



AAC Recommendation on potentials and constraints in the implementation of restorative aquaculture

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I. Background

Policy context

Restorative aquaculture is emerging as a relevant concept at the intersection of EU environmental and food production policies.

The AAC has already recognised, in its recommendation¹ on Vision for Fisheries and Aquaculture in 2040, that some aquaculture systems can contribute to biodiversity in wetlands and aquatic habitats and provide ecosystem services in addition to producing healthy aquatic food. This is consistent with the FAO Guidelines for Sustainable Aquaculture², which encourage aquaculture systems that provide habitat and refuge for terrestrial and aquatic biodiversity, where appropriate. The available evidence and examples are currently strongest for bivalve aquaculture, particularly mussels and oysters, which can contribute to ecosystem functions such as water filtration, nutrient extraction, reef habitat restoration and related biodiversity enhancement. Fish farming in ponds and lagoons likewise provides wildlife habitat, water retention, flood and drought buffering, nutrient filtration and valued cultural landscapes, while producing local food.

The policy context has evolved significantly. The European Ocean Pact³, adopted in June 2025, sets a comprehensive strategy to better protect the ocean, promote a thriving blue economy and support coastal communities. It identifies “protecting and restoring ocean health” and “boosting the competitiveness of the EU sustainable blue economy” among its priorities, explicitly recognizing the importance of fisheries and aquaculture within the future EU ocean agenda.

This agenda is being operationalised through several EU initiatives. The forthcoming European Ocean Act⁴ is intended to improve the coherence and effective implementation of EU maritime governance, also through the revision of the Maritime Spatial Planning Directive⁵. It aims to strengthen cross-sectoral and sea-basin governance, address spatial conflicts, integrate ocean-related targets and support climate-smart maritime spatial planning. This is particularly relevant for restorative aquaculture, which requires appropriate site selection, coexistence with other maritime and freshwater activities and recognition of ecosystem-service delivery.

The Nature Restoration Regulation (NRR)⁶ also provides a direct legal and policy entry point. It requires Member States to put in place restoration measures for ecosystems that are not in good condition. Bivalve reefs (or beds) are listed in Annex 2 as relevant “marine habitats” to be restored, creating a clear opportunity to assess whether and under which conditions

¹ AAC Recommendation for a Vision for Aquaculture in 2040, September 2025: <https://aac-europe.org/wp-content/uploads/2025/12/8-AAC-Recommendation-for-a-Vision-for-Aquaculture-in-2040.pdf>

² FAO Guidelines for Sustainable Aquaculture, January 2025: <https://openknowledge.fao.org/items/74874c9b-237b-415e-b522-9e24d9025550>

³ The European Ocean Pact, June 2025: https://oceans-and-fisheries.ec.europa.eu/european-ocean-pact_en

⁴ Publication foreseen in Q4 2026

⁵ Revision process launch foreseen in Q4 2026

⁶ Nature Restoration Regulation, June 2024: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32024R1991&qid=1722240349976>

bivalve aquaculture can contribute to restoration objectives. The applicability of these emerging restoration approaches to finfish aquaculture such as lagoon fish farming (both freshwater and marine), is rarely considered at the EU level, but may be relevant too.

Restorative aquaculture is also relevant to the EU Water Resilience Strategy⁷ and the ongoing review of the Water Framework Directive (WFD)⁸. The Water Resilience Strategy identifies the protection and restoration of the water cycle as a key priority, while the WFD remains the cornerstone of EU water policy. Aquaculture practices that contribute to nutrient removal, water quality improvement, or ecosystem functioning can therefore support broader EU water-resilience objectives, provided that their effects are measurable and compatible with environmental protection requirements.

The ongoing reflection on the future of fisheries and aquaculture further reinforces the relevance of this recommendation. The Commission's forthcoming Vision 2040 for fisheries and aquaculture is intended to provide a 15-year strategic framework for the sector, addressing sustainability, competitiveness, food security, climate impacts, spatial planning, generational renewal and access to finance. Restorative aquaculture can contribute to this agenda by linking sustainable aquatic food production with ecosystem recovery, coastal resilience and the green transition. In this context, the AAC has already published the recommendation on "the draft guidance document on environmental performance in EU aquaculture" (July 2025). In line with the following reports and background papers:

- Assessment of the ecosystem services of bivalve mollusc farming and fish farming in ponds and wetlands, and challenges and opportunities in promoting the benefits⁹ (January 2026)
- Implementing the Strategic Guidelines for EU aquaculture - Challenges in the bivalve mollusc farming sector and ways to address them¹⁰ (June 2026)
- Ecosystem and climate services in aquaculture (Commission's staff working document, to be published soon)

the AAC will prepare a new recommendation on "Indicators of environmental performances of shellfish aquaculture" that will take restorative aquaculture and regenerative blue economy needs into account.

Finally, the review of the Marine Strategy Framework Directive (MSFD)¹¹ and the evaluation of the Common Fisheries Policy Regulation¹² both underline the need to improve the environmental performance of marine activities while ensuring that EU rules remain coherent, effective and workable. The Commission has noted that the MSFD has not fully

⁷ Water Resilience Strategy, June 2025: https://commission.europa.eu/topics/environment/water-resilience-strategy_en

⁸ Call for evidence, March 2026: https://environment.ec.europa.eu/news/commission-launches-call-evidence-water-legislation-2026-03-17_en

⁹ <https://op.europa.eu/en/publication-detail/-/publication/d85591b4-f0f7-11fo-8d3c-01aa75ed71a1/language-en>

¹⁰ <https://aquaculture.ec.europa.eu/system/files/2026-07/implementing%20the%20strategic%20guidelines%20for%20eu%20aquaculture-HZ0126098ENN.pdf>

¹¹ Call for evidence and public consultation, March 2026: https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/16093-Marine-environment-protection-revision-of-EU-rules_en

¹² CFP evaluation results, April 2026: https://ec.europa.eu/commission/presscorner/detail/en/ip_26_938



achieved good environmental status of marine waters and that marine biodiversity continues to decline. In this context, restorative aquaculture should be assessed as one possible tool to support marine ecosystem recovery.

Against this background, this AAC recommendation aims to clarify the potential and constraints of restorative aquaculture and to identify how EU institutions and Member States can recognise, monitor and support aquaculture practices (including possible synergies between existing commercial aquaculture and restorative aquaculture) that contribute to the objectives of the Nature Restoration Regulation, the European Ocean Pact, the Water Resilience Strategy, the Marine Strategy Framework Directive, the future Vision 2040 for fisheries and aquaculture and the work in progress on indicators of environmental performance by aquaculture.

At international level, the concept of “restorative aquaculture” has been developed notably by the Food and Agriculture Organization of the United Nations’ General Fisheries Commission for the Mediterranean (FAO-GFCM), which refers to aquaculture practices that contribute to ecosystem restoration while producing aquatic food, typically through the provision of ecosystem services and the use of low-trophic species or integrated systems. This concept is increasingly used as a reference in policy and scientific discussions, although it is not yet formally defined in EU legislation.

In parallel, international discussions have increasingly referred to the broader concept of a “regenerative blue economy”¹³, as developed notably by the International Union for Conservation of Nature (IUCN) and further developed in the World Economic Forum's 2026 report *The Regenerative Blue Economy: Pathways to Prosperity*¹⁴. These publications call for ocean-based sectors, including aquaculture, to move beyond minimising environmental impacts and actively contribute to restoring ecosystem functions while generating long-term economic and social value.

The Commission’s Roadmap towards Nature Credits (COM (2025) 374 final)¹⁵ further reinforces the need for a clear EU framework for restorative aquaculture. As the roadmap seeks to support investment in measurable nature-positive outcomes, a definition of restorative aquaculture should help clarify under which conditions some aquaculture activities may contribute to future nature credit schemes.

¹³ Regenerative blue economy, January 2026 : <https://iucn.org/sites/default/files/2026-01/iucn-explainer-brief-regenerative-blue-economy.pdf#:~:text=At%20the%202025%20IUCN%20World%20Conservation%20Congress%2C,on%20decision%20action%20in%20the%20following%20areas:>

¹⁴ Regenerative blue economy, June 2026: https://reports.weforum.org/docs/WEF_The_Regenerative_Blue_Economy_2026.pdf?_gl=1*a6l2py*_up*MQ..*_gs*MQ..&gclid=CjwKCAjwj7HTBhBiEiwA8s35OgE9E6615iev4G24U5cH5dfXY8NUWiFSnVrpB5CXBp3kOqG3x1ymlhoCXolQAvD_BwE&gbraid=oAAAAAoVy5F6ASeXoTRqOkPxJp3_3TabK

¹⁵ Communication of the European Commission on the Roadmap towards Nature Credit, July 2025: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:52025DC0374>

Growing policy expectations and emerging opportunities for restorative aquaculture

EU initiatives such as the European Ocean Pact, the NRR, and the Water Resilience Strategy constitute frameworks in which aquaculture can contribute actively to ecosystem restoration and environmental performance. For aquaculture operators, this implies, in specific cases, the opportunity to shift from a purely production-focused model towards a more multifunctional approach directly integrating ecosystem services or providing restoration-oriented products and services to professional ecosystem restoration practitioners. In this context, aquaculture systems (in particular those involving native oysters and mussels) are particularly relevant, as they can enhance habitat formation, improve water quality through filtration and nitrogen removal and, through these processes, also enhance biodiversity. These characteristics position aquaculture as a potential contributor to restoration objectives under EU legislation.

However, in the absence of a clear EU framework, these contributions remain insufficiently recognised, and operators and their suppliers lack legal certainty as to whether and how their activities and/or products could be formally considered as (assistance to) restoration measures.

The Nature Restoration Regulation reinforces this dynamic by creating a direct policy driver for restorative approaches, requiring Member States to implement measures to restore degraded marine habitats, including bivalve beds. For aquaculture stakeholders, this represents a significant opportunity to position certain practices as tools for habitat restoration, potentially opening access to public funding and enabling their inclusion in national restoration plans, while also strengthening the social licence to operate through demonstrable environmental benefits.

At the same time, Member States are currently struggling to define effective marine restoration measures and are actively seeking guidance. Existing examples, such as mussel and oyster reef development and restoration within marine protected areas (MPAs), demonstrate that aquaculture practices can deliver measurable ecological outcomes and confirm both their technical feasibility and their potential to generate long-term environmental and economic benefits, provided that site-specific approaches and sustained management are ensured. However, these initiatives remain fragmented and are not systematically integrated into EU policy frameworks, which limits their scalability and wider replication.

This situation creates uncertainty for operators, as there is currently no agreed definition of “restorative aquaculture”, no common assessment framework to determine eligibility and no clear procedures to integrate aquaculture activities into restoration planning.

An EU definition would also help clarify the objectives pursued by EU policies in this area. As stated, these developments should also be considered in light of the emerging concept of a “regenerative blue economy”, which focuses on measurable net positive environmental outcomes rather than impact reduction alone. While this strengthens the case for restorative aquaculture, it also reinforces the need for clear definitions, indicators and monitoring frameworks to avoid inconsistent interpretation across Member States and provide them



with a common reference when confronted with related initiatives in marine basins shared with non-EU countries.

Need for clarity, standardisation and recognition

The absence of a harmonised definition at EU level directly affects aquaculture stakeholders by limiting the recognition of existing positive practices, creating regulatory uncertainty across Member States, and increasing the risk of inconsistent implementation of EU legislation. Shared definitions are also necessary to better focus research efforts and thus optimise the use of available funds.

This clarification is also relevant in the context of the Commission's emerging work on nature credits, which will require credible definitions, monitoring methodologies, verifiable environmental outcomes and a high-integrity and science-based certification process.

In this context, an EU definition of restorative aquaculture should go beyond a purely descriptive approach and provide a coherent basis for the identification, implementation and evaluation of aquaculture practices contributing to nature restoration objectives.

This is essential to ensure consistent application across Member States and greater predictability for operators and legislators. As stated, national governments are struggling to identify workable implementation measures of the NRR in marine waters. A harmonized definition of restorative aquaculture at EU level could add a whole new set of societally beneficial measures to the implementation of the NRR, thereby facilitating acceptance of the NRR by regulators and society at large and accelerating its implementation.

At the same time, aligning aquaculture with EU restoration and environmental objectives is becoming increasingly important for maintaining access to maritime space in a context of growing spatial competition, securing public acceptance and social licence, accessing funding linked to environmental performance, and contributing to the long-term resilience of coastal communities. Failure to engage with these policy developments could lead to the marginalisation of certain aquaculture activities in spatial planning processes, increased regulatory constraints without corresponding benefits and a reduced ability for the sector to compete within the broader blue economy.

In summary, a clear definition at EU level leads to substantial benefits at various societal levels, while also removing uncertainty for operators regarding their potential contribution to impact-mitigation and nature restoration objectives.

II. Recommendations

AAC Recommendations:

To the European Commission:

1. Clarify and establish an EU definition of “restorative aquaculture”

The Commission should organise, in consultation with Member States, stakeholders and scientific bodies, a structured process to define “restorative aquaculture” as an activity supporting the implementation of the Nature Restoration Regulation. This process should clarify whether the definition being developed by FAO-GFCM is applicable in the EU context or whether an EU-specific definition is required and assess the implications for different segments of the aquaculture sector, including both food-oriented and non-food-oriented activities.

The definition should be based on demonstrated ecological benefits rather than limited to specific species or production types. Since restorative practices (even those with localised or limited impacts on ecosystems) may cause negative ecological impacts, the definition should stipulate that restorative practices must deliver measurable positive gains in biodiversity and broader ecological benefits that outweigh any negative effects. Negative effects that, because of their nature, cannot be weighed against positive restoration effects must be avoided or limited to a non-significant level. The definition should consider the broader international developments related to the concept of a regenerative blue economy, ensuring coherence with approaches that aim at achieving net positive environmental outcomes.

The definition should also support consistency with the Commission’s emerging framework on nature credits by clarifying the conditions under which aquaculture activities may generate verifiable nature-positive outcomes.

2. Develop NRR-relevant indicators to assess aquaculture impacts

Provide guidance to Member States on how aquaculture can be considered a restoration measure under the Nature Restoration Regulation, including eligibility criteria, monitoring requirements and examples of best practices. This guidance should support the preparation and revision of national restoration plans.

The Commission should organise a process similar to that used for the definition (as in recommendation 1 « Clarify and establish an EU definition of restorative aquaculture »), to determine a set of indicators to measure the effects of aquaculture activities on ecosystem restoration, including all its relevant aspects and functions, ensuring consistency with existing EU frameworks (e.g. MSFD, WFD).

Indicators should, where appropriate, capture the contribution to net positive ecological outcomes, in line with emerging regenerative approaches. These indicators should, where relevant, remain compatible with future EU certification frameworks related to nature restoration effects and related credits.



3. Define minimum performance thresholds for eligibility

The process undertaken by the Commission should establish a set of minimum scores or thresholds on the indicators that aquaculture activities must meet to be recognized as contributing to NRR implementation and eligible for nature credit schemes.

4. Develop harmonized monitoring standards

The process undertaken by the Commission should define appropriate monitoring standards to measure performance against the indicators and thresholds, ensuring scientific robustness, comparability across Member States and proportionality for operators, in particular small and medium-sized enterprises (SMEs). This must include guidelines for a support system for SME's, to prevent monitoring from becoming a prohibitive financial burden for operators.

The AAC welcomes with interest the "Ocean observation initiative" and the "Ocean Eye" envisaged within the context of the Ocean Pact and considers that integrated data management platforms – including satellite data, data from in situ surveys and all sector-specific data (companies, concessions, production figures, health data, etc.) – are essential tools for a proper assessment of the outcome of EU strategies and for supporting decision-making. We believe that platforms implemented at national level, as integral parts of the European Marine Observation and Data Network (EMODnet), should be mandatory and must be developed within the framework of the aforementioned initiatives. These platforms could be funded with the existing Technical Support Instrument.

5. Identification, recognition and support of eligible restorative aquaculture practices

The Commission should develop guidance identifying and describing aquaculture practices, adapted to different environments (marine, coastal and freshwater), that can meet the defined restoration thresholds, building on existing examples such as bivalve bed/reef restoration initiatives. In parallel, the Commission should establish clear procedures to recognise these practices as eligible NRR implementation measures, facilitate their integration into restoration actions, including within marine protected areas where appropriate, and ensure coherence with relevant EU funding instruments and emerging nature credit frameworks. This includes a call for EU-funded projects that are aimed at developing restorative aquaculture and the related nature credit schemes.

To the EU Member States:

1. Integrate the EU restorative aquaculture framework into national Nature Restoration Law implementation plans

Subject to the establishment of a clear EU definition of "restorative aquaculture", as well as agreed indicators and performance thresholds, Member States should integrate aquaculture-based restoration measures into their plans for implementing relevant EU regulations and nature credit schemes. This integration should be based on the EU framework and ensure



consistency across national approaches (while recognising differences in environmental circumstances across European marine, coastal and freshwater regions).

2. Implement national monitoring and reporting systems aligned with EU methodologies for restorative aquaculture under the NRR

Following the development of EU-level indicators and monitoring methodologies, Member States should establish or adapt national monitoring systems to assess the environmental performance of aquaculture activities contributing to restoration. These systems should ensure alignment with EU requirements while remaining proportionate for operators. In those countries where operators are seen as responsible for monitoring, adequate support should be put in place to avoid monitoring tasks becoming financially prohibitive.

3. Support the implementation of eligible restorative aquaculture practices under the NRR, including in MPAs

Once eligibility criteria and procedures are defined at EU level, Member States should facilitate the implementation of recognised restorative aquaculture practices, especially within marine protected areas where appropriate. They should also ensure access to relevant national and EU funding instruments and support operators in complying with the applicable requirements.

4. Support capacity building at enterprise and institutional levels

Stimulate capacity building at production and institutional levels to enable the implementation of the restorative aquaculture concept by operators as well as by scientific and governmental institutes (co-)responsible for effective monitoring and national regulatory frameworks, regarding subsidy schemes, nature credits, spatial planning and related permitting procedures.



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