Contract

Trialling Benthic eDNA Sampling Methods for Monitoring Marine Biodiversity

JNCC SUPPORT CO

UK7: Contract details notice - Procurement Act 2023 - view information about notice types

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Scope

Reference

C25-0847-2088

Description

3. Project Background

The RV Tom Crean will depart from Cork for the TC25035 survey on 9 September 2025 and return on 25 September 2025. Seventeen days of sampling will be carried out as part of the survey, focusing on data collection to support the assessment of potential fisheries management measures. The survey will gather data on the effects of reduced fishing pressure on the recovery of subtidal mud habitats, as well as of sea-pen and burrowing megafauna communities.

North-West of Jones Bank MCZ is situated approximately 165 km offshore from the South-West of England. The site covers 399.14 km2 of continental shelf, and it contributes one of the largest areas of subtidal mud to the MPA network of all designated MCZs. For more

information regarding NWJB MCZ please see https://jncc.gov.uk/our-work/north-west-of-jones-bank-mpa/.

DNA and eDNA are increasingly utilised, cost-effective tools for monitoring biodiversity. Traces of DNA (e.g. from scales, faeces, skin, blood) left in the environment (e.g. water and sediments), called environmental DNA, are left behind by all organisms. Using molecular methods, such as eDNA metabarcoding, we can detect an organism's presence in the environment without directly observing it. eDNA techniques can provide high-resolution pictures of biodiversity from micro to macro scales and inform on assemblage composition and biological processes at reduced costs and time. Niskin bottles, metaprobes and sediment samples have been increasingly used in recent years to collect DNA from inshore marine waters, complementing existing traditional survey methods. However, application of these methods in offshore waters has been more limited.

4. Project Objectives

As part of the offshore survey to North-West of Jones Bank MCZ, the primary research and development objective will be to trial three eDNA sampling techniques to fill significant knowledge gaps on the use of eDNA in offshore environments.

To achieve this objective, the following research questions to be answered are:

1. Which benthic eDNA sampling methods are recommended for sampling offshore marine organisms based on the following factors?

a. Quantity of DNA collected

b. Quality of DNA collected

2. How do the following parameters compare among the benthic eDNA sampling methods?

a. Species detected

b. Species of conservation interest detected

c. Species richness

To answer these questions, JNCC plan to collect four eDNA samples using each of the three methods below, at four stations within the survey area. This will result in up to 48 eDNA samples plus six controls.

eDNA source eDNA collection method Storage Sampling methods

Water Sterivex filter 99% ethanol (volume tbc) Niskin bottles attached to a CTD from a depth 3 metres above the seafloor

Water including sediment particles Gauze 50ml 99% ethanol Metaprobes attached to a towed camera sledge for 30 mins

Sediment Sediment sample Frozen Sediment samples collected from a Day grab

JNCC wishes to commission a contract to undertake this analysis of marine taxa eDNA in water and sediment samples collected on the TC25035 survey of NWJB. JNCC plan to collect a total of 54 samples. However, please note that the resulting sample number will depend on successful sampling delivery, which could be affected by factors such as weather.

JNCC would like to use primers to test samples for the presence of marine vertebrates, fishes, invertebrates, meiofauna and bacteria.

The successful contractor will undertake the analysis as set out below (Section 5) adhering to common standards.

5. Project Objectives: Detailed Tasks

The tenderers should provide a quote broken down into the following elements:

• Transport of 54 samples (48 eDNA samples plus six controls) from Cork, Ireland to the laboratory

• Sample preparation and DNA extraction of 54 samples (48 eDNA samples plus six controls)

• The per-sample analysis of:

o 16 x niskin bottle eDNA samples plus two controls

o 16 x metaprobe eDNA samples plus two controls

o 16 x sediment eDNA samples plus two controls

Using universal primers to target a full range of marine biodiversity such as:

o Bacteria and archaea (e.g. marker 16S rRNA)

o Meiofauna invertebrates (e.g. marker 18SSSU)

o Invertebrates (e.g. marker CO1LB)

o Fish (e.g. marker 12STele)

o Vertebrates (e.g. marker 16SMV3)

• Delivery of a final report, to include:

o Introduction and aims

o Methods

o Results

o Discussion

o Recommendations for future offshore monitoring

The methods section of the report should share sufficient detail for the study to be repeated. It should cover:

• Clear field protocol detailing eDNA sampling and storage for method comparison and validation.

• DNA extraction methods - including the names of kits if used. State how the DNA was quantified and discuss the quality of DNA extracted.

• PCR amplification - specify the primers, PCR cycle conditions and reagents used.

• Sequencing - detail how the DNA products were prepared for sequencing including reagents, primers and conditions. State how the DNA was quantified, and the model of the sequencing machine used. In addition, the methods should allow the reader to understand the confidence in the sequences obtained.

• Bio-informatic processing: State in detail how the bio-informatic processing was completed, by specifying the steps taken. State any programs that were used.

• State any reference libraries used, and if a custom database was created the rules used.

• Where sequences are being used for taxonomic assignment, please explain the methods used to assign a species and why any reads may have been discarded.

The results and discussion sections of the report should include the following:

• The efficiency of DNA extraction and correct amplification of expected PCR products at each stage.

• A discussion of any problems and how they were resolved, such as issues with PCR leading to a change of reagents or amplification conditions.

• A detailed discussion explaining the results and confidence levels of the bioinformatic processing.

• Detailed results, including statistical analysis of data, to address Questions 1 and 2 above.

• To answer Question 2b, the results should include tables on species of interest, detected using each method. The list (to be provided by JNCC) includes UK BAP Priority Species, OSPAR Threatened and/or Declining Species, Annex II species, Species listed as Features of Conservation Interest (FOCI), and invasive non-native species.

Contract 1. Trialling Benthic eDNA Sampling Methods for Monitoring Marine Biodiversity

Supplier

- APPLIED GENOMICS LTD

Contract value

- £35,625 excluding VAT
- £42,750 including VAT

Below the relevant threshold

Date signed

22 September 2025

Contract dates

- 22 September 2025 to 13 February 2026
- 4 months, 22 days

Main procurement category

Services

CPV classifications

- 71700000 - Monitoring and control services
- 73112000 - Marine research services

Contract locations

- UK - United Kingdom

Procedure

Procedure type

Below threshold - unknown

Supplier

APPLIED GENOMICS LTD

- Companies House: 09180742
- Public Procurement Organisation Number: PGNX-7622-JLTG

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United Kingdom

Email: solutions@appliedgenomics.co.uk

Region: UKH16 - North and West Norfolk

Small or medium-sized enterprise (SME): Yes

Voluntary, community or social enterprise (VCSE): No

Contract 1. Trialling Benthic eDNA Sampling Methods for Monitoring Marine Biodiversity

Contracting authority

JNCC SUPPORT CO

- Companies House: 05380206

- Public Procurement Organisation Number: PRPL-6981-TDJT

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Region: UKH11 - Peterborough

Organisation type: Public authority - central government

Devolved regulations that apply: Scotland