjustment is applied, the cell is shaded blue to indicate a change in reported figures.

After expenditure data has been input into the **Input – Database** tab, adjustments are made to ensure that all of the data is in annual terms and represents only England expenditure on biodiversity-related actions. Once the data is consistently catalogued in this way, it is allocated to the four reporting periods. The steps of the logical flow of the adjustments and calculations can be seen in Appendix Figure 1 and are explained in further detail below.



Appendix Figure 1 : Steps attributing expenditure data to reporting periods

Annualise expenditure

Expenditure is recorded in the underlying evidence sources with different metrics. There are four different cost types recorded in the database:[15,16]

- **Total costs**. This is the undiscounted sum of all relevant expenditure necessary to achieve the aims

[15] Where (undiscounted) total costs and total PV costs were documented in a single evidence source, total cost evidence was prioritised. If total costs were not reported, PV costs were included in the database.

[16] Where possible, the database uses the literal definitions provided in the underlying evidence source. Where necessary, the correct category is allocated through wider interpretation of the documentation.

and objectives of a given assessment.

- **Annual costs**. This is the reported, undiscounted expenditure necessary on an annual basis to achieve the aims and objectives of a given assessment.
- **Average annual costs**[17]. This is the undiscounted expenditure necessary to achieve the aims and objectives of a given assessment, calculated by averaging total costs across the time period of assessment.
- **Total Present Value (PV)**[18] **costs**. This is the discounted total cost of all relevant expenditure outlined above.

Expenditure is allocated to time periods of analysis (see later) by multiplying annual and undiscounted costs by the number of years in the period of analysis.[19] Adjustments are required to total cost and total PV cost items; reported annual cost and average annual cost figures are used directly from the underlying evidence source (subject to inflation and euro conversion factors, where relevant):

- **Converting total costs to average annual costs:** Divide the total costs by the period of assessment of the underlying evidence source. *For example, £10 million expenditure calculated for the 5-year period 2015-2020 would be converted to an average annual cost of £2 million (£10 million divided by five years).*
- **Converting total PV cost to equivalent annual value:** Divide the total PV cost by the sum of the discount factors over the period of assessment. *For example, £100 million present value expenditure estimated over a 25-year period implies a summed discount factor of 17. The equivalent annual value is therefore £5.9 million (£100 million divided by 17).*

England adjustment factor

'Location' of evidence is reported in the Database and pulled through for each selected data point. Estimated expenditure should reflect the need, budget and actual expenditure to achieve biodiversity outcomes in England. Therefore, preference is to select evidence reflective of public sector and eNGO expenditure in England.

Default adjustment: The Database allows users to record evidence beyond England (e.g., UK, Great Britain or England and Wales) as well. Where expenditure data reflects an estimate beyond England, a default pro-rata adjustment is applied based on land area. The area-based adjustment factors used are in Appendix Table 4 . Similar data is available in the background 'Scalars' tab for Marine area that could be applied to marine evidence as appropriate in the future.

[17] The difference between average annual costs and annual costs is in how the underlying evidence sources describe the cost. Where the underlying source describes the cost as yearly, and without reference to averaging a total cost across the period of assessment, this is classified simply as "annual". Reference to "average" refers to where documentation explicit spreads the total cost of an item across a given time period. The analysis does not treat these cost items differently.

[18] The present value is the discounted value of a stream of future costs arising from a given assessment (e.g., the costs incurred over the next twenty years to achieve the species recovery targets in the Environment Act (2021)). Discounting is undertaken using annual discount factors (between 0 and 1) to weight the value of future costs, taking account of time preferences and attitudes towards risk. This assessment uses the standard time preference discount rates as recommended by HMT Green Book (HM Treasury, 2022).

[19] The later sub sections describe the method for allocating annual costs across the relevant period of analysis.

Appendix Table 4 : Land area adjustment factors

Location	Land Area (km2)	England as % of...
England	130,279	100%
UK	243,610	53%
Great Britain	229,848	57%
England and Scotland	209,068	62%
England and Wales	151,058	86%

Sources:
UK: https://www.worlddata.info/europe/united-kingdom/index.php
Great Britain: https://brilliantmaps.com/eng-gb-uk/

Bespoke adjustment: Users have the option to over-write this default assumption on a case-by-case basis. There is space within the calculation worksheets to include a bespoke adjustment for individual references subject to data availability. For example, bespoke adjustments have been applied in:

- Goal 1 and Goal 3: For Ofwat (2025) determinations reflecting the proportion of total expenditure allowance (TOTEX) to water companies in England (94%).
- Goal 8: The average between properties at risk of flooding in England (90%) and population of England (84%) relative to the UK is applied across all evidence selected for the analysis (Defra, 2023b; National Infrastructure Commission, 2023; Green Finance Institute, 2024; HM Treasury, 2024).

These assumptions can be refined in future iterations in line with updates or changes to the evidence recorded in the Database.

Biodiversity-related expenditure adjustment factor

The analysis only covers expenditure for which the primary motivating factor is achievement of domestic biodiversity domestic objectives. The workbook provides functionality to support adjustment of the annual costs to reflect cases where a smaller percentage of total expenditure is directly attributable and motivated by biodiversity objective (e.g., Goal 8 target on FCERM through nature-based solutions). There is no single, or default, adjustment relevant to all evidence sources.

On this basis, a bespoke adjustment (application of a factor between 0 and 1) can be applied on a case-by-case basis. Where possible, this should be supported by relevant literature. For example, bespoke adjustments have been applied in:

- Goal 2: As there is not a clear way to apportion biodiversity expenditure that supports air quality from expenditure on Goal 2 outcomes overall, an adjustment factor is estimated based on reduction targets (%) between the National Emissions Ceiling Reductions (NECR) and the Clean Air Strategy. The sum of NECR targets across all pollutants is divided by the Clean Air Strategy target (17% reduction in nitrogen). Therefore only 6% of estimated annual costs across all selected evidence is used in the analysis, reflecting that the marginal cost of each % reduction of each pollutant is treated equally.

- Goal 8: The proportion of flood and coastal protection strategy funding assigned to natural flood management (NFM) is applied to estimated annual costs across all evidence selected for the analysis. 7% is the indicative proportion of FCERM investment of natural flood management (Environment Agency, 2021). This illustrates the challenge of managing flood and coastal risks in the face of climate change.

These assumptions can be refined in future iterations in line with updates or changes to the evidence recorded in the Database or even changes in overall scope. This could include better understanding of spatial targeting (e.g., type of nature-based solution, locations of actions to support air quality or pollutant-specific expenditure).

Time period allocation and forecasting

The following principles describe how average and equivalent annual expenditure are allocated to the relevant reporting periods. Note that for simplicity, the example calculations below assume a total cost basis and hence are calculated by dividing uniformly across the total number of years in the cost assessment. For evidence that relates to present value calculations and annual costs, see the previous section for calculation method notes.

Recorded start and end year

General principle 1: Expenditure is allocated to the time period stated in the underlying evidence. Where dates are recorded in the evidence base (i.e., evidence source *y* estimates the costs of a given measure over between 2030 - 2040 to be £*z* cost), annual costs are allocated to each year in the stated assessment time period, allocated to the relevant reporting period (see Section 2.1.2) . Where the start and end years of the assessments are not recorded, it is assumed that the evidence is relevant to both: (a) the Progress reporting period (2024); and (b) each year in the Short-term period (2025-2030). The annual cost is therefore calculated as necessary and allocated equally to both (a) and (b).

Example 1: where an evidence source clearly outlines expenditure relating to years 2026 – 2028, annual costs are allocated to the Short-term period only. Similarly, for evidence relating to the years 2032 – 2037, annual costs are allocated to the Medium-term period only. In both cases, no cost estimate is recorded for the Progress reporting period.

Where the period of assessment straddles reporting periods (e.g., the assessment period is split across both the Medium-term and Long-term periods), expenditure is allocated to each reporting period based on the number of years of the assessment within that reporting period.

Example 2: where an evidence source clearly outlines expenditure relating to years 2033 – 2045, nine years of annual costs are allocated to the Medium-term period and three years of annual costs are allocated to the Long- term period.

No costs are included in the analysis past the end of the Long-term period. Example 3 provides an example of an impact assessment with an assessment time period which straddles each reporting period and extends past the Long-term period.

Example 3: Evidence documenting expenditure over the 2022 – 2100 period is allocated as follows: (a) 1 year to the "Progress Reporting" period; (b) 5 years to the "Short Term" period (2025 – 2030); (c) 11 years to the "Medium Term" period (2031 – 2042); and (d) 7 years to the "Long Term" period (2043 – 2050). Costs relating to the 2051 – 2100 period are not included in this analysis.

The exception to this principle is where relevant expenditure is assessed starting and ending before the Progress reporting period (see later).

Cost allocation

General principle 2: Expenditure is allocated uniformly across the years of assessment. Costs are allocated to the relevant reporting period:(a) based on the years in the assessment; (b) exclusive of the final year, and (c) are spread uniformly (equally) across the years of the assessment.

Example 4: Evidence documenting expenditure of £1m over the 2026 – 2028 is allocated to the "short term" time period and assumed to accrue equally (£500k per year) over the two years of the assessment (2026 and 2027).

Forecasting future expenditure

General principle 3: One-off costs are not forecast in future periods. One-off costs are assumed to be: (a) costs that relate to achieving a specific aim or objective that is not repeated in a future reporting period; and therefore (b) only incurred within the period of assessment (and associated reporting period) to which they relate. These costs are allocated to the relevant reporting period as per the principles outlined above.

Example 5: Capital expenditure of £5 million between 2025 and 2030 is allocated to each of the years 2025-2029 inclusive in equal amounts (i.e., £1 million). These costs are then assumed to stop.

General principle 4: Ongoing costs are only forecast over the Short-term period where the start and end date are before the Progress reporting period. In comparison, on-going costs *may* be forecast across the entire Short-term period (2025 – 2030) where the associated expenditure is considered reflective of the budget/parliamentary cycle over the next five years, and hence there is more certainty around their profiling in the short term.

Example 6: Ongoing expenditure between 2020 and 2023 is allocated to both: (a) 2024; (b) each of the years 2025-2029 inclusive in equal amounts. Expenditure is therefore allocated in full to both the Progress reporting period and the Short-term period only.

General principle 5: Expenditure assessments which relate to the current or previous periods which end later than 2025 are not profiled past 2030. This is due to higher uncertainty in extrapolating into future periods.

Example 7: Using Example 6, this expenditure, whilst assumed to continue over the entirety of the "Short Term" period, is not assumed to be incurred in the "Medium Term" or "Long Term" periods.

Forecasting current expenditure evidence into the "Short Term" period

This is calculated where:

1) The costs were assessed in either: (a) previous periods (e.g., 2013 – 2017); or (b) the current period (2024);
2) The costs are not one-off, or are generally deemed reflective of an ongoing expenditure need or source (e.g., grant in aid allocations from Defra to its ALBs); and
3) The period of cost assessment starts and finishes before 2025

Where this fact pattern holds, the average annual cost is applied to each year of the "Short term" period. If the time period of assessment stops within the "Short Term".

Example 8: Expenditure of £1 million is assessed over the period 2017 – 2021. The annualised expenditure is £250k (£1 million divided by the four years of assessment). One year of cost (£250k) is allocated the Progress reporting period and five years of cost is allocated to the Short-term period (£1.25 million).

Example 9: Expenditure of £5 million is assessed over the period 2023 – 2028. The annualised expenditure is £1 million (£5 million divided by the five years of assessment). One year of cost (£1 million) is allocated the Progress reporting period and three years of cost is allocated to the Short-term period (£3 million) to cover years 2025, 2026, and 2027.

Further illustrative examples are summarised in Appendix Table 5 .

Appendix Table 5 : Example allocation of annual expenditure across selected time periods

Example time periods	Annual cost (£m/yr)	Progress reporting period (£)	Short-term period (2025-2030)		Medium-term period (2031-2042)		Long term-period (2043-2050)	
			Years (Count)	*Total Cost (£)*	*Years (Count)*	*Total Cost (£)*	*Years (Count)*	*Total Cost (£)*
2017 – 2019	1	1	5	5	-	-	-	
2023 – 2026	6	6	1	6	-	-	-	
2026 – 2028	8	-	2	16	-	-	-	
2027 – 2032	5	-	3	15	2	10	-	
2033 - 2039	3	-	-	-	6	18	-	
2036 - 2045	10	-	-	-	7	70	3	30
2043 - 2051	2	-	-	-	-	-	7	14
2022 - 2100	4	4	5	20	11	44	7	28

A4.2 Goal 1: Thriving plants and wildlife

Appendix Table 6 : Number of data points, sources, assumptions and adjustments applied for Goal 1

Component	Need	Budget	Actual
Sources used and number of data points	19 data points • Defra (2022g) • Defra (2022o) • Sky Ocean Rescue and WWF (2020)	6 data points • Ofwat (2025) • Environment Agency (2022) • UK Government (2021) • Natural England (2023) • Defra and Forestry Commission (2023)	17 data points • UK Government (2021) • Rayment (2021) • Forestry Commission (2023b) • Natural England (2023) • Forestry Commission (2024) • Defra (2024b) • HM Treasury (2024)
Adjustments applied			
Gaps in time period	Yes – 1 data point Sky Ocean Rescue and WWF (2020) assumed end year is 2030 for one data point.	N/A	N/A
Annual cost	Yes – 5 data points Total costs from Defra (2022o) and Sky Ocean Rescue and WWF (2020).	Yes – All data points All data points are total costs.	N/A
Adjust to England	Yes – 3 data points Sky Ocean Rescue and WWF (2020) expenditure is for UK.	Yes – 1 data point Bespoke adjustment applied to Ofwat (2025) reflecting % of total expenditure allowance allocated to English water companies.	Yes – 1 data point HM Treasury (2024) expenditure is for UK.
Adjust for biodiversity-related expenditure	N/A	N/A	N/A
Time profiling			
Progress reporting period	Yes, all data points are used	Yes, all data points are used.	Yes, all data points are used.
Short-term (2025-2030)	Yes, all data points are forecasted for assessment period.	Yes, data from Ofwat (2025) and UK Government (2021) forecasted for assessment period.	Yes, data from Rayment (2021), Forestry Commission (2024), Defra (2024b) and HM Treasury (2024) are forecasted for assessment period.

Component	Need	Budget	Actual
Medium-term (2031-2042)	Yes, data from Defra (2022g; 2022o) are forecasted for assessment period.	No data suitable for forecasting.	No data suitable for forecasting.
Long-term (2043-2050)	Yes, only data from Defra (2022o) are forecasted for assessment period.	No data suitable for forecasting.	No data suitable for forecasting.
Confidence rating (in Short-term estimate)	High - Medium	High - Medium	High
% of total expenditure with low confidence (short-term)	0%	0%	0%

A4.3 Goal 2: Clean air

Low confidence in target alignment of evidence. The evidence base available is not specific to target(s) in scope, and further not limited to biodiversity-related expenditure. Therefore, current alignment should be revisited. For final report, suggest changing alignment to reflect 'Multiple Targets' rather than aligning to single targets in scope.

Appendix Table 7 : Number of data points, sources, assumptions and adjustments applied for Goal 2

Component	Need	Budget	Actual
Sources used and number of data points	5 data points • Defra (2018c)	41 data points • Defra and Department for Transport (DfT) (2017) • Defra (2019)	1 data point • HM Treasury (2024)
Adjustments applied			
Gaps in time period	N/A	Yes – 26 data points 10 data points from DfT (2017) assumed end period is 2030. 6 data points from Defra (2019) assumed end period is 2030.	N/A

Component	Need	Budget	Actual
		10 data points from Defra (2019) assumed time period is 2024 to 2030.	
Annual cost	N/A	Yes - 39 data points 19 data points from DfT (2017) and all data points from Defra (2019) are total costs.	N/A
Adjust to England	Yes - All data points All data points from Defra (2018c) expenditure are for the UK.	Yes - 34 data points 18 data points from DfT (2017) and 16 data points from Defra (2019) are UK expenditure.	Yes - All data points All data points from HM Treasury (2024) expenditure are for the UK.
Adjust for biodiversity-related expenditure	Yes -all data points Adjustment of 6% of the annual costs attributed to biodiversity expenditure based on reduction targets from the National Emissions Ceiling Reductions and the Clean Air Strategy.	Yes - all data points Adjustment of 6% of the annual costs attributed to biodiversity expenditure based on reduction targets from the National Emissions Ceiling Reductions and the Clean Air Strategy.	Yes - all data points Adjustment of 6% of the annual costs attributed to biodiversity expenditure based on reduction targets from the National Emissions Ceiling Reductions and the Clean Air Strategy.
Time profiling			
Progress reporting period	Yes, all data points are used.	Yes, all data points are used.	Yes, all data points are used.
Short-term (2025-2030)	Yes, all data points are used.	Yes, data from DfT (2017) and Defra (2019) are forecasted for assessment period.	Yes, all data points are used.
Medium-term (2031-2042)	No data suitable for forecasting.	No data suitable for forecasting.	No data suitable for forecasting.
Long-term (2043-2050)	No data suitable for forecasting.	No data suitable for forecasting.	No data suitable for forecasting.
Confidence rating (in Short-term estimate)	Low	Low	Low
% of total expenditure with low confidence (short-term)	100%	100%	100%

A4.4 Goal 3: Clean and plentiful water

Appendix Table 8 : Number of data points, sources, assumptions and adjustments applied for Goal 3

Component	Need	Budget	Actual
Sources used and number of data points	17 data points • Defra (2022m) • Environment Agency (2015) • Environment Agency (2022) • Rayment (2021)	24 data points • Environment Agency (2015) • Environment Agency (2022) • Ofwat (2025)	4 data points • Environment Agency (2022) • Environment Agency (2024)
Adjustments applied			
Gaps in time period	N/A	Yes - 3 data points Environment Agency (2015) assumed time period is 2024 to 2030.	Yes - 3 data points Environment Agency (2022) assumed time period is 2024 to 2030.
Annual cost	Yes - 15 data points Total costs from Defra (2022m), Environment Agency (2015) and Environment Agency (2022).	Yes - 21 data points Total costs from Ofwat (2025), Environment Agency (2015) and Environment Agency (2022).	N/A
Adjust to England	N/A	Yes - 6 data points Bespoke adjustment applied to Ofwat (2025) reflecting % of total expenditure allowance allocated to English water companies from England and Wales figure.	N/A
Adjust for biodiversity-related expenditure	N/A	N/A	N/A
Time profiling			
Progress reporting period	Yes, all data points are used.	Yes, all data points are used.	Yes, all data points are used.
Short-term (2025-2030)	Yes, data from Defra (2022m), Environment Agency (2015), Environment Agency (2022) and Rayment (2021) are	Yes, data from Ofwat (2025), Environment Agency (2015) and Environment Agency	Yes, data from Environment Agency (2022) and Environment Agency (2024) are

Component	Need	Budget	Actual
	forecasted for assessment period.	(2022) are forecasted for assessment period.	forecasted for assessment period.
Medium-term (2031-2042)	Yes, data from Defra (2022m) and Environment Agency (2015) are forecasted for assessment period.	No data suitable for forecasting.	No data suitable for forecasting.
Long-term (2043-2050)	Yes, data from Defra (2022m) and Environment Agency (2015) are forecasted for assessment period.	No data suitable for forecasting.	No data suitable for forecasting.
Confidence rating (in Short-term estimate)	High - Medium	High - Medium	Medium
% of total expenditure with low confidence (short-term)	0%	0%	0%

A4.5 Goal 4: Managing exposure to chemicals and pesticides

No evidence is available to assess targets within Goal 4 directly; however, it is recognised in principle that spending to achieve targets under Goal 3 (e.g., WFD Ecological Status, abandoned metal mines) will support the Goal 4 targets in scope of this analysis.

A4.6 Goal 6: Using resources from nature sustainably

Sustainable Soils expected to be captured under Goal 1. Marine related targets were low priority for this study; figures should be interpreted with caution.

Appendix Table 9 : Number of data points, sources, assumptions and adjustments applied for Goal 6

Component	Need	Budget	Actual
Sources used and number of data points	3 data points • WWF (2020)	1 data point • Defra and Marine Management Organisation (2019)	No data points • N/A
Adjustments applied			
Gaps in time period	N/A	N/A	N/A
Annual cost	Yes – 2 data points Total costs from WWF (2020).	Yes – 2 data points Total costs from Defra and Marine Management Organisation (2019).	N/A
Adjust to England	Yes – 3 data points 3 data points from WWF (2020) expenditure is for the UK.	N/A	N/A
Adjust for biodiversity-related expenditure	N/A	N/A	N/A
Time profiling			
Progress reporting period	Yes, all data points are used.	Yes, all data points are used.	N/A
Short-term (2025-2030)	Yes, all data points are used.	Yes, all data points are used.	N/A
Medium-term (2031-2042)	Yes, one data point from WWF (2020) is forecasted for assessment period.	No data suitable for forecasting.	N/A
Long-term (2043-2050)	No data suitable for forecasting.	No data suitable for forecasting.	N/A
Confidence rating (in Short-term estimate)	High - Medium	Low	N/A

Component	Need	Budget	Actual
% of total expenditure with low confidence (short-term)	0%	100%	N/A

A4.7 Goal 8: Reduced risk of harm from environmental hazards

Appendix Table 10 : Number of data points, sources, assumptions and adjustments applied for Goal 8

Component	Need	Budget	Actual
Sources used and number of data points	3 data points • National Infrastructure Commission (2023)	2 data points • Defra (2023c) • Green Finance Institute (2024)	1 data point • HM Treasury (2024)
Adjustments applied			
Gaps in time period	N/A	N/A	N/A
Annual cost	Yes – 3 data points Total costs from National Infrastructure Commission (2023).	Yes – 2 data points Total costs from Defra (2023c) and Green Finance Institute (2024).	N/A
Adjust to England	Yes – 3 data points 3 data points from National Infrastructure Commission (2023) expenditure is for the UK.	N/A	N/A
Adjust for biodiversity-related expenditure	Yes - 3 data points 3 data points from National Infrastructure Commission (2023) adjusted for the proportion of flood and coastal protection strategy funding	Yes - 2 data points 2 data points from Defra (2023c) and Green Finance Institute (2024) adjusted for the proportion of flood and coastal protection strategy	Yes - 1 data point 1 data point from HM Treasury (2024) adjusted for the proportion of flood and coastal protection strategy funding assigned to natural flood management (NFM).

Component	Need	Budget	Actual
	assigned to natural flood management (NFM).	funding assigned to natural flood management (NFM).	
Time profiling			
Progress reporting period	Yes, one data point from National Infrastructure Commission (2023) is forecasted for assessment period.	Yes, all data points are used.	Yes, all data points are used.
Short-term (2025-2030)	Yes, one data point from National Infrastructure Commission (2023) is forecasted for assessment period.	Yes, all data points are used.	Yes, all data points are used.
Medium-term (2031-2042)	Yes, one data point from National Infrastructure Commission (2023) is forecasted for assessment period.	No data suitable for forecasting.	No data suitable for forecasting.
Long-term (2043-2050)	Yes, one data point from National Infrastructure Commission (2023) is forecasted for assessment period.	No data suitable for forecasting.	No data suitable for forecasting.
Confidence rating (in Short-term estimate)	Medium	High	High
% of total expenditure with low confidence (short-term)	0%	0%	0%

A4.8 Goal 9: Enhancing biosecurity

Appendix Table 11 : Number of data points, sources, assumptions and adjustments applied for Goal 9

Component	Need	Budget	Actual
Sources used and number of data points	3 data points • Invasive Species Rapid Response working group (2018) • Environmental Audit Committee (EAC) (2019)	7 data points • Invasive Species Rapid Response working group (2018)	1 data point • Eschen et al. (2023)
Adjustments applied			
Gaps in time period	Yes – 2 data points EAC (2019) assumed end year is 2030 for one data point and Invasive Species Rapid Response working group (2018) assumed time period is 2024 to 2030 for one data point.	Yes – 7 data points Invasive Species Rapid Response working group (2018) assumed time period is 2024 to 2030 for 7 data points.	N/A
Annual cost	N/A	N/A	N/A
Adjust to England	Yes – 3 data points 3 data points from EAC (2019) and Invasive Species Rapid Response working group (2018) expenditure are for GB.	Yes – 2 data points 2 data points from Invasive Species Rapid Response working group (2018) expenditure are for GB.	N/A
Adjust for biodiversity-related expenditure	N/A	N/A	N/A
Time profiling			
Progress reporting period	Yes, all data points are used.	Yes, all data points are used.	Yes, all data points are used.
Short-term (2025-2030)	Yes, all data points are used.	Yes, all data points are used.	Yes, all data points are used.
Medium-term (2031-2042)	No data suitable for forecasting.	No data suitable for forecasting.	No data suitable for forecasting.
Long-term (2043-2050)	No data suitable for forecasting.	No data suitable for forecasting.	No data suitable for forecasting.

Component	Need	Budget	Actual
Confidence rating (in Short-term estimate)	Medium	Medium	Medium
% of total expenditure with low confidence (short-term)	0%	0%	0%

A4.9 Goal 10: Enhancing beauty, heritage, and engagement with the natural environment

Low priority Goal for analysis. Reflects evidence that was included in GFI Database, but no further evidence searching completed to fill in gaps.

Appendix Table 12 : Number of data points, sources, assumptions and adjustments applied for Goal 10

Component	Need	Budget	Actual
Sources used and number of data points	3 data points • Rayment (2021) • Glover (2019)	2 data points • Defra and Forestry Commission (2023)	8 data points • Natural England (2023) • Glover (2019)
Adjustments applied			
Gaps in time period	Yes – 1 data point Glover (2019) assumed time period is 2024 to 2030 for one data point.	N/A	N/A
Annual cost	Yes – 1 data point Total cost from Glover (2019).	N/A	Yes – 1 data point Total cost from Glover (2019).
Adjust to England	N/A	Yes – 2 data points 2 data points from Defra and Forestry Commission (2023) expenditure are for UK.	Yes – 2 data points 2 data points from Glover (2019) expenditure are for England and Scotland.

Component	Need	Budget	Actual
Adjust for biodiversity-related expenditure	N/A	N/A	N/A
Time profiling			
Progress reporting period	Yes, 2 data points from Rayment (2021) and Glover (2019) are forecasted for assessment period.	Yes, all data points are used.	Yes, all data points are used.
Short-term (2025-2030)	Yes, 2 data points from Rayment (2021) and Glover (2019) are forecasted for assessment period.	No data suitable for forecasting.	Yes, 3 data points from Glover (2019) are forecasted for assessment period.
Medium-term (2031-2042)	Yes, one data point from Rayment (2021) is forecasted for assessment period.	No data suitable for forecasting.	No data suitable for forecasting.
Long-term (2043-2050)	Yes, one data point from Rayment (2021) is forecasted for assessment period.	No data suitable for forecasting.	No data suitable for forecasting.
Confidence rating (in Short-term estimate)	Medium	Medium	Medium
% of total expenditure with low confidence (short-term)	0%	N/A	0%

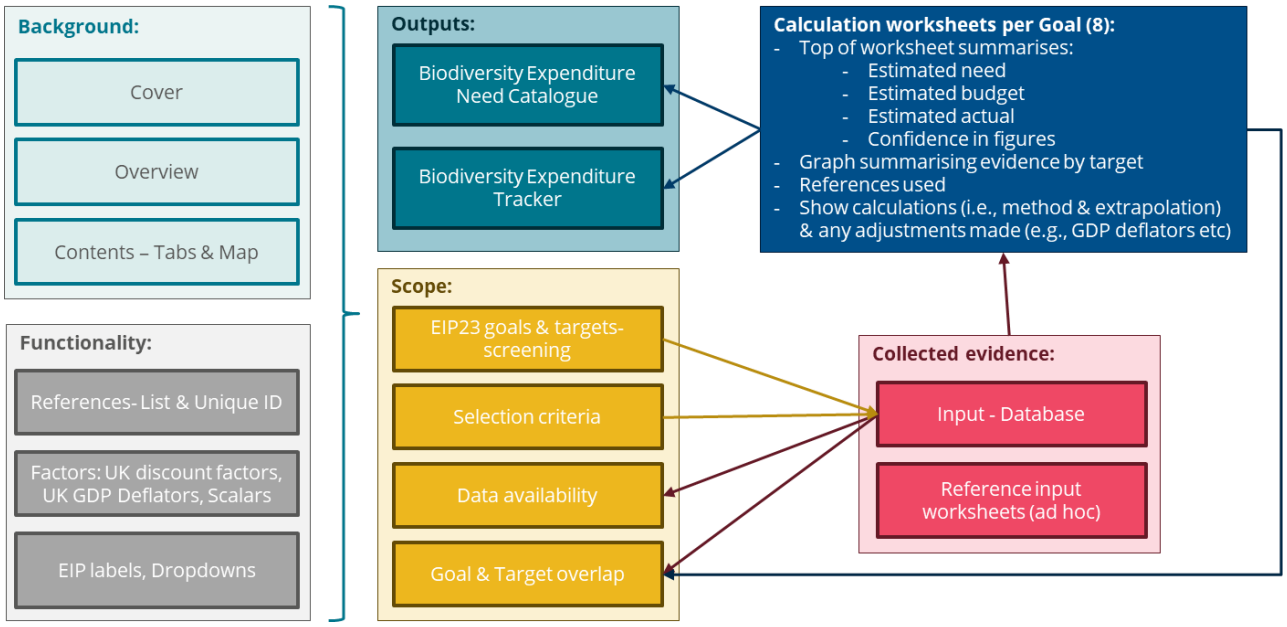
Appendix 5 – Guidance on Excel Workbook

The Excel Workbook guidance is complimentary to the analytical approach in Section 2.2 where principles and analytical methodology are described. This guidance is designed to allow users to understand the Workbook, identifying key points of input across the input, calculation and outputs worksheets.

A5.1 Overview of workbook structure

The expenditure towards biodiversity targets is recorded and estimated in a single MS Excel workbook to ensure that all data and parameters remain linked. To enable understanding and future adjustment (e.g., new evidence, revised assumptions, change in scope), the workbook lays out the data, assumptions and parameters in separate cells and on separate tabs.

The Workbook (INS307-12-BDExpenditure-Workbook-Final-Jun25) is made up of tabs grouped according to their functions, illustrated in the map in Appendix Figure 2 The coloured arrows show how groups of tabs (e.g., collected evidence) link together (e.g., to calculation worksheets). The colour-coding of tabs is consistent throughout the workbook. Additional colour-coding of cells is used to indicate points of user input and where extrapolations or assumptions have been applied, this is shown in Appendix Table 13 .



Appendix Figure 2 : Expenditure towards biodiversity targets workbook map

The Workbook structure and design prioritises flexibility, therefore dynamic lookups are used consistently across worksheets. However, in doing so there is heavy importance placed on consistent labelling, structuring of formulas to enable lookups to function. Overall functionality could be improved through the use of named ranges and macros or VbA coding to ensure greater consistency across users.

The Workbook is structured with the background and output tabs at the front, followed by scope, calculations, input(s) and functionality tabs at the back. This ensures that different 'types' of users can access the information they are looking for (e.g., some may focus on Outputs only, Goal area experts will look at calculation worksheets and database more holistically). *The 'Overview' tab will be updated to provide*

the necessary information for users to help navigate and understand purpose of the workbook. Some of this information is already within the Scope tabs (e.g., selection criteria) reflecting the content of the Technical Report (e.g., Section 2).

Input – Database: Core worksheet to the functionality of the Workbook. The Database tab is where evidence is recorded, collated and inflated to support the goal-level calculations. It is the central repository of expenditure evidence and where the data selection occurs, and justification is recorded. Each data point is given a unique Row ID that serves as the 'lookup value' in formulas throughout the workbook. Evidence is recorded as stated in the source, with a mixture of free-text and dropdown options to support recording information consistently. Expenditure values can be reported in different units (e.g., £m, £k, £bn) and price years, as there are subsequent columns that convert all evidence into a consistent unit (£) and are automatically adjusted for inflation in accordance with user inputs on the '**Overview**' tab. Further details are provided in A5.3.

Reference list and unique ID: Each reference has been given a unique reference ID which is entered into the **Input – Database** tab to allow basic information on the evidence source to be pulled across (e.g., short-hand reference, title).

Goal Calculation tabs: Goal calculation worksheets link directly to the **Input – Database** using a series of lookup of functions that identify 'yes' this data point has been selected and 'yes' this data point is aligned (and therefore relevant) to this Goal. The worksheets are divided into four parts:

- **Reporting results** in teal box at the top links directly to the **Output worksheets**. This is the estimated expenditure for the progress reporting period and chosen future reporting period shown in the **Catalogue and Tracker**.
- **Worksheet sense-check** set up is a series of built-in checks to ensure that the user has structured the worksheet and made any necessary amendments to the reporting tables to enable calculations and results to flow through. This is a collapsible section; however, the use of True or False statements will flag whether something needs to be reviewed and what the change should be.
- **Summary of results** presents the aggregate annual and forecasted expenditure for each target, or across multiple targets within the Goal. The aggregation is linked directly to the **Calculate** section of the worksheet.
- **Summary by confidence rating** provides a further breakdown of the target-level results to reflect confidence in selected evidence by target. This is collapsible so that users can review if of interest.
- **Adjustment inputs** provide assumptions used to scale evidence from the Database. This is in line with assumptions and adjustments described in A4.1. Note this is also a collapsible section to streamline the analysis and results view as needed.
- **Calculate** section is completely automated. Columns will auto-populate to pull across selected evidence in the Database. To add/remove data points changes must be made directly in the Input – Database worksheet, as the FILTER formula in Column will update to reflect the selection. This dynamic formula is what allows minimal user input across **calculation** worksheets and enables the **Input – Database** to be the central update point.

Output tabs: This includes

- **Biodiversity Expenditure Need Catalogue:** This presents the estimated need, budget and actual expenditure for each Goal for the Progress Reporting Period and selected future reporting period. There is a structure to also report the same information at the target-level, however this section remains unlinked due to partial and inconsistent evidence available by target.
- **Biodiversity Expenditure Tracker:** Is linked to the **Catalogue**, pulling across estimated expenditure for the Progress Reporting Period and selected future reporting period to compare to Defra (2024b) indicator on funding for biodiversity. Note for this version of the workbook comparison is limited to the 'total' across Goals in the progress reporting period, as without further details on what is or is not covered in Defra (2024b) a breakdown by Goal is not possible, nor is there confidence in forecasting the indicator value as the method is subject to change.

Scope tabs: The tabs labelled **EIP23 goal and targets- screening** and **selection criteria** reflect the conceptual and analytical approach described in the technical report. Additional tabs include an assessment of **data availability**, reflecting the number of references or data points included in the Database and used across goal calculation worksheets. These tables are reported in Section 3.1 of the Technical Report. Furthermore, identified overlaps between Goals as captured in the **Database** and for selected evidence in the **Calculation worksheets** are reflected in series of matrices in the **Goal & Target overlap** tab.

A5.2 User input and maintenance

The Workbook has been designed so that user inputs are required predominantly in the '**Input – Database**' tab, with minimal revisions across other tabs in the workbook. Color-coding of individual cells varies across the workbook to keep additional formatting to a minimum. For ease, at the top of each worksheet a key is presented to indicate what colouring of cells means. Shaded cells throughout the workbook are in Appendix Table 13 .

Appendix Table 13 : Cell colour coding legend and descriptions

Legend	Description
	• User input required. Cell can be varied (e.g., using dropdown) or hard-coded (e.g., setting price year). In other instances, user input may be more involved (e.g., developing bespoke adjustment factors).
	• Cells above column headings in **Input – Database** tab indicating columns are required to be filled by user to support calculations.
	• In **Input – Database** these cells are linked to reference input worksheet(s). • Within the reference **input worksheets** cells are shaded in the same colour.
	• In **Input – Database** these are cells where a calculation within the worksheet is completed (e.g., inflationary adjustment in Columns AN – AP) • In reference **input worksheets** these are cells that are linked to **Calculation worksheets** as bespoke adjustment factors. • In **Calculation worksheets**, these are cells where an assumption or adjustment has been applied to annual cost estimates.

Legend	Description
	• In **Input – Database** cells are linked to EIP23 goals & targets screening tab.
	• No data – used in Calculation worksheets
	• Not in scope - used in **Scope tabs**.

Appendix Table 14 indicates where user inputs are required across tabs, and whether additional maintenance of the tab is required to support continued functionality. The latter reflects updating functional inputs on a regular basis and is subject to OEPs discretion of how often the Workbook itself should be updated. As a minimum, it would be in line with annual progress reporting requirements which would dictate the need to revise or refine the evidence within the **Input – Database**.

Appendix Table 14 : User input and maintenance requirements for workbook tabs.

Tab name	User input required?	Maintenance required?
Background		
Cover	N/A	Version control log should be kept up to date.
Overview	Yes – user sets price year, reporting unit and can amend reporting periods here.	N/A
Contents – Tabs & Map	N/A	N/A
Outputs		
BD Expenditure Need Catalogue	Yes – User selects which future reporting period to presents results for.	N/A
BD Expenditure Tracker	N/A	N/A
Scope		
EIP goals & targets - screening	Yes - Only if scope is changing, user can select EIP23 Targets to include.	Should be kept aligned with EIP23 Goals and Targets. Worksheet is linked to Input – Database to ensure consistent Goal/Target numbering and language
Selection criteria	N/A	
Data availability assessment	N/A	N/A – Tables are linked to Input – Database to reflect changes. New tables can be added at user discretion.
Identifying overlaps across Goals and Targets	N/A	Two matrices are linked to Input – Database and Calculation worksheets to reflect changes. Matrix on Goal 1 Targets and EIP23 Goals can be updated to reflect latest thinking.

Tab name	User input required?	Maintenance required?
Calculations		
Goal 1 - Calculation	Yes – User can include or amend bespoke adjustment factors (described in Appendix A4.1).	Additional Goal worksheets can be added as needed. Tab 'Goal X' is blank and can be duplicated.
Goal 2 - Calculation		
Goal 3 - Calculation		
Goal 4 - Calculation		
Goal 6 - Calculation		
Goal 8 - Calculation		
Goal 9 - Calculation		
Goal 10 - Calculation		
Goal X - Calculation		
Collected Evidence		
Input - Database	Yes – This is where data on expenditure is entered. Primary point of user input required.	To support monitoring, Database should be updated in line with key government announcement and decision-making schedules (e.g., Spending Review) as well as strategy revisions (e.g., FCERM, INNS revisions).
Input - W1	N/A	User's choice to add new worksheets (e.g., if new evidence available or update to one of the existing tabs).
Input - H5		
Input - H7		
Input - G2c		
Input - G2b		
Input - G3b		
Input - T3		
Input - T4		
Input - T7		
Input - T24		
Input - B1a, B4a, B4b		
Input - B3		
Functionality		
References	N/A	Reference ID system should be maintained to support linking between Database and Calculation worksheets. Should be updated to reflect new references reviewed and/or added to the **Input – Database**.

Tab name	User input required?	Maintenance required?
UK GDP Deflators	N/A	Should be updated at point of re-analysis to latest Deflator series.
UK Discount Factors	N/A	Should be updated in line with revisions to the Green Book.
Labelling - EIP Goals	N/A	Should reflect latest EIP23
Scalars	N/A	Default scalars can be revised as needed
Dropdowns	N/A	Dropdowns should be maintained, possible to add in new options but should be done consistently.

A5.3 Input – Database

Key part of the Catalogue is the categorisation of spending evidence to facilitate the analysis of required expenditure. This includes:

- Reference information – lead author/publication authority, publication date, reference type (e.g., government statistics, annual report, budget).
- Location – England or UK (in absence of England specific)
- Spending organisation – national government, local government, executive agency, non-departmental public body, non-ministerial department (as relevant)
- Type of expenditure – direct, indirect, one-off or ongoing. Expect that evidence will reflect a combination of these expenditure types.
- Classification of spend by action – record activities (e.g. habitat creation, restoration) to support linking to Goal and Target(s).
- How much – annual, average annual, total or present value costs to achieve target and commitment in publication price year and inflated to reporting price year.
- Attribution to primary Goal and Target(s) – alignment to goal and target(s) based on information recorded with confidence in attribution assessed. User needs to link the 'target' column to the **EIP23 screening tab** to ensure consistency in labelling, this is done using a CONCAT formula with a delimiter of ';'. In future this could be replaced with a multi-select dropdown using a VbA.
- Qualitative assessment of overlaps between goals and targets – identifies secondary goals and/or targets that the expenditure item contributes to. User needs to link the 'target' column to the **EIP23 screening tab** to ensure consistency in labelling, this is done using a CONCAT formula with a delimiter of ';'. In future this could be replaced with a multi-select dropdown using a VbA.

There are a mixture of free-text and dropdowns within the **Database** to allow for detailed information to be recorded (e.g., specific habitats, actions) and supports justifying the categorisation of evidence within the **Database**. In the future, some of these columns may be hidden as the Workbook is refined and users become more familiar with its structure and the type of information required to support OEPs use.

As shown in Appendix Table 13 the majority of colour-coding is in the **Input – Database tab**. This includes dark blue shading of cells above column headings to indicate which ones are linked to the goal calculation worksheets. Appendix Table 15 lists the columns and column names or group name that are required to be populated. The distinction here is to support the fundamental function of the lookup formulas, whilst also supporting analysis and aggregation of expenditure evidence.

Appendix Table 15 : Columns in Input – Database that need to be filled by user

Reason	Column	Column Name or Group(s) of columns
Fundamental for linking to Calculation worksheets	B	Row reference ID
	H & I	Selects evidence to (i.e., indicate 'Yes') and shows reasons for not selecting a data point
	AQ, AS & AT	Alignment of expenditure to primary Goal and Target(s), including confidence rating in alignment.
Required for analysis and aggregation of expenditure	C	Unique reference ID (auto-populates Column D which is linked to the calculation worksheets).
	J	Location
	Z	One-off and/or ongoing expenditure
	AA	Evidence type (i.e., need, budget, actual)
	AB	Description of action(s)
	AE & AF	Time period – start and end year, as stated in reference. Use 'Not Specified' if not stated.
	AG, AH, AI	Record value, as default single values are reported under 'Central' (col. AH) and used in the analysis
	AJ	Price year
	AK	Monetary unit
	AL	Type of value
	AV & AW	Identifies overlaps across Goals/targets (i.e., secondary goal(s))

Appendix 6 – Supporting evidence for data gaps and uncertainties

Appendix Table 16 : Example evidence for Section 3.1, by theme

Theme	Source	Supporting evidence
Goal 4 Data Gap	(Defra, 2005)	"The UKTAG did not recommend standards for phosphorus in lakes or for nitrogen in estuaries and coastal waters in their final report in August 2006. These elements have therefore not been considered in this Partial RIA."
	(Environment Agency, 2015)	"Measures to achieve chemical status objectives are not included in this appraisal. This is because of the current high uncertainty in scale and potential cost of the measures that might be required."
	(Environment Agency, 2022)	"Most measures to achieve water body chemical status objectives were not included in this assessment. Many of the required measures are already in place (for example, product bans or the phasing out of certain activities). The need, scale and cost of other potential measures are uncertain."
Uncertainty/ gaps in attribution to target	(Defra, 2022e)	Goal 1-marine protected area target: "The nature of the marine target is to bring together and formalise the existing approach to improving the condition of Marine Protected Areas, and therefore the costs of achieving the target are not additional. The management and monitoring policies and actions have been incorporated into the baseline, so no costs are a direct result on the target being introduced."
	(Glover, 2019)	"Peatland restoration covers multiple targets depending on motivation", but the data is not sufficient to capture this. Identifies crossovers between the landscapes target, habitat creation and woodland creation.
	(Defra, 2024b)	"Many expenditure items are designed to meet more than one policy objective: an example is tree planting, which promotes biodiversity but might be largely driven by a demand for landscaping. In practice, the assessment by relevant experts of the appropriate share of any spending which can be attributed to biodiversity needs to take into account issues such as the quality of conservation measures and the original intentions of the expenditure."
Issues with attribution to Goal 1	(Water UK, 2016)	"There is considerable uncertainty over the magnitude of impacts on deployable output that will arise from changing abstraction licences in order to meet and preserve good ecological status of water bodies and the habitats they support."
	(Committee on Climate Change (CCC), 2020)	"Due to lack of evidence, the benefits of services of biodiversity and water quality are not included in this analysis"
Data Issues	(Defra, 2010)	"Measures for reducing NH3 emissions are developed outside of the MPMD." Inconsistency in measurement.
	(Environmental Audit Committee (EAC), 2020)	Key point from these papers is that there is a split in resources and funding between rapid responses to new/future INNS as they arise, and ongoing attempts to limit/eradicate INNS that are already established in the UK. While these are separate kinds of projects/programmes, it can be tricky to distinguish between the two in

		these papers. Added to this is the uncertainty about future spend on INNS, given it is unknown what species will actually reach the UK/become a bigger issue
	(Williams *et al.*, 2010; Eschen *et al.*, 2023)	The updated version (Eschen *et al.*, 2023)has been added to the database where possible, however, sometimes not enough detailed breakdown of costs is provided, in which case the original (Williams *et al.*, 2010) values have been provided Here, the focus is on the costs to public bodies from established INNS, rather than prevention of new INNS becoming an issue
	(Defra, 2024b)	"Direct conservation consists of activities that directly protect and promote variety among living organisms. However, direct action is often ineffective unless supported by a range of other activities such as research and development, education and publicity, or even simply administration. Sources of information may not always distinguish between these elements, and it is necessary to exercise judgment as to when an item should be included or not, or whether the relevant component relating to direct action should be estimated by expert judgment or by reference to other information. For simplicity, the staff costs associated with implementing biodiversity focused programmes within large organisations are not included."
Measurement does not align with this project	(Sky Ocean Rescue and WWF, 2020)	Reports many values of net gains and benefits rather than costs.
	(Defra, 2010)	Quantifies the health costs of not abating rather than the cost of achieving the target.
	(Natural England, 2023)	Reports values in net gains and benefits rather than costs
	(Agrii, 2024; Defra and Rural Payments Agency, 2024, 2025)	Per hectare values only, no total cost estimates.
	(Committee on Climate Change (CCC), 2020)	Detailed breakdown of costs for each change land use are only provided at a per hectare level, and not given for the national scenario
Uncertainty over public/private spend split	(Defra, 2022h)	The assessment values the total cost to society of delivering the target. These costs will fall on government and business (through private finance), although the relative split between these agents is uncertain and will depend on how the target is implemented. As such, the split of costs between business and government has not been estimated.
	Defra (2022g)	"The analysis conducted for this IA is not of specific agreed government policy and some of the measures which have been costed include speculative technologies and behaviour changes. It is therefore outside the scope of this analysis to give detail on how the costs will be divided across business, government, and households. It has not been possible at this stage to provide a breakdown of the total transition (capital) and operating costs for several measures, as would be required for a full regulatory impact assessment."
	Defra (2022b)	"The ratio of private sector and public sector cost burdens will depend on the specific policies and actions implemented. The targets themselves put a duty on

		government, not business, and it is expected that the contribution of the private sector will primarily be voluntary or captured in other regulatory impact assessments such as Biodiversity Net Gain (BNG)."
	Natural England (2023)	"Natural England is predominantly funded by Defra Grant in Aid (88%), our funding agreement operates within the context of the Comprehensive Spending Reviews (CSR) which HM Treasury agrees with each Government Department. 2022-23 was the first year of a three-year settlement being undertaken for the financial periods 2022-23 to 2024-25." Funding is then not disaggregated by target/goal.
	Defra (2024b)	"Where the relevant data are available, expenditure figures relating to biodiversity protection are separated out from general environmental spending. When this breakdown is not possible, estimates are made as to how much of the total spending can be attributed towards biodiversity protection. These estimates are mostly made through contacts within the organisations concerned, ideally by the person responsible for the relevant programme."
	Committee on Climate Change (CCC), (2023)	"estimated an investment need of around £56 million per year for reducing flood risk through natural flood management in England and Wales (over the period 2022 - 2032)" – no reported split between public and private
Government action resulting in increased private spend	Defra and DfT (2017)	"The UK government's Renewable Transport Fuel Obligation has encouraged around £1 billion of private investment in UK biofuel production facilities and provides the equivalent carbon savings to taking over one million cars off the road each year."
	Defra (2022b)	"In recognition of the role of markets in tacking environmental challenges, the government has set a new objective to raise at least £500 million in private finance to support nature's recovery every year by 2027 in England, increasing to more than £1bn by 2030. Government has been working with the Financing UK Nature Recovery Coalition to understand how to scale up private finance for nature, within a robust framework for high integrity new markets for ecosystem services that ensures real improvements are delivered for nature."

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