Sourcing Oysters & Biosecurity Measures

Effective biosecurity and oyster supply chain management are essential for successful oyster restoration projects.

Supply chain management

Unlike Pacific oysters, which are widely farmed due to their faster growth rates and higher commercial demand, European Flat oysters are harder to source because they are less profitable to grow. As we do not need to wait for the oysters to be the size people would want to eat, Restoration Forth can buy younger, smaller oysters after just two years.

The creation of this supply model offers better profits to oyster growers who want to contribute to restoration of European Flat oysters, which similar projects could look to follow.

Given the sporadic nature of hatchery production, diversifying sources to build a resilient network of suppliers ensures the long-term sustainability of restoration and reduces dependency on any single hatchery.

It is our hope that this collaboration between oyster farmers and conservation projects can further support the restoration of this keystone species.

Biosecurity

Biosecurity safeguards the long-term success of restoration projects, as it ensures we do not unintentionally spread pests and diseases from one place to another.

Oysters can carry unwanted organisms (such as invasive seaweeds, parasites and other bivalves) on and in their shells, as well as through the water they hold inside. By implementing rigorous biosecurity protocols, we minimise ecological risks, ensuring that oyster restoration enhances, rather than harms, marine habitats.

Once you have selected a suitable site for your oyster restoration, and received the relevant permits, the next key steps are as follows:

1. **Supplier Selection and Health Screening:** Ensure absence of pests and diseases at suppliers' site and screen samples for concerns such as *Bonamia ostreae*, *Martelia refringens* and *Oyster Herpes OsHV-1 virus*, through a registered and accredited disease screening laboratory.

2. **Oyster Collection:** Coordinate timely, efficient collection from suppliers in the spring or autumn when air temperatures are cool. A holding tank is recommended for receiving oysters and in which dirty oysters can be kept until cleaned.

3. **Biosecurity Protocols:**

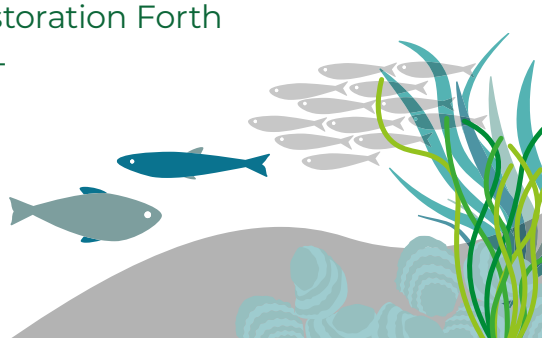
    - **Physical Cleaning** – remove visible animals and seaweeds on the shell surface.
    - **Chemical Cleaning** – sterilise the shells with either 4% Formaldehyde or 1% bleach.
    - **Quarantine** – store the oysters for 5 days in artificial seawater, in a clean, closed system with UV sterilisation on recirculating water. This further reduces biosecurity risks by cleaning any water retained within the oyster shells. Ensure at least 2 water changes during the 5 days.

4. **Oyster Deployment:** Release oysters at restoration sites. Restoration Forth have done this from a boat (for subtidal sites) and on the shore (for intertidal sites).

5. **Monitoring:** Continuous tracking of growth and survival of representative oysters and associated biodiversity.

Lessons Learned

- **Supplier Relationships:** Establishing long-term relationships with oyster suppliers encourages more farmers to engage in restoration efforts. A diverse supply chain is necessary to mitigate risks associated with farm failures or fluctuations in oyster availability.
- **Time Management:** Many elements in this process have a long lead in time (e.g. applying for licences etc). Bear this in mind when planning restoration.
- **'People Power':** One of the most time-intensive aspects of our work is the physical cleaning during biosecurity. For each batch of 5,000 oysters, this process requires around 400 hours to ensure that the oysters are free from any potential invasive species.
- **Volunteer Coordination:** Volunteer-based restoration projects should always plan for higher than expected dropout rates. Overestimating the number of volunteers needed helps ensure that fieldwork is completed efficiently.
- **Staffing:** Managing the operational process of restoring oysters, from sourcing to deployment, requires dedicated staffing. Restoration Forth employs a Shellfish Restoration Officer, hosted by Heriot-Watt University, and a Shellfish Engagement Officer, hosted by Marine Conservation Society, to do this.



External Resources

Want to learn more about oyster restoration and biosecurity? Here are some helpful resources:

NORA (Native Oyster Restoration Alliance) (https://noraeurope.eu/)

- Restoration Handbook
- Biosecurity Handbook
- Monitoring Handbook

Native Oyster Network (https://nativeoysternetwork.org/)

- Resources