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NSAC/EAPO Advice on Innovative Fishing

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1. Background

In February 2023, the Commission published the Fisheries and Oceans Pact with the main objectives being the promotion of the use of cleaner energy sources and reduced dependency on fossil fuels as well as reduced impact on marine ecosystems.

One of the most critical discussions of the past years has been the future of bottom-trawling, the traditional method for capturing benthic species. Bottom trawling is one of the world's main fishing methods and is responsible for 26% of the marine catch in Exclusive Economic Zones (EEZs)¹. However, challenges determined by quota exhaustion for the limiting species leading to mixed fishery closure, calls for bottom-trawling bans in MPAs, and ongoing research revealing information on its impacts on marine ecosystems are pushing the industry to re-imagine the fishing method and redefine the narrative around traditional fishing techniques.

New, innovative gear could spur selective fishing and minimize bottom-contact, thereby contributing to the protection of vulnerable species and habitats, as well as reducing fuel use and CO₂ emissions through reduced drag. With such and other optimisations, demersal fishing could be reinvented as a nature-friendly supplier of healthy seafood.

¹ https://www.researchgate.net/publication/359281130_New_perspectives_on_an_old_fishing_practice_Scale_context_and_impacts_of_bottom_trawling



To investigate the current state of fishing innovation within EU waters and bring together stakeholders to discuss technical solutions, management strategies, and funding opportunities necessary for promoting innovation and its uptake, the NSAC collaborated with the European Association of Fish Producers Organisations (EAPO) in hosting a symposium on Innovative Fishing in Brussels on March 7, 2024. The symposium featured presentations from a diverse array of researchers representing institutes and organizations from both EU member states and third countries. These presentations provided attendees – including representatives from European institutions, national administrations, fisheries, environmental NGOs, and others – with an overview of the available innovations. A comprehensive report summarizing the symposium's discussions and insights is accessible [here](#).

The symposium followed the publication of the ICES response to EU's request for a review of innovative gears for potential use in EU waters and their impacts² in October of 2023. Additionally, extensive discussions on measures within the Commission's Marine Action Plan, as well as among Producer Organizations and Advisory Councils, highlighted the need to minimize the impact of bottom-contacting gear on the seabed and benthic habitats. Drawing from the insights of the ICES advice, the NSAC/EAPO symposium utilized the PESTEL³ framework to guide participants in the identification of challenges and solutions in the realm of fishing innovations. Responses gathered during the event guide our recommendations, which are presented in Section 3 of the paper.

2. Overview of case studies and presentations

The [NSAC/EAPO Symposium](#) saw the presentations of case studies as well as ongoing and past innovation projects by a number of prominent researchers and experts in the field. A brief overview of the given presentations, constituting a basis for the breakout sessions identifying challenges and solutions is summarised below:

- Overview on [lessons learned from the pulse fishing ban](#) highlighted how despite success in technological readiness and uptake of the pulse fishing technology, the failure to address broader social and economic impacts led to its downfall.

² https://ices-library.figshare.com/articles/report/EU_request_on_review_of_innovative_gears_for_potential_use_in_EU_waters_and_their_impacts/24212694

³ Originally developed for business development, the PESTEL framework encompasses six umbrella categories: Political, Economic, Social, Technological, Environmental, and Legal factors. In the ICES advice, it was used for assessing external factors influencing the uptake of innovative fishing gear, though organizing the data collection on factors impacting fishers' decisions and identifying potential barriers.

- The presentation of results from the [ICES' advice on innovative gears](#) informed participants on main fishers' motivations to adopt new technologies and on how the PESTEL framework was applied to the dual cod-end gear case study.
- An example of a [real-time decision tool](#) developed to provide fishers with crucial catch information was presented to the audience. Such tool has been shown to boost fishing precision and efficiency, reduce bycatch and habitat impact, lower CO2 emissions, and improve transparency.
- A gentle and effective fishing with new and innovative trawl gear was showcased. The [Semi-Circle Spreading Gear](#) concept started its commercial trials in 2023 and has shown to enhance efficiency, reduce fuel consumption, and minimize seabed disturbance, though raising concerns on the used material and its wear.
- A presentation showcased a [Spanish tool](#) designed to optimize fishing effort allocations. The tool provides catch predictions, aiding fishers in decision-making to avoid unwanted catches and comply with the Landing Obligation.
- Participants were introduced to the [KingGrid technology](#), a novel approach to sorting grids. This innovation builds upon existing solutions to effectively reduce bycatch, particularly addressing the challenge of increasing suspended materials in EU waters clogging other bycatch reduction technologies.
- The [Modular Harvest System](#) (MHS) technology, currently being studied and trialed in the Netherlands, was presented. The technology presents the ability to improve the condition and survival of caught undersized fish, thereby increasing the marketable catch and the survival of fish being released. In addition, it appears to reduce discards of certain species.
- Precision fishing [opportunities and challenges in the UK](#) were showcased, offering insights into the country's main innovation projects and ongoing efforts toward co-management. Presently, these efforts are expressed in consultative approaches through Fisheries Management Plans.
- Research taking place on innovative [modified nets in the Nephrops fishery](#) was outlined. Particularly, two promising gear modifications, the dual cod-end and the coverless trawl, are set to be trialed and evaluated in the coming year.
- The [Belgian example of co-management](#) in fisheries was presented. Currently 38 Belgian fishing vessels provide real-time confidential data to scientists, enhancing efficiency and allowing for better quota management. The presentation also highlighted the need for alternative management approaches which consider the social dimension.



3. NSAC Advice

Building upon the findings of the Innovative Fishing symposium, and following the PESTEL umbrella categories (political, economic, social, technological, environmental, legal), NSAC and EAPO advise the following:

Political

- a. **Bottom-up involvement** of fishers in gear innovation and approval processes speeds up practical application and increases wider gear uptake.
- b. Consideration should be given to **alternative management strategies** with minimum control and enforcement, while simultaneously emphasizing the importance of establishing trust and showcasing the value of fisheries data to encourage information sharing among fishers.
- c. In the ever-changing policy context, there is a pressing need to **reform or adapt** the **Common Fisheries Policy (CFP)** to account for these changes. Alternatively, specific legislation tailored to accommodate flexible innovations should be developed.
- d. A **clear and unambiguous process** of the legal authorization of the use of innovative gear should be established, so that the investments are considered safe and there is a limited possibility of a posteriori ban, once investments have already been made.
- e. Following the principle of subsidiarity, the Member States should be responsible for approving technical measures in a pragmatic approach, thereby facilitating the uptake of innovations.
- f. **Co-management** options should be explored and embraced, with consideration of diverse cultural and historic backgrounds. The establishment of a **permanent committee** comprising Member States' authorities, scientists (including representatives from national research bodies, STECF, and ICES), and other relevant stakeholders could significantly aid the co-management process.
- g. In the future, significant consideration should be given to **regionalization of innovations**, as there are significant differences in the gear use in different sea basins.
- h. Article 15 on the Landing Obligation should be revised to an Information or **Registration Obligation** applying to less restrictive use of innovative gear while incorporating impact assessment procedures.
- i. Conducting a **structural analysis of the strengths, weaknesses, opportunities and threats (SWOT)** of the EU fisheries innovation system is

imperative to identify tailored legal and political solutions, streamlining decision-making processes.

- j. A clear **vision for the future** of the fisheries sector in the EU must be developed.
- k. Fisheries management plans should pivot from being solely based on the quantity of fish caught to focus on **rebuilding plans** that address the entire ecosystem.
- l. Enhancing the **pragmatic and adaptive nature of management** approaches and ensuring adequate human resources across all fronts are essential.
- m. Efforts to **mitigate polarization** in the public debate on the impacts of bottom-trawling fishing should be prioritized.

Economic

- a. **Compensating fishers** for revenue loss due to gear innovation should be prioritized, making sure this is allowed in the EMFAF and other programmes. In view of this, resource allocation should be reconsidered.
- b. **Available funding instruments** and options should be **better promoted** by European Institutions and Member States.
- c. **Financial instability** due to quota changes from fluctuating scientific advice should be addressed by managers. Stability of quotas and Total Allowable Catches should be ensured as much as possible.
- d. Clarification is needed on the **sustainable fishing financial model**, particularly regarding who bears the responsibility for compensating for sustainably fished catch, which often results in reduced overall catch.

Social

- a. Fishers' willingness to innovate should be equally regarded as their ability. **Intrinsic motivation** is crucial for successful innovation adoption. Measures should be taken to foster such motivation (long-term vision, economic and other incentives, peer pressure/healthy competitiveness).
- b. Efforts made by fishers in implementing innovations to mitigate impacts and enhance efficiency should be recognized, fostering a more **positive narrative** surrounding fishing operations.
- c. Building **trust in** the value of **new technologies** among fishers is essential to relieve concerns about potential bans on innovative solutions.
- d. Active involvement of fishers and their representatives in **knowledge exchange** throughout the **development stages** of innovations is vital, as they possess invaluable insights into what works best on vessels. This collaboration

enhances the socio-economic pillar of CFP and fosters trust and transparency among industry, scientists, and managers. Organizations of custom **Fisheries Conferences or Dialogues** could aid this collaboration.

- e. Transparency should also be increased through improved **digitalization of processes** to enhance enhancing trust and efficiency.
- f. **Generational renewal** and comprehensive crew education ought to be a priority, not only to cultivate openness to innovation among fishers, but also to ensure the long-term security and stability of the fishing sector.
- g. When introducing new and potentially controversial technologies such as Remote Electronic Monitoring (REM) or Artificial Intelligence (AI), it is essential to shift the narrative (new technology needed to contribute to data collection). Positive **incentives**, both monetary and non-monetary, should be employed to encourage the adoption of these technologies.

Technological

- a. Working space on board should be prioritized to accommodate **operational flexibility** in response to changes. Additionally, **technical capacity** (i.e., data collection via REM) should also be ensured on vessels in order to be able to perform independent trial verifications.
- b. **Incentivizing** the implementation of REM on board by allowing **free choice of gear** use can encourage participation in such programs.
- c. Ways of ensuring **accurate catch data** for input into scientific advice should be investigated, as current advice does not always accurately reflect the ongoing situation. Moreover, to supplement scientific advice, real-time data should be used for improved decision-making.
- d. A **unified catalogue** recording used gears with assessment of their performance should be created and made easily accessible for a quick overview. This would enhance trust between stakeholders. Considerations should also be given to reviewing existing innovation networks such as the [European Fisheries Technology Platform](#).
- e. **Quick innovations** should be contemplated to address immediate fisheries challenges. Thoughts should be given to **adapting existing technologies** to meet current needs.
- f. As commercial trials of technologies appear to be limited, ensuring that technologies are thoroughly **tested in commercial settings** before widespread implementation should be a priority.
- g. **Tailoring innovation** to meet the specific needs of fishers in different regions is essential for successful adoption and implementation.

- h. The current **market** should be **adapted** to accommodate available and future technological innovations to ensure widespread access to these technologies.

Environmental

- a. **Environmental gains** of implementing innovations, such as improved target species catch, reduced fishing time, lighter gear, and long-term cost-saving should be effectively highlighted.
- b. A **clear definition** and classification of '**bottom impacts**' should be provided to allow for a unified understanding of environmental effects of such impacts.
- c. Increasing the **robustness of scientific trials** to assess the environmental effects of innovations is essential for gaining a better understanding of oceanic ecosystems and their functioning.
- d. Recognition and **acceptance of a certain level of impacts** of bottom-trawling in specific marine areas are crucial, along with the need of collaborative approaches to address these impacts effectively.
- e. **Effective predator management** should be ensured for more efficient fishing, enabling the catch of equivalent quantities in shorter timeframes.

Legal

- a. Consideration should be given to **adopting a results-based legal system** that focuses on regulating outputs rather than specific gears. This can be achieved at the fleet-level through the help of monitoring tools.
- b. Implementing **more flexible and adaptive legislation** for technology adoption, with reduced bureaucratic burden, is essential to facilitate gear efficiency improvements and modernization. This approach would enable legislation to **keep pace with innovation** and adapt to changing realities. For example, new gears could be provisionally accepted, with a subsequent result-based analysis assessing selectivity, environmental, and socio-economic impacts. A joint recommendation and delegated act could then be enacted after the completion of the analysis.
- c. The **trade-offs of different regulatory approaches** should be carefully considered. Employing strict control and enforcement measures can be costly, complex, and potentially detrimental to trust and cooperation, while opting for a more flexible approach can foster collaboration and promote ecosystem health. However, this approach may entail certain costs and require discussions around acceptable mortality rates.
- d. Prioritizing enhanced **inclusion of stakeholders in the drafting of legislation** is crucial for ensuring that regulatory frameworks are comprehensive, effective,



and reflective of diverse perspectives. It also ensures that the regulations are better implemented and considered legitimate.

- e. The legal frameworks vary between the EU and third countries like the UK and Norway. It is crucial to **strive for a level playing field** in the implementation of innovations across different countries that share the same sea basins. This would help ease the burdens placed on fishers by ensuring consistency and fairness in the adoption of innovative practices.

4. Conclusion

Drawing from existing examples, it is clear that consideration of political, economic, social, technological, environmental, and legal factors is important in the gear innovation process and in assessing fishers' ability and willingness to engage. We believe that addressing these factors comprehensively through a range of actionable measures and/or regulatory changes will enable the fishing sector to align with essential environmental objectives while simultaneously ensuring the provision of healthy seafood to a growing population and sustaining livelihoods for communities reliant on it.

We would like to thank the Commission and the North Sea Member States for considering our recommendations. If at any point a need arises to discuss these further, we invite you to contact our Secretariat and arrange further engagement.