



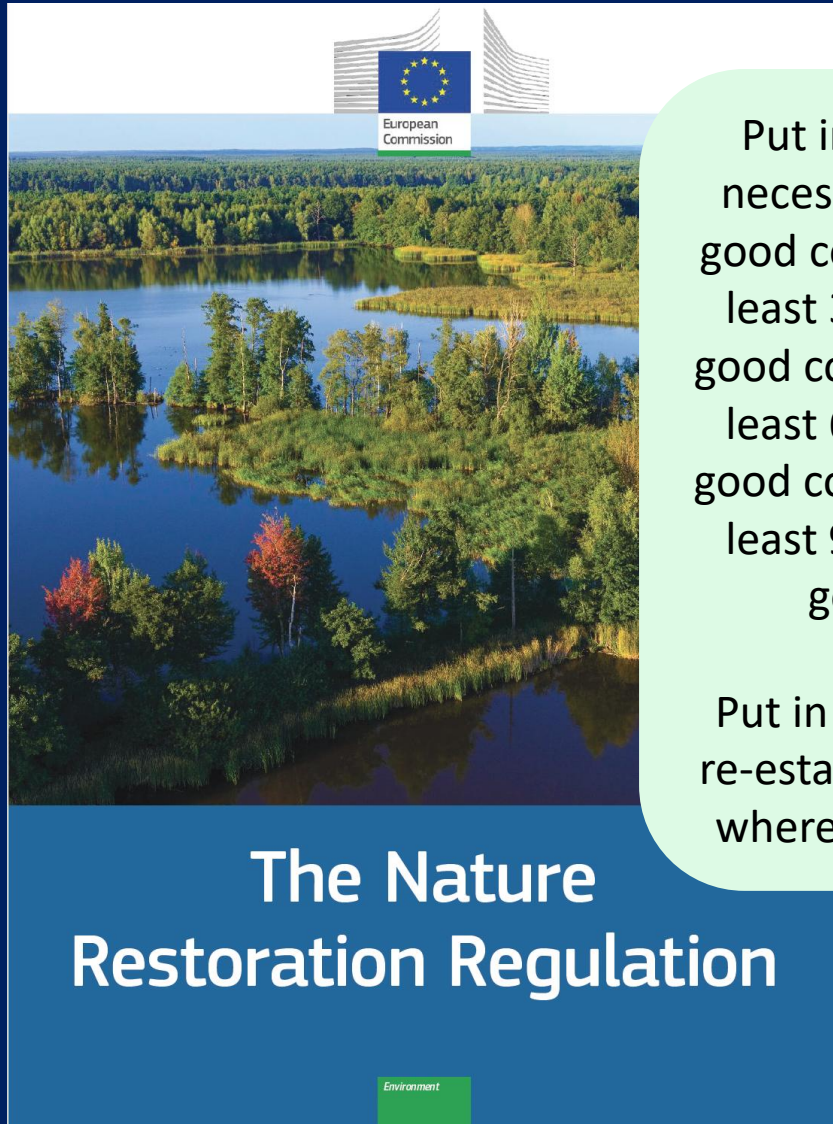
A STRATEGIC ROADMAP FOR UPSCALING THE PROVISION OF EUROPEAN FLAT OYSTER, *OSTREA EDULIS*, TO SUPPORT LARGE SCALE RESTORATION.

10th June 2026



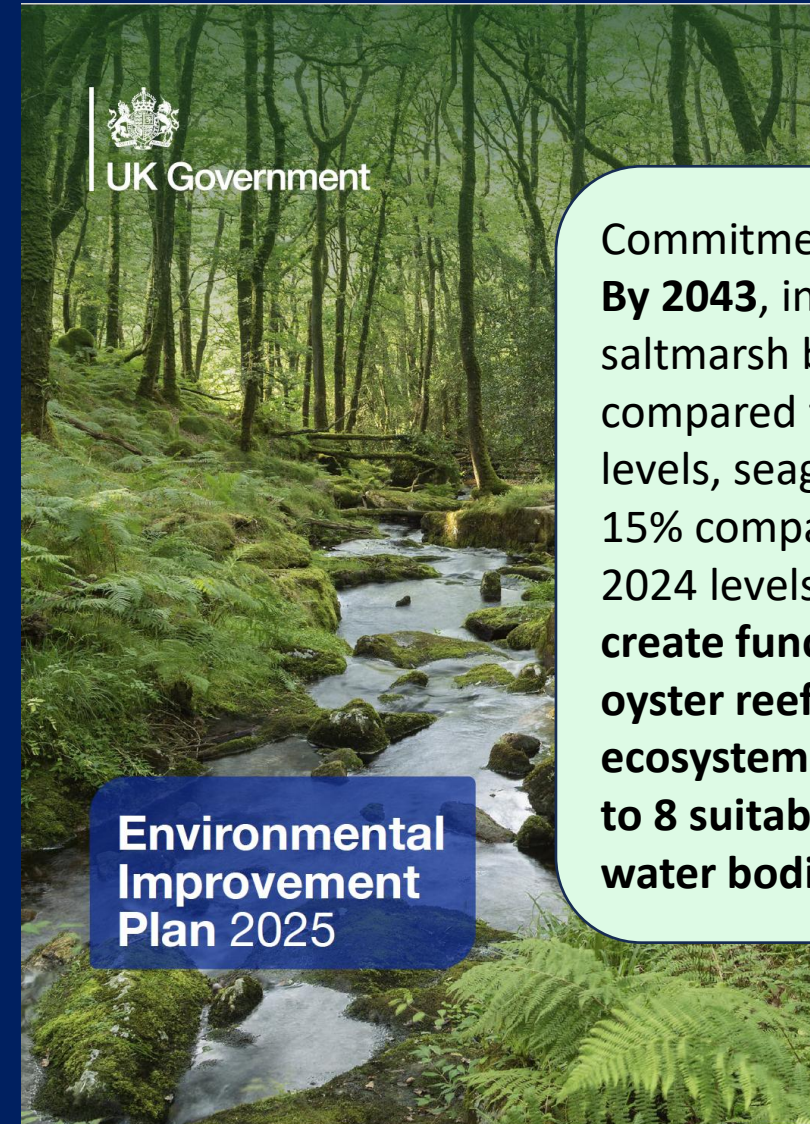
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NRR and EIP as drivers of restoration



Put in place measures necessary to improve to good condition by 2030 at least 30% of area not in good condition, by 2040 at least 60% of area not in good condition. By 2050 at least 90% of area not in good condition

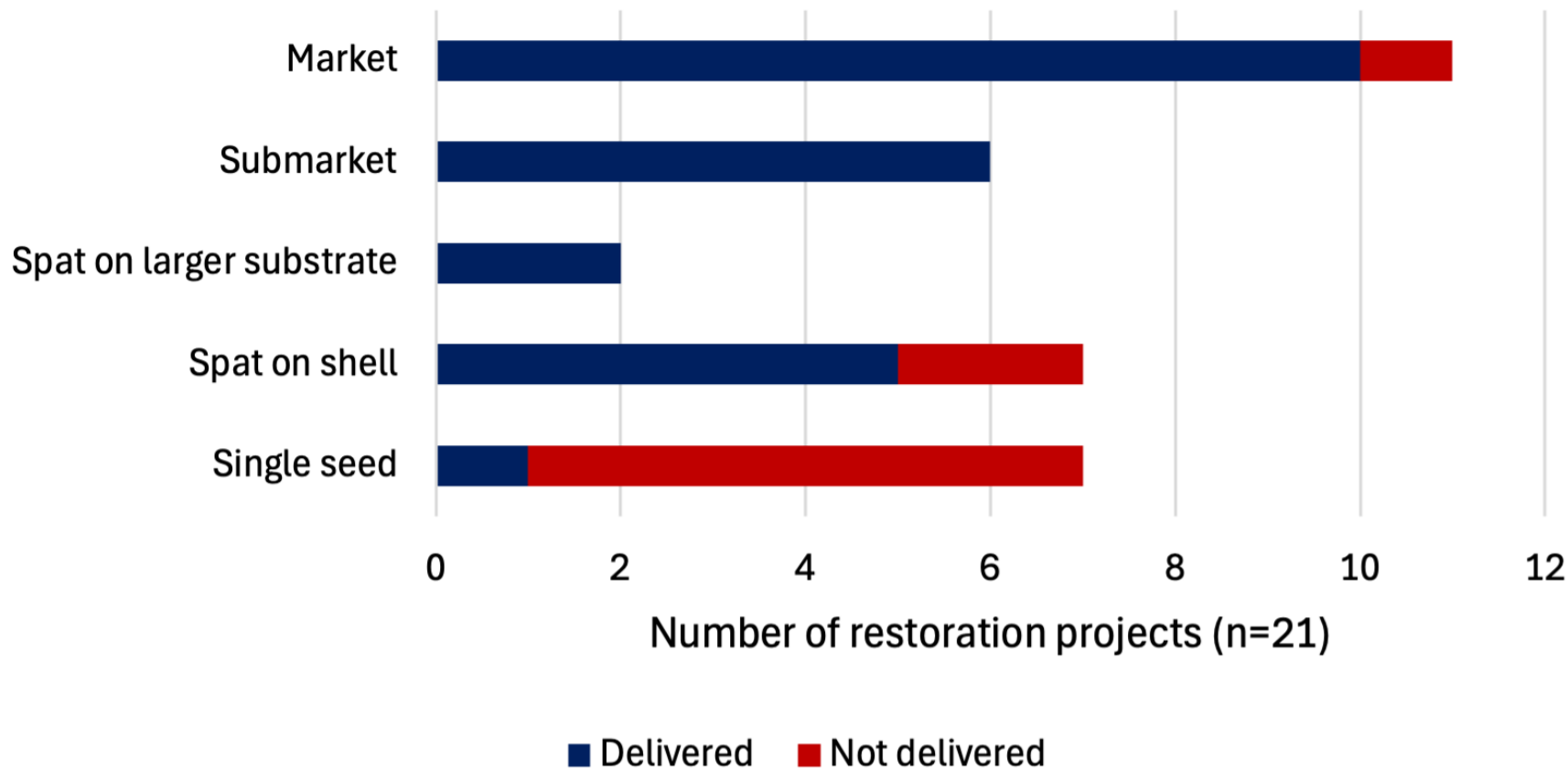
Put in place measures to re-establish listed habitats where they do not occur



Commitment 13:
By 2043, increase saltmarsh by 15% compared to 2009 levels, seagrass by 15% compared to 2024 levels and **create functional oyster reef habitat at ecosystem scales in 5 to 8 suitable English water bodies**

Suitable seed supply as a barrier to up scaling restoration

Proportion of orders delivered on time in full



Considerations (variably applicable):

- ✓ Local broodstock
- ✓ Bonamia free
- ✓ Free from other notifiable diseases
- ✓ Bonamia “tolerant”
- ✓ Donor site matched in disease and INNS status
- ✓ Cost
- ✓ Availability



Photo: Philine zu Ermgassen



Mali Ston bay, Croatia



Photo: Tristan Hugh-Jones



Photo: Philine zu Ermgassen

Project Aim

Develop a roadmap to greater reliability, abundance and suitability of oyster seed for European native oyster restoration efforts, from hatcheries.



zu Ermgassen, P.S.E., Cucknell, A., Debney, A., Uttley, M., Preston, J. (2026) Roadmap to scaling up *Ostrea edulis* hatchery production in Europe. Zoological Society of London, London UK.

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Strategic Roadmapping Process

- Establish context
 - Define the Aims
 - Define the Scope
- NORA Production Working Group Workshop
-In person workshop at the Native Oyster Network UK & Ireland
-Questionnaires to restoration practitioners and oyster producers
- Why? What? How? When?
Establish a coherent logic

Workshop at the Zoological Society of London 6-7th
October 2026



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Roadmapping Timeline

- NORA Production Working Group Workshop (March 2025)
- In person workshop at the Native Oyster Network UK & Ireland (April 2025)
- Questionnaires to restoration practitioners and oyster producers (April-June 2025)
- In person workshop to develop the strategic roadmap (Oct 2025)
- Iterative improvement, in discussion with regulators and industry representatives (Oct- Nov 2025)
- Launch for public consultation NORA 6 conference (Nov 2025)
- Incorporation of feedback from the consultation (Nov 2025-March 2026)



Roadmap to scaling up *Ostrea edulis* hatchery production in Europe

VISION 2040

*Hatchery production of *Ostrea edulis* is increased to meet the tailored demands of Europe-wide restoration and regenerative aquaculture efforts.*

Product requirements and appropriate sourcing is clearly understood across both supply and demand, with a wide range of broodstock genotypes available for purchase.

Clear, consistent and feasible regulation is in place for the movement of oysters from/to restoration areas, shaped by scientific advancement.

This is supported by a skilled workforce available for European native oyster hatcheries to deliver at scale.

Roadmap to scaling up *Ostrea edulis* hatchery production in Europe

BARRIER	
Limited and inconsistent demand for oyster seed from current restoration efforts and regenerative aquaculture. Limited supply of restoration appropriate products from producers.	
Lack of investment pipeline to scale up hatchery production.	
Lack of clarity in the restoration community about seed sourcing options and planning timescales.	
Limited understanding of long-term ecological impact of source broodstock on genotypes and disease status.	
Lack of guidance on oyster movement applicable to restoration activities.	
Lack of skilled technicians to support scaling up of hatchery production.	

- RECOMMENDATION 1
- RECOMMENDATION 2
- RECOMMENDATION 3
- RECOMMENDATION 4
- RECOMMENDATION 5
- RECOMMENDATION 6

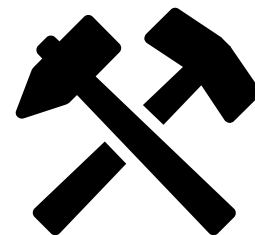


**Develop skills
pipeline for
hatcheries**

Key stakeholder groups



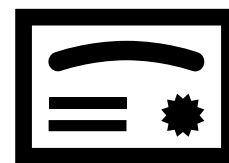
Academia



Practitioner



Producer organisations



Regulators



Hatcheries



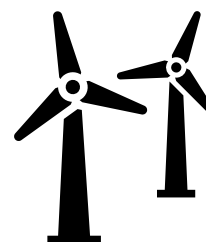
Government



Education sector

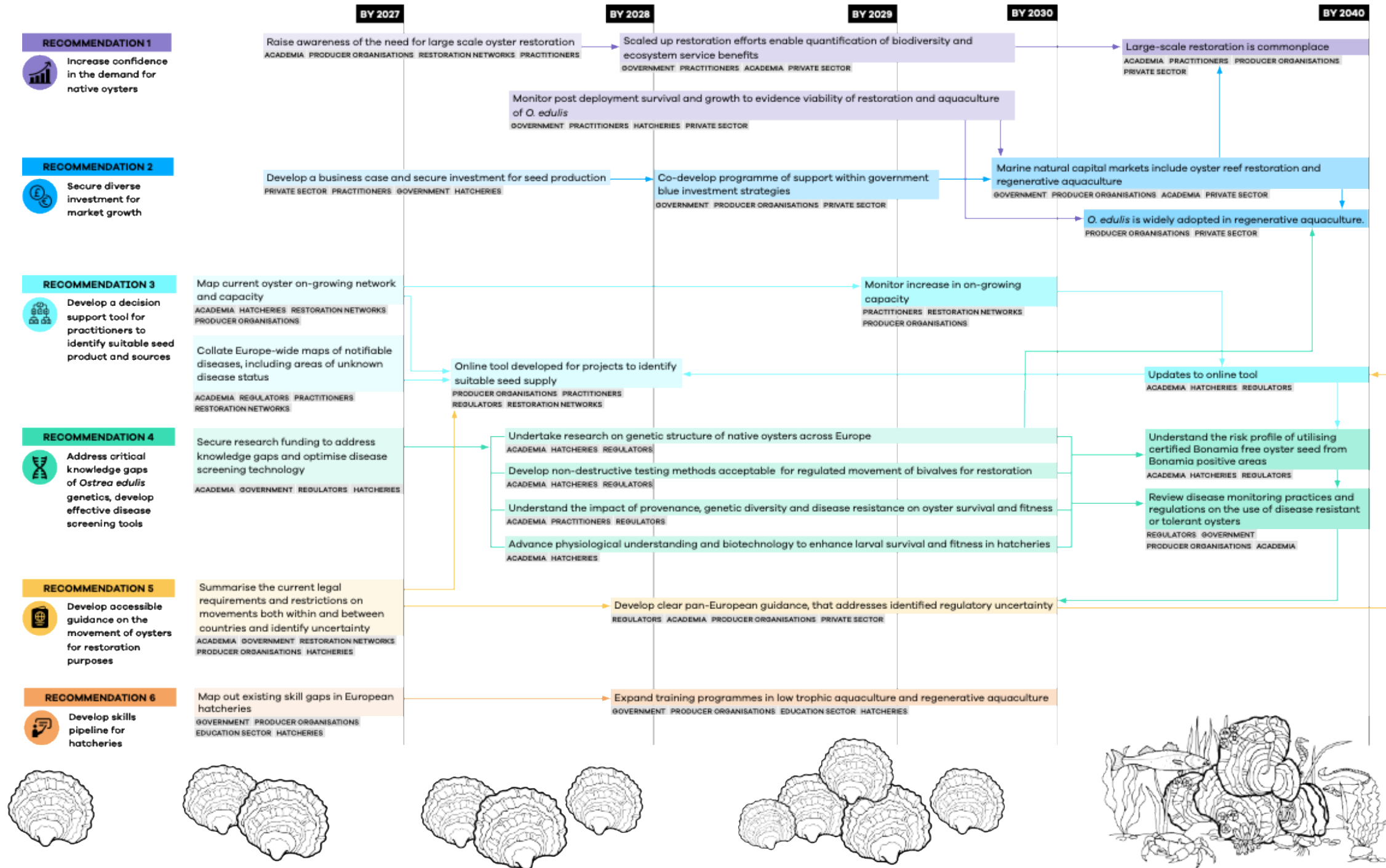


Restoration networks

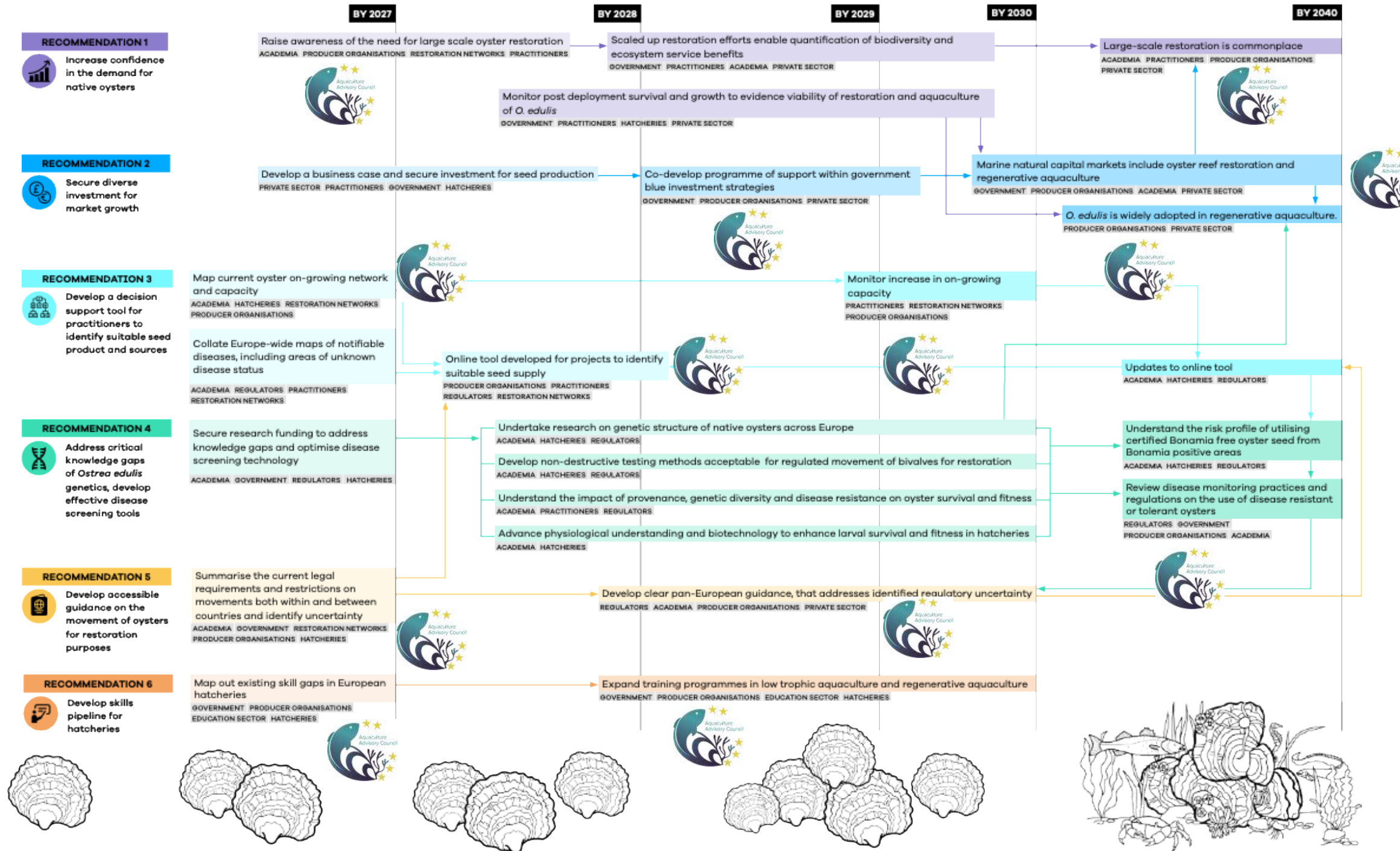


Private Sector

Roadmap to scaling up *Ostrea edulis* hatchery production in Europe



Roadmap to scaling up *Ostrea edulis* hatchery production in Europe



RECOMMENDATION 1



**Increase confidence
in the demand for
native oysters**

BY 2027

Raise awareness of the need for
large scale oyster restoration

Academia, Restoration networks,
Practitioners, Producer
Organisations

BY 2029

Scaled up restoration efforts
enable quantification of
biodiversity and ecosystem
service benefits

Academia, Practitioners, Private
Sector, Government

Monitor post deployment
survival and growth to evidence
viability of restoration and
aquaculture of *O. edulis*

Practitioners, Academia, Private
Sector, Government

BY 2040

Large-scale restoration is
commonplace

Academia, Practitioners,
Producer Organisations

RECOMMENDATION 2



**Secure diverse
investment for
market growth**

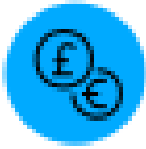
Marine natural capital markets include oyster reef restoration and
regenerative aquaculture

GOVERNMENT PRODUCER ORGANISATIONS ACADEMIA PRIVATE SECTOR

O. edulis is widely adopted in regenerative aquaculture.

PRODUCER ORGANISATIONS PRIVATE SECTOR

RECOMMENDATION 2



Secure diverse investment for market growth

BY 2027

Develop a business case and secure government investment for seed production

Private sector, Practitioners, Government, Hatcheries

BY 2030

Co-develop programme of support within government blue investment strategies

Producer Organisations, Government, Private Sector

RECOMMENDATION 4



Address critical knowledge gaps of *Ostrea edulis* genetics, develop effective disease screening tools

RECOMMENDATION 1



Increase confidence in the demand for native oysters

O. edulis is widely adopted in regenerative aquaculture

Producer Organisations, Private Sector

BY 2040

Marine natural capital include oyster reef restoration and regenerative aquaculture

Producer Organisations, Government, Academia, Private Sector

RECOMMENDATION 3



Develop a decision support tool for practitioners to identify suitable seed product and sources

BY 2027

Map current oyster on-growing network and capacity

Academia, Hatcheries, Restoration Networks, Producer Organisations

Collate Europe-wide maps of notifiable diseases, including areas of unknown disease status

Academia, Regulators, Practitioners, Restoration Networks

Online tool developed for projects to identify suitable seed supply

BY 2028

Producer Organisations, Practitioners, Regulators, Restoration Networks

Updates to online tool

Academia, Hatcheries, Regulators

BY 2030

Monitor increase in on-growing capacity

Practitioners, Restoration Networks, Producer Organisations

RECOMMENDATION 4



Address critical knowledge gaps of *Ostrea edulis* genetics, develop effective disease screening tools

RECOMMENDATION 5



Develop accessible guidance on the movement of oysters for restoration purposes

RECOMMENDATION 4



Address critical knowledge gaps of *Ostrea edulis* genetics, develop effective disease screening tools

BY 2027

Secure research funding to address knowledge gaps and optimise disease screening technology

Academia, Government, Regulators, Hatcheries

RECOMMENDATION 2



Secure diverse investment for market growth

O. edulis is widely adopted in regenerative aquaculture.

PRODUCER ORGANISATIONS PRIVATE SECTOR

RECOMMENDATION 3



Develop a decision support tool for practitioners to identify suitable seed product and sources

Updates to online tool

ACADEMIA HATCHERIES REGULATORS

Undertake research on genetic structure of native oysters across Europe

Develop non-destructive testing methods acceptable for regulated movement of bivalves for restoration

Understand the impact of provenance, genetic diversity and disease resistance on oyster survival and fitness

Advance physiological understanding and biotechnology to enhance larval survival and fitness in hatcheries

Academia, Hatcheries, Regulators, Practitioners,

Understand the risk profile of utilising certified *Bonamia* free oyster seed from *Bonamia* positive areas

Academia, Hatcheries, Regulators

Review disease monitoring practices and regulations on the use of disease resistant or tolerant oysters

Regulators, Government, Producer Organisations, Academia

BY 2030

RECOMMENDATION 5



Develop accessible guidance on the movement of oysters for restoration purposes

Online tool developed for projects to identify suitable seed supply

BY 2027

Summarise the current legal requirements and restrictions on movements both within and between countries and identify uncertainty

Academia, Government, Restoration Networks, Producer Organisations, Hatcheries

RECOMMENDATION 3



Develop decision support tool to identify suitable seed production at the project level

Updates to online tool

BY 2029

Develop clear pan-European guidance, that addresses identified regulatory uncertainty

Producer Organisations, Regulators, Academia, Private Sector

BY 2030

RECOMMENDATION 6



**Develop skills
pipeline for
hatcheries**

BY 2027

Map out existing skill gaps in
European hatcheries

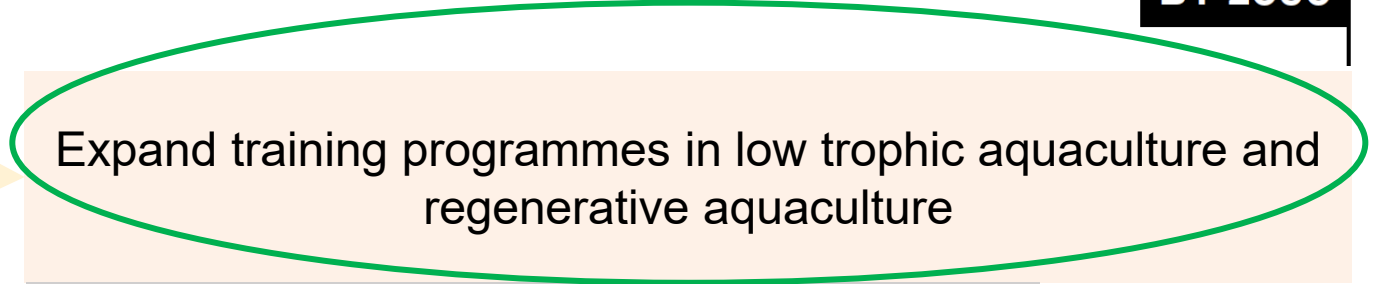
Government, Hatcheries,
Education Sector



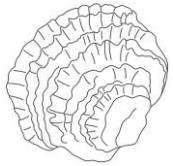
BY 2030

Expand training programmes in low trophic aquaculture and
regenerative aquaculture

Government, Hatcheries, Producer
Organisations, Education Sector



Scaling up restoration and seed production aligns with



Kunming-Montreal Global Biodiversity Framework



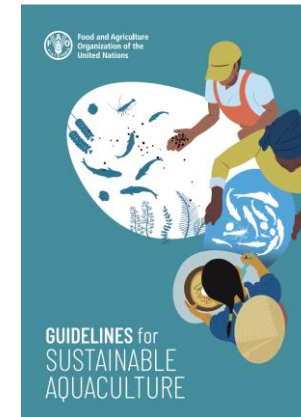
Convention on
Biological Diversity



AAC 2040 vision



FAO Guidelines for Sustainable Aquaculture



EU Ocean Pact



With thanks to



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NORA Production Working Group

Ostrea Aquaculture

Morcambe Bay Oysters

Stichting Zeeschelp

Ferme Marine

The Oyster Restoration Company

Roem van Yerseke

Wageningen Marine Research



Native Oyster Network UK & Ireland

Thünen Institut

International Marine Centre

Roslin Institute

Scottish Association for Marine Sciences

Northbay Innovations Ltd.

EATiP

EMPA



NATIVE
OYSTER
NETWORK
UK & IRELAND

and to AAC, Fish Health Inspectorate Scotland, Fish Health Inspectorate England and Wales

CONTRIBUTORS

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