

**Report of Pembrokeshire Marine Special Area of Conservation Officer**

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**Subject: Pembrokeshire Coast National Park Native Oyster Rearing Project**

**Purpose of Report**

To provide members with an overview and update of the Bangor University native oyster rearing project.

This project is led by the conservation team within the National Park.

**Background**

Overfishing in the 1800s near universally drove the native oyster to commercial and functional extinction throughout its European range. A host of other threats including habitat degradation, pollution and disease have contributed to its continued status as a threatened species.

Native oysters are large-scale biogenic reef builders. However, currently they generally only occur as scattered individuals. Historically, native oyster reefs ecosystems persisted at large scales (several km<sup>2</sup>) across Europe and their wonderful 3D structure supported a rich associated biological community. A fully functional reef ecosystem is proposed to consist of >20 oysters per m<sup>2</sup>. An oyster bed is defined when oysters number >5 per m<sup>2</sup>.

**Native oysters and carbon**

Oyster shells are made of calcium carbonate, and their formation results in assimilation of carbon. Oysters also slow down water flow, and filter and deposit material which acts to trap organic carbon on the seabed. The native oyster has the capacity to enhance the deposition of carbon, potentially trebling carbon drawdown through biodeposition alone (compared to deposition rates in the absence of oysters). They also support other habitats and species which contribute to carbon storage.

A single oyster can filter up to 200 litres of water per day, removing particulates and improving water quality. Cleaner water promotes healthier and more resilient ecosystems, which are better at sequestering carbon.

**Native oysters in the Milford Haven Waterway**

The Milford Haven Waterway was historically the location of one of the main native oyster (*Ostrea edulis*) beds in Wales. Native oysters are very sparsely distributed, and where they are present are very rarely found in numbers >1 per m<sup>2</sup>. No permits for dredging have been issued since 2010 offering *de facto* protection from fishing upstream of the Cleddau Bridge.

Previous work on native oysters in the Waterway in 2016 by the West Wales Shellfishermans Association Ltd determined that the main barriers to an increase in native oyster numbers were seen to include a lack of broodstock, the presence of *Bonamia ostreae* (a parasite that can cause lethal infections in shellfish), the overabundance of the American slipper limpet (*Crepidula fornicata*) and low-quality settlement material (cultch). With very limited recruitment (little or no observed spat) to the oyster population, active restoration was identified as a key factor in enabling recovery.

Natural Resources Wales continued restoration efforts and deployed some cultch (settlement material) and young oysters. Work has also focused on a restoration action plan for Wales.

### ***Natur am Byth! (2023-2027)***

*Natur am Byth!* unites nine environmental charities with Natural Resources Wales to deliver the country's largest natural heritage and outreach programme to save species from extinction and reconnect people to nature.

The native oyster is one of the project's target species to protect and restore.

Building on previous oyster restoration efforts in the Waterway, *Natur am Byth! Môr* led by the Marine Conservation Society has deployed 40,000 mature native oysters (provided via Tethys Oysters) to date (20,000 in May 2024 and 20,000 in April 2025) at carefully selected restoration sites, seeking to provide conditions that can boost natural reproduction. The project is also monitoring the oysters and overall habitat, looking at survivability, signs of reproduction (young oyster spat) and factors that can impact oysters.

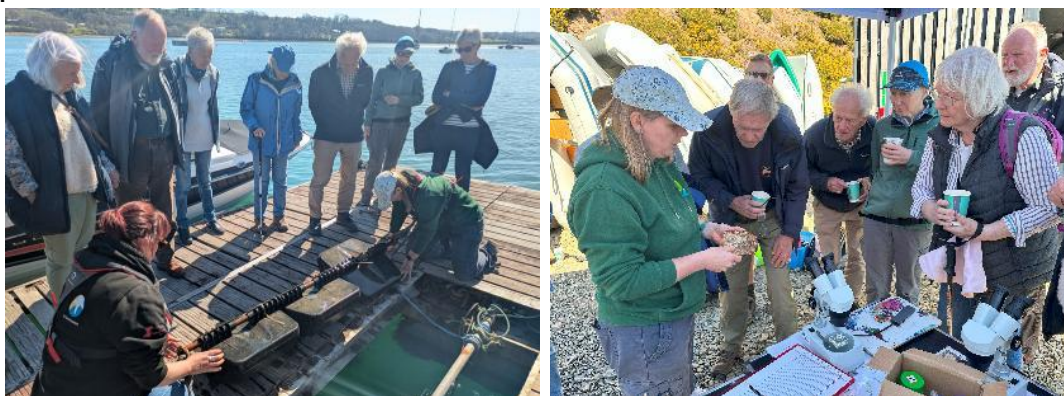


*Deployed native oysters. Image taken during diving monitoring May 2025. Photo: ASML Ltd / Marine Conservation Society.*

A further deployment of native oysters (supplied by Câr-y-Môr) is scheduled to take place in October 2025.

An important part of *Natur am Byth!* is people engagement. This has taken place with the help of the Darwin Centre and shore walks during low tide. Native oyster "hotels" (cages) slung beneath the pontoon at Rudder's Boat Yard in November 2024 have provided a good tool for engagement and sessions have enabled participants to help to monitor oyster growth as part of the project. Some oysters from the Bangor University project (below) have been added to the hotels. Friends of PCNP visited

the hotels in April 2025 and a session later in the year will offer opportunity to PCNPA staff.



*Friends of PCNP visit to Natur am Byth! Môr oyster hotels, 7 April 2025. Photo: Sue Burton*  
The Pembrokeshire Marine SAC Officer is seconded to the Marine Conservation Society to help deliver *Natur am Byth! Môr* until August 2027.

### **Wild Coast: Bangor University Milford Haven Waterway Native Oyster projects**

*SLSP Wild Coasts* has supported two further oyster restoration projects. These are based on oyster larvae rearing, undertaken by Bangor University, using hatchery-based aquaculture facilities at the School of Ocean Sciences.

1. The first project was a feasibility study to assess the potential for hatchery-based aquaculture production to support native oyster restoration efforts within the Milford Haven Waterway.

The project used 148 mature local Milford Haven Waterway native oysters as broodstock, breeding them to produce in excess of 200,000 tiny 0.2-1cm juvenile oyster spat settled on to a mixture of clean scallop, cockle and oyster shells. There is a view that existing old native oysters may have some resistance to disease. This, and the desire to protect the genetic make-up of local populations, which may also provide additional resilience, is why restoration using indigenous stock is so attractive.



*Native oyster spat settled onto a scallop shell (coin for scale). Photo: Sue Burton*

Approximately 200,000 of these oyster spat on scallop shells were deployed to the Waterway in February 2025, aided by students from Paddle West who transported

the oysters to their restoration site in shallow water where they were laid by hand. Some were placed in the oyster hotels at Rudders Boat Yard, and some were placed with Tethys Oysters in Angle Bay on intertidal trestles where they could be monitored.

Duration: October 2023 – March 2025

Net cost: £42,000

**2.** A second rearing phase, also with Bangor University, is currently underway. This phase uses juvenile oysters which were spawned, reared, and settled onto natural shell (cultch) material using broodstock oysters from the Milford Haven Waterway as part of the previous feasibility study.

The project is further growing on approximately 50,000 juvenile oysters in the hatchery with the objective of increasing the size to approximately 20mm in shell height. By increasing their size and the thickness of their shells it is anticipated that they will be more resistant to predation once returned to the Waterway.

This phase is proving to be valuable in providing comparative data to the oyster spat on shell deployed i) on the seabed, ii) in the oyster hotels, iii) in Angle Bay.

Growing spat on shell for native oyster restoration is a recent development. Survival post-deployment was a relative unknown. The collaborative work between PCNPA, Bangor University and the *Natur am Byth!* Môr project is providing evidence that spat on shell is a highly successful means of oyster restoration, and a possible short-cut to reef creation. The project has demonstrated that we are capable in Wales of successfully progressing native oyster restoration with our own home-grown native oysters and expertise.

Duration: May 2025 to October 2025

Net cost: £19,900



*Native oyster spat settled onto scallop shell from (left to right) seabed 8 May 2025, hotels 2 June 2025, Angle Bay 28 May, Bangor hatchery 18 August 2025.*

### **Future native oyster restoration**

The biggest challenge for native oyster restoration efforts is supply. There are very few suppliers. The learning from the Milford Haven restoration experience will help to inform hatchery production and provide assurance to native oyster restoration practitioners that survivability of tiny spat on shell can exceed that of individual juvenile oysters which are more prone to physical damage and predation.

The restored oysters will continue to be closely monitored via the *Natur am Byth!* Môr project in 2026 and 2027 to assess their survival and growth, helping to inform future restoration efforts and strengthen the long-term recovery of the species in the Milford Haven Waterway whilst also improving water quality, storing carbon and creating habitat for marine life.

Discussions are already underway to build on the fantastic work that PCNPA and others have supported to date. Partners are exploring options to continue to support native oyster restoration further into the future. These include the urgent need to address water and sediment pollution.

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