Reviewed July 2017

PEMBROKESHIRE NATURE PARTNERSHIP
PARTNERIAETH NATUR SIR BENFRO

Species Action Plan: Native Oyster (*Ostrea edulis)*

Introduction

Scope

This plan is for the native oyster (flat oyster), *Ostrea edulis*. Actions to conserve and enhance the distribution or abundance of this species may, however, be directed at the habitats upon which they rely. Reference should therefore be made to the relevant habitat action plans listed in the related plans and policies and further information section, below.

Vision Statement

To enhance the number and distribution of native oysters within the Milford Haven Waterway in Pembrokeshire.

Description of Species

The native or flat oyster (*Ostrea edulis* L.) is a sessile, filter-feeding, bivalve mollusc. It is associated with estuarine and shallow coastal water habitats with sediments ranging from mud to gravel. The species is a habitat building foundation species. Historical descriptions of oyster beds depict oyster dominated substrate forming high complexity habitat, supporting a high diversity and abundance of associated species. Oysters are filter feeders, clearing the water of particles and enriching the surrounding sediments with organic and inorganic matter. These functions of oyster beds may provide important ecosystem services, including improved water quality and enhanced biodiversity and secondary production. Furthermore the native oyster is of significant cultural value; people have a strong affinity to the oysters and the heritage of the associated fishery.

Reviewed July 2017

Distribution

Ostrea edulis is widely distributed around the British Isles, the North Sea, Mediterranean and Black Sea. In Wales, the native oyster is predominantly found in the Milford Haven Waterway and in areas of Swansea Bay.

Native oysters occur widely within the Milford Haven Waterway although they are generally low in number; it is clear from historic records that the river Cleddau once held a far greater stock of oysters than it does today. Historic accounts place the native oyster at the centre of important local fisheries in South Wales back to the Roman occupation of Britain, and describe a fishery supporting 200 vessels landing over 9 million oysters at its peak in the 19th century. There has been no commercial oyster fishing in the Milford Haven Waterway since 2010, although this has been as a consequence of permitting rather than lack of interest in the fishery.

The native oyster is also cultivated and can be found in North America, Australasia and Japan. It is however less commonly cultivated than the pacific oyster *Crassostrea edulis*.

Population Trend

Stock abundance generally was probably greatest in the 18th and 19th centuries, when there were large offshore oyster grounds in the southern North Sea and the Channel, producing up to 100 times more than today's 100-200 tonnes. During the 20th century its abundance declined significantly in European waters. The species is now considered to be functionally extinct in most of its global range. The main UK stocks are now located in the rivers and flats bordering the Thames Estuary, The Solent, River Fal, the west coast of Scotland and Lough Foyle.

In the Milford Haven Waterway, the current oyster population density is low (Pell 2011, zu Ermgassen 2017). Distribution is known to be very patchy; diver-gathered data in 2016 found oyster densities in the Burton and Beggars Reach areas to be 0.17m^2 and 0.05m^2 respectively (Lock 2017). There is insufficient comparable data over a sufficiently long time period to assess whether the population is currently declining. Examination of data from the latest survey in late 2016 / early 2017 (zu Ermgassen, 2017) suggests the mean size of native oyster in the Waterway has not changed significantly from that found in 2011, which does suggests that some limited recruitment has taken place. The size distribution in the recent survey, however, found little evidence for significant recent recruitment. Oysters are subject to Allee effects, meaning that their mode of reproduction makes them susceptible to population decline when the population density or abundance is low. It is generally accepted throughout Europe that the situation of the native oyster is unlikely to improve without human intervention.

Conservation Status

The native oyster is listed by OSPAR (Convention for the Protection of the Marine Environment of the North-East Atlantic) as a threatened and/or declining species and habitat (OSPAR agreement 2008-6, OSPAR Commission, 2009). They are considered to be an important component of EU Special Area of Conservation features and therefore require protection under the Habitats Directive. In the Milford Haven Waterway they are a key component of the estuaries feature which is currently in unfavourable condition. The native oyster is also a Biodiversity Action Plan priority species afforded protection under the Environment (Wales) Act (2016). In early 2017 the native oyster was recognised by a specialist Welsh Government marine biodiversity restoration and enhancement task and finish group as the number one priority species for restoration and enhancement in Wales.

It is clear that the recovery and restoration of the native oyster species as well as the habitat it builds is widely recognised as a conservation and policy priority.

Threats

There are many factors that can affect native oysters, most contributing to the high variability of recruitment, such as temperature, food supply, hydrodynamic containment in a favourable environment and anthropogenic effects (e.g. coastal development and waste disposal). Notable widespread factors include (in no particular order):

- **Predators.** *Ocenebra erinaceus* the oyster drill is one of the main predators of native oyster alongside species such as crabs, starfish, dog whelks, and shell-boring worms.
- **Non-native species.** The American oyster drill *Urosalpinx cinerea* and the slipper limpet *Crepidula fornicata* were introduced to the UK with *Crassostrea virginica* from North America around 1900. *Urosalpinx*, like its native relative *Ocenebra erinaceus* is a predator but has yet to be recorded in Wales. *Crepidula* is another filter feeder competing for space and food. It deposits pseudofaeces and creates `mussel mud`. This mud degrades the grounds and hinders recruitment, but dead *Crepidula* shell provides cultch upon which oysters settle.
- **Disease.** The parasitic protozoan *Bonamia ostreae* is widespread across much of Europe and has caused large mortalities in France (from whence it was introduced) and in the Netherlands, Spain, Iceland and England. It was first recorded in the Milford Haven Waterway in 2006. Another protozoan parasite, *Marteilia refringens*, has also been found in French stocks but so far it has not affected UK stocks.
- **Climate.** Severe winters, such as those experienced in 1947 and 1963, caused high mortalities in the UK, particularly on the east coast where stock levels have not recovered to the pre-1963 levels.

- **Pollution.** Tri-butyl tin (TBT) anti-fouling paints used on ships and leisure craft in the early 1980s caused stunted growth and probably affected reproductive capacity.
- **Cultch availability.** Sufficient substrate in suitable condition for juvenile recruitment must be available (see note on *Crepidula fornicata* above).

Within the Milford Haven Waterway, the most recent work (zu Ermgassen, 2017) points to three issues being the current most likely contributors to the low oyster densities in the Haven: lack of broodstock, *Bonamia*, and cultch quality/availability. In brief this conclusion has been reached because:

- There are low densities of oysters and limited signs of recruitment.
- The positive *Bonamia* status of the Milford Haven Waterway is established.
- There is limited evidence of other drivers currently having an impact on the oyster population.

Related Plans and Policies and Further Information

Other plans / policies directly affecting the management of these species in Pembrokeshire are:

- Pembrokeshire Marine Habitat Action Plan.
- Pembrokeshire Marine SAC Management Scheme.
- Fisheries legislation / permits.

Plan Aims

Aim	Deadline	Comments
Maintain the existing geographical distribution of the native oyster within the Milford Haven Waterway in Pembrokeshire.	Date of next review	Within biological and resource constraints.
Seek to increase the population of the native oyster within the Milford Haven Waterway in Pembrokeshire.	Date of next review	Within biological and resource constraints.

Suggested Action

Action	Report By	Lead Role	Progress / Additional Information
Identify areas within the Waterway where native oysters are most likely to survive long-term in greatest numbers and seek to achieve agreements from managing authorities to protect these areas from activities that are likely to conflict with their continued well-being.		NRW	Largely dependent on securing adequate resources.
Gain a greater understanding of the distribution and effects of *Bonamia* on the current native oyster population.		NRW	Largely dependent on securing adequate resources.
Pursue active intervention in a few locations to increase the density of reproductively active adults in the population with the aim of enhancing broodstock.		NRW	Largely dependent on securing adequate resources.
Investigate the potential for rearing spat in ponds or hatcheries to subsequently use to boost oyster numbers.		NRW	Largely dependent on securing adequate resources.
Gain a greater understanding of local oyster spat generation, distribution, settlement and survival.		NRW	Largely dependent on securing adequate resources.