



Standard Contract for Goods and/or Services - Order Form

1. Purchase Number	Order	To be confirmed
2. Customer	Natural England	
3. Contractor(s)	[Redacted under FOIA Section 4] Limited, Invergowrie, Dundee, DD2 5DA	
4. Defra Group Members	The following Defra Group members will receive the benefit of the Deliverables: Natural England	
5. The Agreement	<p>This Order is part of the Agreement and is subject to the terms and conditions referenced at Appendix 1 and shall come into effect on the Start Date.</p> <p>Unless the context otherwise requires, capitalised expressions used in this Order have the same meanings as in the terms and conditions.</p> <p>The following documents are incorporated into the Agreement. If there is any conflict, the following order of precedence applies (in descending order):</p> <ul style="list-style-type: none"> a) this Order; b) the terms and conditions at Appendix 1; and c) the remaining Appendices (if any) in equal order of precedence. 	
6. Deliverables	Applicable Deliverables	Goods Only: <input type="checkbox"/> Services Only: <input checked="" type="checkbox"/> Good and Services: <input type="checkbox"/>
	Goods	None
	Services	Description: in Appendix 2 – Specification / Description To be performed at the Contractor's premises. Date(s) of Delivery: 07/10/2024 – 28/02/2025
7. Start Date	07/10/2024	
8. Expiry Date	28/02/2025	
9. Charges	The Charges for the Goods and/or Services shall be as set out in Appendix 3 – Charges. The Charges are fixed for the duration of the Agreement.	
10. Payment	Payments will be made in pounds by BACS transfer using the details provided by the supplier on submission of a compliant invoice.	
11. Contractor's Liability Cap (Clause 13.2.1)	A sum equal to £5,000,000.	

12. Customer's Authorised Representative(s)	For general liaison your contact will continue to be Redacted under FOIA Section 40 Personal Information						
13. Contractor's Authorised Representative	For general liaison your contact will continue to be Redacted under FOIA Section 40 Personal Information						
14. Optional Intellectual Property Rights ("IPR") Clauses	The Customer has chosen Option B in respect of intellectual property rights provisions for the Agreement as set out in the terms and conditions.						
15. Progress Meetings and Progress Reports	<ul style="list-style-type: none">The Contractor shall attend progress meetings with the Customer every monthThe Contractor shall provide the Customer with progress reports every 2 weeks						
16. Address for notices	<table><tr><td>Customer:</td><td>Contractor:</td></tr><tr><td colspan="2">Redacted under FOIA Section 40 Personal Information</td></tr></table>	Customer:	Contractor:	Redacted under FOIA Section 40 Personal Information			
Customer:	Contractor:						
Redacted under FOIA Section 40 Personal Information							
17. Key Personnel of the Contractor	<table><tr><td>Key Personnel Role:</td><td>Key Personnel</td><td>Contact Details:</td></tr><tr><td colspan="3">Redacted under FOIA Section 40 Personal Information</td></tr></table>	Key Personnel Role:	Key Personnel	Contact Details:	Redacted under FOIA Section 40 Personal Information		
Key Personnel Role:	Key Personnel	Contact Details:					
Redacted under FOIA Section 40 Personal Information							
18. Procedures Policies and	For the purposes of the Agreement: The Customer's security / data security requirements are: To comply with best practice in relation to data security and ensure any data transfer is done securely.						

19. Special Terms	N/A
20. Additional Insurance	N/A
21. Further Data Protection Provisions	The further data protection provisions contained within Appendix 4 of the terms and conditions are applicable to this Agreement where indicated below: Yes: <input type="checkbox"/> No: <input checked="" type="checkbox"/>

Signed for and on behalf of the Customer	Signed for and on behalf of the Contractor
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Redacted under FOIA Section 40 Personal Information

Appendix 1: Terms and Conditions

The Customer's Standard Good & Services Terms and Conditions which can be located on the [Natural England Website](#) and which are called 'Standard Goods & Services Terms and Conditions'

Appendix 2: Specification/Description

A framework for assessing confidence in metabarcoding assays and results

Background to the specific work area relevant to this purchase

DNA-based methods have the potential to significantly change how we monitor and assess ecosystems. Natural England has been exploring the use of these methods for environmental monitoring for several years, delivering a series of reports which focus on the development of DNA-based methods with potential in a particular area. These methods are now being used more widely within Natural England, particularly the detection of ecological communities using environmental DNA (eDNA). This is often conducted by employing metabarcoding assays which target specific species assemblages (e.g. fish, mammals) or broader taxonomic groups (e.g. vertebrates, invertebrates, bacteria).

The DNA Team aims to operationalise DNA-based methods and produces guidance for using them in monitoring projects. In order to provide sound recommendations, it is important that we understand the limitations of and uncertainties with DNA-based methods. Natural England staff need to be able to understand how DNA-derived data can be used, and the confidence they can have in data derived using different DNA-based methods which have been validated to different stages.

A validation framework for single species eDNA assays was previously developed to allow end-users to evaluate previously published assays for future research and routine monitoring (Thalinger and others 2021). By using the scale, end-users can appropriately interpret results. It also provides validation and reporting standards for the development of new assays. Natural England commissioned a simplified version of this framework to allow us to assign a confidence level to single species assays for their use in condition assessments and management plans, or to target where more survey effort may be required (Harper and others 2021). However, no such framework exists for metabarcoding assays.

Metabarcoding assays are inherently more complex than single species assays. There are many available metabarcoding assays and often more than one for a given taxonomic group. Different assays may have been validated to varying degrees on different sample types in different environments and applied in various contexts, which affects the interpretation of results. There are also numerous eDNA metabarcoding providers, each providing results in a non-standard format. This situation has led to challenges for widespread adoption of eDNA metabarcoding approaches by end-users. It is difficult for Natural England staff to understand, interpret, and determine confidence in the results of different metabarcoding assays or assess the risk of false positive or false negative results.

This project aims to address some of these challenges through the development of an eDNA metabarcoding assay validation framework. This will include:

- Establishing key criteria to enable the classification of metabarcoding assays based on their taxonomic coverage, taxonomic resolution and detection sensitivity for different groups.
- Assessing the suitability of metabarcoding assays for different sample types and environments.

This will enable end-users to determine the recommended scenarios for application of a given assay and improve assay performance with further validation.

Requirement

The objective of this project is to construct a validation framework for eDNA metabarcoding assays. The contractor should work closely with the Natural England Project Officer and a steering group comprised of academic, government, non-governmental, and commercial organisations to ensure that the framework is appropriate for use by Natural England staff and other end-users.

Please provide separate quotes for undertaking each requirement. Natural England reserves the right to let only one of these requirements.

1. Framework construction
 - a. The contractor should produce an overview of validation steps for metabarcoding assays. Different approaches to metabarcoding and their trade-offs (e.g. one-step vs. two-step PCR, PCR vs. ligation, Qubit vs. qPCR quantification, choice of sequencing platform, OTUs vs. ASVs, method of taxonomic assignment) should be discussed.

- b. Building upon existing projects aiming to define best practice and minimum reporting standards for metabarcoding, the contractor should define parameters that can be used to assess metabarcoding studies in consultation with leaders in eDNA metabarcoding (to be proposed by contractor and agreed upon by Natural England and the project steering group). These should encompass all steps of the metabarcoding process, including in silico and in vitro validation of primers, sample collection, sample preservation, DNA extraction, PCR amplification, library preparation, sequencing, bioinformatics, and data analysis.
 - c. The parameters should be placed onto a levelled scale from Basic to Operational, i.e. the validation scale (to be proposed by contractor and agreed upon by Natural England and project steering group). Consideration will need to be given to requirements for a metabarcoding assay to be operational for regulation vs. other scenarios. The remaining uncertainties at each level and valid interpretation of results should be identified.
2. Pilot test
 - a. The contractor should perform a small-scale test of the validation scale using the 12S-V5 primers (Riaz and others 2011; Kelly and others 2014) as a case study. Up to 20 scientific publications that have used this metabarcoding assay on eDNA samples (i.e. water, sediment, soil, air or other environmental samples and not faeces, gut contents, blood meals or other samples derived directly from organisms) should be assessed for the validation scale parameters and the assay level determined.
 - b. Modifications to the validation scale required for a large-scale meta-analysis of the scientific literature should be proposed by contractor and agreed upon by Natural England and the project steering group.
3. Scoping exercise
 - a. The contractor should distribute a questionnaire to the UK DNA Working Group and other eDNA consortia to assess which metabarcoding primers are most commonly used on which sample types, and in which environments.
 - b. The contractor should perform a literature review to identify metabarcoding studies for inclusion in a meta-analysis. The number of studies should be reduced to a maximum of 500 using the results of the questionnaire (to be proposed by the contractor and agreed upon by Natural England and the project steering group).
4. Meta-analysis
 - a. The contractor should perform a meta-analysis of studies identified by the literature review using the validation parameters and place metabarcoding assays on the validation scale.
 - b. Recommendations for future work and/or best practice should be provided.
 - c. A template for assessing new metabarcoding assays against the validation scale should be provided (to be proposed by the contractor and agreed upon by Natural England and the project steering group).
 - d. The contractor should archive and publish the literature database and meta-analysis online and open access.

The results should be compiled into a final detailed report (see outputs for details).

Quotation submission

Please provide the following supporting documents:

- Proposed methodologies
- Health & Safety Policies/certificates
- CVs of key personnel who will be directly involved with this contract
- Examples of past work

Sustainability

Natural England protects and improves the environment and is committed to reducing the sustainability impacts of its activities directly and through its supply chains. We expect the Contractor to share this commitment and adopt a sound, proactive sustainable approach in keeping with the 25 yr environmental plan/our commitments compliant with all applicable legislation. This includes understanding and reducing direct and indirect sustainability impacts and realising opportunities, including but not restricted to; resilience to climate change, reducing greenhouse gas emissions, water use and quality, biosecurity, resource efficiency and waste, reducing the risk of pollution, biodiversity, modern slavery and equality, diversity & inclusion, negative community impacts.

As a delivery partner, the successful contractor is expected to pursue sustainability in their operations, thereby ensuring the Contracting Authority is not contracting with a supplier whose operational outputs run contrary to the Contracting Authority's objectives. The successful contractor will need to approach the project with a focus on the entire life cycle of the project.

Please provide details of how any plastic waste produced as part of DNA extraction will be reduced.

Outputs and Contract Management

A final written report detailing the activities and analysis undertaken should be provided to the Natural England Project Officer. The final report must follow the [Natural England report writing guidance](#) including use of template and adherence to the accessibility requirements.

The data and report produced will be made available by Natural England under an Open Government Licence.

The Final Report must include:

Requirement	Information
Framework construction	<p>An introduction to eDNA metabarcoding and barriers to widespread adoption by end-users.</p> <p>An overview of approaches to metabarcoding and their trade-offs.</p> <p>A summary of consultation with academic leaders and end-users in the field.</p> <p>A list of the validation parameters (names and definitions) that will be used to assess metabarcoding studies, and where they place on a levelled scale from Basic to Operational.</p> <p>A discussion of remaining uncertainties at each level of the scale and valid interpretation of results.</p>
Pilot test	<p>The results of the pilot test using the 12S-V5 metabarcoding assay.</p> <p>An Excel spreadsheet containing the results of scoring for each validation parameter and the overall validation level should be provided.</p> <p>Any modifications to the validation scale required for a large-scale meta-analysis of the scientific literature should be discussed.</p>
Scoping exercise	<p>A list of the most frequently used metabarcoding assays (based on questionnaire results), the proportion of studies they have been used in of those identified by the literature review, the sample types they have been applied to, and the environments they have been used in.</p> <p>Clear and detailed methodology of questionnaire design and distribution as well as literature search and refinement including databases and queries used.</p>
Meta-analysis	<p>Clear and detailed methodology for the meta-analysis.</p> <p>Results of the meta-analysis, including where metabarcoding studies rank on the validation scale.</p> <p>Discussion of findings and a list of recommendations for further work and/or best practice.</p> <p>Provide a template for assessing new metabarcoding assays against the validation scale.</p> <p>Open-access archival and publication of the literature database and meta-analysis.</p>

The report will be made publicly available on our Access to Evidence portal. After submission and publication on Access to Evidence, the content of the report will contribute to a publication in a scientific journal. The contractor may be the lead author if they are prepared to take responsibility for writing the manuscript and publication. Otherwise, the contractor will be an author on this publication and lead authorship will be determined after completion of the project in consultation with all partners. The Natural England Project Officer will be last author.

Following the completion of this project, the report will be evaluated and reviewed by Natural England, and any next steps decided on.

Important timescales and deadlines for key deliverables are outlined below.

Deliverable	Responsible Party	Date of completion
Inception meeting held	Successful contractor and Natural England	October 2024

Fortnightly meetings with Natural England's project officer	Successful contractor	
Monthly meetings with the project steering group	Successful contractor and Natural England	
Draft report (in digital format, details above) sent to Natural England	Successful contractor	31st January 2025
Draft report with any Natural England comments returned	Natural England	14th February 2025
Final report (in digital format) and data submitted to Natural England	Successful contractor	28th February 2025

Appendix 3: Charges

Requirement 1

Descriptions of Tasks	Cost per Day	No of Days	Total Cost per Task
Redacted under FOIA Section 43 Commercial Information			
Total Overall Cost			£5,073.56

Requirement 2

Descriptions of Tasks	Cost per Day	No of Days	Total Cost per Task
Redacted under FOIA Section 43 Commercial Information			
Total Overall Cost			£3,272.50

Requirement 3

Descriptions of Tasks	Cost per Day	No of Days	Total Cost per Task
Redacted under FOIA Section 43 Commercial Information			
Total Overall Cost			£6,700.76

Requirement 4

Descriptions of Tasks	Cost per Day	No of Days	Total Cost per Task
Redacted under FOIA Section 43 Commercial Information			
Total Overall Cost			£17,790.28

Appendix 4: Processing Personal Data

Contract:	N/A
Date:	N/A
Description of authorised processing	Details
Identity of Controller and Processor for each category of Personal Data	N/A
Subject matter of the processing	N/A
Duration of the processing	N/A
Nature and purposes of the processing	N/A
Type of Personal Data	N/A
Categories of Data Subject	N/A
Plan for return and destruction of the data once the processing is complete UNLESS requirement under law to preserve that type of data	N/A
Locations at which the Contractor and/or its subcontractors process Personal Data under this Agreement	N/A
Protective Measures that the Contractor and, where applicable, its subcontractors have implemented to protect Personal Data processed under this Agreement against a breach of security (insofar as that breach of security relates to data) or a Personal Data Breach	N/A