Overfishing and disease are two of many factors that have resulted in a <90% loss of *Ostrea edulis* habitat and restoration is underway across Europe. Native oyster restoration has often centred around fishery enhancement to satisfy consumer demand, but the current European focus is habitat revival. An undisturbed oyster bed is thought to offer beneficial ecosystem services such as a distinct 3D habitat for fish and invertebrates, cleaner water through their water clearance, and coastal stability. The common goal for oyster habitat restoration is to create a healthy self-sustaining *O. edulis* population. Early considerations for restoration include the density at which to lay oysters, and how to assemble them for maximum recruitment each subsequent year.

### Considerations for native oyster restoration...

**Density**

<table>
<thead>
<tr>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited reproductive success</td>
<td>Higher disease &amp; mortality</td>
</tr>
<tr>
<td>5 – 10 oysters m⁻² has been suggested for ‘successful’ <em>O. edulis</em> restoration, yet most natural UK beds are now &lt; 2 oysters m⁻².</td>
<td>The elevation of native oysters has been shown to result in increased clearance rates than those left on the seabed.</td>
</tr>
</tbody>
</table>

**Elevation**

<table>
<thead>
<tr>
<th>i. Sediment load</th>
<th>ii. Flow rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Reduced sediment load</td>
<td>• Increased laminar water flow</td>
</tr>
<tr>
<td>• Reduced bacterial abundance</td>
<td>• Greater oxygen concentration</td>
</tr>
</tbody>
</table>

### Method

**Density**

<table>
<thead>
<tr>
<th>Elevation (x m) above seabed</th>
<th>250 oysters m⁻² (High)</th>
<th>125 oysters m⁻² (Low)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.2 m</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>0.8 m</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

**Monitor (quarterly):**

- (a) Oyster respiration/clearance rate
- (b) Disease prevalence, and intensity
- (c) Oyster mortality
- (d) Oyster growth/condition
- (e) Associated epifauna
- (f) Reproductive potential

**Flume Experiment:** Effect of water current speed on *O. edulis* respiration rate

1. Establish the current speed/sheer stress (v') at which oyster valves close
2. Measure oyster respiration rate post exposure to water currents (a) below and (b) above v'.
3. Observe boundary effects of *Crepidula fornicata*.

**Implication:** Site choice for *O. edulis* restoration.

**Lab Experiment:** Effect of sediment load on *O. edulis* clearance rate

1. Determine the effect of sediment grain size on oyster clearance rate
2. Measure clearance rates of oysters offered varying ratios of phytoplankton to sediment particles

**Implication:** Site and relaying choices (i.e. elevation) for *O. edulis* restoration.

**References**