# **Terms of Reference**

# **ETP Desk Study (WP 3-1)**

## **Introduction**

Red swamp crayfish harvested from the Doulong River in the Dafeng District supply Bakkavor and Lyons Seafood via local processor, Baolong. All wish to ensure supplies achieve the Marine Stewardship Council (MSC) sustainability standard.

A Fisheries Improvement Plan (FIP) has been developed (Poseidon, 2017) to address the shortcomings in information and management that were identified in pre-assessments undertaken in recent years (MRAG, 2016, SAI Global, 2014). The FIP includes the design and implementation of a stock assessment, supported by the necessary data collection, to inform the management of the fishery.

## **Objective**

The objective is this work is to what Endangered, Threatened and Protected (ETP) species are likely to be found in the Doulong river system and associated wetlands (inc. the adjacent Yancheng Nature Reserve).

## **Background**

Red swamp crayfish (*Procambarus clarkii*) was introduced in China in 1929. Since then, it has been farmed on a relatively small scale, as the species was treated as an invasive species and pest. During the 1980s, interest in cultivation was stimulated by the development of the national and international markets for crayfish, leading to the establishment of processing plants. In many regions crayfish are cultured using a crayfish-crop rotation strategy.

Most crayfish production is reported to occur in the lower regions of the Yangtze River, mostly in the Jiangsu Province. Wild caught crayfish account for a small portion of the total Chinese production. Each year, approximately 50,000 t of wild-caught crayfish is produced. By way of comparison, in 2014 the total production of farmed crayfish in China was 569,661 t (FAO, 2017). Dafeng City catch records show that total regional landings in 2015 were around 12,000 t, of which around 4,000 t was purchased by Baolong itself, with the rest going to local sales. Dafeng District production comes from 500 licensed fishermen operating in the Doulong River and associated channels. Around 10% of fishermen supply Baolong.

Crayfish in the Dafeng region are fished using fixed cages and shrimping (Fyke type) nets and the regulations specify a minimum mesh size of 2 cm. No bait is used in the fishery. Gear is typically fished for 24 hours (less often in summer when the water temperature is higher and the crayfish actively foraging for food) and retrieved before re-setting. These are often tied to stakes to the riverbed and fished from small wooden one or two person-operated boats.

Red swamp crayfish can now be considered a naturalized species in a number of regions of China (Li et al, 2012) and is now described as both economically and socially accepted or indeed, important (as a food and for export revenue). Eradication is not an option and could potentially lead to greater negative environmental impacts.

## ETP (endangered, threatened or protected) species are defined by MSC as follows (see Section SA3.2.5 of the FCR v2):

## 1. Species that are recognised by national ETP legislation;

## 2. Species listed in the binding international agreements given below:

## Appendix 1 of the Convention on International Trade in Endangered Species (CITES), unless it can be shown that the particular stock of the CITES listed species impacted by the UoA under assessment is not endangered.

## Binding agreements concluded under the Convention on Migratory Species (CMS), including:

## Annex 1 of the Agreement on Conservation of Albatross and Petrels (ACAP);

## Table 1 Column A of the African-Eurasian Migratory Waterbird Agreement (AEWA);

## Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas (ASCOBANS);

## Annex 1, Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS);

## Wadden Sea Seals Agreement;

## Any other binding agreements that list relevant ETP species concluded under this Convention.

3. Species classified as ‘out-of scope’ (amphibians, reptiles, birds and mammals) that are listed in the IUCN Redlist as vulnerable (VU), endangered (EN) or critically endangered (CE).

## **Specific Requirements**

The consultant will conduct a desk study to identify what ETP species might be found, either on a permanent, seasonal or occasional basis, in the Doulong river system and associated wetlands (inc. the adjacent Yancheng Nature Reserve). The consultant will list these species (with the Chinese and English common names, as well as the scientific name to species level), providing a brief narrative on the nature, spatial and temporal distribution of the ETP species in the FIP geographic area.

## **Outputs**

The required outputs are:

* A methodology statement and indication of how the final results will be presented within one month of contract award.
* A draft final report providing details of the survey methodology used, the results, conclusions and recommendations. A final version of this report will be produced, addressing comments from the FIP managers.

## **Timescale**

The final outputs are to be delivered within 3 months of contract award (see Outputs for details).

## **Resource Needs and Budget**

Consultant profile: A local environmental specialist with experience of the ETP species likely to be associated with coastal and inland wetland habitats.

Provisional budget:

5 days fees @ £300/day £1,500

Translation £100

**TOTAL £1,600**