



## Dornoch Environment Enhancement Project (DEEP project)

---



**Moët-Hennessy**  
**United Kingdom**  
**2014 > Ongoing**  
**#conservation #ResourceEfficiency**  
**#WasteManagement**



### Objective

To reintroduce 200,000 oysters by 2024 and a 40-hectare reef with four million oysters by 2030.

To recreate extinct native oyster reefs in the Dornoch Firth.

This will help to purify the by-products created through the distillation process, enhance biodiversity and improve water quality.

### Description

Glenmorangie Distillery takes their environmental responsibilities very seriously. Underlining the distillery's commitment to a sustainable future, in 2014 Glenmorangie forged an ambitious and innovative partnership with Heriot-Watt University and the Marine Conservation Society to create the Dornoch Environmental Enhancement Project (DEEP). The project for DEEP includes restoring long-lost oyster reefs to the Dornoch Firth to act in tandem with the distillery's anaerobic digestion plant to help purify the waters of the Firth.

#### **Research**

The project's first phase, led by Professor Sanderson of the Heriot-Watt University, trawled archaeological records, ancient literature and fisheries records, then sampled shell material, to show that oysters had existed in the Dornoch Firth up to 10,000 years ago and that

reintroducing them was feasible.

### **The oysters**

In 2017, oysters from a wild oyster population in Loch Ryan, were placed on two sites in the Firth in ballasted bags, to confirm that they would thrive. Their survival paved the way for a feat never attempted before in Europe – recreating natural reefs. In 2018, waste shells were used to cover the seabed in two locations to stabilise the sediment and allow the oysters to grow on top, mimicking their natural habitat. Oyster spat (larvae) are grown to a suitable size before being introduced to the Firth on the reefs.

### **Cleaning distillation by-products**

The distillery's anaerobic digestion plant, commissioned in 2017, breaks down 95% of the COD (chemical oxygen demand) load in the waste left-over by-products from the distillation process. This treated effluent is a highly nutritious food for oysters which are natural bio filters. The oyster reefs feed off this remaining 5% waste. With one oyster able to purify up to 200 litres of water a day, the reef will be capable of fully purifying the waste within 10 years.

### **Other benefits**

The reef also cleans other organic materials and will ultimately enhance biodiversity, improve water quality, increase carbon storage and protect the shoreline from the potential climate change effects of higher seas.

Wild populations of oysters are recognised as in need of protection throughout Europe. Native oysters in the Firth were decimated in the 19th century due to overfishing. Their return to the Firth not only enriches the eco-system but re-introduces a population of oysters that had once flourished in the Firth.

## Partners

Centre of Marine Biodiversity and Biotechnology at Heriot Watt University

The Marine Conservation Society

Moët Hennessy (The Glenmorangie Company is owned by Moët Hennessy which is ultimately controlled by Moët Hennessy Louis Vuitton LVMH).

## Results

Number of oysters introduced: 90,000 by May 2024; 80,000 by the end of 2023; 60,000 by the end of 2022; 30,000 by July 2022; 40,000 by November 2022 and 20,000 by August 2021. The first 300 oysters were introduced in March 2017 to confirm they would survive.

Water purification: The aerobic digestion plant purifies up to 95% of the wastewater and the remaining 5% is naturally cleaned by the oysters.

## Measurement & evaluation

### **Research published by the DEEP project**

March 2023 "Could biodiversity double in a decade?"

Research has, for the first time, predicted the biodiversity gain of reintroducing European native oysters. The findings demonstrate that biodiversity will likely double over a decade once oyster restoration projects are complete. This means the population of species will increase in a balanced way. Data has also shown a link between increased shell material as the oyster population grows and increased biodiversity.

The research can be viewed at [here](#) on Peer-reviewed scientific journal PLOS ONE.

A short film to support the research [can be viewed here](#).

### Awards

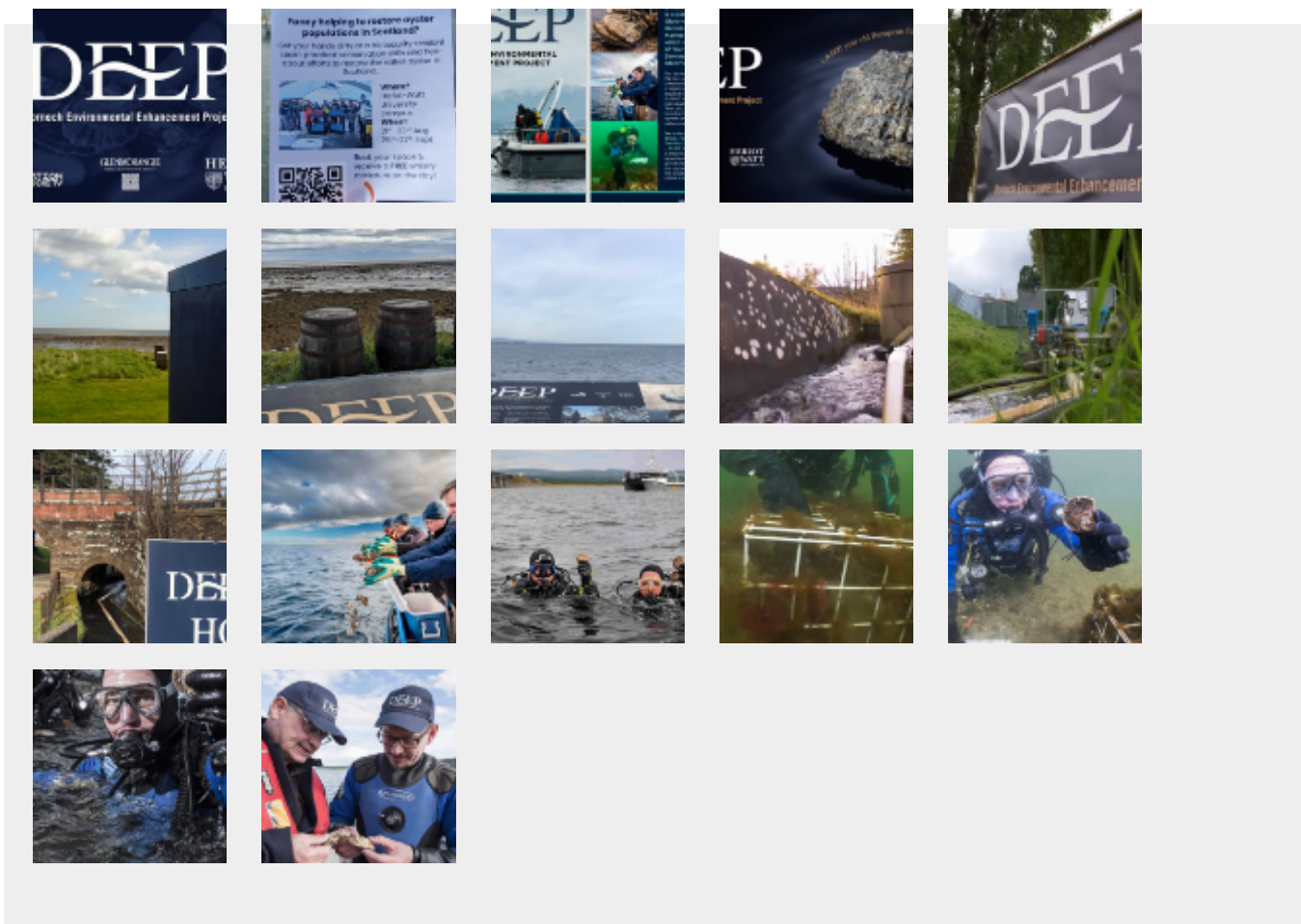
**VIBES** Awards: Winner of the Hydro Nation Award, 2017 and Finalist of Best of VIBES Award, 2019.

## Website

<https://www.glenmorangie.com/en-int/our-responsibilities/environment>

## Downloads

## Photo gallery



## Documents

**Vibes case study Glenmorangie-2017** (pdf - 0.48 Mo)