2018 Baseline Intertidal Biotope Mapping Survey of Upper Fowey and Pont Pill MCZ

Contract Reference: ECM_52422

WORK PACKAGE ORDER	
FRAMEWORK AGREEMENT NUMBER 23999: Ref: 22643	**DATE: 19th June 2018**
WORK PACKAGE NUMBER:	
FROM: Natural England	**TO:** Ecospan Environmental Ltd
[redacted]	
SERVICES:	
SEE ANNEXES A & B	
CONTRACT PERIOD:	
18th June 2018 – 16th February 2019	
CONTRACT PRICE EXCLUDING VAT:	**CONTRACT PRICE INCLUDING VAT:**
£10,445	£12,534
CONFIRMATION OF REQUIREMENTS:	
The General Terms at Schedule 3 of the Framework Agreement shall be deemed to have effect in relation to this Call-Off Contract.	

Execution of the Contract is carried out in accordance with EU Directive 99/93 (Community framework for electronic signatures) and the Electronic Communications Act 2000. The Contract is formed on the date on which both Parties communicate acceptance of its terms on the Authority's electronic contract management system ("**Bravo**").

ANNEX A

SERVICES

Specification

1 Introduction

The Upper Fowey and Pont Pill MCZ consists of two spatially separate areas. This estuarine site is located on the Cornish coast and protects a total area of 2 km^2 making it one of the smallest MCZs. The larger area protects the upper tidal reaches of the Fowey estuary extending to Lostwithiel and including the estuarine River Lerryn, Penpoll Creek and Bodmin Pill. The smaller area protects Pont Pill, a tributary estuary flowing into the Fowey on the Eastern side near Polruan.

Upper Fowey and Pont Pill MCZ protects an area that is representative of the estuarine habitats found across the south-west region of England. The habitats and associated species within the site make an important contribution to the marine protected areas network. The site contains a range of sediment types including intertidal mud, intertidal sand and muddy sand, intertidal coarse sediment and sheltered muddy gravels as well as saltmarsh and saline reedbeds. The site also has areas of low energy intertidal rock with estuarine rocky habitat communities which create an environment capable of supporting a diverse range of species.

The aim of this survey is to undertake a full baseline survey of the designated intertidal habitats within Upper Fowey and Pont Pill MCZ. This will include mapping the intertidal biotopes found within the boundary of the site using the current biotope classification system and providing information on the health of habitats and communities identified. This information will then be used by NE staff to make a condition assessment of specified attributes of the intertidal sediment and rock features of the MCZ.

1.1 Survey Area

The survey will cover all intertidal areas within the Upper Fowey and Pont Pill MCZ (Figure 1 & Figure 2). For a detailed view of the intertidal areas included in this contract please visit the MAGIC map website. The maps below show the two sections of the MCZ separated for illustration purposes. When completing the survey, analysis and report, the two sections of the MCZ should be considered together as a single site.

1.2 Previous Surveys

The habitats within the Upper Fowey and Pont Pill MCZ were primarily designated using data from the 1985-1996 MNCR Area Summaries – Inlets in the Western English Channel survey.

There has since been data added from the ‘Intertidal mudflat layer for England’ taken from the MESH combined EUNIS 20140203 dataset.

In 2015 data was added to the site from ‘October 2015 Tomson Ecology, South west Strategic Regional Coastal Monitoring Programme - Ecological Mapping. Rame Head to Lands End’ taken from the Channel Coast Observatory EMSW0” Rame Head to Lands End dataset.

The Environment Agency will be undertaking WFD monitoring in the site in May 2018 this will include up to 25 sediment cores the results of which should be included in the data analysis and reporting for this project.

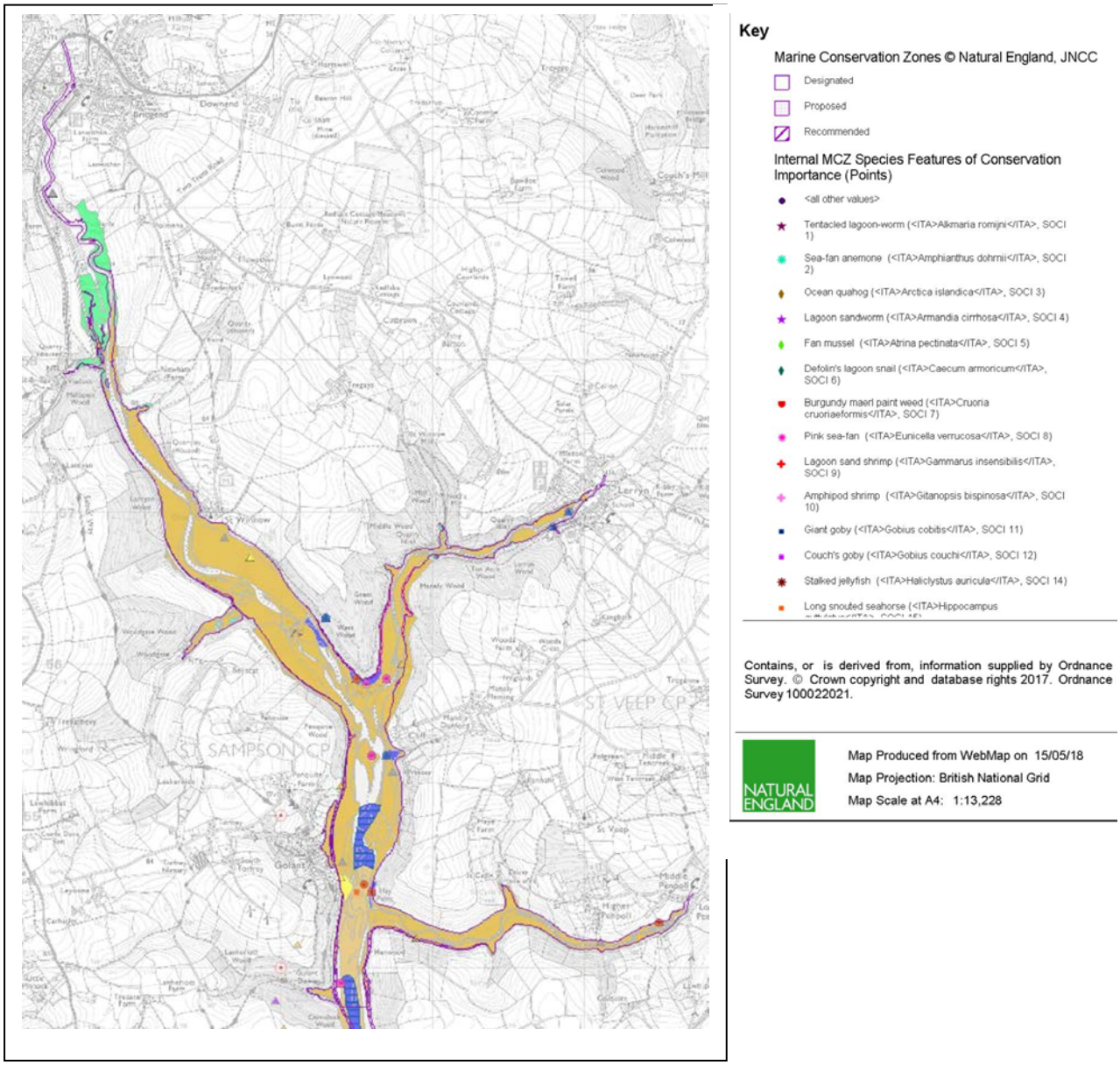


Figure 1: Upper Fowey and Pont Pill MCA. Upper Fowey section

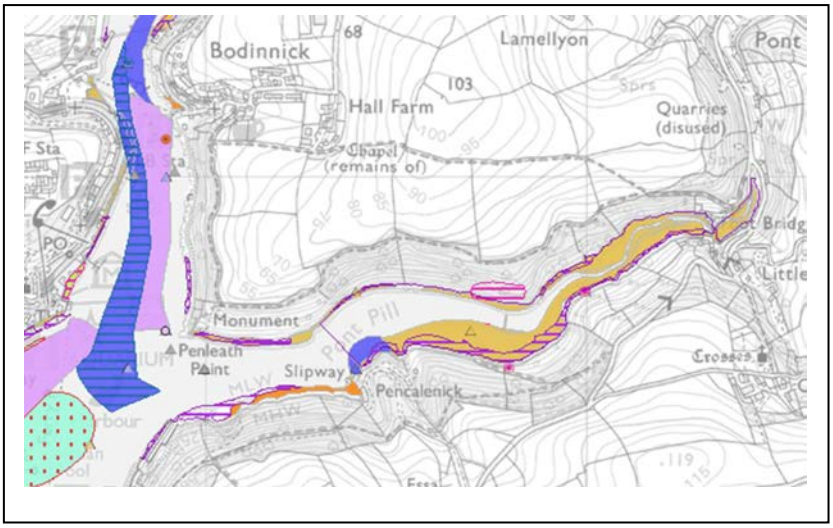


Figure 2: Upper Fowey and Pont Pill MCA. Pont Pill section

2 Aims & Objectives

Natural England wish to commission ecological survey work during the summer of 2018 in order to collect high quality data to provide a baseline and information for our condition assessment of the intertidal features of the site. The features for which we require information are listed below:

- Intertidal coarse sediment
- Intertidal mud
- Intertidal sand and muddy sand
- Low energy intertidal rock
- Estuarine rocky habitats
- Sheltered muddy gravels

Coastal saltmarsh and saline reedbeds is a feature of the MCZ site, however the survey is aimed at sediment and rock and therefore the saltmarsh and saline reedbeds do not need to be surveyed.

The information gathered must be of sufficient quality to provide a full baseline for the site relating to the intertidal habitats according to methodologies outlined in JNCC common standards guidance.

In brief, Natural England are seeking potential contractors to pay particular attention to survey design so that quantitatively robust data is acquired which will permit rigorous statistical analysis to identify spatial and temporal changes in both community structure and composition and the abundance of key species, and support robust condition assessment judgments by Natural England.

The survey design should achieve the following aims:

- Acquire high quality biological data of suitable resolution to allow key attributes of condition to be assessed according to CSM guidance for the intertidal features.

- Using the data collected, produce a biotope map for the intertidal features of the MCZ (rock and sediment).
- Ascertain percentage of intertidal reef and sediment feature area where the community has been significantly altered by Pacific Oyster abundance.

The specific objectives of this contract are to, in collaboration with Natural England, plan, undertake and report on intertidal sampling in order to produce a baseline for the features listed above.

The contractor is required to complete a phase I biotope survey of the littoral rock and sediment habitats and a phase II rock survey to gather information sufficient to produce detailed descriptions of the littoral rock biotopes present within the study areas including biotope extent and composition.

The Environment Agency will be collecting sediment cores within the Fowey Estuary for the Water Framework Directive and this will provide the data for the sediment biotopes present. The EA sediment samples will be collected in May 2018 to Natural England standards.

Once the contractor has completed the phase I biotope mapping survey, Natural England and the Environment Agency will identify any gaps in the phase II sediment core sampling and the Environment Agency will then collect any additional sediment core samples required.

The contractor will be required to produce a report and deliverables of both the phase I and phase II surveys.

The specific attributes to be monitored and reported on are listed in Table 2.

Table 2: MCZ attributes

Feature/Subfeatures	**Attribute**	**Target**
All	Distribution: presence and spatial distribution of biological communities	Restore/Maintain the presence and spatial distribution of (subfeature) communities, according to the map.
All	Structure: non-native species and pathogens	Reduce the introduction and spread of non-native species and pathogens, and their impacts
All	Structure: species composition of component communities	Maintain the species composition of component communities
Sediment features only	Structure: sediment composition and distribution	Maintain the existing distribution of sediment composition types across the feature.
Sediment features only	Structure: sediment total organic carbon content	Maintain total organic carbon (TOC) content in the sediment at existing levels

Sediment features only	Supporting processes: sediment contaminants	Reduce surface sediment contaminants (<1cm from the surface) to below the OSPAR Environment Assessment Criteria (EAC) or Effects Range Low (ERL) threshold.
All	Structure: habitat zonation*	Maintain the estuary zonation, which is affected by both changes in salinity gradient and tides in the estuary from river to sea (horizontally) and with shore height (vertically) from terrestrial to subtidal.

*For the habitat zonation attribute please consider this in the survey design and provide information where possible; however we do not wish to include additional data collection beyond that required for the other attributes.

Contaminant samples will be collected as part of the EA survey, however analyses will depend on available budget. Natural England will confirm to the contractors whether the contaminant analysis has been completed and therefore should be reported on.

In addition to the above the following should also be recorded where relevant:

- Presence and location of the alga *Caulacanthus ustulatus* (in addition to the Invasive non-native species listed in Section 3.8)
- In all areas Natural England requires the contractor to record the area of each feature where the community is significantly affected by the abundance of Pacific oysters (*Magallana gigas*). This should be included within the biotope map. Areas where the density of *M. gigas* is considered to have formed a reef (100% cover or more) should be recorded and mapped separately from areas that are significantly affected but have not yet formed a reef as the management required for this differs.

Please note: sediment sample analysis (Sample infauna, PSA, TOC) will be undertaken by a third party contractor under a separate NE/EA framework.

If any habitats or species of interest are found during the survey, these should be mapped, quantified and described where possible. Images & video clips are also very helpful.

Analysis and Reporting

To enable Natural England to undertake condition assessments for each site we require the contractor to provide an analysis and interpretation of the data collected.

Each of the sections of the MCZ should have its own site description that is more detailed than the overall site description. These should describe the main characteristics of the sector, including location, substratum and aspect.

Under this specification contractor must:

1. Following agreement of the fieldwork protocol with Natural England, the contractor will undertake the necessary survey work to meet the overarching aims and objectives.
2. Cover interpretation and analyses of raw data including the undertaking of appropriate analyses of specimens. Please note: Sample infauna and PSA analysis will be undertaken by a third party contractor under a separate NE/EA framework. (Sample analysis is therefore not part of this framework).
3. Potential anthropogenic influences within or near the survey site should be identified, photographed, mapped, and where possible quantified in order to collect evidence of potential damage to the site. Further analysis should (if appropriate) focus on investigation of the potential impacts of these pressures (e.g. bait collection, trampling, trawl marks, dumped or discarded material, gear or nets).
4. Provide information on macroalgal blooms for WFD by completing the Opportunistic Macroalgal sheet at the back of the 'Assessing opportunistic macroalgal blooms for WFD in transitional and coastal waters' operational instructions.
5. Undertake appropriate statistical analyses of data, including univariate and multivariate statistics, to enable the assessment of each attribute target. The quantitative characterisation of benthic communities and a description of the range of shore habitats and associated fauna that exist within the survey area should be provided.
6. Where appropriate contractors should inform and validate their sample design/intensity by performing power analysis. For example species accumulation curves, tests for autocorrelation, power of change detection using diversity indices.
7. Evaluate the effectiveness of data collection methods, techniques and technical equipment.
8. Provide detailed 'standard operating protocols' for the work undertaken to ensure that these can be repeated as required in the future.
9. In light of the data obtained provide preliminary advice on the 'condition' of each attribute, i.e. whether the targets have passed or failed, has there been change in the attribute over time and is there any evidence that the feature has been impacted by anthropogenic influences. In each attribute assessment, there should be consideration for any variation across specific geographic areas, notable communities or exposure to environmental or anthropogenic factors. Natural England will review this evidence when carrying out the overall feature(s) condition assessment in accordance with Natural England guidance which takes account of a number of further considerations. In addition, the contractor is not obliged to, but is welcome to provide any overriding thoughts on the integrity of the whole feature, which will be considered by site leads in their condition assessment process.
10. Report the detailed findings of the project in succinct and clear final reports, including appropriate GIS outputs, Marine Recorder files, MEDIN compliant metadata, a confidence assessment of the data outputs and standard survey imagery (further detailed in General Requirements of the framework, SECTION 3 Paragraph 12. Required Standards).
11. As well as the data products listed above provide additional outputs such as short video clips and photographs (georeferenced) showing the features and the communities These will form an image reference collection for the survey and should be of sufficient quality to enable Natural England to use them to create a catalogue of representative habitats/species, for publicity and engaging the public with our work.

12. If contaminant samples are collected as part of the contract there may be a requirement to enter this data into the MERMAN (Marine Environment Monitoring and Assessment National) database.

3 Methods

3.1 Development of a Suitable Sampling Design

Where survey work is being undertaken the contractor will need to develop an appropriate sampling design in collaboration with Natural England in order to meet the aims of the project. The full detail of this design will be provided to and owned by Natural England.

Survey design needs to be considered in relation to:

1. Enabling comparisons with previous data sets, where available. It should be noted that relevant Standard Operating Protocols for previous surveys need to be referred to and utilised, where appropriate, to facilitate comparable time-series data.

2. Where necessary improving upon previous sampling designs to provide more robust temporal statistical comparisons when repeated in the future.

3. Results from previous surveys (where available) should be used to inform current sampling i.e. power analysis.

4. The overall level of resources available to Natural England to deliver monitoring and survey work.

5. To test the ability of the monitoring work to distinguish between natural change and anthropogenically driven change within a realistic timescale and budget.

Where previous studies and data sets are available, but may now be viewed as inadequate to deliver the statistically robust ongoing quantitative analysis that Natural England require, the emphasis should be on improving methodologies, whilst having regard for, and making the best use of existing data.

3.2 Pre-survey Deskwork

Before the survey is carried out the contractor will discuss any pre-survey work with the project officer including:

1. Clarification of roles, responsibilities and expectations
2. Acquisition and checking of sources of relevant information and gathering of local advice in preparation of a project plan
3. Review existing information provided by Natural England or any datasets known to the contractor.
4. Ways of working and close collaboration with NE in developing project plan, particularly selection of survey sites, taking account of NE/EA pre-survey scoping work, and finalising survey design and methodologies.
5. Ensure that up to date charts are used to position sample sites away from cables, pipelines or any other coastal infrastructure. Should any coastal infrastructure exist within an area to be sampled then a buffer should be used to ensure that sampling activity does not cause damage and this should be clearly displayed within the survey

plan. Should coastal infrastructure be found during fieldwork then any sample sites should be relocated and project officer informed.

3.3 Site Access

The project officer should be contacted prior to commencement of any fieldwork.

Natural England will obtain permission from seabed owners or leaseholders for survey work and will supply a copy of this permission to the contractor. The contractor will be responsible for obtaining permissions in other areas where Natural England does not currently have this information. The contractor must subsequently forward these permissions to Natural England.

3.4 Protected Species & Licensing

The contractor should ensure that all appropriate marine and protected species licences and legal requirements (such as a MCZ Assessment) for the survey have been attained and are valid before the survey commences.

3.5 Field Survey

Surveys for intertidal rock should take account of the CSM Guidance for littoral rock and inshore sublittoral rock habitats as well as the procedural guidelines for intertidal resource mapping, intertidal ACE and biotope recording and intertidal quadrat photography and sampling fish in rock pools found within the Marine Monitoring Handbook (Davies et al. (Eds) 2000).

Contractors should also comply with recent guidance developed by MESH for mapping and survey techniques: 'Recommended operating guidelines (ROG) for aerial photography' (Piel and Populus, 2008).

Surveys for intertidal sediment should follow the guidance provided within JNCC's CSM Guidance, and more specifically the section on Littoral Sediment Habitats and Marine Monitoring Handbook. Faunal sampling should conform to standard methodology ISO 16665:2014, and identification should be carried out in accordance to the NMBAQC quality control guidelines following Standard Operation Procedure ES-04.

Provision should also be made for the possibility of NE representatives (with appropriate health and safety training and experience) to participate as observers during survey operations. Please keep the project officer informed of survey dates so this can be arranged if required.

3.6 Data Analysis

Natural England expects robust and appropriate spatial and temporal statistical univariate and multivariate (community) analysis to be completed, and the results presented and discussed. The methods of data analysis the contractor will use must be clearly stated within the tender documents. An explanation of why certain methods have been chosen should be included, and a justification of any relevant assumptions supplied. GIS should be used to

present any geographical information and data gathered or created during the project. Base mapping including OS tiles and aerial photographs can be provided by Natural England under licence if required.

The results should be compared to previous surveys and other relevant papers (including appropriate statistical analysis). Any observed changes should be set into context using other existing information.

3.7 Invasive Non-Native Species

Invasive non-native species (INNS) are considered to be one of the top five pressures directly driving biodiversity loss globally. Prevention is the key focus, particularly in marine environments. The contractor shall be aware of and work in accordance with standard good practice biosecurity measures to avoid spread of INNS:

1. Equipment, clothes and boots should be clean before carrying out any work on site
2. When on or near water it is important that equipment is drained after use and as far as possible dried
3. Boats to be used in survey work should have their hulls cleaned on a regular basis. Best practice guidelines should be followed as outlined by The Green Blue

INNS species that we particularly want contractors to look out for and record for MSFD monitoring purposes:

Species name	**Common name**	**List**
Alexandrium catenella	A Dinoflagellate	Horizon
Amphibalanus reticulatus	Barnacle	Horizon
Asterias amurensis	Flatbottom sea star	Horizon
Caulerpa racemosa	Sea grapes	Horizon
Caulerpa taxifolia	Caulerpa/ killer alga	Horizon
Celtodoryx ciocalyptoides	Sponge	Horizon
Chama sp.	Jewel box clam	Horizon
Dendostrea frons	Mangrove oyster	Horizon
Gracilaria vermiculophylla	red algae	Horizon
Hemigrapsus penicillatus	Japanese Shore Crab	Horizon
Hemigrapsus sanguineus	Asian/Japanese shore crab	Horizon
Hemigrapsus takanoi	brush clawed shore crab	Horizon
Megabalanus coccopoma	Titan acorn barnacle	Horizon
Megabalanus zebra	Barnacle	Horizon

Mizuhopecten yessoensis	Japanese scallop	Horizon
Mnemiopsis leidyi	Comb jelly	Horizon
Ocenebra inornata	Asian/Japanese oyster drill	Horizon
Paralithodes camtschaticus	Red King crab	Horizon
Polysiphonia subtilissima	red algae	Horizon
Pseudochattonella verruculosa	Alga	Horizon
Rhopilema nomadica	Nomad jellyfish	Horizon
Telmatogeton japonicus	marine splash midge	Horizon
Acartia (Acanthacartia) tonsa	Marine copepod	Present
Amphibalanus amphitrite	Striped barnacle	Present
Asterocarpa humilis	Compass sea squirt	Present
Bonnemaisonia hamifera	Red seaweeds	Present
Caprella mutica	Japanese skeleton shrimp	Present
Crassostrea angulata	Portuguese oyster	Present
Crassostrea gigas	Pacific oyster	Present
Crepidula fornicata	Slipper limpet	Present
Diadumene lineata	Orange-striped sea anemone	Present
Didemnum vexillum	Carpet sea squirt	Present
Dyspanopeus sayi	Say mud crab	Present
Ensis directus	American jack knife clam	Present
Eriocheir sinensis	Chinese mitten crab	Present
Ficopomatus enigmaticus	Marine tubeworm	Present
Grateloupia doryphora	Red seaweeds	Present
Grateloupia turuturu	Devil's Tongue Weed (macroalgae)	Present
Hesperibalanus fallax	A barnacle	Present
Heterosigma akashiwo	A dinoflagellate	Present
Homarus americanus	American lobster	Present

Rapana venosa	Asian rapa whelk	Present
Sargassum muticum	Japanese weed, wireweed	Present
Schizoporella japonica	Bryozoan	Present
Spartina townsendii var. anglica	Common cord-grass, Townsend's grass or rice grass	Present
Styela clava	Leathery sea squirt	Present
Undaria pinnatifida	Japanese kelp	Present
Urosalpinx cinerea	American oyster drill	Present
Watersipora subatra	Bryozoan	Present

The contractor must collect georeferenced photographs of INNS observed on site, record these on Marine Recorder, report immediately to project officer and include within the survey report. Any species currently listed as 'alert' species should be flagged immediately to the GB Non Native Species Secretariat. More information and guidance including ID guides can be found at www.nonnativespecies.org.

3.8 Risk Assessments

All risk assessments need to be seen and signed off by the project officer (ideally when presented with the project plan), as part of the contract management process.

3.9 Weather Downtime & Contingency

Weather downtime should be defined as those periods during the course of Marine Monitoring Operations where the influence of weather conditions results in a halt to any monitoring due to the impact on data quality and/or operational safety.

To ensure the safety of the Contractor and integrity of the project, good, clear, documented communications with the project officer is essential. Any permission to accrue weather downtime costs given must be in writing or by email from the project officer to the Contractor. Any charges for weather downtime where no evidence of prior approval exists will not be approved and will not be reimbursed.

Approved weather downtime maybe charged to Natural England at an Operational Weather Downtime Rate, as agreed in the Framework Agreement.

Situation	Rate
Not immobilised	no costs
Intertidal contracts	maximum 1 day, by prior agreement with project officer per total survey.
Other	maximum 2 days by prior agreement project officer per total survey.

4 Outputs – Products & Timescales

All project outputs should be delivered to agreed deadlines.

4.1 Timeline for Project Delivery:

Event	Date
Issue of Request for Quotation	22nd May 2018
Deadline for clarification questions	12:00 noon BST, 29th May 2018
Deadline for receipt of Quotation	12:00 noon BST, 4th June 2018
Evaluation of Quotations	w/c 4th June 2018
Contract awarded	w/c 11th June 2018
Start up meeting	w/c 18th June 2018
Finalise sampling design	w/c 25th June 2018
Produce final project plan.	w/c 25th June 2018
Obtain any necessary access permissions.	By survey date
Submission of brief field report and draft biotope map	27/07/2018
EA to supply contractor with any additional sediment core results by	1/12/2018
Draft final report to be provided by	11/01/2019
Associated products to be provided by	11/01/2019
NE to return comments draft report to contractor	18/01/2019
Final report, biotope maps and output to be delivered	15/02/2019

Any delays to this timetable should be discussed with the project officer and delays not outside the control of the contractor will be penalised.

5 Other

In support of this contract NE will provide the contractor with:

- Project support from dedicated Project Officer
- Technical guidance and support on the Marine Monitoring Framework
- Opportunity to feedback and discuss progress and the project
- Supporting GIS datasets (if required) under licence for use in this contract:
  a. Base map data from Ordnance Survey
  b. Imagery from Next Perspectives
  c. S-57 vector data from the UK Hydrographic Office (in ArcGIS format)*
  d. Raster charts from Oceanwise*

*(Not to be used for Navigation)

- Please see the following site for information on how to acquire GI information https://www.gov.uk/how-to-access-natural-englands-maps-and-data

The intellectual property rights and copyright for all products (including photographs) will lie with Natural England. All data will be made available by Natural England under the Open Government Licence at the end of the project via MESH and the MEDIN Data Archiving Centres.

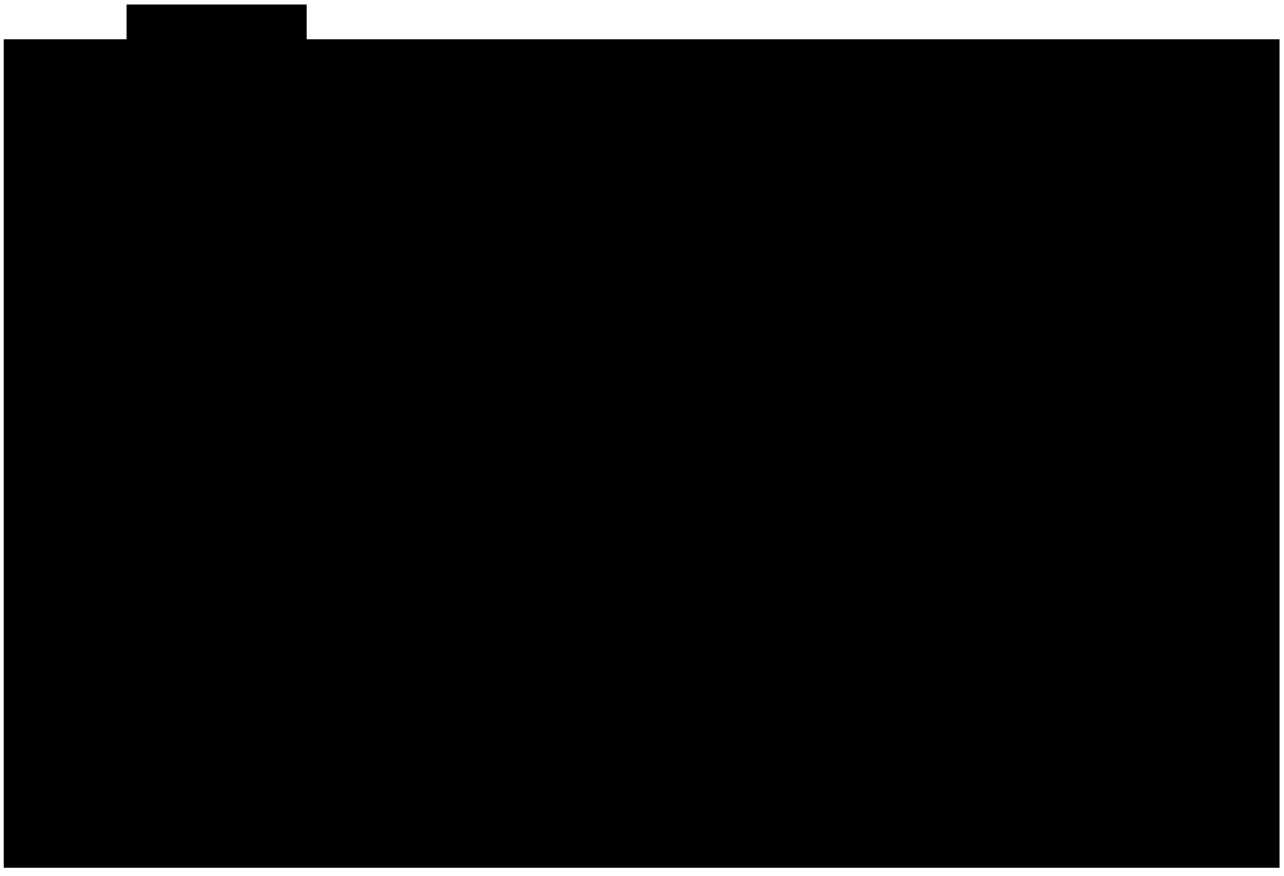
6 References

Moore, J.J., Smith, J., & Northern, K.O. 1999. *Marine Nature Conservation Review Sector 8. Inlets in the western English Channel: area summaries.* Peterborough, Joint Nature Conservation Committee (Coasts and seas of the United Kingdom. MNCR series)

October 2015 Tomson Ecology, South west Strategic Regional Coastal Monitoring Programme - Ecological Mapping. Rame Head to Lands End

ANNEX B

Ecospan Environmental Ltd's Response



ANNEX C

PRICING SCHEDULE

1. The Authority will pay the Contractor no more than fixed priced of

£10,445 excluding VAT

2. Invoices will be submitted upon satisfactory completion of tasks identified in Schedule 1 and payments will be made in accordance with the Contractor's commercial proposal (see below).

3. The Contractor shall provide the Authority an invoice of the eligible costs properly incurred by the Contractor in carrying out the project.

4. Subject to any variation of the project, the amount in Paragraph 1 shall remain throughout the duration of the agreement.

5. Within 30 days of receiving an invoice satisfactory to the Authority, the Authority shall pay to the Contractor, the amount of the eligible costs which the Authority reasonably considers to have been properly incurred by the Contractor in carrying out the project during the relevant period.