

Pacific oyster aquaculture - developing a protocol

The farming of Pacific oysters in the UK

The Pacific oyster (*Crassostrea gigas*) was introduced into the UK in the early 1960s under strict quarantine procedures, through what was then the Ministry of Agriculture Fisheries and Food (MAFF) Laboratory in Conwy. It was seen as an alternative species to the native oyster, stocks of which have been lost from many areas of the UK through overfishing, pollution and disease. Since its introduction, Government funded research (especially in the 1970s and 1980s) and FIGG investment have helped to support the development of the Pacific oyster industry in many of our estuaries. In 2007, 1,169 tonnes of Pacific oysters were produced by UK oyster farmers (CEFAS Shellfish News, Number 26, Autumn/Winter 2008).



Figure 1 Pacific oyster lays and trestles



Figure 2 Pacific oysters

There is increasing evidence that Pacific oysters are recruiting in the wild, and natural populations can be found, especially in the Kent and Essex area. There are concerns that with climate change and increasing sea water temperatures, reefs of Pacific oysters could become established (as has occurred in other parts of Europe, for example in France and in the Waddensee). Indeed, many of our estuaries were once populated with native oyster (*Ostrea edulis*) reefs and these have provided a natural food source, certainly since Roman times and no doubt before, as evidenced by oyster shells found in middens.

A protocol for farming Pacific oysters - background

Native marine habitats, animals and plants that are of European and national marine conservation importance (in terms of their representation, rarity and biological role) are protected in areas designated as European Marine Sites (which include Special Areas of Conservation) and national Sites of Special Scientific Interest. Living reefs, such as common mussel beds, mud flats and sand flats that may provide important bird feeding areas, are also protected.

Many of these sites are in exactly the same areas or close to where the Pacific oyster has been cultivated since the early 1970s. The statutory nature conservation agencies have concerns that the conservation objectives of these sites will be jeopardised should natural populations of Pacific oysters be allowed to develop. One of the actions in the MoU between the Shellfish Association of Great Britain (SAGB) and Natural England (NE), which was signed during the 2008 SAGB Annual Conference, is to 'clarify the status of Pacific oysters'.

Seafish provides advice to industry on environmental issues and has become aware of the excessive time and cost that can be incurred by new businesses wanting to farm Pacific oysters in European Marine Sites when subject to an environmental assessment, known as an 'Appropriate Assessment'. Natural England (NE) and the other statutory nature conservation agencies (including the Countryside Council for Wales – CCW and Scottish Natural Heritage – SNH) advise the 'competent authority' that grants permission to farm shellfish on the marine conservation interests of the sites and the potential impacts of a Pacific oyster farm.

FIFG-funded project to develop a draft protocol

In 2008, Seafish completed a FIFG-funded project to develop a protocol for cultivating the Pacific oyster in Marine Protected Areas (MPAs). The project was a collaboration between industry, the Statutory Nature Conservation Agencies (NE, CCW and the Environment and Heritage Service (N.I.)) together with DARD (N.I.) and the Irish Aquaculture Initiative.

The objective was:

"To produce a Protocol that provides a framework and template under which a decision making process can be identified with respect to Pacific oyster cultivation proposals in or around MPAs with specific reference to any potential environmental impacts on designated features of MPAs through wild settlement of Pacific oysters."

The main aim of the project was to produce a Technical Report that would then act as a comprehensive reference source for a first version of the Protocol. The main purpose of the Technical Report was to describe the varied seawater temperature profiles around the UK and through this to assess the likelihood of Pacific oyster recruitment, matched against actual observations of recruitment.

Both documents have both been completed and can be downloaded from the Seafish website.

Developing the protocol

Sea water temperatures around the UK (both retrospective and based on future climate change predictions) were used to help explain wild Pacific oysters occurrence around our coasts now, and to predict areas at risk from further spread. This was based on the number of degree days for oysters to reach spawning and more importantly, recruitment conditions.

The analysis showed that changes in sea water temperatures over time have been noticeable. When introduced in the 1960s, the Pacific oyster presented little risk of wild settlement. However, since the mid 1990s, sea water temperatures have increased steadily with the greatest increase being experienced in south east England. Some current predictions of climate change show a projected increase in temperatures of 0.4 °C every 10 years.

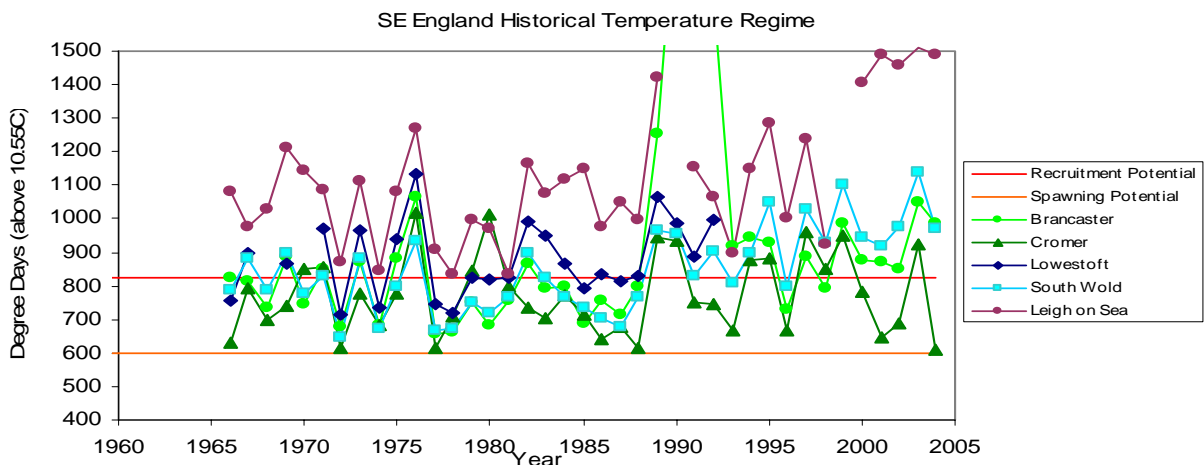


Figure 3 South east England historical sea temperature regime with recruitment events. (Other examples can be found in the full report.)

A first version of a protocol has been developed (see website link below) that could provide options for industry when faced with having to provide information for an Appropriate Assessment. It was suggested that a number of options might be needed for areas considered to be at low, medium or high risk from Pacific oysters spawning and recruiting.

Is a protocol the best way forward at this stage?

The answer to this question is very dependent on who you are. While a protocol may provide a template to help the start up of new businesses, many in the oyster farming industry want other options to be considered. Many businesses have been established for more than 25 years and these jobs and livelihoods need to be protected. One view is that even if UK growers were prevented from farming Pacific oysters, MPAs would still be under threat because Pacific oysters will spread naturally from mainland Europe.

Summary

- A genetic study of oysters collected from wild populations would help to assess whether wild Pacific oyster settlements are purely descendents of the original broodstock introduced by MAFF in the 1960s, or whether larvae have arrived from mainland Europe.
- Oyster farmers in Essex are managing the wild settlements and are using these oysters as part of their marketing strategy. They would welcome proposals for developing new methods for handling and marketing large volumes of Pacific oysters, which would in turn help to restrict the further spread of wild populations. Food security is becoming a global issue and one we must all help to address. Pacific oysters are filling the environmental niche left after the demise of the native oyster in many areas.
- It is likely that the Pacific oyster will continue to come under increased scrutiny due to existing and emerging national and EU legislation, and from increasing media interest. For example, to meet environmental conservation objectives, the Appropriate Assessment process is often hampered by insufficient information so that the precautionary principle is evoked. We have Marine Conservation Zones proposed within the new Marine Act so the dialogue between fisheries and conservation organisations must continue and work towards mutually acceptable goals.
- Under the Water Framework Directive, the Pacific oyster has been put on to the 'red list' as a species that would prevent a water body from meeting good quality designation. This list is flexible at the moment and the Pacific oyster has been put on the 'red list' as a precautionary approach until further questions can be answered.
- There is a need for information gathering and sharing to continue between industry, fisheries managers, conservationists, scientists and regulators. We also need to consider what our European partners are doing in relation to their respective industries. The Pacific oyster is rising very quickly up many political agendas and we all need to be prepared.

For further information see:

http://www.seafish.org/pdf.pl?file=seafish/Documents/658_Pacific%20Oyster%20Protocol_Technical%20report.pdf and

http://www.seafish.org/pdf.pl?file=seafish/Documents/658_Pacific%20Oyster%20Protocol_Protocol%20Template.pdf

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