Tender specification
Supply of marine acoustic telemetry equipment

June 11th 2021

1.1 Objective of the contract

The purpose of this document is to describe and define the modalities of supply of marine acoustic telemetry equipment and its accessories. The objective of this contract is to enable the Isles of Scilly Inshore Fisheries and Conservation Authority (IoSIFCA) to study the behaviour and movement of species of fish at different spatiotemporal scales, and to understand changes in space occupation as a function of variations in environmental conditions or anthropogenic pressures.

1.2 Context

To follow the trajectory of fish or crustaceans in space and time (the term fish will be mostly used in the rest of the document), it is not possible to use classical technologies such as GPS. As part of the Intereg funded 'Fish Intel' project, we will use acoustic telemetry to study movements of crawfish (*Palinurus elephas*). The electronic tags to be acquired will make it possible to acoustically transmit the unique identification of the fish within an array of receivers. The position of the fish will therefore be known when it is within the acoustic telemetry network.

The acoustic and/or electronic tags sought will be attached to the outside carapace of an individual crawfish.

The deployment of this acoustic telemetry equipment in a network is part of a national and international scientific collaborative effort on the tracking of marine species on the continental shelf of the northeast Atlantic. It is therefore important that the equipment from different suppliers be compatible with each other so that tagged fish can be detected beyond the network that will be deployed within the framework of this public contract. The deployed network will also have to be capable of detecting tagged fish outside the tags acquired within the framework of this public market. The deployed acoustic telemetry network will be part of the European Tracking Network and will therefore allow for compatibility between multiple equipment vendors.

2 Contract description

2.1 Contract quantity

The maximum order quantity will be 100 transmitter tags and a maximum of 12 receivers over the contract period. The minimum number ordered will be 80 tags and 8 receivers. The exact number will depend on the unit cost.

2.2 Form and duration of the contract

The contract is a purchase order contract and will be concluded for 2 years from its notification. The contract will include two lots:

- the acoustic and/or electronic tags (and necessary accessories)
- the acoustic receivers (and necessary accessories)

2.3 Details on delivery terms and conditions

Place of delivery
The equipment will be delivered to Isles of Scilly IFCA, Town Hall, Isles of Scilly, TR21 OLW

Provisional delivery schedule

- 50 transmitters are required by July 2021
- Up to 12 receivers and up to a further 50 transmitters are required by July 2022

3 Technical specifications

3.1 Lot 1: Tags and accessories

Acoustic tags (transmitters) must be compatible with acoustic receivers (see Lot 2) and must have the following characteristics:

- Transmitter transmission delays must be programmable;
- A unique identifier for each acoustic transmitter;

Different models of tags and accessories can be proposed. The offer must specify the accessories necessary for the proper use of the tags and their deployment. For example, the characteristics of a programming interface software of the tags may be detailed. The tags will be fixed externally.

The tag to be acquired will have to be robust and able to withstand depths of up to 200 metres and be reliable (accuracy of the collected data). The duration of the battery of the tag must allow a minimum acquisition of 1 year of data. The acoustic transmission power must be as high as possible to allow the greatest possible detection range by the receivers in ambient conditions of sometimes high noise linked to tidal currents and swell conditions.

Detailed specifications	
Model	Specify
Volume	Specify
Diameter	Specify
Total diameter	Specify
Length	Specify
Weight in Water	Specify
Battery life	12 months at least
Acoustic sensor	
Transmit interval	programmable
Power outputs	Specify
Carrying frequency	69 kHz
Compatibility across different telemetry suppliers	Specify
Detection range	Specify
Additional Specifications	
Clock	Specify
Programmable logging	required
Rate of tag failure	Specify

3.2 Lot 2: Acoustic receiver and accessories

Acoustic receivers must be compatible with the tags (see Lot 1) and have the following basic characteristics (see table below):

- Robust design that can be deployed up to a depth of 200m;
- Data download (fish identifier and environmental variables recorded at the time of transmission) with a communication system;
- Large data storage capacity (> 1 million detections);

- An interface software that can interrogate the receivers, download the data and visualise them;
- Accoustic release canister (or equivalent) including rope and floats to contain acoustic release receiver and enable remote recovery of receivers to the surface
- Ability to operate at 69Khz;
- Including batteries.

Detailed specifications	
Model	specify
Dimension	specify
Weight	specify
Power supply	specify
Detection	assist with range test data
Battery Life	> 12 months
Maximum depth	200 m
Receive frequency	69 kHz
Retrieval method	Specify
Data storage / Capacity	specify
Acoustic communication from surface	required
Attachment	Specify
Transmitters	logs and decodes all
Compatibility across different telemetry equipment vendors	specify

The offer should specify the characteristics of the proposed programming interface (software). In the same way, the offer will have to detail all the accessories necessary for the deployment of an acoustic telemetry network, for example, directional hydrophones (and their communication case, etc.) adapted to communicate from the surface with the receivers or to make active tracking from a light boat.

Different models of acoustic receivers (and accessories) can be proposed in relation, in particular, with particular specificities making them more adapted to the conditions of installation. For example, it could be a cabled receiver for installation on an already instrumented buoy and autonomous in energy; a simple receiver with batteries for fixing on a navigational buoy or easily accessible structures at sea; a receiver with an acoustic release for immersion on the bottom and easy recovery; a receiver allowing the positioning of neighboring receivers to allow the tracking of movements on a fine scale by triangulation.

A minimum warranty of 1 year is required. The conditions of replacement of the receivers in case of malfunction will have to be indicated.

In particular, an acoustic receiver with the following characteristics will be sought:

- Receiver with a remote release system via an acoustic communication system (the reliability of the acoustic release should be specified);
- Complimentary receiver retrieval system e.g. rope canister