**Development and Improvement of Tree Planting Scientific Indicators**

**Summary**

The Department for Environment, Food and Rural Affairs (Defra) is looking for tenderers to submit bids to support and build the evidence base for the Nature for Climate Fund Tree Planting Programme (‘the Programme’). We welcome proposals from a consortium of organisations bringing together several institutions including (but not limited to) commercial, academia, and / or subject matter experts.

The overall aim is to demonstrate the Programme’s impact in the following outcome areas:

***Tier 1***

1. *Carbon sequestration*
2. *Biodiversity*

***Tier 2***

1. *Flood mitigation*
2. *Water quality*
3. *Air quality*

The development of indicators will be used to demonstrate the **attributable** changes caused by the Tree Planting Programme up to 2025, and address evidence gaps in the Programme Key Performance Indicator (KPI) Framework. Our aim in commissioning this research is to provide usable, robust, relevant and timely evidence so that the Customer can deliver a thorough monitoring and evaluation of the programme that gives confidence to others.

We are pleased to invite proposals for the development of indicators. We envision that the successful supplier will use fieldwork and/or existing research to illustrate long-term potential change. The findings will feed into the Programme evaluation running to January 2025. The successful supplier will illustrate the Programme’s long-term trajectory in achieving its outcomes, by monitoring or modelling short-term observations.

**Programme background**

In 2018 Defra launched the [25 Year Environment Plan](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/693158/25-year-environment-plan.pdf) (25YEP), which outlines the Government’s focus on tree planting as a key driver of improved environmental and social outcomes. It includes a vision to drive extensive increases in tree planting in towns, cities and rural areas. It summarises ambitions to protect and support existing trees and forests, and to develop enhanced markets for UK forest products. In addition to this, the UK government is also following advice from the Committee on Climate Change (CCC) as part of the UK’s commitment to deliver Net Zero by 2050 and meet the Paris Agreement goals.

In 2020 the Committee on Climate Change (CCC) recommended significant increases in tree planting, woodland creation and management, and peatland restoration in the UK, leading to a Government UK-wide manifesto commitment to increase tree planting and woodland creation across the UK by 30,000 hectares per annum before the end of the current parliament in 2025. England has a target of planting approximately 7,500 hectares of woodlands per year, by the end of this Parliament. Action Plans for trees and peat were launched in May 2021 to ensure that these commitments can be delivered in support of Net Zero whilst securing maximum benefits for citizens and the environment.

More recently, the [Environmental Improvement Plan (EIP) 2023](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1133967/environmental-improvement-plan-2023.pdf) introduced the plan to deliver the 25YEP vision. It sets out several long-term targets and commitments including increase tree canopy and woodland cover from 14.5% to 16.5% of total land area in England by 2050, a new interim target to increase this by 0.26% by January 2028 and restore or create more that 500,00 hectares of wildlife-rich habitat by 2042.

In line with our tree canopy and woodland cover targets, the [England Trees Action Plan](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/987432/england-trees-action-plan.pdf) (ETAP) sets out the government’s ambition for the treescape it wants to see in England by 2050 and beyond in order to reduce climate change and to improve biodiversity in the UK.

The £750 million Nature for Climate Fund (NCF) is a primary delivery vehicle to meet the above Defra targets and generate a trajectory to ensure the Government meets ETAP policy outcomes. The Programme incorporates new partnerships and provides grants and advice to increase woodland creation and expansion to at least 7,500ha per year by March 2025, as well as a range of associated environmental benefits, including strengthened biodiversity, habitat creation, and social/economic development in line with government ‘levelling up’ objectives.

Defra has designed the Programme as a portfolio of projects that increase woodland creation, expansion and management through new partnerships with other public bodies, grants and advice for landowners. There are three types of tree planting project interventions designed to directly accelerate tree planting to the required rates (each containing multiple grant delivery mechanisms):

* Planting on Private Land: new support and incentives to get private landowners planting trees and establishing woodlands
* Planting on Public Land: Boosting tree planting and woodland creation on publicly owned and managed land
* Woodland Creation Partnerships: Creating woodlands through new and existing partnerships

There are additional, cross-cutting activities within the programme which support planting initiatives by enabling the wider transformation in capacity, capability and behaviours needed to accelerate planting and woodland creation. These are:

* Promotion and Engagement: promoting tree planting grants to new and existing audiences
* Communications and Stakeholders: helping generate a sense of excitement and interest around new woodland
* Increasing Sector Capacity: supporting the forestry and tree nursery sectors; ensuring we have enough saplings and a strong workforce
* Research and Development: supporting projects to achieve maximum impacts through research that will be disseminated to researchers, policy makers, forestry practitioners and delivery teams to maximise knowledge sharing.

The Programme works with a range of Delivery Partners, all of which manage a number of different workstreams and sites. A full list and description of projects in each work stream, can be found in Annex A.

**Background to the requirement**

A monitoring and evaluation framework was developed in May 2022 to set out the evaluation approach and establish programme key performance indicators (KPIs). This highlighted that the programme evaluation requires more robust data that allows it to demonstrate attribution in specific outcome areas.

Potential suppliers may find the following deliverables useful for context:

* Theories of Change - Programme level theory of change alongside four nested thematic level theories of change. The thematic theories of change reflect four key areas contained within ETAP and are nested into the programme level outcomes, to demonstrate clear links between thematic and programme level outcomes and impacts. See Annex B1 and B2.
* KPI Framework - A KPI framework consisting of log frames that details indicators against the impacts and outcomes in the programme Theory of Change. See Annex C.

The majority of the current indicators in our priority outcome areas do not demonstrate the impact caused directly by the Programme, and instead capture the national picture/trends.

**Aims and objectives**

We welcome both pragmatic and innovative proposals to develop indicators that can be used within the programme lifecycle to demonstrate the Programme’s impact in the final evaluation (July 2024). Nevertheless, we expect the developed research will have some long-term utility for successor tree planting programmes as well as projecting the benefits from the NCF programme, which will be realised over a far longer time than the lifespan of the Programme.

The key aim of this work is to provide research or a model / trajectory that will allow us to:

* Establish whether the Programme is delivering its key outputs and outcomes and is **on track to achieve its long-term impacts**.
* **Demonstrate changes** within the life of the Programme, more than likely providing a modelled **trajectory** of the achievement of outcomes or similar.
* **Attribute** the changes to the Programme.

The outputs of this work are likely to be used to inform future delivery of successor tree planting programmes. The outcome areas have been grouped into two tiers to highlight key outcome areas for the programme. **It is important that potential suppliers address both tiers to the best of their ability.**

***Tier 1***

1. *Carbon sequestration*
2. *Biodiversity*

***Tier 2***

1. *Flood mitigation*
2. *Water quality*
3. *Air quality*

Table 1 on the following page details the outcome area, current proposed indicator, and our requirement.

*Table 1: Indicators*

|  |  |  |
| --- | --- | --- |
| **Outcome area** | **Current Indicator(s)** | **Requirement** |
| Carbon Sequestration | Emissions/removals are estimated using output from Forest Research’s CSORT model[[1]](#footnote-2)[[2]](#footnote-3), an off-line version of Carbine, the greenhouse gas accounting model used to calculate the forestry contribution to the UK LULUCF Greenhouse Gas inventory. Three indicative woodland types are represented in the model: productive conifer, productive broadleaf, and unmanaged. Carbon sequestration modelling is based on conventional forestry growth and yield models which apply an s-shaped growth function. This accounts for the fact that many forestry systems, particularly broadleaf woodland, commonly have slower growth during the establishment phase (the period after planting). As such, carbon sequestration in the early years is conservative before accelerating as the trees begin to reach maturity. Modelling also accounts for operational carbon emissions from NCF planting and carbon stored in timber hard wood products that have been harvested. See [here](https://cdn.forestresearch.gov.uk/2022/02/fcrp018-3.pdf) for more details on the Forestry Research carbon modelling. | The projected carbon sequestration levels are based on tree planting data collected by delivery partners. The projections to date are at Programme level at current and we would like to see a comparison across the Programme regions or sites, as well as a programme level projection.  The successful supplier should focus on providing a more accurate estimation of changes in carbon sequestration levels or early indications to estimate whether the Programme is on track to achieving its targets. Actual carbon sequestration rates from woodland creation are uncertain, particularly as local geography, species choice and soil condition will vary greatly from site to site.  Field work and/or research may be required to improve understanding of certain factors that influence carbon modelling. For instance, there is a lack of data on early growth of trees and branch and root biomass, stocking density, and soil. |
| Biodiversity | UK Biodiversity Indicator indices measuring woodland species abundance and distribution (C5: Woodland Birds Index, C6: Index of Butterflies of wider countryside in woodland, C4a: Change in the relative abundance of priority species in the UK, C4b: Status of UK priority species – distribution)[[3]](#footnote-4). National Forest Inventory records on Woodland Ecological Condition[[4]](#footnote-5). | We are interested in species and functional diversity and habitat creation but understand it may be difficult to measure accurately within the given timeframe. We expect the successful supplier to use a proxy to indicate whether the Programme is on the right trajectory to support biodiversity outcomes. Note, there are many ways of demonstrating changes in biodiversity and we welcome pragmatic approaches.  Mapping and measuring habitat availability (e.g. location and condition of woodlands and trees) could provide a good indication of quantity of usable habitat, as well as connectivity to account for species movement, tree mortality/establishment, woodland ecological condition, woodland diversity (genetic, structural and species diversity), and more. Other methods could involve using or building on existing research on established woodlands or modelling trade-offs between ecosystem services. |
| Flood mitigation | The indicator is based on mapping that indicates where planting is likely to contribute to flood risk reduction benefit. Proposed woodland must touch either ‘Opportunity for Floodplain Woodland’ or ‘Opportunity for Wider Catchment Woodland’ in the ‘EWCO Water – Flood Risk’ layer on the Forestry Commission’s map browser and Land Information Search. | We expect the successful supplier to build on this approach and use maps to distinguish where trees have been planted against flood risk areas and better understand the potential impact on overall flood risk reduction (such as increased storage volume, area of increased permeability or change in interception of rainfall).  We encourage suppliers to review existing methods and evaluations to inform their approach to monitoring (e.g. [Natural Flood Management Programme](https://www.gov.uk/government/publications/natural-flood-management-programme-evaluation-report/natural-flood-management-programme-evaluation-report#executive-summary)). |
| Water Quality | This 25 YEP indicator[[5]](#footnote-6) is composed of several metrics including: percentage of water tests meeting good (or better) Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (the WFD regulations) status for ecology and chemistry, percentage of water bodies achieving good ecological status, and compliance of waters specially protected for specific uses such as drinking water abstraction and nature conservation. | We understand it will be difficult to measure changes in water quality within the given timeframe. At a minimum, it will be beneficial to understand the impact of planting in areas of England with the lowest water quality and the estimated change in water quality as a result.  We welcome a pragmatic approach and are open to the parameters used to indicate changes in water quality. Suppliers can build on or use existing research as well as deliver new research through fieldwork if required. |
| Air quality | Modelling of pollutant levels using ONS Pollution Removal Ecosystem accounts. The actual pollutant removal of NCF planting is location (and species) dependent and cannot be accurately quantified.  There is mixed literature on the impact of trees on air pollutant removal; methodologies around this may change, and our ability to report on this against 5-year milestones as part of the Programme KPI Framework will rely on the ONS paper to be updated.  *Source:* [*N524081RE.pdf (nerc.ac.uk)*](https://nora.nerc.ac.uk/id/eprint/524081/7/N524081RE.pdf) | The successful supplier should provide a more accurate forecast of changes in air quality at programme and/or site-specific level. This may involve carrying out fieldwork on programme sites to better understand pollutant removal, if at all, including some or all of the following:   * PM10 * PM2.5 * SO2 * NH3 * NO2 * O3   We’re interested in understanding the impacts of both urban tree planting and rural planting. If it is not possible to improve on existing methods, it could be that the successful suppliers take a more pragmatic approach to explore where trees are planted (e.g. close to industrial areas) and map these against areas with high levels of pollution or similar. Other methods could involve using or building on existing research. |

**Timeline**

There are three key stages under the Programme evaluation and the first is underway (mid-term evaluation). The mid-term evaluation will use existing evidence and KPIs.

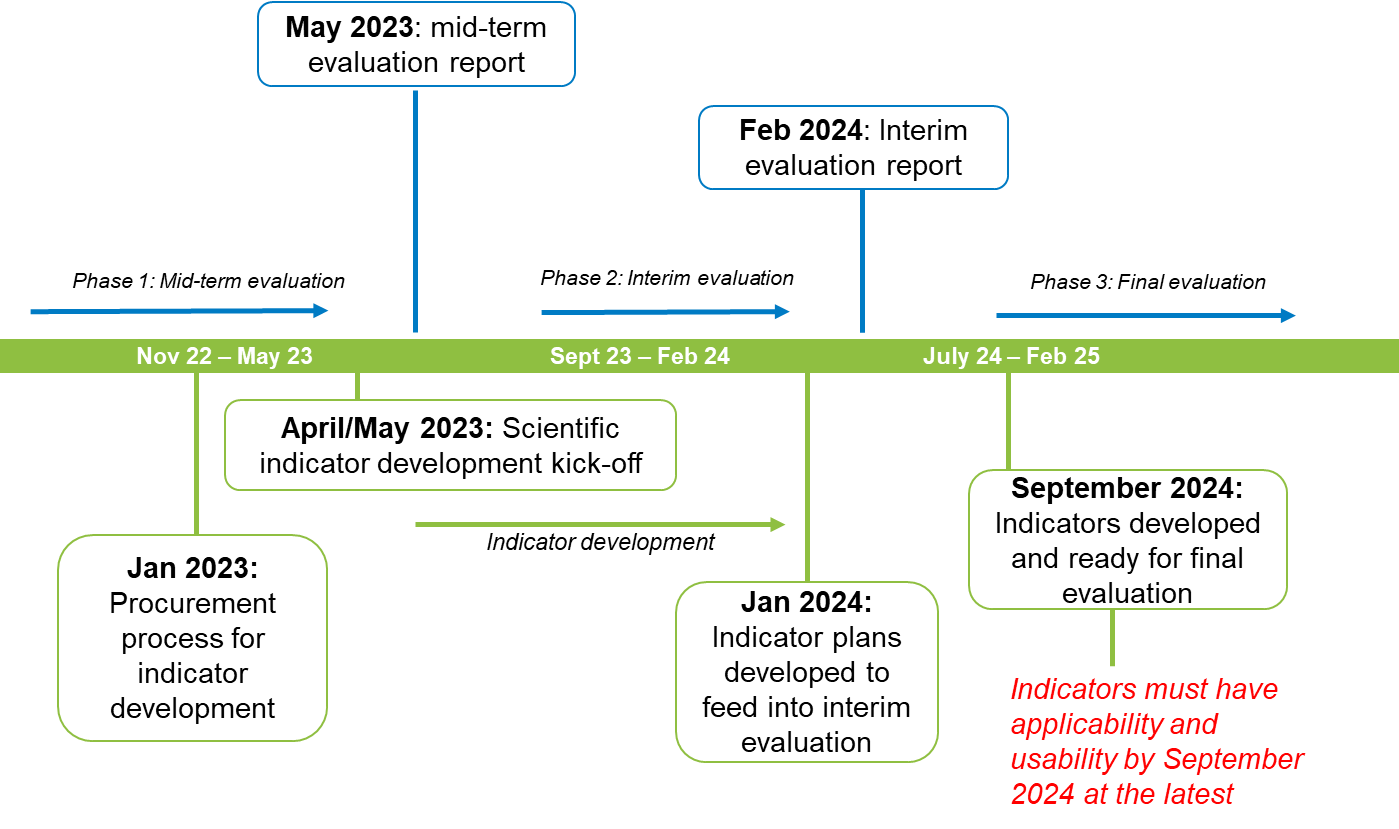
Suppliers need to provide final indicators by September 2024 so they can be incorporated into the programme evaluation plan. We will need to be kept updated on the thinking and progress being made by the successful supplier with evidence developing alongside the evaluation. The level of detail required during the remaining phases is detailed below:

Interim evaluation (August 2023 – Feb 2024)

The Programme evaluation will **better understand** **and provide some evidence** of output and outcome-level results and the Programme’s likely contribution to the longer-term impacts and investment objectives outlined in the NCF business case.

Final Evaluation (July 2024 – Dec 2024)

**Provide an overall evidence** base for the delivery and impact of the NCF Tree Planting Programme.



**Approach and Methodology**

We expect potential suppliers to review the Theory of Change and KPI Framework to inform their proposed approach and methodology. The successful supplier will take a pragmatic and robust approach that can be delivered within the allocated timeframe.

The approach/methodology should take the following into consideration:

* *Attribution and net impact –* Does the research have potential to demonstrate the outputs and outcomes are caused by the Programme? Does the research take into consideration potential negative impacts?
* *Forecasting –*Does the indicator provide a trajectory of the benefits? If so, what are the underlying assumptions, dependencies and caveats?
* *Existing data –*Is there existing evidence and research that can be drawn on to develop the indicator?
* *Primary data and research –* What new data (if at all) is required to develop the indicator
* *Scope –*Can the indicator be applied to the Programme or is site specific research more appropriate? If so, what are the key caveats that need to be borne in mind if extrapolating to a national picture?
* *Accessibility and visualisation* – Can the findings be presented to a lay audience in a digestible format? Is the presentation format easy to navigate? What platforms will be used? (e.g. RShiny, ArcGIS, GIS or similar)

We welcome innovative and advanced methods and tools including but not limited to, LiDAR, Laser scanning, GIS mapping, Earth Observation and any other appropriate options that will allow delivery within the scope and timeframe of this Programme.

The methods proposed must explore the net impact (both positive and negative impacts) on the environment and link the impact back to the Programme. We welcome suppliers that can provide an approach and methodology considering these points, outlining the benefits and limitations of their approach. These points will be considered when bids are assessed. More detail on the scoring criteria can be found later in this document.

**Please note that Defra has no preferred methods for indicator development but requires a clear rationale for the approach taken and a clear demonstration that it will meet the aims and objectives outlined in this brief.**

**Data and scope**

The following data will be available for the successful supplier for each site:

1. Total land
2. Total area planted (hectares)
3. Number of trees planted (available for some project but not all)
4. Woodland or tree cover outside woodland
5. Tree species breakdown
6. Grid references
7. Spatial files (available for some sites)

Annex D shows a data template submitted by delivery partners that is submitted on a monthly basis. Defra **does not** have permission to gain access to some sites and therefore would support the successful supplier to liaise with Delivery Partners and landowners if fieldwork or ongoing monitoring is required. Positive relationships have been established between delivery partners and landowners and therefore this is unlikely to be a barrier. The majority of delivery partners hold spatial data on sites that can be shared with the successful supplier.

Suppliers are expected to have or obtain data licenses for any data or maps that may be required.

The successful supplier will **not** include trees established through natural colonisation as this method is a small proportion of overall Programme planting and will not be counted towards the Programme’s planting targets.

**Outputs**

Below is a summary of required outputs, although this list should not stymie additional innovative products. Reports must be produced in line with the Authority’s publications and accessibility standards.

1. *Detailed project plan including recruitment and sampling approaches and methods, following an inception meeting.*
2. *Summary monthly progress reports.*
3. *A technical report on the research/indicator development including an executive summary.*
4. *Evidence compendium(s) summarising the research and how it will be used to demonstrate environmental benefits.* *The evidence compendium(s) will be easy to navigate and be in an impactful style that is succinct.*
5. *Visualisation of the findings (format to be suggested by potential suppliers) and usable for evaluation.*

We expect the evidence compendium(s) and any findings used in the evaluation will be published.

# **Programme of Work and Project Management**

It is important that the activities align with the Programme evaluation. We expect the supplier to provide all outputs to inform the evaluation by September 2024.

Defra will nominate a Project Manager who will be responsible for the day-to-day management of this contract, the relationship with the successful contractor, and will liaise with the Trees and Woodlands Scientific Advisory Group (TAW-SAG) and National Biodiversity team to review the work and ensure it meets our aims and objectives.

The successful contractor will be expected to appoint a Project Manager who will act as the principal point of contact for Defra and who will be responsible for the day-to-day management of the project. Appropriate escalation routes to senior managers must be included in the project bid. Ways of working will be agreed at inception - the contractor will regularly update the Project Manager on project progress for example, via regular meetings, progress reports, and updates when there are any significant issues (as early as possible).

**Quality management**

The contractor should provide details of the measures that will be taken to manage and ensure the quality of the work. Please include details of the quality assurance policy in place and how this will ensure the quality of the project. The contractor should take note of DEFRA’s [quality assurance processes.](https://www.gov.uk/government/organisations/department-for-environment-food-rural-affairs/about/research)

# **Required skills**

Potential suppliers should provide information about the skills and experience of the project team deemed relevant to the indicator development, which should include but is not limited to:

* Detailed technical knowledge/understanding of any relevant policy landscape
* Technical expertise and experience of modeling / forecasting
* Knowledge of latest publications, data and other relevant information
* Experience of presenting clear written and verbal deliverables
* Project design and management skills to oversee the development and delivery of the project to time, cost and quality criteria
* Specific subject matter expertise in outcome area

# **Ethics and Data Protection**

The contractor should identify any ethical issues relevant to this project and provide details of how any specific risks will be addresses. The successful bidder must comply with all of the requirements of the Data Protection Act 2018 and shall ensure appropriate research consents from interviews or any data collection. Contractors are responsible for ensuring that all necessary permissions are acquired for the use of data, visuals or other materials through the project that are subject to copyright law, and that the materials are used in accordance with the permissions that have been secured. Contractors are also responsible for ensuring suitable referencing of materials in all project outputs including project data.

The successful contractor must comply with General Data protection regulation (GDPR) and ensure that any information collected, processed and transferred on behalf of Defra will be managed, held, handled and transferred successfully. The successful contractor will be assigned the role of ‘Data Processor’ for the duration of the contract and Defra will act as the ‘Data Controller’.

Contractors should provide a data management plan outlining any specific data security issues related to this project and detailing how these will be managed.

**Intellectual Property Rights**

Contained in the Terms and Conditions.

**Evaluation criteria**

The criterion for evaluating your proposal is detailed below. The description for sub-criteria should be used to guide your response; however, we welcome additional details.

Table 2:

|  |  |  |  |
| --- | --- | --- | --- |
| **Criteria** | Quality | Price | Social Value |
| **Weighting** | 60% | 30% | 10% |

**Quality sub-criteria weightings**

Table 4:

|  |  |  |  |
| --- | --- | --- | --- |
| **Sub-criteria** | | **Description** | **Weighting** |
| **What methodology has been proposed?** | | The supplier has demonstrated a clear understanding of the aims, objectives and main concerns of demonstrating the Programme’s impact.  The supplier has provided a detailed description of how the outcome areas will be addressed including (but not limited to):   * details on methods, * data sources (primary / secondary), * how attribution will be addressed, * the scope (site specific / national picture), * any underlying assumptions and limitations, * potential applicability to successor programmes | 40 |
| **Are the proposed outputs appropriate for lay audiences? How will outputs be visualised?** | | The supplier has demonstrated the indicator can be digestible for lay audiences.  The supplier has provided infographics and / or visualisations for the evaluation and lay audiences.  The supplier has provided innovative or creative solutions to disseminating research findings. | 15 |
| **What is the suppliers’ organisational experience? What is the team expertise?** | | There isorganisational and individual experience relating to each outcome area.  There is strong scientific, technical and statistical expertise or ability to draw on experts.  The assigned team is suitable for the project and have a vast amount of experience.  Note: Pen profiles should be provided in the response. CVs should be a maximum of 0.5 pages per member of staff. | 15 |
| **How will the supplier enable strong co-ordination across elements of the project and deliver the project on time?** | | The leadorganisation(s) are well equipped to successfully liaise with its partners.  There is a suitable approach to project management to support the successful delivery of the project on time.  There is a strong team structure and roles and responsibilities are defined.  The appropriate governance is in place and clearly explained. | 20 |
| **How will risk be managed?** | | The supplier has a suitable approach to performance management and stakeholder management  The supplier has a suitable approach to risk management (including risk log and mitigation actions). | 5 |
| **What quality management, data protection and ethics protocols will be in place?** | | The supplier has considered ethics and has procedures and protocols in place.  The supplier has secure systems in place for data sharing (e.g., cloud-based or other) in line with GDPR requirements. | 5 |
| Score | Comment | | |
| 100 | Excellent - Response that meets the requirements. Indicates an excellent response with detailed supporting evidence and no weaknesses resulting in a high level of confidence. | | |
| 70 | Good - Response that meets the requirements with good supporting evidence. Demonstrates good understanding. | | |
| 50 | Acceptable - Response is relevant and acceptable. Meets the requirements – the response generally meets the requirements but lacks sufficient detail to warrant a higher mark. | | |
| 20 | Poor - Response provides the minimum level of detail to meet the requirements for the first year for which funding is requested and will require further clarity/detail ahead of any further years funding. | | |
| 0 | Unacceptable - Nil or inadequate response. Failed to provide confidence that the proposal will meet the requirements. An unacceptable response with serious reservations. | | |

**PROPOSAL**

Potential suppliers **must** submit proposals to address all outcome areas.

We will not be providing indicative costs as contractors may adopt different approaches.

**Note: Your proposal should not exceed 25 sides of A4 (excluding the Costs and CVs which can be provided as additional attachments).**

Attachments must not be included unless requested apart from a full cost schedule that presents the task/deliverable against the number of days required, by whom, and associated cost, and CVs.

Do not make or append Caveats and Assumptions in your proposal – any points of uncertainty must be raised as a clarification point prior to submitting the proposal. Where assumptions are to be made, these will be stated by the Authority’s Project Manager.

**Presentation:**

**What methodology has been proposed for Tier 1 indicators, how does it achieve our objectives and how will key limitations be addressed? 60%**

The supplier has clearly set out how their proposed methodology:

* achieves our objectives;
* addresses key limitations;
* provides additional value in comparison to the current indicators in our KPI framework.

**How will the project ensure high quality outputs are delivered on time? 20%**

The supplier has clearly set out how:

* The project will use a collaborative approach
* Both internal and external stakeholders will be involved
* Draft and final outputs will be of a high standard when shared with Defra (this could include but is not limited to internal quality assurance and peer reviews)

**What previous experience can be drawn on for visualising and disseminating outputs? 20%**

The supplier has provided a practical example of how they have delivered innovative solutions for visualising or disseminating research and how that can be applied to this project.

1. Morison et al. (2012), ‘Understanding the carbon and greenhouse gas balance of forests in Britain’, [fcrp018.pdf (forestresearch.gov.uk)](https://cdn.forestresearch.gov.uk/2012/05/fcrp018.pdf) [↑](#footnote-ref-2)
2. Matthews, Broadmeadow (2009), ‘The potential of UK forestry to contribute to government’s emissions reduction commitments’, https://www.cabdirect.org/cabdirect/ abstract/20103082977 [↑](#footnote-ref-3)
3. [*https://data.jncc.gov.uk/data/8fab1c70-e45f-4c41-ad5c-5c23fad46dbb/ukbi2022-summarybooklet-a.pdf*](https://data.jncc.gov.uk/data/8fab1c70-e45f-4c41-ad5c-5c23fad46dbb/ukbi2022-summarybooklet-a.pdf) [↑](#footnote-ref-4)
4. [NFI Woodland Ecological Condition - Forest Research](https://www.forestresearch.gov.uk/tools-and-resources/national-forest-inventory/what-our-woodlands-and-tree-cover-outside-woodlands-are-like-today-nfi-inventory-reports-and-woodland-map-reports/nfi-woodland-ecological-condition/) [↑](#footnote-ref-5)
5. [*Indicator: B3 - State of the water environment - Outcome indicator framework for the 25 Year Environment Plan (defra.gov.uk)*](https://oifdata.defra.gov.uk/2-3-1/) [↑](#footnote-ref-6)