Enabling sustainable coexistence between offshore wind farms and small-scale fisheries in Dutch waters

Author(s): Neitzel, S.M. and Deetman, B.

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Enabling sustainable coexistence between offshore wind farms and small-scale fisheries in Dutch waters

Integrating lessons learned from the UK in governance, ecological monitoring, operational safety, and socio-economic resilience

Authors: Neitzel, S.M. and Deetman, B.

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[1] *SMP-25039 | Sustainable fishing in offshore wind farms - Topsector Agri & Food*

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Summary

Offshore wind development is expanding rapidly across Europe, increasing the need for practical coexistence between renewable energy and traditional fisheries. While the United Kingdom has more than a decade of experience with commercial fishing, particularly static gear fisheries, within offshore wind farms (OWFs), the Netherlands has not yet implemented such co-use in practice. This project aimed to exchange knowledge between UK and Dutch stakeholders to support future Dutch policy and operational decision-making on static-gear fisheries in OWFs. The study combined interviews with UK fishers, fishing organisations, offshore wind developers and researchers. Field visits to major east-coast ports and offshore wind hubs were done. Five core themes emerged from the interviews and on-site observations: collaborative governance, safe operations, ecological research needs, socio-economic resilience, and integrated spatial planning.

In the UK, coexistence is enabled by a permissive legal framework in which fishers maintain the possibility to fish inside offshore wind farms, supported by structured liaison roles, communication protocols, and tools such as KIS-ORCA for sharing spatial data. FLOWW and ESCA provide widely accepted best-practice guidelines that help coordinate expectations between sectors. Coexistence works best when professional fisheries liaison officers facilitate constant communication and when developers share operational plans early and transparently. Static gear fisheries (e.g. crab and lobster) generally operate safely within fixed-turbine offshore wind farms. Floating wind projects present new uncertainties, particularly for mobile gear fisheries.

Ecological monitoring remains inconsistent across projects, and much data is non-public, limiting broader scientific uptake. Fishers contribute important local ecological knowledge, noting species shifts, electromagnetic field (EMF) concerns, and temporary effects during construction. Knowledge gaps include cumulative species displacement and the need for new survey methods as traditional sampling becomes constrained by wind farms and MPAs. Shared research investments, potentially through Horizon Europe, could strengthen evidence-based management.

Socio-economic challenges include uneven compensation schemes, short-term project-based payments, localised crowding of displaced fishing effort, and sector-wide labour shortages as crew shift to offshore energy. Maintaining resilient coastal economies will require strategies that support workforce development, intergenerational continuity, and equitable involvement of fishers throughout project lifecycles.

Spatial planning approaches differ across Europe. The UK's open-access model relies on trust and voluntary coordination, while the Netherlands uses more restrictive zoning that limits fishing access. The rise of floating wind farms and cumulative displacement pressures underline the need for ecosystem-level spatial assessments that integrate energy, fisheries, and conservation priorities.

The findings point to several future directions:

- strengthening international knowledge exchange;
- establishing shared safety protocols and incident reporting systems;
- improving transparency around ecological and operational data;
- investing in joint research on ecological and fisheries impacts;
- and ensuring socio-economic sustainability by valuing fishers' practical experience and preserving coastal livelihoods.

Together, these steps can support fair, safe, and effective coexistence between fisheries and offshore wind across Europe.

1 Introduction

As offshore wind development rapidly expands across European waters, the need for coexistence between renewable energy and traditional fisheries has become increasingly urgent. Previous studies focused on the possibilities and constraints for fishers within wind farms (Cramer et al. 2015) and the operational aspects, including safety and risk management, of commercial fishing within wind farms (Rozemeijer et al. 2023). Furthermore, a desk study compiling all existing knowledge on passive fishing, particularly in relation to wind farms, was published in 2023 (Neitzel et al. 2023). While several completed and ongoing projects have touched on the potential of passive fishing in wind farms, these opportunities have been explored only research-based. Practical knowledge and field experiences in the Netherlands remain limited to the 2023 and 2024 field trials, which involved various fishing gears and a limited number of field tests to further investigate the practical aspects of passive fishing in wind farms (Neitzel et al. 2024 and 2025). These previous studies identify mismatches between co-use ambitions, the existing policy framework, and the characterization of the current static-gear fishing. Adjustments to both fishing operations and policies are necessary to align co-use ambitions with the current capabilities of the fisheries sector (Neitzel et al. 2023, 2024, 2025). Challenges that need to be addressed include offshore wind farm accessibility, legislation, vessel optimization and gear application (such as catch enhancement, selectivity, spatial deployment and gear combinations). The United Kingdom already has many years of practical experience with commercial fishing activities taking place within offshore wind farms, while the Netherlands has not yet implemented such coexistence in practice. Sharing the UK's lessons learned and experiences is therefore essential to inform Dutch fishers and policy officers for future implementation. The aim of this project is therefore to exchange knowledge and experiences from different stakeholders from the UK as a first insight concerning commercial fishing with static gears in offshore wind farms.

2 Materials and Methods

2.1 Interviews and field work

In the UK, a total of 8 interviews in 6 different communities (Figure 1) were held with individual small-scale fishers (3), fishermen's federations and fisheries liaisons (2), offshore wind developer and representatives (2) and a fisheries scientist working on offshore wind (1). These stakeholders and communities were selected because offshore wind operators, fishers, and scientists possess the most relevant insights, as they are directly involved or have direct links to (operating or planned) wind farms in the areas. Most interviewees were suggested by fishermen's federations and contacts through ICES WGOWDF[2] (ICES working group on Offshore Wind Development and Fisheries); other contacts were found through individual contacts of the researchers and the small-scale fisher involved in this project.

The topics covered by the interviews were suitability of fishing gears, ecology and stocks, current legislation, effect on the business model, safety and risks, insurance, communication procedures and relevant research projects. These topics were identified as key topics by the research team, consisting of two researchers from Wageningen Marine Research (WMR) and Wageningen Social and Economic Research (WSER), and one small-scale (static gear) fisher from the Netherlands. The topics were identified based on previous studies and existing knowledge (Neitzel et al. 2024 and 2025). Although this study focused on small-scale, fixed gear fisheries and fixed offshore wind turbines only, discussions about mobile gear and floating wind farms have taken place as well. Before the field trips to the UK were organised, the interview questions and key stakeholders were discussed with the Dutch Fishermen's Federation 'Nederlandse Vissersbond' to ensure no important topics or questions were forgotten. After every interview, a report including the findings from the interview was made and submitted to the interviewees for their review. Any inconsistencies and unclarities were discussed and adjusted before finalizing each interview report. The outputs of the finalised interview reports were analysed anonymously and are the basis for this report.

2.2 Study area

Six of the main fishing ports nearby offshore wind hubs on the east coast of the UK were visited during two field trips in July and September 2025 (Figure 1). These ports were the focus of this study because the five southern ports are close to offshore wind farms in operation where fishers have been fishing for years. The North of Scotland (Kirkwall) was visited as both floating and fixed offshore wind projects will be planned in the near future and therefore concerns are raised among fishers and local communities.

[2] WGOWDF

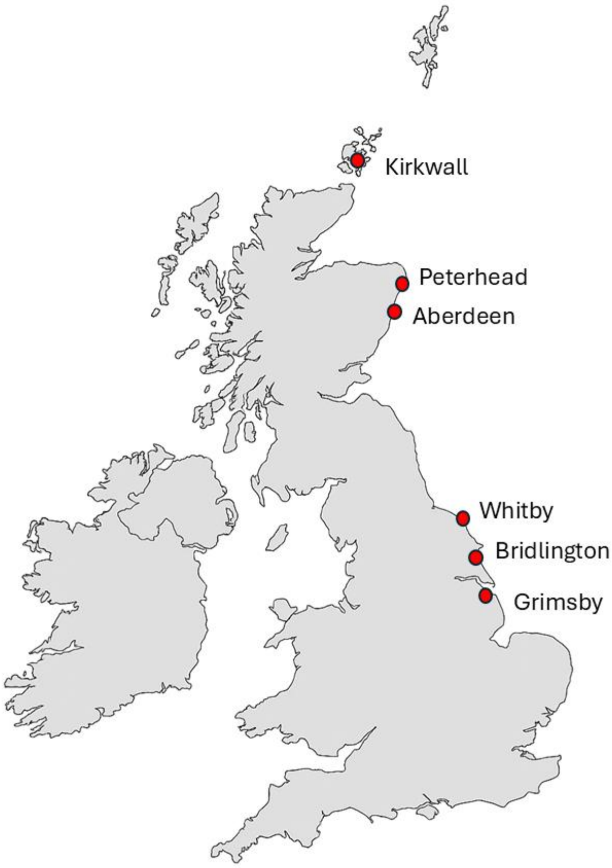

Figure 1 *– Map of the UK with the 6 study locations in Orkney, Scotland and England.*

2.3 Knowledge exchange

To inform all Dutch fishers, an article about the field trip was published in the Dutch fisheries newspaper 'Visserijnieuws' shortly after the trip[3]. To discuss the results with a group of Dutch fishers, one workshop will be held together with the Dutch Fisheries Innovation Network, called Visserij Innovatie Netwerk (VIN) (organisation in prep). Also, a meeting with one offshore wind developer in the Netherlands was organised in order to exchange knowledge gained from the UK and to share opinions and ideas.

To expand engagement in international collaboration with other European research institutes, a discussion about the next steps, identified key issues, lessons learned and knowledge gaps in research was held with members of the European Fisheries and Aquaculture Research Organizations (EFARO). The project team gave a presentation and invited all participants to contribute ideas on an effective way to facilitate practical knowledge exchange about fishing in offshore wind farms.

[3] *Visserij met vaste vistuigen in bijna alle Britse windparken - Nieuws voor de visserijsector in Nederland en België*

3 Results

3.1 Key themes

The results identify 5 key themes which were brought up by the interviewees in the UK, and during the meeting with the windfarm operator in the Netherlands as well: collaborative governance, ecological monitoring and research, safe operations and coexistence practices, workforce and socio-economic resilience and integrated spatial planning. Table 1 gives an overview of all relevant findings per theme with the identified issues and how to address these issues. The column 'How to address issues' contains findings from the UK, while the column 'Goals for nearby future' contains the lessons we can learn for the future, which are also applicable to the Netherlands. Also, the last column contains goals and recommendations to improve the process of implementation. We describe the key findings per theme in more detail in the paragraphs below. Challenges identified include inconsistent information sharing (monitoring data, research outcomes are often non-public), uneven communication with developers and the lack of a spokesmen or fisheries liaison in some areas, unclear liability or insurance coverage that deters some fishers to fish in (future) offshore wind farms (in the UK mainly concerning floating wind farms; in NL for all wind farms). These will be discussed in the next paragraphs as well.

Table 1 *– Identified key issues and their action plans on the five main topics.*

KEY THEMES	ISSUES IDENTIFIED	HOW TO ADDRESS ISSUES	GOALS FOR NEARBY FUTURE
COLLABORATIVE GOVERNANCE	Fragmented communication and differences between developers, regional coordination works well through fisherman's federations or fisheries liaisons (fisheries representatives).	Regular stakeholder meetings including fisheries liaison, FLOWW & ESCA guideline updates, international knowledge exchange.	Establish a national Offshore Wind–Fisheries Platform with relevant developers, federations and representatives involved in the NL. Organize regular practical, international meetings with researchers and fishers to share updates, relevant knowledge and identify knowledge gaps leading to research or follow-up tasks.
ECOLOGICAL MONITORING & RESEARCH	Knowledge gaps on species distribution, impacts of offshore wind farms and ecosystem interactions.	Better understanding of ecosystem dynamics through pre- & post-construction surveys, OWF displacement effects, eDNA and stable isotope studies to look into species diet & trophic analysis.	Integrate VK knowledge in the national MONS program[4] Launch internationally coordinated research programs and surveys, possibly through ICES to support fisheries management and understanding possible impact of offshore wind on fisheries.
SAFE OPERATIONS & COEXISTENCE PRACTICES	Risks from gear-turbine interactions, cable safety, and no entry during construction phases.	Safe distance regulations, early construction and maintenance notices, available compensation for fishers, gear placement coordination, insurance frameworks.	Minimize risks and accidents through mitigating measures (f.e. gear marker schemes, plotter data publicly available, reporting protocols, and OWF-fisher safety certification), ensure effective communication between fisheries and developers.
WORKFORCE & SOCIO-ECONOMIC RESILIENCE	Crew shortage and migration to offshore energy activities may threaten fisheries sustainability.	Fisheries funds, compensation schemes, community engagement, crew recruitment strategies.	Create cross-sector training & retention programs to maintain or increase local fishing employment. Implement or keep compensation for (temporary) displacement due to offshore wind construction. Safeguard that fishing in an OWF is not less profitable than fishing outside the OWF (e.g. no extra costs).
INTEGRATED SPATIAL PLANNING	Cumulative OWFs + MPAs can displace fisheries, risking possible increased local pressure on the ecosystem.	Biodiversity enhancement, keep fishing in OWFs feasible for both fixed and mobile gears, monitor displaced fishing effort through research.	Implement nature inclusive designs (NIDs, such as reef cubes or specific scour protection), scour protection mapping, coexistence planning with trawlers & static gear within OWFs.

[4] MONS Onderzoeks-en monitoringprogramma - Noordzeeloket

3.1.1 Collaborative governance

In the United Kingdom, fishing legislation in offshore wind farms is equivalent to legislation outside offshore wind farms[5]. As a result, this regulatory framework supports the principle of coexistence between the fishing and offshore renewable energy sectors, a practice that has been successful for decades[6]. Fishers retain the same rights to fish in the area once the offshore wind farm has been built. However, fishers and offshore wind developers must take each other into account to ensure safety and the ability to work. Through fisheries liaisons representing the fisheries sector and working for offshore wind operators, a good level of collaboration and communication can be maintained which is important in reaching consensus and mutual trust between stakeholders involved.

Site scouting begins with The Crown Estate, who identifies and releases potential offshore wind locations. Developers then bid for these sites and, once successful, design the wind farm layouts. During this process, consultation with a Fishing Liaison and an Offshore Wind Fisheries Representative is an optimal way to ensure that fisheries considerations are integrated from the earliest planning stages. While the overall regulatory environment is permissive, it remains somewhat fragmented. Coordination and communication practices vary across projects and developers, leading to inconsistencies in how stakeholder engagement and coexistence measures are implemented.

To strengthen collaboration, the Fishing Liaison with Offshore Wind and Wet Renewables Group (FLOWW[7]) was established in 2002. FLOWW's mission is to promote constructive relationships between the fishing and offshore renewable energy industries and to encourage effective coexistence across the UK. Together with the European Subsea Cables Association (ESCA[8]), FLOWW has issued updated best practice guidelines that outline structured procedures for liaison, cable safety, and coexistence design principles (FLOWW 2025). Examples of best practices guidelines include disruption settlements, protocols for lost or damaged gear, fisheries community funds and engagement in subsea cable design. Additionally, the Kingfisher Information Service – Offshore Renewable & Cable Awareness (KIS-ORCA[9]) project provides a key information-sharing platform. Jointly managed by ESCA and the Kingfisher Information Service of Seafish, KIS-ORCA ensures spatial transparency by supplying fishers with accurate, up-to-date, and freely accessible information about subsea cables and offshore renewable energy structures across Europe. This data is available in multiple formats and can be integrated directly into onboard navigation and plotting systems, enhancing safety and facilitating coexistence at sea.

3.1.2 Safe operations and coexistence practices

Effective coexistence between the fishing industry and offshore wind developers is built on a foundation of regular communication, mutual trust, and operational transparency. Establishing professional fisheries liaison officers and maintaining clear reporting systems are key to fostering these relationships, ensuring that safety, trust, and good communication practices are upheld throughout all project stages. The collaboration between FLOWW and ESCA provides a strong model of mutual reporting and cooperation. Fishers contribute by notifying developers of gear locations, while developers reciprocate by sharing maintenance and operational plans in advance by email. This accessible exchange promotes confidence, reduces misunderstandings, and supports safer operations for both sectors. Developers have also taken proactive steps to minimize navigational risks and enhance coexistence. Initiatives such as establishing gear marker funds and encouraging the use of visible gear tagging systems have proven valuable, as they help both fishers and offshore wind developers identify equipment locations more easily and avoid potential conflicts. For example: there were fishermen who used plastic soft drink bottles, while the offshore wind developer prefers marker buoys. The efforts to minimize risks are widely recognized and appreciated within the fishing sector.

Static fishing gears are most commonly used on the UK east coast, used to fish for crab and lobster. These gears are better suited to the spatial layout of turbine arrays compared to mobile gears that often have higher bottom penetration, generally use larger gears and vessels and need more space for turning and hauling the

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[5] *Fishing regulations: The Blue Book - GOV.UK*
[6] *Caring for crustacean habitats in wind farms | Ørsted*
[7] *The Fishing Liaison with Offshore Wind and Wet Renewables Group*
[8] *ESCA Guidelines*
[9] *Homepage | KIS-ORCA*

gears. Mobile gears such as trawling have shown potential in some new fixed-turbine wind farms but are generally incompatible with floating wind farm designs. A desk study from the Netherlands is currently investigating the suitability of mobile gear types for use in future offshore wind farms, which will be fixed turbines only (Neitzel et al., in prep).). Not being able to fish mobile gears and worries about the compatibility of passive gears in floating windfarms has generated considerable concern among fishers near areas identified for future floating wind development, as the viability of their operations (and by extension, their livelihoods) may be at risk.

Fishing within offshore wind farms in the UK is allowed, as there is no additional legislation; however, responsibility for risk management is ultimately left to the discretion of individual skippers. They must decide what to do in advisory zones, typically extending 50 metres around each fixed wind turbine. They also must take into account the spatial data provided through the KIS-ORCA platform to support safe navigation and operational planning. While insurance does not generally present a major barrier or additional costs to fishers, coverage for activities within offshore wind farms is to some providers uncertain as there is limited to no experience or data regarding such incidents. The fishers interviewed did not have additional insurance for fishing in an offshore wind farm. It is expected that the vessels and fishing gear used do not pose any additional risks, taking into account good seamanship and fishing responsibly. This also includes avoiding difficult weather circumstances such as strong winds and high waves, leading to higher risks of accidents for crew, gears and infrastructure.

To date, incidents involving fishing within offshore wind farms have been minimal. Occasional cases of gear loss and one reported vessel collision have been managed locally without significant escalation and no damage to the wind turbine (pers. comm. fishers). Previous studies on risk assessments for passive gears and offshore wind farms in the Netherlands have also identified possible risks, of which most risks appear to have minimal impact. The most occurring risk that was identified was gear loss and gear snagging on cables, scour protection or objects. Overall, these experiences demonstrate that, with proper communication, mutual respect, and adherence to best practice guidelines set-up as a joint guide between both sectors, coexistence between static-gear fisheries and offshore wind operations can be achieved safely and sustainably.

3.1.3 Ecological effects, research and knowledge gaps

Developers are required to carry out ecological monitoring before and after offshore wind farm construction. However, these requirements have become increasingly inconsistent across projects and results from these studies are often not publicly available. As a result, the comparability and long-term value of ecological datasets are often limited. While Nature Inclusive Design (NID) measures (such as the installation of reef cubes) offer potential ecological benefits, their implementation remains voluntary rather than a standardized practice. A substantial amount of environmental data is available through The Crown Estate's Marine Data Exchange, yet this resource remains underutilised. Many researchers and stakeholders find the data difficult to access or integrate into broader ecological assessments. Fishers operating near offshore wind farms have reported a range of ecological observations that complement formal monitoring efforts. Some have raised concerns about the potential effects of electromagnetic fields (EMF) generated by subsea cables. Others have noted shifts in the presence of bird and crustacean species, as well as temporary declines in local populations during construction phases, followed by signs of recovery once operations stabilise.

Key priorities include understanding species distribution and displacement under the cumulative expansion of offshore wind farms, and how these changes interact with broader climate-driven shifts in the North Sea. Furthermore, there is a growing need for more trophic data which can be more easily achieved by the use of stable isotope analysis and environmental DNA (eDNA), especially in areas where surveys cannot continue in their original form due to offshore wind construction, to support ecosystem-based fisheries management. Methodological challenges also persist. Traditional stratified random sampling approaches used in fisheries surveys are increasingly distorted by the presence of wind farms and Marine Protected Areas (MPAs), introducing inconsistencies into stock assessments and long-term monitoring programs and time-series. Addressing these challenges will require new survey frameworks, possible legal aspects or permits, and collaborative research strategies.

Finally, there is growing momentum behind calls for joint Horizon Europe research proposals focusing on food web dynamics, species distribution modelling, and fisheries displacement. Such coordinated efforts would help close critical knowledge gaps, enhance ecological understanding, and guide the sustainable coexistence of offshore wind development and fisheries across European waters.

3.1.4 Workforce and socio-economic resilience

Compensation mechanisms for fishers affected by offshore wind development are currently developer-driven and vary per project. Examples include Ørsted's Hornsea 3 and West Morcombe compensation funds[10], which provide payments to those directly impacted by construction or displacement. Only static gear fishers are identified. Mobile gear fishers are considered to be able to move to other fishing grounds.

These payments to static gear fishers are generally short-term, tied to specific project phases, and do not extend into the operational lifespan of the wind farms. Some fishers have used compensation funds to invest in vessel or gear upgrades, helping them adapt to changing conditions or diversify their fishing activities. Nonetheless, these schemes have also introduced economic tensions within fishing communities, particularly between those who receive compensation and those who do not experience direct displacement but may still face indirect impacts such as reduced access or altered fishing grounds. Also, due to (temporary) displacement of fishers in a certain area, other areas become (over)crowded and fishing pressure increases locally.

At the same time, the fishing sector in general, is facing growing labour shortages. Many skilled crew members are transitioning to the offshore energy industry and other employers on land, attracted by higher wages, greater job stability, and improved working conditions. This shift has led to a gradual erosion of the traditional fishing workforce and a loss of intergenerational continuity, as younger fishers increasingly view other careers as more secure and sustainable options. Fishing, by contrast, is often perceived as more physically demanding, financially uncertain, and less rewarding in the long term, especially in the past couple of years. Maintaining a balanced coexistence between offshore wind and fisheries will not only safeguard employment but also help preserve maritime heritage, local food security, and the social fabric of coastal regions. A solution for the labour shortages in the fishing sector has not been found yet and is broader than the UK only.

3.1.5 Integrated spatial planning

The United Kingdom operates, after the construction phase, under an open-access coexistence model, where fishing within offshore wind farms is managed through voluntary coordination between sectors rather than strict spatial exclusion. This approach allows for flexible co-use of marine space but also depends heavily on mutual trust, local risk management by skippers and effective communication. In contrast, some European countries like the Netherlands have adopted more spatial planning frameworks (Bonsu et al. 2024). Under these systems, designated zones for offshore energy development are generally closed to all fishing activity. While this reduces potential conflicts between industries in practice, it also limits opportunities for genuine co-use and integrated marine resource management. The emergence of floating offshore wind technology introduces new layers of complexity to spatial coexistence. While there are chances of successfully implementing static gear fisheries in floating wind farm projects, compatibility with mobile gears remains uncertain, given the larger mooring footprints and subsea cable configurations associated with floating systems. Recent proposals have suggested designating floating offshore wind farms as quasi–Marine Protected Areas (MPAs), on the basis that reduced fishing pressure within these zones could offer ecological benefits. However, this idea has been met with skepticism from environmental NGOs and fishers alike, who question both the ecological rationale and the governance implications of such designations. A key concern across all models is the cumulative displacement effect of offshore wind farms and MPAs. As fishing grounds become increasingly restricted or fragmented, pressure intensifies on the remaining accessible areas. If as a result catches per vessel decline, the number of fishers will diminish due to deteriorating economic profitability. To address these challenges, stakeholders are calling for ecosystem-level spatial assessments that integrate fisheries, renewable energy, and conservation planning. Such an approach would help identify and mitigate unintended consequences of displacement, ensuring that marine spatial planning supports both ecological sustainability and the long-term resilience of fishing communities and offshore wind development.

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[10] *Hornsea 3 Community Benefit Fund Consultation | Ørsted*

4 Discussion and conclusions

4.1 Future directions and recommendations

Strengthening coexistence between fisheries and offshore wind requires coordinated action at multiple levels: from practical collaboration at sea to policy alignment across borders. Several key measures will be described in this chapter that can help build long-term resilience, safety, and mutual understanding between sectors. It should be noted that the results and conclusions presented in this report are drawn from only eight interviews with stakeholders across six communities. As such, the findings should be viewed as an initial indication of the differences between the UK and the Netherlands. Further research, including more interviews and additional locations, could yield more robust insights and is recommended as a next step.

4.1.1 Knowledge exchange

Stakeholder integration and international learning should form the foundation of a long-term coexistence strategy. Leveraging the UK's extensive experience alongside European best practices in spatial planning and compensation can create a more harmonized and transparent approach. Involving fishers, developers, regulators, and researchers from the earliest design stages through to decommissioning the offshore wind farm will ensure that diverse perspectives are represented. Establishing a national or regional knowledge and collaboration platform, linking science, industry, and government, would support shared research priorities, identify knowledge gaps, and promote joint problem-solving. Currently, there is little knowledge exchange between fishing communities or on a national level, even though this is important for learning from each other, sharing concerns and experiences, and adhering to the established guidelines. At the European level, enhanced cooperation and structured knowledge exchange should be prioritized as well. Initiatives such as Dutch–UK learning missions through for example ICES or the VIN could serve as effective models for sharing best practices in real-world contexts. Joint visits on vessels and offshore sites would enable fishers, developers, and regulators to experience operational realities first-hand, helping to bridge cultural divides and foster mutual understanding.

4.1.2 Safety standards

Standardised safety practices are equally important. The introduction of offshore wind farm fishing safety training programs, or the publication of a shared safety protocol issued by fishermen's federations in collaboration with developers, would promote consistent safety standards across regions. Complementary to this, the creation of a centralised incident reporting database would allow for data-driven, risk-based planning and continuous improvement of operational procedures. Exchanging gear identification methods and retrieval protocols remains another practical priority. Promoting the use of clear and manageable gear markers in all countries and exchange knowledge on retrieval systems, building on existing gear marker programs in the UK, would enhance navigational safety and minimize conflicts between fishers and offshore wind developers. Maintaining clear safety standards and improving data transparency between the offshore wind developer and the fishers involved are essential for building trust. This also includes upholding advisory distances and ensuring open access to data on cable locations, scour protection, and ecological monitoring. Integrated workforce programs could also be developed to facilitate mobility between fisheries and offshore renewables, supporting skill diversification, employment security and better mutual understanding.

4.1.3 Research gaps

Research-led policy development will be critical in guiding sustainable management. Tools such as environmental DNA (eDNA), stable isotope analysis, and species displacement modelling can provide insights into the ecological and socio-economic effects of offshore wind expansion. Investment in applied, cross-border research will allow for adaptive monitoring that captures changes over time and space, informing evidence-based decision-making.

4.1.4 Socio-economic importance

In the United Kingdom, the wind farm developer and the fishing industry are involved in the project from the planning stage of wind farm construction. This leads to an equal relationship that forms the basis for mutual respect. No other companies are invited to develop activities in the wind farm, unlike in the Netherlands. The fishers involved know the area from fishing before the construction of the windfarm and are aware of potential risks. Extra risks due to constructions are to overcome. In practice, this proves to be feasible. New co-users often lack this practical experience due to new types of co-use in novel environments such as aquaculture, nature projects, solar energy and algae farming in offshore wind farms, and could benefit from fishers' experience.

Ensuring socio-economic sustainability remains central to a balanced marine economy. Addressing labour shortages and developing pathways to retain the next generation within the fishing industry will be essential. By supporting coastal livelihoods, investing in skills, and maintaining equitable participation across sectors, both fisheries and offshore renewables can contribute to a sustainable, resilient blue economy.

5 Quality Assurance

Wageningen Marine Research utilises an ISO 9001:2015 certified quality management system. The organisation has been certified since 27 February 2001. The certification was issued by DNV.

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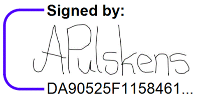
Justification

Report: C102/25
Project Number: 4318100524

The scientific quality of this report has been peer reviewed by a colleague scientist and a member of the Management Team of Wageningen Marine Research

Approved: Alba Pulskens
Social scientist

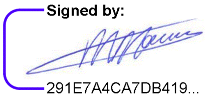
Signature:



Date: 9 December 2025

Approved: A.M. Mouissie, PhD
Business Manager Projects

Signature:



Date: 9 December 2025

Wageningen Marine Research
T +31 (0)317 48 70 00
E marine-research@wur.nl
www.wur.nl/marine-research

Visitors'adress
- Ankerpark 27 1781 AG Den Helder
- Korringaweg 7, 4401 NT Yerseke
- Haringkade 1, 1976 CP IJmuiden

With knowledge, independent scientific research and advice, **Wageningen Marine Research** substantially contributes to more sustainable and more careful management, use and protection of natural riches in marine, coastal and freshwater areas.

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