Recommendations for applying Nature-Based Solutions as an approach for sustainable use of aquatic resources while achieving the policy goals of the biodiversity strategy

Nature-Based Solutions (NBS) are generally defined as interventions or measures, which support biodiversity and support the delivery of ecosystem services. Although definitions from organisations like the EU and IUCN differ slightly on how much NBS are benefitting biodiversity and to what extent they should support restoration of ecosystems, i.e. rebuilding modified ecosystems, the idea is to support sustainable development of activities like fisheries, aquaculture, renewable energy production or coastal protection by using, modifying or enhancing existing ecosystem services, while preserving their basic functions. The recommendations presented in this paper are focussing on these commonalities in definition.

Nature's contribution to people, as defined by the Intergovernmental Science-Policy Platform for Biodiversity and Ecosystem Services (IPBES), can have both positive and negative impacts on the quality of life for people. The aim of NBS should be to minimize the negative and reinforce the positive contributions. Our seas and waters may impact human well-being negatively through e.g. storms and floods, climate change, diseases and parasites, harmful algal blooms and toxins, or dispersal of microbial pollution, chemicals and plastics, or positively through e.g. increased health and wellbeing, aquatic food, renewable energy, marine biotechnology and transport. In some national strategies, the EU Biodiversity Strategy 2030, and the first Horizon Europe work programme NBS are seen mainly as a measure to support climate change mitigation and adaptation, while supporting nature restoration. However, there is a large potential for developing NBS that would minimize the negative effects of fisheries and aquaculture on biodiversity and ecosystems, while simultaneously increase production and support of other services such as renewable energy production. However, scanning a range of existing marine cases that resemble NBS reveals that improvements or changes in the classes[1], quantity or value of both ecosystem services and disservices are often not evaluated.

For NBS to deliver on multiple objectives, there is a need to broaden the scope of the ecosystem-based approach to management, for which a lot of research and effort has taken place over the years in the realm of fisheries management. Now, there is a need to utilize this frame to balance human activities and environmental stewardship in a multi-use context. New knowledge and tools are needed to consider the collective pressures, deal with trade-offs to optimize the net benefits of diverse societal goals in a sustainable manner. As the sea-basins and aquatic systems differ in the EU, regional characteristics must be considered. There is a need to link the application of ecosystem-based management with risk assessments – and link ecological, economic and social data, analyses and models to understand interactions and

[1] Haines-Young, R. and M.B. Potschin (2018): Common International Classification of Ecosystem Services (CICES) V5.1 and Guidance on the Application of the Revised Structure. Available from www.cices.eu

trade-offs between management objectives – the wish for different human activities on one side and ecosystem targets on the other. There might even be trade-offs among the ecosystem targets that NBS can deliver that may require development of a hierarchy of environmental priorities. To become operational in the governance of EU waters there is a need to develop new, integrated advice and build on the tools and systems that support ecosystem-based management that at the same time take into account all the elements of sustainability, including the socio-economic ones. There are already multiple tools that could be implemented, but these need to be further accepted in EU policy making and advise, as well as adapted to take the NBS approaches into account.

A potential challenge for implementing NBS in general is that the (societal) costs and benefits may be distributed in different ways between stakeholders. Thus, there is a potential to explore creating new types of NBS and novel methods for payment or investment in NBS. There might be a fear of burden shifting in terms of where, when, who and how people and ecosystems are impacted by NBS. Thus, life cycle inspired impact assessment should be developed, which would also take into account NBS' resilience to future climate.

NBS which aim to underpin or exploit specific ecosystem services (e.g. fisheries, wildlife for nature-based tourism), are not necessarily supported by adequate management plans, which can ensure the sustainability of NBS. A policy review is therefore advised in the evaluation of proposed NBS, just as is the inclusion of relevant stakeholders to understand long term NBS project risks. This would eliminate e.g., the risks of greenwashing coastal development projects. New knowledge is needed to know what type of environmental data collection, policy alignment and degree of stakeholder involvement should be minimum requirements for each type of NBS in EU waters, considering the diversity among ecosystems and coastal communities.

To further advance the use of NBS to increase the fisheries and aquaculture output (aquatic food provisioning) there is a need for research and new insights. To develop and explore this potential it would initially be fundamental to provide an overview of present marine NBS-like actions that have been monitored sufficiently to allow performance to be evaluated quantitatively and underpin recommendations about efficient application and scaling in support of EU policy targets, food from aquatic resources and reversal of environmental degradation.

Also, there is a need to develop instruments to evaluate which alternative marine NBS are most desirable, from an environmental, social and economic perspective in an EU context, considering the overall demand for alignment with marine policies and the ecosystem approach.

It is thus recommended that national efforts, the next HEU work programme and the partnerships working in the area (e.g., Biodiversa and Sustainable Blue Economy) consider further advancing the knowledge of NBS towards a sustainable fisheries and aquaculture development in the EU.

Background

In September 2020 SCAR-FISH initiated a discussion on the potential for implementation of the EU's Biodiversity strategy 2030 in the aquatic domain. The Strategy aims not only to increase the protection but also restore biodiversity and well-functioning ecosystems to increase resilience from human pressures. IPBES has pointed at five direct drivers of biodiversity loss: 1) changes in land and sea use, 2) overexploitation, 3) climate change, 4) pollution, and 5) invasive alien species. Human activities on the other hand also rely on ecosystem services provided by the ecosystems. The challenge is to relieve the pressure on the ecosystems while maintaining a sustainable utilisation of goods and services from our aquatic systems.

The NBS concept has in recent years been explored in particular in relation to climate change. Nature regulates the climate, and nature-based solutions, such as protecting and restoring wetlands, peatlands and coastal ecosystems, or sustainably managing marine areas, forests, grasslands and agricultural soils, are seen as essential for emission reduction and climate adaptation in the strategy.

SCAR-FISH aimed to explore the potential for utilising the NBS concept for societal challenges other than climate change, in particular, for a continued and sustainable use of aquatic resources through fisheries and aquaculture activities. Thus, SCAR-FISH invited European Marine Board, ICES, EATiP and EFARO to provide their view of the potential for developing nature-based solutions to this end, while the EC provided an overview of recent and ongoing projects in H2020.