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Irish Fish Processors and Exporters Association, Roshine Road, Killybegs Co Donegal

21 October 2026

The Secretary
An Coimisiún Pleanála
64 Marlborough Street
Dublin 1, D01 V902

Case number ABP-319866-24

Dear Secretary,

Case ABP-319866-24: North Irish Sea Array Offshore Wind Farm. Submission on the further information

The Irish South and East Fish Producers Organisation (IS&EFPO), the Irish Fish Producers Organisation (IFPO), the Killybegs Fishermen's Organisation (KFO), the Irish South and West Fish Producers Organisation (IS&WFPO) and the Irish Fish Processors and Exporters Association (IFPEA), the five member organisations of the Seafood Ireland Alliance ("the SIA"), enclose their joint submission on the further information submitted by North Irish Sea Array Windfarm Limited, which the Commission notified to parties by letter dated 25 August 2026.

The SIA represents the owners and skippers of the Irish demersal otter trawlers that fish Nephrops on the western Irish Sea grounds (Functional Unit 15) and land principally into Clogherhead and Howth. These vessels are the receptor that the Developer's own assessment identifies as the most affected by the proposed development, with an effect of array construction assessed as "very significant" before mitigation. The IS&EFPO, IFPO, KFO and IS&WFPO are Producer Organisations representing the owners of Irish fishing vessels for whom the approach taken on this project will set a precedent for offshore wind development elsewhere on the Irish coast. The IFPEA represents the processors and exporters who depend on these landings, and who have not been assessed or consulted.

The submission sets out twelve grounds. The principal points are these.

- **The assessment has not been updated.** The residual and operational effects sections of Chapter 16 are unchanged, and the share of the fishery inside the array still rests on vessel monitoring data for 2016 to 2020.
- **The stock and the quota have fallen.** The FU15 Nephrops stock fell below its MSY trigger point in 2025, the ICES catch advice for 2026 is 35.47 per cent lower than for 2025, and the Irish Area 7 Nephrops quota fell by 21.12 per cent. Nephrops now provide 78.88 per cent of the value these vessels land from the Irish Sea, as whitefish stocks have declined.
- **The residual conclusion is unsupported.** The effect falls from "very significant" to "moderate to slight" without any re-scoring of sensitivity or magnitude, and the Developer accepts that this result depends on mitigation that has not been agreed.
- **The mitigation does not reach the fleet.** Disturbance payments cover construction and decommissioning only, rest on a formula that has not been disclosed, and are ruled out for cumulative operational effects. The principal monitoring tool is designed for vessels under 12 m. The Sustainable Fisheries Community, which the Developer relies on, is a community-based initiative in which the IS&EFPO and the IFPO, whose members fish the site, do not take part, and it does nothing to mitigate the impacts on the fleet.
- **Coexistence has not been shown for twin- and quad-rigged trawls.** Fishing effort, survey density and vessel tracks from 2019 to 2023 all place the array on the core of the Nephrops ground, not at its margin. The Technical Coexistence Assessment models a single trawler. A BIM study of 88 European offshore wind farms found towed-gear effort inside them reduced by 79 per cent on average, and by 76 per cent in the United Kingdom, where towed gear is permitted.

- **The FMMS is incomplete and the residual conclusion avoids the NMPF tests.** NMPF Fisheries Policy 2 places a socio-economic assessment first among the contents of an FMMS, and the other elements depend on it. By treating the residual effect as not significant, without evidence that the mitigation achieves this, the assessment also avoids the public benefit test in Fisheries Policy 1(d).
- **Cumulative displacement and socio-economic effects have not been assessed.** No assessment has been made of the crews, processors and ports that depend on the fishery, as National Marine Planning Framework Fisheries Policy 2 requires. The FMMS does not record the divergent views of the fishing industry, and the consultation behind it was a one-way briefing, ad hoc and without an agreed record.
- **The fleet's own evidence points the other way.** Thirteen vessels that fish the array take between €2.9 million and €8.1 million a year from inside it, against the Developer's €1.55 million for the whole Irish fleet. Twelve of them could not tow inside the built array, and nine of the ten owners who answered say that a crew household could not cover a single month's loss. The first results of the SIA's assessment are set out in Appendix 1 to the submission.

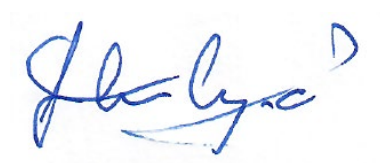
The SIA asks the Commission to hold an oral hearing on commercial fisheries; to find that the effects on the Irish Nephrops trawl fleet remain significant after mitigation, so that NMPF Fisheries Policy 1 requires the public benefits of the proposal to be shown to outweigh them; and, should it be minded to grant approval, to attach the eight conditions set out in Section 4 of the submission.

The SIA has commissioned an independent socio-economic assessment of the effects on the fleet. Its first results, from a consultation of thirteen vessels that land into Clogherhead and Howth, are set out in Appendix 1 to the submission. Interviews with owners are continuing, and the ICES advice for FU15 for 2027 is expected at the end of October 2026. The SIA asks that it be given the opportunity to present the full results and the new advice to the Commission.

Correspondence on this submission may be sent to the undersigned at the IS&EFPO address above, or by email to isefpo@gmail.com (IS&EFPO) or aodh.odonnell@ifpo.ie (IFPO).

The IFPO, KFO, IS&EFPO, IS&WFPO and IFPEA made Submission No. 35 on this application on 9 August 2024.

Yours faithfully,



John Lynch

Chief Executive Officer, Irish South and East Fish Producers Organisation

For and on behalf of the Irish South and East Fish Producers Organisation, the Irish Fish Producers Organisation, the Killybegs Fishermen's Organisation, the Irish South and West Fish Producers Organisation and the Irish Fish Processors and Exporters Association

Enclosure: Submission on the further information, by the Irish South and East Fish Producers Organisation, the Irish Fish Producers Organisation, the Killybegs Fishermen's Organisation, the Irish South and West Fish Producers Organisation and the Irish Fish Processors and Exporters Association, with Appendix 1: The socio-economic impact on the Irish Sea Nephrops fleet (prepared by Seaview Marine, October 2026).

North Irish Sea Array Offshore Wind Farm

Case Reference ABP-319866-24

“Submission on the further information”

North Irish Sea Array Windfarm Limited
on the North Irish Sea Array (NISA) offshore wind farm.

Irish South and East Fish Producers Organisation

Irish Fish Producers Organisation

Killybegs Fishermen's Organisation

Irish South and West Fish Producers Organisation

Irish Fish Processors and Exporters Association



Submitted to: An Coimisiún Pleanála, 64 Marlborough Street, Dublin 1, D01 V902.

Submitted by: the Irish South and East Fish Producers Organisation (IS&EFPO), Viewmount House, Dunmore Road, Waterford; the Irish Fish Producers Organisation (IFPO), 8 Anvil Court, Killybegs, Co. Donegal F94 YX9T; the Killybegs Fishermen's Organisation (KFO), Bruach na Mara, St. Catherine's Road, Killybegs, Co. Donegal F94 DC8N; the Irish South and West Fish Producers Organisation (IS&WFPO), The Pier, Castletownbere, Co. Cork; and the Irish Fish Processors and Exporters Association (IFPEA), Roshine Road, Killybegs Co Donegal / Creenveen, Carrick Co Donegal F94 X361; jointly, as members of the Seafood Ireland Alliance.

Prepared by: Seaview Marine, for the SIA.

Date: October 2026.

1 Introduction

This submission is made jointly by the five member organisations of the Seafood Ireland Alliance: the Irish South and East Fish Producers Organisation (IS&EFPO), the Irish Fish Producers Organisation (IFPO), the Killybegs Fishermen's Organisation (KFO), the Irish South and West Fish Producers Organisation (IS&WFPO) and the Irish Fish Processors and Exporters Association (IFPEA), referred to together as "the SIA". It responds to the further information submitted by North Irish Sea Array Windfarm Limited ("the Developer") on the North Irish Sea Array (NISA) offshore wind farm, which the Commission notified to parties by letter dated 25 August 2026, with submissions invited by 21 October 2026.

The SIA represents the owners and skippers of Irish demersal otter trawlers that fish *Nephrops norvegicus* (Dublin Bay prawn) on the muddy grounds of the western Irish Sea, Functional Unit 15 (FU15), and that land principally into Clogherhead and Howth. The vessels tow bottom trawls in single, twin, and quad rig. These vessels form the receptor that the Developer's own assessment identifies as the most affected by the proposed development: Chapter 16 of the 2024 Environmental Impact Assessment Report (EIAR) assesses the effect of array construction on Irish demersal otter trawlers as "very significant" before mitigation. The IS&EFPO, IFPO, KFO and the IS&WFPO are Producer Organisations representing the owners of Irish fishing vessels for whom the approach taken on this project will set a precedent for offshore wind development elsewhere on the Irish coast. The IFPEA is the national body representing Irish fish processors, retailers, and exporters, who depend on the landings from these grounds.

Scope of this submission

The submission is confined to commercial fisheries, and to the further information as it bears on the Nephrops trawl fleet. The following documents, submitted by the Developer in June 2026 in response to the Commission's request for further information of 10 April 2025, were reviewed:

- **Addendum to Chapter 16.** Commercial Fisheries, RFI Update (Arup, 2026).
- **Appendix A16.1.** Commercial Fisheries Technical Report (NiMa Consultants, March 2026).
- **Appendix A16.2.** Fisheries Management and Mitigation Strategy (FMMS), Rev 2 (June 2026), including Appendix B (Sustainable Fisheries Community), Appendix C (outline construction disturbance compensation protocol) and Appendix E (Technical Coexistence Assessment).
- **Request for Further Information Response Report.** Items 1(b), 5, 12(a) and 12(b) (Arup, 2026).
- **Response to Submissions Report.** Sections 3.12 (Commercial Fisheries) and 5.6 (Nephrops Fishermen and Producer Organisations) (Arup, 2026).
- **Addendum to Chapter 33.** Socioeconomic, Tourism and Recreation (Arup, 2026).

The SIA's members made Submission No. 35 on this application on 9 August 2024 (Nephrops Fishermen and Producer Organisations, lodged by Benville Robinson LLP on behalf of the owners of 24 Nephrops vessels and the IFPO, KFO, IS&EFPO, IS&WFPO and IFPEA). That submission set out that the FMMS had not been prepared with the industry, that the disturbance payment strategy had not been discussed or developed with it and covered construction only, that no socio-economic assessment had been made, and that the vessels could not fish between

the turbines. The further information does not address these points. This submission does not repeat Submission No. 35. It updates it with the changes in the stock, the quota and the fleet since 2024 and with the first results of the SIA's own assessment, and refers to the Developer's response to it at Section 5.6 of the Response to Submissions Report where that bears on the further information.

The SIA's own assessment

The Seafood Ireland Alliance has commissioned Seaview Marine to carry out an independent socio-economic impact assessment of the proposed development on the Nephrops trawl fleet. Its first stage, a consultation of the owners and skippers who fish the array area, has returned answers for thirteen vessels that land principally into Clogherhead and Howth and together land between €9.6 million and €14.8 million a year. Combined with the STECF landings data and the BIM economic impact studies of the two ports, those returns allow the loss to be followed from the value at stake to the households that carry it. The first results are set out in Appendix 1 and summarised in Section 3.9. Interviews with owners are continuing, and the SIA asks that the Commission provide an opportunity for the full results to be presented (Section 4).

2 Summary of the SIA's position

The further information submitted by North Irish Sea Array Windfarm Limited on the North Irish Sea Array (NISA) offshore wind farm does not change the Developer's assessment of the effects on the Nephrops trawl fleet, and the conclusion that those effects become "not significant" after mitigation is not supported by the evidence submitted. The principal grounds, each set out in Section 3, are as follows.

1. **The assessment has not been updated.** The residual effects section of Chapter 16 is unchanged, the operational assessment is unchanged, and the spatial evidence remains the 2016 to 2020 vessel monitoring data.
2. **The resource and the fleet have changed.** The FU15 Nephrops stock fell below the maximum sustainable yield (MSY) trigger point in 2025, the catch advice for 2026 is 35.47 per cent lower than for 2025, and the Irish Area 7 Nephrops quota fell by 21.12 per cent between 2025 and 2026.
3. **Nephrops are now the mainstay of the fleet.** Irish Sea whitefish stocks are at or near closure, and Nephrops provided 78.88 per cent of the value landed from the Irish Sea by Irish demersal trawlers of 18 to 40 m in 2024.
4. **The residual effect is asserted.** The effect falls from "very significant" to "moderate to slight" without any re-scoring of sensitivity or magnitude, to a category that does not appear in the Developer's own significance matrix.
5. **The mitigation does not reach the affected fleet.** Disturbance payments are confined to construction and decommissioning and rest on an undisclosed formula; payments for cumulative operational effects are expressly ruled out; and the principal monitoring tool is designed for vessels under 12 m.
6. **Coexistence has not been demonstrated for the gear used.** The Technical Coexistence Assessment models a single trawler and does not consider twin or quad rig, and the European evidence shows towed-gear effort inside operational wind farms falling by 79 per cent on average.
7. **Cumulative displacement has not been assessed.** The cumulative assessment lowers the sensitivity of the fleet from medium to low and reaches a cumulative effect smaller than the project-alone effect.
8. **The value of the fishery is not established.** The Developer's documents use two prices for Nephrops, one twice the other, and the €1.55 million value attributed to the array area cannot be reproduced. The thirteen vessels that have responded to the SIA's consultation alone take between €2.9 million and €8.1 million a year from inside the array (Appendix 1).
9. **No socio-economic assessment has been made.** The households, crews, processors and ports that depend on the fishery are not assessed, as National Marine Planning Framework (NMPF) Fisheries Policy 2 requires. The SIA's first results show that the loss of income to Clogherhead and Howth from thirteen vessels alone is €1.7 million to €6.6 million a year, and that the welfare loss to the households that carry it is larger still (Appendix 1).
10. **The FMMS has not been agreed.** The consultation was a one-way briefing, ad hoc and without an agreed record, and the FMMS does not record the divergent views of the fishing industry, as Fisheries Policy 2 requires where agreement is not reached.
11. **The FMMS is incomplete.** Without a socio-economic assessment, none of the other elements that Fisheries

Policy 2 sets out for an FMMS can be completed.

12. **The residual conclusion avoids the NMPF tests.** By treating the residual effect as not significant, the assessment avoids the public benefit test in Fisheries Policy 1(d) and Co-existence Policy 1(c), without evidence that the mitigation achieves that result.

The SIA has assessed the further information against five principles: a just transition, under which the costs of decarbonisation are not transferred to fishing communities (ILO, 2015); an independently verified baseline, against which impact and compensation are measured; inclusion of the whole value chain, from vessel and crew to processor and port; obligations that run for the whole life of the project, through construction, operation and decommissioning; and assessment of cumulative effects at the scale of the sea area. The grounds set out in Section 3 show that the further information falls short of each. The SIA asks the Commission to hold an oral hearing on commercial fisheries; to find that the effects on the Irish Nephrops trawl fleet remain significant; and, should it be minded to grant approval, to attach the conditions set out in Section 4.

3 Grounds

(1) The commercial fisheries assessment has not been updated.

Item 1(b) of the request for further information asked the Developer to confirm that the information supporting the application remained relevant, or to update it. The Developer's response to the request is confined in practice to the baseline:

- **Residual effects.** Section 16.7 of the Addendum to Chapter 16 states: "There are no changes to this section." The residual conclusions of 2024 therefore stand without re-examination, although the mitigation on which they depend has been substantially revised.
- **Operational effects.** Section 16.5.3 states that there are no changes to the operational phase assessment. Only Impacts 4 and 15 (disturbance of the fish and shellfish resource) were revised, following the change to suction bucket jacket foundations.
- **Effects on the Nephrops ground.** Nephrops do not move away from disturbance; they remain in and around their burrows (Submission No. 35). A lower predicted effect from the change of foundation type does not reduce the loss to the fleet where the ground is disturbed or made inaccessible, and every vessel in the SIA's consultation that rated the effect on Nephrops and the mud habitat rated it 5, could force me out (Appendix 1).
- **Spatial evidence.** The location of the fishery, and the share of it lying inside the array, rest on surface swept area ratio data for 2016 to 2020 (Addendum Table A16.1). Rectangle-level landings data run only to 2021 or 2022 (Appendix A16.1, Table A2.1).
- **Value inside the array.** The figure of €1.55 million a year landed by Irish trawlers from inside the array area is repeated from 2024 in the Response to Submissions Report (Section 5.6.3.6.1), without update or derivation.

Appendix A16.1 adds port-level landings for 2020 to 2024 and concludes that the updated dataset "does not indicate any material change from the baseline described in the 2024 EIAR". The same appendix records the changes in stock status set out in Section 3.2, which are material.

(2) The FU15 stock and the Irish Nephrops quota have declined.

Appendix A16.1 (paragraph 28) states that the long-term trend in FU15 Nephrops abundance is downward and that "In 2025, the stock abundance fell below the maximum sustainable yield biomass." The consequence for fishing opportunities is shown at Table 1.

Advice for 2027 is expected from ICES at the end of October 2026, after the closing date for submissions. The SIA asks the Commission to take it into account. A fleet whose stock is below its trigger point, and whose quota has been cut by a fifth in a single year, has less capacity to absorb the loss of grounds; the Developer's own sensitivity criteria, under which the fleet was scored medium because "low levels of alternative fishing grounds are available" and the fleet "is generally vulnerable to impacts" (2024 EIAR, Chapter 16, Section 16.5.2.1), point to a higher sensitivity, not an unchanged one.

Table 1: Change in Nephrops fishing opportunities relevant to the fleet, 2025 to 2026

Measure	2025 (t)	2026 (t)	Change (t)	Change
ICES catch advice, Nephrops FU15 (Irish Sea West)	10,062	6,493	-3,569	-35.47%
TAC, Nephrops Area 7 (NEP/07.)	16,689	13,167	-3,522	-21.10%
Irish quota, Nephrops Area 7	5,313	4,191	-1,122	-21.12%

Sources: ICES (2025) advice nep.fu.15 for 2026, which states the 2025 advice of 10,062 t (ICES Advice and Scenarios Database); EU fishing opportunities regulations for 2025 and 2026 (initial allocations, before swaps). Percentages are calculated from the tonnages shown.

(3) Irish Sea whitefish have declined: Nephrops are now the mainstay of the fleet.

Whitefish stocks of the Irish Sea that once supplemented Nephrops catches are now at or near closure (Table 2).

Table 2: ICES advice for the principal Irish Sea demersal stocks

Stock	Latest ICES advice	Stock status reported by ICES
Cod 7a	Zero catch for 2026, and for each of 2027 and 2028	Spawning stock below Blim
Whiting 7a	200 t for 2026	Spawning stock below Blim; fishing pressure above FMSY
Plaice 7a	Zero catch for 2027 (the first zero-catch advice in the ICES record from 1987)	Spawning stock below Blim; fishing pressure above FMSY
Haddock 7a	586 t for 2026 (revised in November 2025 from 1,331 t), and for each of 2027 and 2028	Downgraded to category 5; status not assessable
Sole 7a	548 t for 2027	Spawning stock above Blim; fishing pressure above FMSY and FPA

Sources: ICES advice sheets cod.27.7a, whg.27.7a, ple.27.7a, had.27.7a and sol.27.7a (2025 and 2026).

The landings of the Irish demersal trawl fleet reflect this change. Table 3 shows, from the Scientific, Technical and Economic Committee for Fisheries (STECF) Annual Economic Report, the share of Nephrops in the value landed by the two Irish fleet segments to which the represented vessels belong.

Table 3: Nephrops share of first-sale value landed by Irish demersal trawlers, 2013 and 2024.

Fleet segment and area	Total value 2013 (€)	Nephrops share 2013	Total value 2024 (€)	Nephrops share 2024
Demersal trawl 18–24 m, all areas	47,523,974	39.86%	45,191,733	64.06%
Demersal trawl 24–40 m, all areas	41,404,999	40.58%	47,400,202	48.85%
Demersal trawl 18–40 m, Irish Sea (7a)	8,236,409	80.27%	8,124,759	78.88%

Source: STECF Annual Economic Report 2025 (STECF 25-07), landings by fleet segment and ICES division, Irish fleet (segments DTS1824 and DTS2440). Shares are calculated from the values shown.

In the Irish Sea, the whitefish landed by the two segments (cod, haddock, whiting and plaice) fell from 1,533.12 t in

2019 to 555.82 t in 2024, a fall of 977.30 t or 63.75 per cent; cod landings were 7.48 t and plaice 2.28 t in 2024. Nephrops therefore carry the fleet, and the scope for these vessels to replace lost Nephrops earnings with other Irish Sea species is small.

(4) The residual significance conclusion is unsupported.

Chapter 16 (2024) scores Irish demersal otter trawlers as of medium sensitivity, and the magnitude of array construction (Impact 1) as high, giving "very significant". After mitigation, Table 16.12 records the residual effect as "moderate to slight", with the single sentence that the FMMS measures "have reduced the significance of effect on Irish demersal otter trawlers to a not significant level".

- **No re-scoring.** Neither the sensitivity nor the magnitude is re-scored after mitigation. On the Developer's matrix (Table 16.5), a change from "very significant" to "moderate" requires the magnitude to fall from high to low, two full classes, and a further step to "slight" requires the sensitivity to fall as well. No quantity in the assessment changes to support either step.
- **A category outside the matrix.** "Moderate to slight" does not appear in Table 16.5, which contains the categories profound, very significant, significant, moderate, slight, not significant and imperceptible.
- **Dependence on implementation.** The Developer accepts at Section 5.6.4 of the Response to Submissions Report that "The resulting residual effect (which is not significant in EIA terms) relies upon the effective implementation of the FMMS and SFC initiative." Section 3.5 shows that the FMMS and the Sustainable Fisheries Community (SFC) do not address the loss suffered by the fleet.
- **No economic criteria.** Chapter 16 states that "specific economic criteria were not set" for magnitude, which rests on judgement. The residual step therefore cannot be tested against any measure of loss.

(5) The mitigation does not reach the affected fleet.

- **Construction and decommissioning only.** The disturbance payment protocol (FMMS, Appendix C) is an "outline construction disturbance compensation protocol"; the Response to Submissions Report (Section 5.6.3.5.2) confirms that disruption payment claims apply to the construction and decommissioning phases, with claims for gear damage in all phases. The operational effect on the fleet (Impact 6) is assessed as "significant" before mitigation, and no payment is offered for loss of access during operation.
- **Losses during surveys.** Effects on the fleet begin before construction. At the meeting of 8 November 2024, the IFPO reported a drop in the Nephrops fishery during the Developer's 2024 geophysical survey, with one vessel forced to change its gear and move to squid. The Developer's contractor recorded the report and undertook to investigate (contractor's minutes of 8 November 2024).
- **Cumulative operational payments ruled out.** The FMMS (Section 5.3) states that "the Developer does not consider disruption payments to be a feasible or appropriate form of mitigation for cumulative operational effects."
- **An undisclosed formula.** Payments are to be calculated "Using a standard formula based on the information harvested from both the SFPA and the Marine Management Organisation (MMO)" (FMMS, Appendix C). The formula

is not given, the claimant must supply three years of sales notes and accounts, and the figure that should depict the process is missing from the document ("The overall process is depicted in .").

- **Monitoring designed for small vessels.** The Digital Effort Traceability Project, on which the FMMS relies for monitoring and for its cumulative mitigation strategy, is "targeted at Ireland's under-12 m inshore fleet" (FMMS, Section 4.3). It does not cover the larger trawlers that are the principal receptor.
- **A development-phase fund.** The €1 million Fisheries Coexistence Fund is committed "during this development phase" and has funded a traceability pilot, a coastal education vehicle, a low-impact fishery pilot and a biodiversity initiative. None of these compensates a vessel for lost access to the Nephrops grounds.
- **No independent resolution of disputes.** Under the FMMS (Appendix C), the Developer "will offer support and guidance to all claimants". No independent arbiter is provided, although the FMMS lists the Seafood/ORE Working Group Dispute Resolution Mechanism among its guidance. SSE Renewables, which is developing Arklow Bank 2, refers unresolved claims "to an independent arbiter" (SSE Renewables, 2022).
- **Evidence not shared.** The Developer states that it "carried out a body of work to establish the catch per unit effort (CPUE)" and the "value of earnings" over ten years (FMMS, Appendix C). It has not disclosed that work. The Seafood/ORE Working Group Summary Guide, which the Developer commits to follow, provides that information "will be evidence-based and provided in a way that is easily understood and accessible", and that the sectors should "Cooperate to determine the impact" (Seafood/ORE Working Group, 2023).
- **The SFC is not mitigation for the fleet.** The Developer relies on "the effective implementation of the FMMS and SFC initiative" for its residual conclusion (Response to Submissions Report, Section 5.6.4). The Sustainable Fisheries Community is a community-based initiative. It does nothing to mitigate the impacts on the fishing industry and has no practical relevance to the vessels that fish the NISA site. The IS&EFPO and the IFPO, the two Producer Organisations whose members are most directly affected, are not taking part in it because of serious concerns about the initiative. A measure in which the representatives of the affected fleet do not take part cannot deliver the residual effect the Developer claims. The IFPO did not sign the Memorandum of Understanding on the SFC that the Developer sent to it on 14 November 2024.

(6) Coexistence within the array has not been demonstrated for the demersal fleet.

The Developer's case that fishing will resume inside the array rests on the Technical Coexistence Assessment (FMMS, Appendix E). Its terms are as follows.

- **Geometry.** A minimum turbine spacing of 1,000 m, centre to centre, with a 75 m operational buffer on each edge, gives an effective trawlable width of 850 m. Each jacket has a 50 m footprint and a 50 m safety zone, giving 150 m in diameter.
- **Vessel modelled.** A single 28 m demersal trawler towing at 3 knots.
- **Tide.** With the dominant tidal stream running NNE to SSW and the corridors bearing 323°, peak spring flows of up to 2.3 knots produce a cross-tidal component of about 2.0 knots, and the assessment records that "elevated risk arises during gear deployment and recovery".

- **Gear not modelled.** The assessment does not consider twin or quad rig, the spread of the doors and sweeps, the position of the gear astern and down-tide of the vessel, or turning at the ends of corridors up to 5.74 nautical miles long.

The Developer's own 2024 assessment accepts that "twin-rigged trawl gears typically require a greater distance for safe operation and therefore may be less likely to target grounds in the vicinity of infrastructure" (Chapter 16, Impact 6). The FMMS records that the IFPO stated in 2023 that "trawling will likely not take place within the array area", and that the IS&EFPO stated that "the areas around the edge of the offshore infrastructure boundary will likely become an area of high fishing pressure" (FMMS, Appendix D, Table 6-1). Neither statement is reflected in the residual assessment. Further, the published evidence from operational wind farms supports the fishing industry's view.

- **European evidence.** A study of 88 offshore wind farms in European waters over 12 years, commissioned by Bord Iascaigh Mhara (BIM), found that "Mean predicted towed effort was reduced by 79% in OWF extents", with reductions ranging from 99 per cent in Belgium to 76 per cent in the United Kingdom, and concluded that "Novel OWF infrastructure would likely be needed to enable coexistence with towed-gear fisheries" (Cosgrove et al., 2026).
- **Regulatory practice.** Bottom-towed gear is not permitted inside offshore wind farms in most EU Member States, the United Kingdom and possibly France being the exceptions (Van Hoey et al., 2021; Cosgrove et al., 2026).
- **European Commission.** The Commission's 2025 study finds that "bottom-contacting mobile gear fishers ... often cannot operate in OWFs, even if partial access to restricted zones is granted", and that restricted access particularly affects mobile gear "who require large areas for manoeuvring" (Pal et al., 2025). At a 2022 workshop of the North Western Waters (NWWAC) and Pelagic Advisory Councils (PelAC), Cefas (Centre for Environment, Fisheries and Aquaculture Science) noted that some gears "could work in OWF (passive traps), but others not (e.g., active trawls)" (NWWAC and PelAC, 2022).
- **Irish Sea Nephrops experience.** In the eastern Irish Sea, "VMS data showed a decline in Nephrops trawling following the construction of Walney 2", and "The risks to trawling dissuaded or reduced the amount of trawling undertaken by the majority of Northern Irish skippers"; skippers cited snagging on cables and rock armour, the risk of collision after engine failure, and the cost of gear, rock armour being described as "a significant hazard to prawn nets, worth up to £20k" (Gray, Stromberg and Rodmell, 2016).

Figures 1 to 5 show where the array sits in relation to the fishery. Figure 1 shows the extent of the FU15 Nephrops grounds; the array area and the export cable route lie on their south-western part. Figure 2 shows Irish Nephrops landings from 2018 to 2022, from the Marine Institute's Atlas of Commercial Fisheries around Ireland: the array area lies on the western edge of the most heavily fished part of FU15, where landings reach about 1,500 kg per km² a year. Figure 3 shows Irish bottom otter trawl effort from 2014 to 2018: the most heavily fished ground lies immediately east of the array area and extends into it. Figure 4 shows the Nephrops burrow density estimated by the 2021 underwater television survey, with one of the two highest-density patches in FU15 lying immediately north of the array area. Figure 5 shows the tows recorded by a vessel fishing the ground from 2019 to 2023: in every year they run on the same NNW to SSE line through the length of the array area, continuing beyond it at both ends. The array is therefore placed on the core of the ground that the fleet works every year, not at its margin, and any loss of towing inside the array, during construction or in operation, falls on the most heavily used part of that ground.

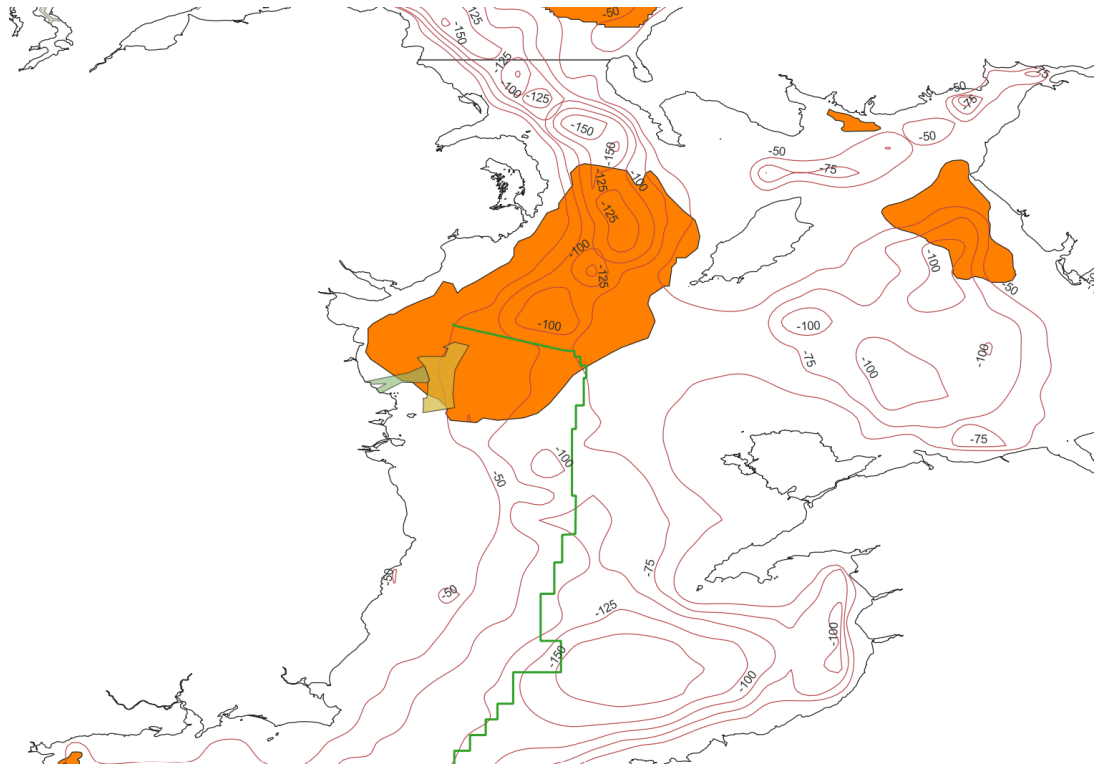


Figure 1: FU15 Nephrops grounds (orange) with depth contours (red lines), the Irish EEZ boundary (green line), the NISA array area (yellow) as shown in Marine Notice 69 of 2022 and the NISA cable route (light green) as shown in Marine Notice 63 of 2022

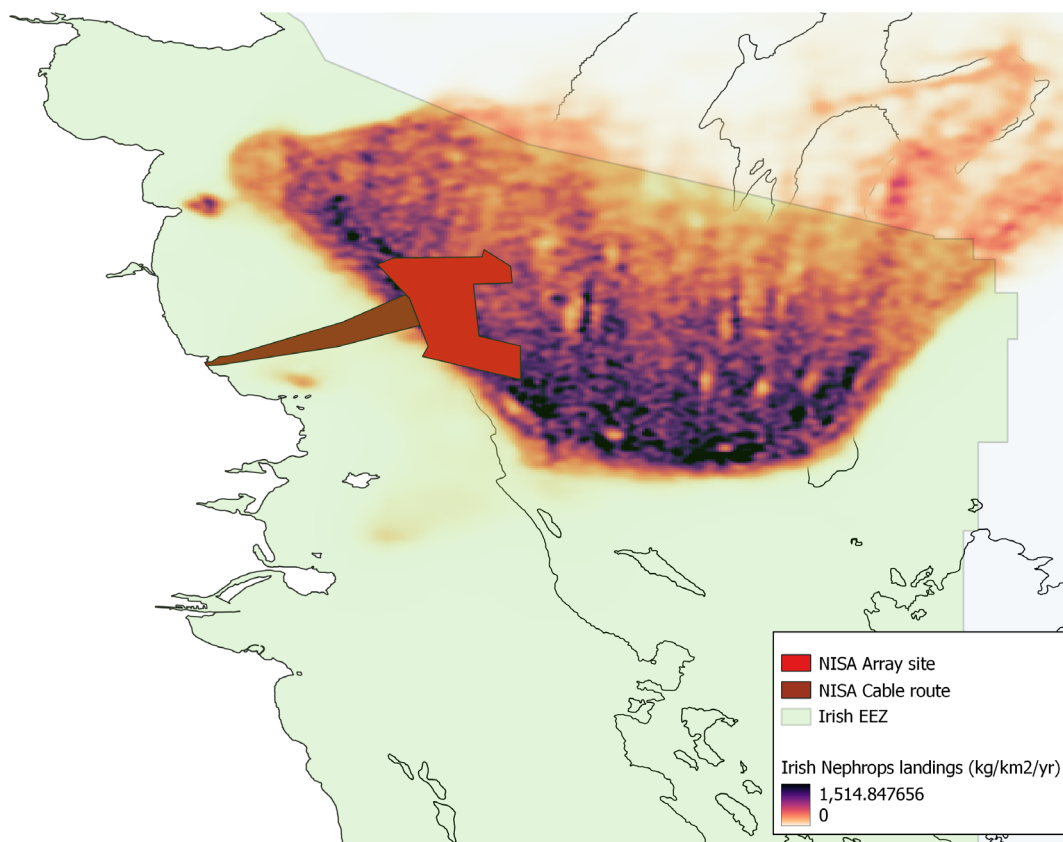


Figure 2: Irish Nephrops landings, 2018 to 2022 (kg per km² per year), with the NISA array site and cable route. Source: Marine Institute, Atlas of Commercial Fisheries around Ireland, 4th edition (2024)

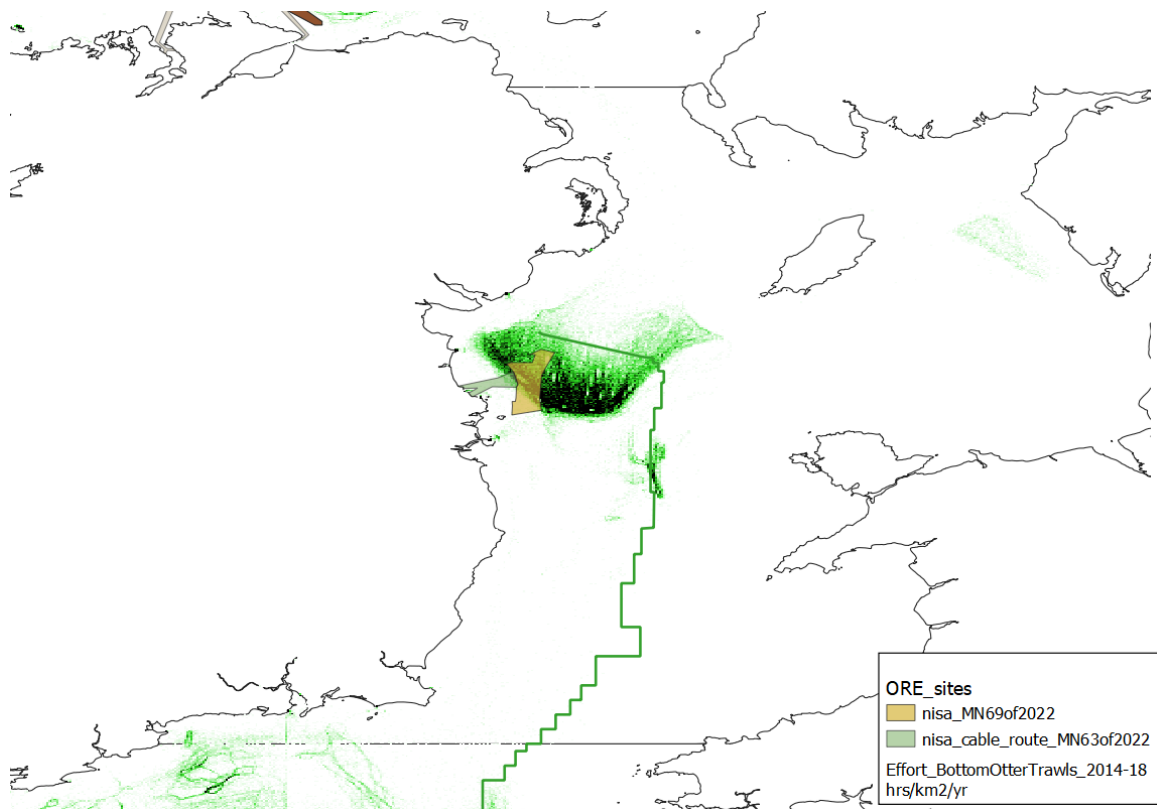


Figure 3: Irish bottom otter trawl effort, 2014 to 2018 (hours per km² per year), with the NISA array area and cable route

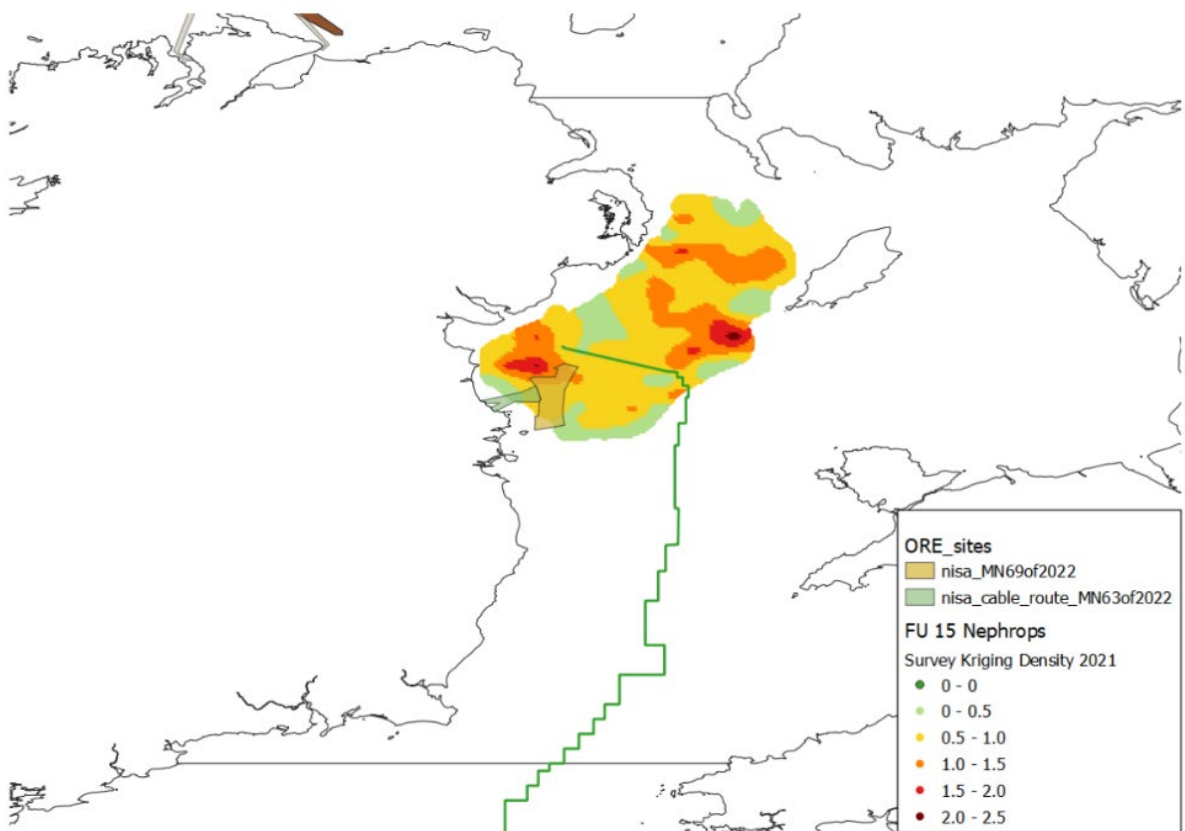


Figure 4: FU15 Nephrops density from the 2021 underwater television survey (kriged burrow density), with the NISA array area and cable route

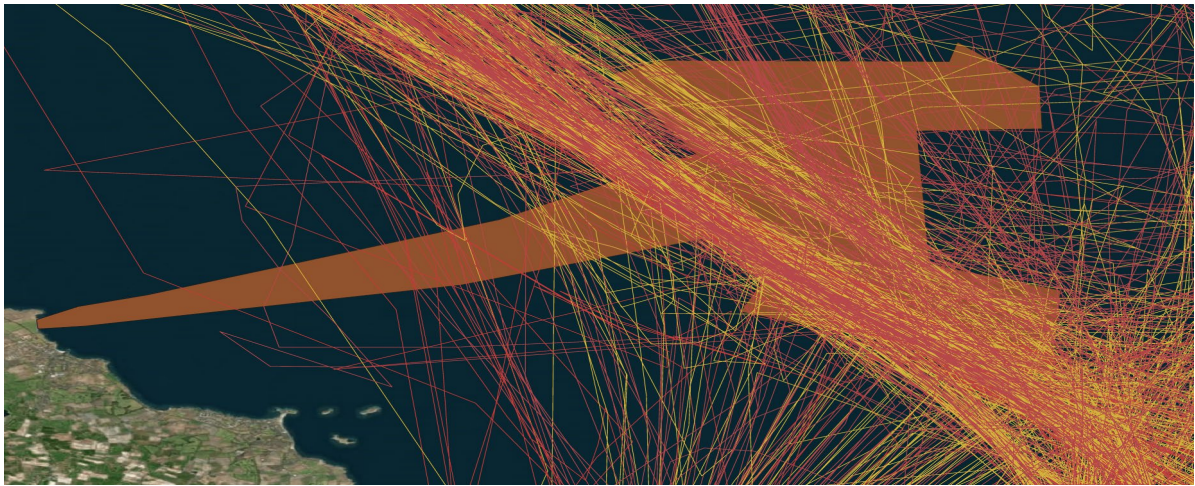


Figure 5: Recorded positions and tows of a vessel fishing the ground, 2019 to 2023 combined, across the NISA array area and export cable corridor (shaded)

On this evidence, the assumption in Chapter 16 that fishing will resume between the turbines, subject only to a 50m operating distance, cannot be relied on for the twin- and quad-rigged Nephrops fleet.

Submission No. 35 also showed that the array lies across the route the fleet uses to reach the surrounding Nephrops grounds. The Technical Coexistence Assessment is concerned with towing within the array; it does not assess the extra steaming and lost fishing time of working around it, which most vessels in the SIA's consultation put at two to four fishing days a month (Appendix 1, Step 2).

(7) Cumulative displacement has not been assessed (request item 12(b)).

Item 12(b) asked the Developer to consider, "in a holistic and integrated manner", the cumulative effects of displacement of fishing effort with the other Irish Sea Phase One projects. The revised cumulative assessment (Addendum to Chapter 16, Section 16.9.3) does not do so:

- **Sensitivity lowered.** The cumulative assessment judges the sensitivity of the Irish demersal otter trawl (Nephrops) fleet to be low "given the grounds targeted across the region", although the project-alone assessment scores it medium.
- **Circular reasoning.** Displacement is assessed on the basis that "if there is no reduction in access, then there will be no displacement", and that the magnitude of reduced access from the Tier 1 projects is low. The displacement caused by NISA itself, which the project-alone assessment scores "significant" during construction (Impact 3), is not carried into the cumulative assessment.
- **A cumulative effect smaller than the project alone.** The cumulative conclusion, "moderate to slight", is lower than the project-alone conclusion for the same receptor. A cumulative effect cannot be smaller than the effect of one of its components.
- **The receiving grounds.** No assessment is made of the capacity of the remaining FU15 grounds to absorb displaced effort, of competition with the Northern Irish fleet, which takes 75.6 per cent of FU15 landings (2024 Appendix 16.1, paragraph 58), or of the effect of displacement onto a stock now below its trigger point. The Advisory Councils' workshop recorded that displacement "could lead to the carry-over of fishing to other areas, thus intensifying fishing pressure in these areas" (NWWAC and PeIAC, 2022).

(8) The value of the fishery is not established.

The Developer's documents value the same fishery on inconsistent bases (Table 4).

Table 4: Inconsistencies in the Developer's value and area figures

Item	Developer's figure	Check
Nephrops price, Chapter 16 (2024), Section 16.3	€7,800 per tonne; 1,410 t worth €10.2 million	$1,410 \text{ t} \times €7,800 = €10,998,000$; $€10,200,000 \div 1,410 \text{ t} = €7,234.04$ per tonne
Nephrops price, Appendix 16.1 (2024), paragraphs 52 and 59	€3,900 per tonne	Half the Chapter 16 price
Value inside the array, Chapter 16, Impact 1	€1.55 million a year	Not derived; equals 198.72 t at €7,800 or 397.44 t at €3,900
Nephrops ground	1,500 km ² (Chapter 16, 2024); 1,354.7 km ² (Response to Submissions, Section 5.6)	Array share 5.90% or 6.53%
Seabed disturbed in the array, Option 1	4,465,913 m ² , "5.4%" (Response to Submissions, Section 5.6); 4,765,913 m ² (Addendum Table A16.4)	$4,465,913 \div 88,500,000 = 5.05\%$; $4,765,913 \div 88,500,000 = 5.39\%$

Source: the Developer's documents as cited. Calculations by Seaview Marine.

Appendix A16.1 (2026, paragraphs 24 and 25) reports Nephrops landings by Irish vessels in 2024 of approximately 8,500 t, worth approximately €66 million. On those approximate figures, $€66,000,000 \div 8,500 \text{ t} = €7,764.71$ per tonne, close to the Chapter 16 price and approximately twice the Appendix 16.1 price. Since the magnitude of the effect, and any disturbance payment, depend on the value at stake, the SIA asks that the value of the fishery inside the array be recalculated transparently from current data.

The SIA's consultation provides an independent check. The thirteen vessels that replied take between €2.9 million and €8.1 million a year from inside the array, with a central estimate of €5.2 million. Applying their share of landings from inside the array (43 per cent) to the STECF landings of Irish demersal trawlers in the Irish Sea puts the figure for the Irish fleet at €5.2 million to €5.6 million a year. The Developer's €1.55 million implies that only 12 per cent of those landings come from inside the array (Appendix 1, Table A1.1).

(9) No socioeconomic assessment has been made of the fleet, its crews or its ports.

NMPF Fisheries Policy 2 provides that an FMMS should contain "an assessment of the potential impact of all stages of the development ... on the affected fishery or fisheries, both in socio-economic terms and in relation to environmental sustainability", including "any impact upon cultural identity within fishing communities". The FMMS contains no such assessment, and the Addendum to Chapter 33 refers to fishing only as part of the "fishing village identity" of Howth. The dependence of the two ports on the fishery is substantial.

- **Clogherhead.** In 2023 the seafood sector at Clogherhead turned over €58.7 million, of which €25.8 million

came from commercial fishing (32 operators), and supported 295 direct jobs and 550 jobs across the Mid East region, with a total gross value added of €42.5 million; 85 per cent of sales were exported, and stakeholders identified offshore renewable energy as a threat to access to fishing grounds (BIM, 2025a). The majority of the landings from the affected grounds by the vessels the SIA represents pass through Clogherhead.

- **Howth.** In 2023 commercial fishing at Howth turned over €10.3 million, a fall of 65.5 per cent in real terms since 2018, with the number of fishing operators halved; fish processing turned over €153.0 million and employed 505 people, and stakeholders identified offshore renewable energy developments as "a major concern" (BIM, 2025b).

A loss of access to the Nephrops grounds is transmitted from the vessel to its crew, whose earnings are a share of the catch, and from the vessel to the processors and service businesses of the port. None of these pathways is assessed. The SIA's own assessment has begun to measure them. Following the loss through each stage for the thirteen vessels that have replied gives the results in Table 5.

Table 5: The loss to the Nephrops fleet, followed from the array to the households (thirteen vessels)

Stage	€ million a year (low, central, high)	What it shows
Value taken from inside the array	2.9, 5.2, 8.1	More than the Developer's €1.55 million for all Irish trawlers, even at the bottom of the range
Direct loss, after moving gear and the cost of moving	1.4, 2.7, 4.8	Most could make up €50 to €74 of every €100 elsewhere, at an extra cost of €10,000 or more a month
Loss of income to Clogherhead and Howth	1.7, 3.4, 6.6	For every €1 the boats lose, local suppliers and household spending lose a further 18 to 38 cents
Loss of income over a 30-year exclusion, present value	29, 59, 114	The built array removes the ground for its whole life; the loss does not end with construction
Welfare loss to the households that carry it	3.7 to 5.5 (central)	Larger than the loss of income in every scenario tested

Source: SIA consultation of thirteen vessels, October 2026; STECF Annual Economic Report landings data; BIM economic impact studies of Clogherhead and Howth (BIM, 2025a, 2025b). Calculations by Seaview Marine, set out in Appendix 1.

Three findings stand out. First, thirteen vessels alone take more from inside the array than the Developer attributes to the whole Irish fleet. Second, the loss is not confined to construction: the built array removes the ground for the life of the development, and twelve of the thirteen vessels could not tow inside it. Third, the loss falls on households that cannot absorb it. Nine of the ten owners who answered said that a typical crew household could cover none of a month's loss, and that their household could manage for less than a month before cutting essentials. Crew are paid a share of the catch, and a crew family living on one fishing wage is below the at-risk-of-poverty line, so each euro it loses costs it more than a euro in welfare. The welfare loss is therefore larger than the loss of income, which a statement of landed value alone cannot show.

The Commission's 2025 study recommends "integrating socio-economic assessments into Strategic Environmental Assessments (SEAs) and Environmental Impact Assessments (EIAs)", and records that "fishers struggle to provide concrete, quantifiable evidence" linking offshore wind to lower incomes (Pal et al., 2025). As the Developer holds the spatial and earnings analysis on which any such link depends, the SIA considers that the burden of quantifying the loss rests with the Developer.

(10) The FMMS has not been agreed with the fishing industry.

NMPF Fisheries Policy 2 provides that, where it does not prove possible to agree the FMMS with all interests, "Divergent views and the reasons for any divergence of views between the parties should be fully explained in the FMMS, and dissenting views should be given a platform within the said FMMS to make their case." The FMMS quotes this requirement (Appendix A) but records no divergent views. The consultation record shows that the FMMS was circulated on 25 February 2026, discussed on 12 March 2026, and recirculated on 2 April 2026 (FMMS, Table A6.2); it does not show agreement by any member of the SIA. The FMMS also records "in excess of 1,000 individual engagements" with fishers, while the Response to Submissions Report (Section 5.6.3.6.1) records "in excess of 2,000". The number of engagements is not a measure of their quality.

The experience of the SIA members of the consultation on the FMMS explains why it records neither agreement nor divergent views.

- **One-way briefing.** Consultation consisted of the Developer describing its intention to proceed and the projected timeline from planning to construction, with little or no consideration of the fishing industry's concerns.
- **Sporadic engagement.** Engagement with the IS&EFPO and the IFPO has been intermittent, and the quality of consultation has been poor as a result. On 10 October 2023, when the Developer gave notice of a new geotechnical survey campaign, the IFPO replied that "it has been some time since we had contact".
- **No defined process.** Meetings with industry representatives through the Producer Organisation channel have been arranged ad hoc, with no agreed protocol. The IS&EFPO and IFPO minutes of the meeting of 19 May 2023 record that all present agreed that the communication guidelines published by DECC and agreed between seafood and ORE representatives at working group level would in future be adhered to in full.
- **No agreed record.** Minutes of the meetings were drafted by the Developer's fisheries liaison contractor, who described those of 19 May 2023 as "the minutes I recorded on the day". On 7 June 2023 the IS&EFPO and the IFPO replied with their own expanded minutes of that meeting, as "an accurate and balanced record of the meeting", and in April 2024 they prepared expanded minutes of the meeting of 15 March 2024. There is no record that any version was agreed between the parties. Their minutes of May 2023 record, among other things, that the Developer's representative did not have a clear mandate to put a compensation proposal to the meeting.
- **Limited influence.** These shortcomings, and the limited influence of the views of the IS&EFPO and the IFPO, have left the seafood representatives with the view that the process did not distinguish genuine consultation from ratification.
- **No feedback.** Processes have been repeated without feedback or follow-up on the proposals of the IS&EFPO

and the IFPO, and with no visible change in outcomes. This has undermined the credibility of the engagement. The Developer's own minutes of the meeting of 19 May 2023 record an offer to engage on a proposal within three weeks, and the attendees' view that stakeholder engagement was "nothing more than a tick box exercise". On 22 August 2023, after meetings on 19 May and 15 June 2023, the IFPO asked when "the promised detailed substantive proposal" would be made available. The Developer replied that the planning application had been put back to 2024 and that the document was in draft. At the meeting of 15 March 2024, the FMMS was described as still under review. At the meeting of 8 November 2024, by the contractor's own minutes, the IFPO pointed out that "the FMMS currently in place is there without input from the Fishing industry", and the IS&EFPO asked for a framework for dealing with direct impacts, and a baseline, before the SFC was launched.

- **Short notice and incomplete participation.** The meeting of 26 July 2024 was confirmed by email on the evening of 24 July 2024, less than 48 hours beforehand. On 26 July 2024 the IFPEA wrote to the Developer and its fisheries liaison contractor asking that it be recorded that "we were not facilitated in any NISA consultation to date" and described 48 hours' notice as "not fair or reasonable". The processors who depend on the fishery were not part of the consultation.

A consultation conducted in this way provides neither the agreement nor the full explanation of divergent views that Fisheries Policy 2 requires, and the FMMS should not be read as agreed by the fishing industry.

(11) An FMMS cannot be completed without a socio-economic impact assessment.

NMPF Fisheries Policy 2 requires an FMMS "where significant impact upon fishing activity arising from any proposal is identified", as it is here. The first element of an FMMS listed in the policy is "an assessment of the potential impact of all stages of the development or other suggested use on the affected fishery or fisheries, both in socio-economic terms and in relation to environmental sustainability". The policy adds that this assessment "should include consideration of any impact upon cultural identity within fishing communities, as well as identifying indirect / in-combination matters" (NMPF, p. 137).

The other elements of the policy depend on that assessment:

- **Mitigation measures.** "Reasonable measures to mitigate ... any socio-economic impacts" cannot be designed, or shown to be reasonable, until those impacts have been identified and measured.
- **Public benefit.** "Demonstration of the public benefit(s) that outweigh the significant impacts identified" requires the impacts to be quantified on the same footing as the benefits.
- **Divergent views.** Where agreement is not reached, the policy requires the divergent views to be recorded in the FMMS (NMPF, p. 138). Those are views about impacts and mitigation. Without an assessment of the impacts, there is nothing on which agreement can be sought or divergence recorded.
- **Timing.** The FMMS "should be drawn up as part of readying a proposal prior to submission, with measures identified to be considered in finalising conditions of any authorisations granted". A socio-economic assessment deferred until after consent cannot inform those conditions.

The policy says an FMMS "could include" these elements, and that its content "should be relevant to the particular circumstances". The SIA accepts this. In this case, however, the Developer's own assessment identifies the Irish

Nephrops trawl fleet as the receptor most affected, with an effect assessed as very significant before mitigation. In these circumstances a socio-economic assessment is the most relevant element of all. The FMMS reproduces Fisheries Policy 2 in its Appendix A but contains no such assessment (Section 3.9).

The SIA therefore submits that the document before the Commission is not yet a Fisheries Management and Mitigation Strategy within the meaning of the NMPF. It cannot be completed until the effects on the fleet, its crews, the processors and the ports have been assessed. Fisheries Policy 2 also asks fishing interests to "provide best available, transparent and accurate information and data in a timely manner". The SIA offers its own assessment (Section 1.3 and Appendix 1) on that basis.

(12) The residual significance conclusion takes the proposal outside the NMPF tests that would otherwise apply.

The significance given to the residual effect decides which NMPF tests apply.

- **Fisheries Policy 1.** Proposals with significant adverse impacts on access must avoid, minimise or mitigate them. "If it is not possible to mitigate significant adverse impacts on fishing activity, the public benefits for proceeding with the proposal that outweigh the significant adverse impacts on existing fishing activity must be demonstrated" (NMPF, p. 137).
- **Co-existence Policy 1.** Where significant adverse impacts, including displacement, cannot be mitigated, "proposals should set out the reasons for proceeding" (NMPF, p. 80).

The Developer's assessment reduces the residual effect on the Irish Nephrops trawl fleet from "very significant" to "moderate to slight". Chapter 16 defines this as not significant in EIA terms (Section 16.2.6.3). The effect of that conclusion is to remove the proposal from the public benefit test in Fisheries Policy 1(d) and from the requirement in Co-existence Policy 1(c).

As Section 3.4 shows, the reduction:

- is made without re-scoring sensitivity or magnitude.
- arrives at a category that is not in the Developer's own matrix.
- rests on mitigation that the Developer accepts has still to be implemented.
- is not tested against any economic criterion.

The cumulative assessment has the same consequence. It lowers the sensitivity of the fleet from medium to low and reaches a cumulative effect smaller than the project-alone effect (Section 3.7).

A conclusion with that consequence must be shown on evidence, and it has not been. The SIA asks the Commission to treat the effects on the fleet as significant until the Developer shows otherwise by assessment. The Commission should then require the demonstration of public benefit that Fisheries Policy 1(d) sets out.

4 Requests to the Commission

The SIA asks the Commission:

1. **Oral hearing.** To hold an oral hearing on commercial fisheries, at which the SIA may present the full results of its socio-economic assessment, the first of which are set out in Appendix 1, and the 2027 ICES advice for FU15.
2. **Significance.** To find that the effects of the proposed development on the Irish Nephrops trawl fleet remain significant after mitigation, and that NMPF Fisheries Policy 1 therefore requires the public benefits of the proposal to be demonstrated to outweigh them.

Should the Commission be minded to grant approval, the SIA asks that conditions be attached requiring the following.

1. **An agreed FMMS before commencement.** A final FMMS, prepared with the SIA and recording any divergent views as Fisheries Policy 2 requires, to be submitted for written agreement before any offshore works commence, and incorporating the independent socio-economic impact assessment required by Condition 6.
2. **A published payment method.** The method and formula for disturbance payments, and the data on which they rest, to be published and agreed with the SIA before construction, using a standardised method based on concrete evidence of time at sea and revenue, with all relevant parties involved in its design (Pal et al., 2025).
3. **Payment for operational loss.** A mechanism to compensate vessels for loss of access during operation, triggered where monitoring shows that fishing has not resumed within the array.
4. **Trawl trials before construction.** Trawling trials in the proposed corridors with twin- and quad-rigged Nephrops trawlers, in representative tidal conditions, with the final layout and the absence of rock armour within corridors to be agreed in the light of the results.
5. **Monitoring of the affected fleet.** Monitoring of fishing activity and catch rates covering vessels over 12 m, with before-and-after comparison and independent review of the results, designed on a Before-After-Control-Impact basis, as recommended in the Department's guidance (DCCAE, 2018).
6. **An independent socio-economic assessment.** An independent assessment of the effects on vessels, crews, processors and ports, updated before construction, to inform the payment mechanism, with terms of reference agreed with the SIA, an assessor nominated jointly, independent peer review, and an update at each phase of the project.
7. **Independent dispute resolution.** Claims not resolved by agreement to be referred to the Seafood/ORE Working Group Dispute Resolution Mechanism or to an independent arbiter.
8. **Over-trawl surveys and cable protection.** Over-trawl surveys of all cables and protection within the array and corridors after installation, with results shared with the SIA, and no rock protection within designated trawl corridors.

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Appendix 1

The socio-economic impact on the Irish Sea Nephrops fleet

1. The consultation

The Seafood Ireland Alliance asked the Nephrops trawlers that work the North Irish Sea Array ground to describe, in their own terms, how the survey works, the construction and the built array would affect them. Each owner completed an online form for each vessel. The returns went directly to Seaview Marine as independent assessor and were not seen by the Developer.

The form follows the loss from the ground to the household. It asks how much of each vessel's fishing comes from inside the array, and in which months. It asks how much could be made up elsewhere, at what cost, and what happens to the grounds that displaced boats move onto. It asks who buys the catch and where the vessel's money is spent. It asks how long the owner's and the crew's households could cope with a lost month. Finally, it asks owners to rate 53 specific effects of the works, from 1 (hardly at all) to 5 (could force me out of the fishery).

Thirteen vessels have replied so far, two under 18 metres and eleven of 18 metres and over, landing mainly into Clogherhead and Howth. All are Nephrops trawlers, and together they land between €9.6 million and €14.8 million a year. The results are reported here in aggregate only, so that no vessel or owner can be identified.

2. How the loss is followed

A value-at-risk figure tells us how big the shock is. It does not tell us who bears it, or whether they can withstand it. This Appendix therefore follows the loss along a chain of four estimates (Figure A1.1). It combines the IPCC framework of hazard, exposure and vulnerability, Hallegatte's (2014) measures of resilience, and Holling's (1973) distinction between a system that recovers and one that is pushed across a threshold.

- **Threatened loss:** the landed value in the path of the works, before anyone responds.
- **Direct loss:** what is left once skippers have moved their gear and fished elsewhere, plus what that costs them.
- **Loss of income:** the direct loss as it spreads through the port, to buyers, suppliers and local spending, and over the years it lasts.
- **Welfare loss:** what the loss of income means to the households that carry it, given what they can absorb.

Each estimate corresponds to a stage of the source, pathway and receptor sequence used in environmental impact assessment. The welfare loss is the measure of significance. At each step the official data (STECF Annual Economic Report, fleet register, sales notes, BIM Port Reports, CSO and Green Book) give the structure, and the fleet's own answers give the vessel-level detail.

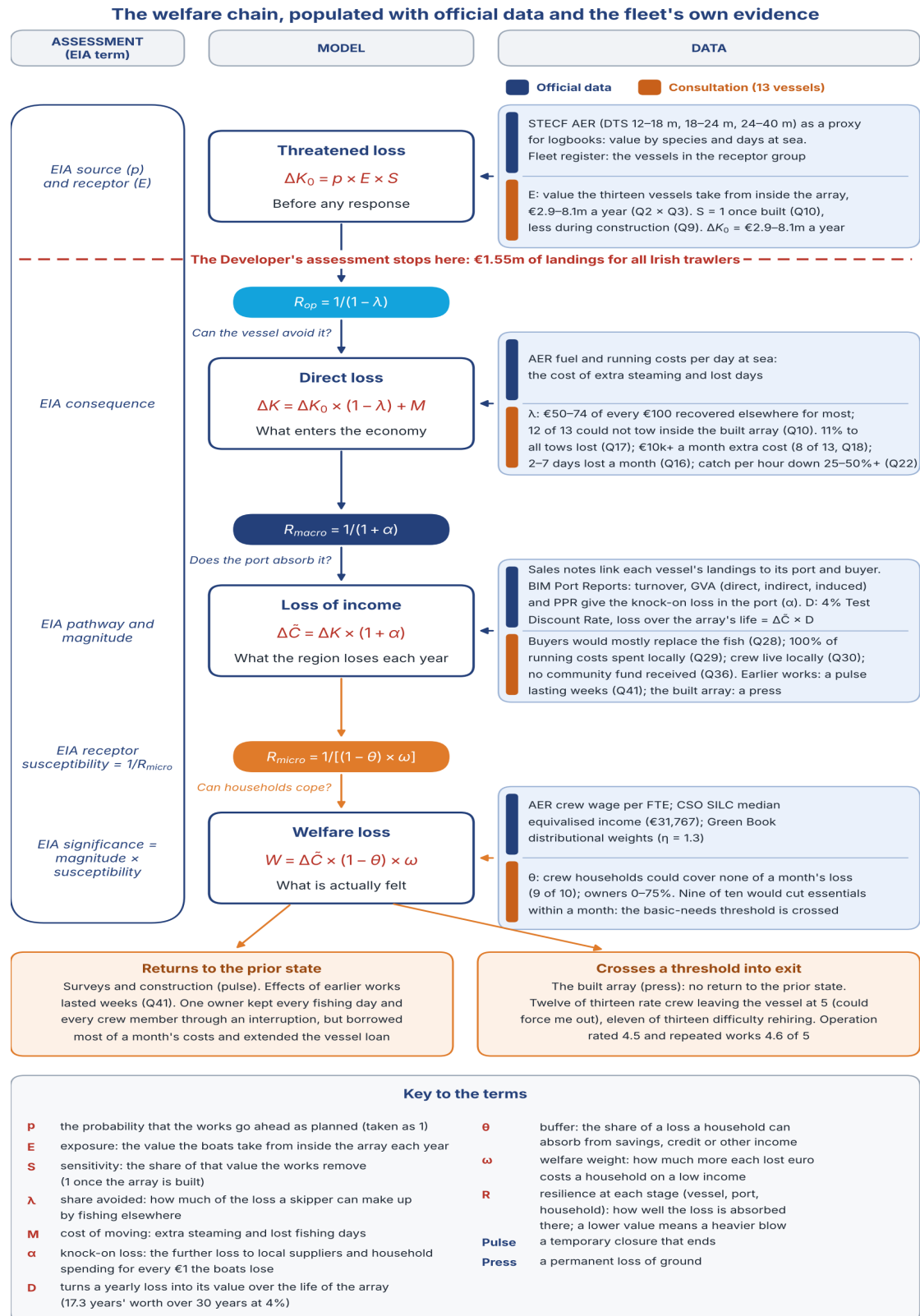


Figure A1.1 The welfare chain, populated with official data and the fleet's own evidence. The red line marks where the Developer's assessment stops.¹

¹ In the resilience literature these two outcomes are called engineering resilience, Reng, the speed with which a system returns to its prior state, and ecological resilience, Reco, the size of shock a system can absorb before it crosses a threshold into a different state (Holling, 1973).

3. Results

Step 1: Threatened loss

How much of their fishing sits inside the array? Ten of the thirteen vessels take between 26% and 50% of their landings by value from inside the array area, and the other three between 51% and 75%. For twelve of them, Nephrops makes up 76% to 99% of the value taken there. Applied to their landings, that puts between €2.9 million and €8.1 million a year in the path of the works (Figures A1.2 and A1.3). This is their exposure, E: the value the boats take from inside the array. The Developer's estimate, €1.55 million, is for all Irish trawlers together. Thirteen vessels alone exceed it at the bottom of their range, and by more than five times at the top.

$$\text{Threatened loss } \Delta K_0 = p \times E \times S$$

E (value taken from inside the array) = €2.9–8.1m a year; S = 1.0 once the array is built

$$\Delta K_0 = \text{€2.9–8.1m a year}$$

How much of that value does the array remove? That is the sensitivity, S. Once the turbines are in, twelve of the thirteen could not tow inside the array at all, so the whole of E is removed and S is 1. During construction S is lower: eleven of the thirteen could keep towing the parts of the array not being worked, so S then depends on how much of the array is closed at any one time.

How much of each boat's income comes from inside the array is a separate question: its dependence. For these vessels it is 26% to 75%. Dependence does not change the size of the loss. It governs how hard the loss hits the boat and the households behind it, and it is taken up in step 4.

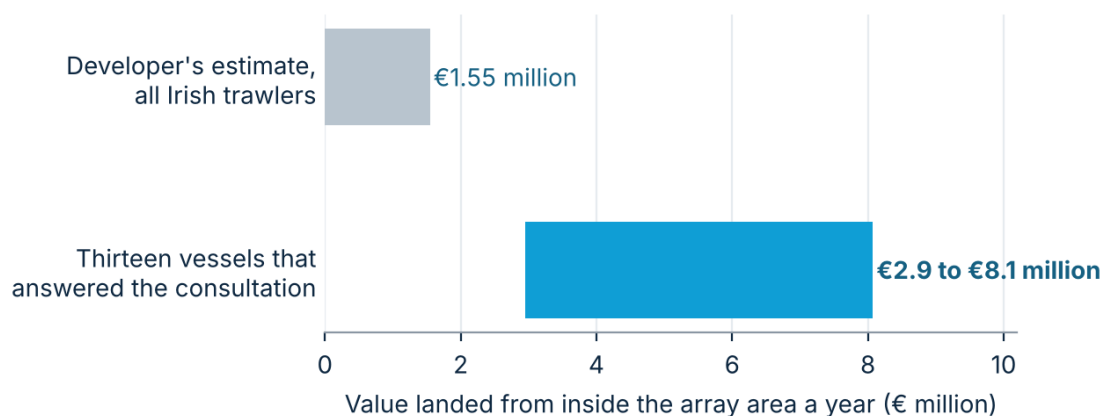


Figure A1.2 Value landed from inside the array area each year: the thirteen vessels that replied, against the Developer's estimate for all Irish trawlers.

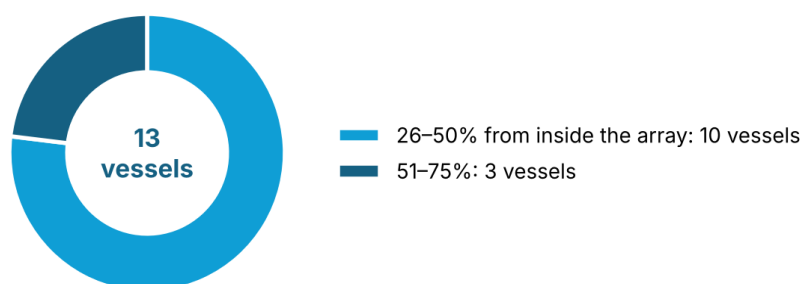


Figure A1.3 Share of each vessel's landings that comes from inside the array (all thirteen vessels).

How does that compare with the official record? The STECF landings data, used here in place of logbooks, show that Irish demersal trawlers of 12 to 40 metres landed an average of €12.1 million a year from the Irish Sea (ICES Division 7.a) between 2013 and 2024, and €13.0 million in 2022 to 2024 (Figure A1.4). Nephrops made up between 57% and 80% of that value, and more than 70% in each of the last three years. The Developer's €1.55 million is about 12% of recent landings. The thirteen vessels that replied take between €2.9 million and €8.1 million a year from the array alone, between 23% and 62% of everything Irish demersal trawlers land from the Irish Sea.

Two estimates of E compared. The survey gives two independent routes to the thirteen vessels' exposure, and they agree. Annual landings multiplied by the share from inside the array gives a central estimate of €5.2 million. Peak and off-peak monthly landings multiplied by the monthly share from inside, over the months each vessel fishes there, gives about €5.5 million. Together the thirteen vessels land about €12.2 million a year, so on average 43% of their value comes from inside the array.

Table A1.1 Exposure E estimated from the survey and from the STECF landings

Method	Basis	E, € million a year
Survey, annual route	Q2 landings × Q3 share from inside the array, thirteen vessels	5.2 (range 2.9 to 8.1)
Survey, monthly route	Q5 monthly landings × Q6 monthly share, over the months fished (Q4)	5.5
STECF × survey share	Irish demersal trawl landings from the Irish Sea × 43%	5.2 (2013–24) to 5.6 (2022–24)
STECF × Developer's implied share	Irish Sea landings × 12%	1.44 to 1.55

For the fleet as a whole, E is the Irish Sea landing value multiplied by the share that comes from inside the array (Table A1.1). Applying the thirteen vessels' 43% to the STECF landings gives €5.2 million (2013 to 2024) to €5.6 million (2022 to 2024). This is an upper bound since vessels that did not reply are likely to depend less on the array. The thirteen vessels' own landings are more than nine tenths of everything Irish demersal trawlers land from the Irish Sea, so their own central estimate of €5.2 million already sits at the bottom of the fleet figure. The two methods fit together. The Developer's €1.55 million fits neither: it implies that only 12% of Irish Sea landings come from inside the array.

The share from inside the array will also be estimated from the spatial distribution of Irish Nephrops landings, as an

independent check on the 43%. Haul-level logbook and VMS records would narrow the range further, and the owners who replied have consented to their release. The same data show why segment averages are not enough to judge dependence: on average the Irish Sea provides 11% to 22% of a segment's earnings, while the vessels that replied take 26% to 75% of theirs from the array alone.

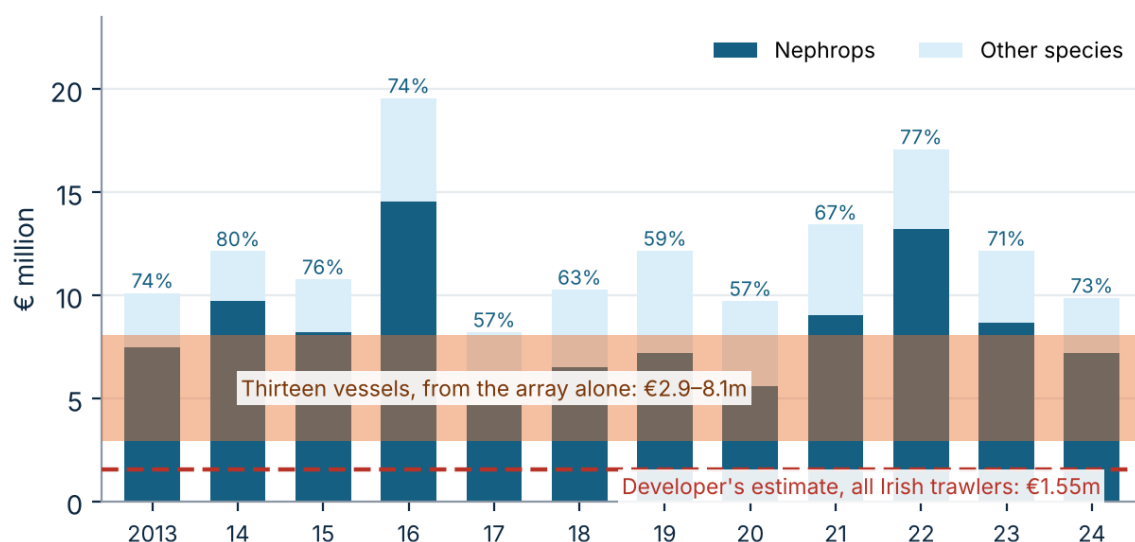


Figure A1.4 Irish demersal trawl (12 to 40 m) landings from the Irish Sea, 2013 to 2024, with the Nephrops share of value, against the thirteen vessels' value from inside the array and the Developer's estimate. Source: STECF Annual Economic Report landings data.

When does it matter most? Eleven of the thirteen fish the array from April to July, and all thirteen fish it in June. Those are also their peak months (Figure A1.5). The works and any closures fall in the best part of their year, not the margins of it.

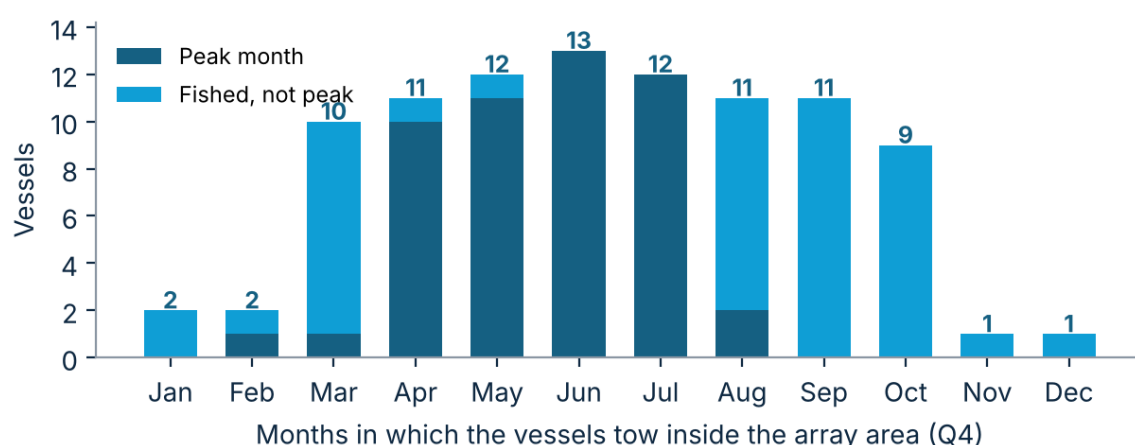


Figure A1.5 Months in which the vessels tow inside the array area, and their peak months.

What this tells us

Thirteen vessels alone have between €2.9 million and €8.1 million a year at stake inside the array, concentrated in their best months. The Developer's figure for the whole Irish trawl fleet is below the bottom of that range.



Figure A1.6 Running estimate, step 1: threatened loss against the Developer's estimate.

Step 2: Direct loss

How much can they avoid? Skippers will not simply stop fishing; they will move. The question is how far moving saves them. During construction, eleven vessels could partly keep towing the parts of the array not being worked and two could not. Once the turbines are in, twelve of the thirteen could not tow inside the array. None could make up the lost fishing at other times of the year (Figure A1.7).

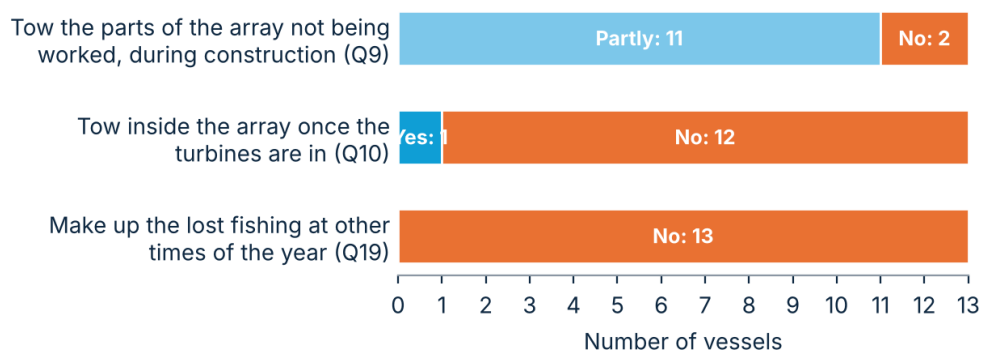


Figure A1.7 Could the vessels keep fishing?

Nine of the thirteen expect to make up €50 to €74 of every €100 they now take inside the array, two €75 to €99, and one less than €25; the thirteenth did not know (Figure A1.8). Between a tenth and all of the tows now made inside the array would be lost outright rather than moved (Figure A1.9).

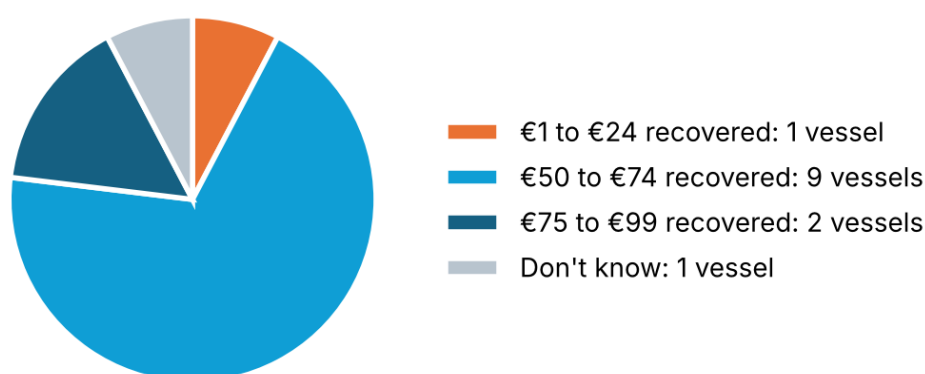


Figure A1.8 Of every €100 now taken inside the array, how much could be made up elsewhere?

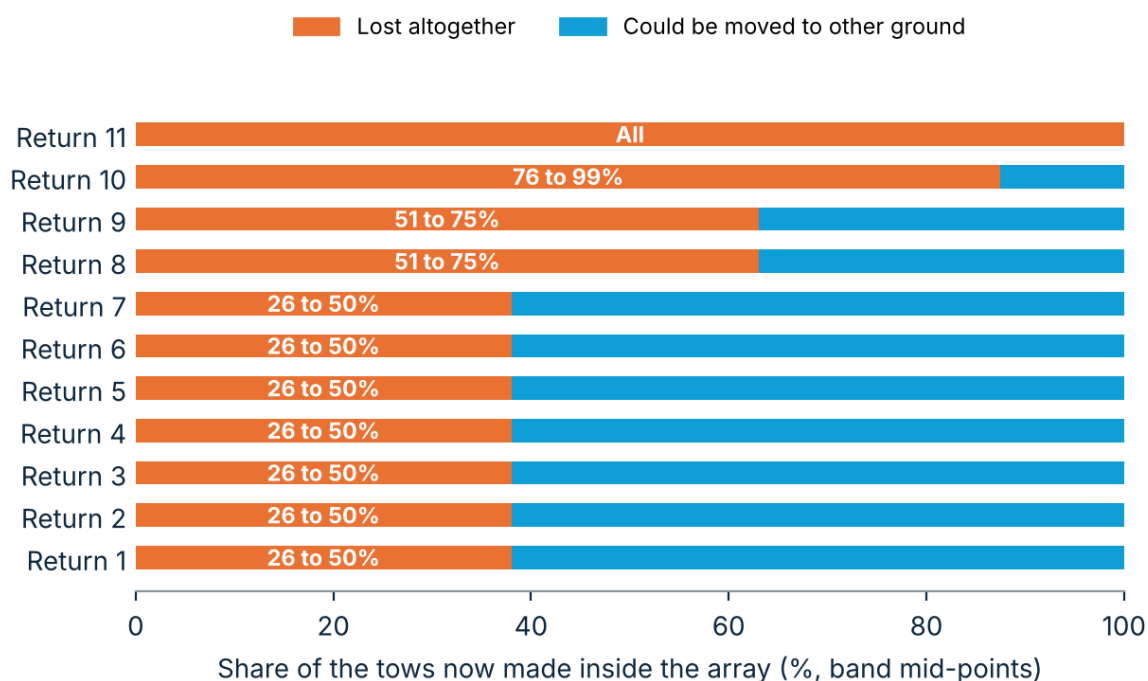


Figure A1.9 Share of the tows inside the array that could be moved, and the share lost altogether (individual returns, unnamed).

And at what cost? Moving is not free. Eight of the thirteen put the extra cost of steaming to and working other ground at €10,000 or more a month, and four at €5,000 to €10,000, and most would lose two to four fishing days a month to extra steaming and safety zones. The ground they move to would not fish as well: twelve expect a lower catch per hour there. Twelve expect more than ten extra boats on their alternative ground once the array is built, and all thirteen expect their own catch per hour to fall by 25% to 50% or more as a result (Figure A1.10). Displacement does not remove the loss; it spreads it onto the boats already fishing those grounds.

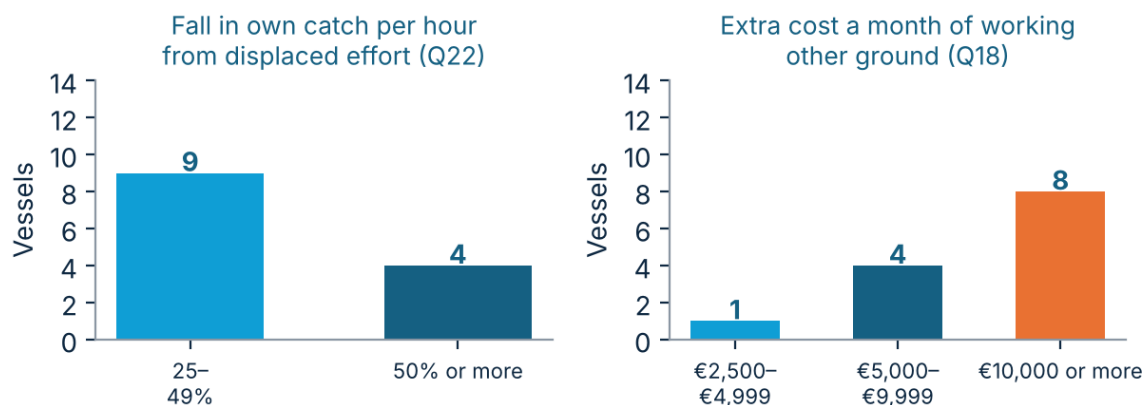


Figure A1.10 Fall in catch per hour from displaced effort, and extra monthly cost of working other ground.

$$\text{Direct loss } \Delta K = \Delta K_0 \times (1 - \lambda) + \text{cost of moving}$$

λ (share avoided) = 0.50–0.74 for most vessels, 0.75–0.99 for two, 0.01–0.24 for one.

extra cost $\geq$ €0.8m a year

$\Delta K =$ €1.4–4.8m a year

What this tells us

Moving gear saves at most about half of the threatened loss, and much of that saving is spent on extra steaming. Between €1.4 million and €4.8 million a year still enters the economy as a direct loss, from thirteen vessels alone.

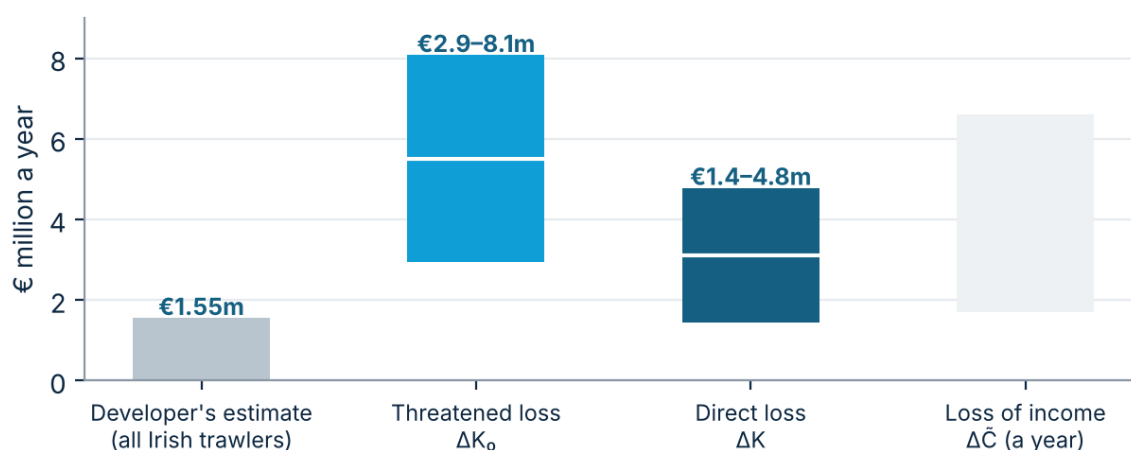


Figure A1.11 Running estimate, step 2: direct loss.

Step 3: Loss of income

How far does it spread through the port? The direct loss travels outward along three channels (Figure A1.12). Processing is the weakest of them here. Ten vessels sell all their catch to an agent or exporter, two to a local

processor and one to both, and in eleven cases of thirteen the buyer would replace the fish from elsewhere. Ancillary trade is stronger. Twelve of the thirteen spend all of their running costs locally, on fuel, ice, repairs, net making and chandlery, and the suppliers of a demersal fleet (net lofts, marine engineers) have few other customers to fall back on. Household spending is the third channel. Eleven of the thirteen have crew households living near the landing port, so lost crew income is lost local spending. Together these make up the knock-on loss: what the local economy loses, on top of the boats' own loss, for every €1 the boats lose.

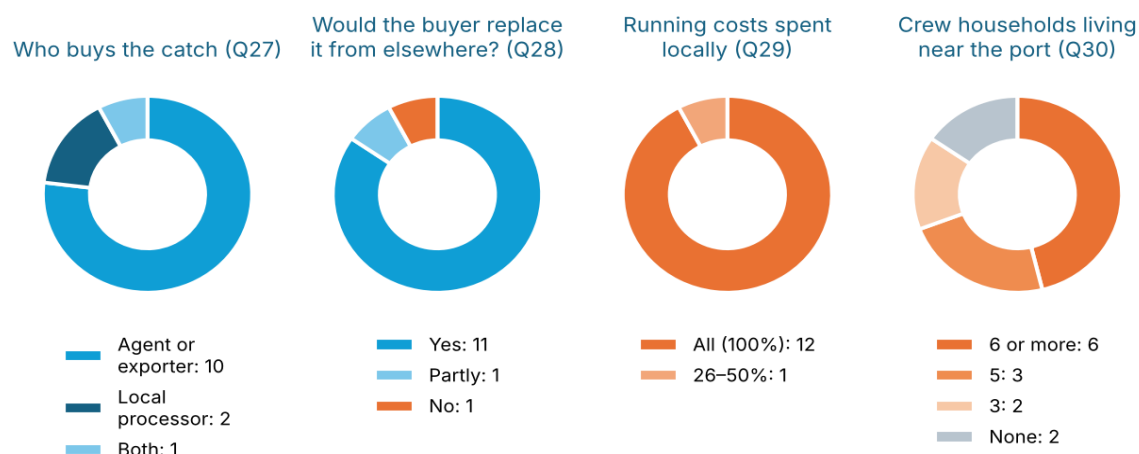


Figure A1.12 The port and community channels: who buys the catch, whether buyers could replace it, where running costs are spent, and where crew households live.

What do the port's own figures say? The BIM economic impact studies of Clogherhead and Howth (2023) allow each channel to be measured for the two ports where this fleet lands (Figure A1.13). For every euro of commercial fishing turnover, the regional supply chain gains €0.24 of value added at Clogherhead and €0.27 at Howth, and household spending a further €0.085 and €0.107. The two ports differ sharply in processing. Clogherhead's processors handle about 1.3 times the port's fishing turnover and depend on local landings. Howth's handle about fifteen times and already buy almost all their raw material from elsewhere, so a local loss largely passes them by.

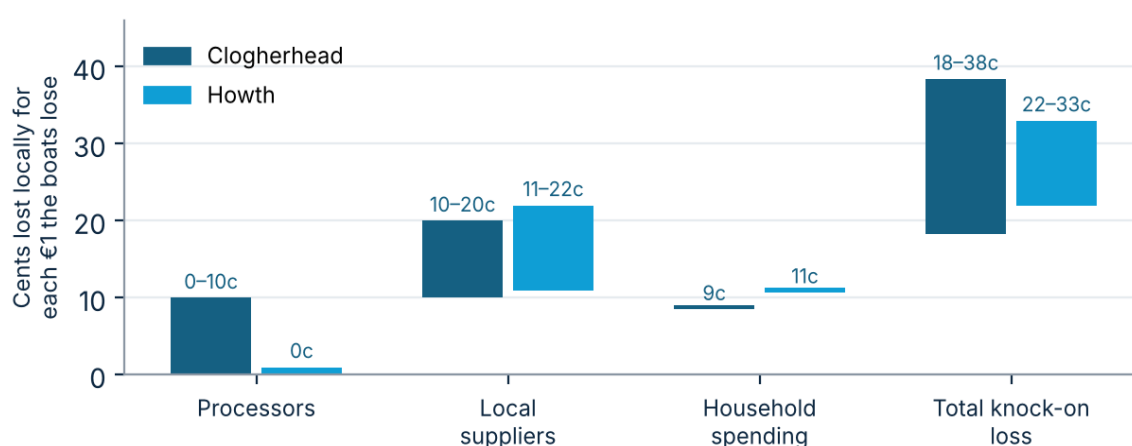


Figure A1.13 The knock-on loss: how many cents the local economy loses, by channel, for every €1 the boats lose. In total it is 18 to 38 cents at Clogherhead and 22 to 33 cents at Howth. Ranges reflect how much of their trade suppliers can keep with other customers (20% to 60%). Source: BIM economic impact of the seafood sector, Clogherhead and Howth, 2023.

No compensation scheme yet offsets any of this. No vessel has received anything from the Sustainable Fisheries

Community fund, and one was not aware of it. Owners expect a payment for a lost month, but none has been agreed.

How long does it last? This is the decisive term. A survey closure or a season of construction is a pulse: the ground reopens and the loss stops. The built array is a press: it removes the ground for the life of the development, and nothing on the resource side brings it back. Discounted at the 4% Test Discount Rate, a two-month closure counts as 0.17 of a year's loss, while a 30-year exclusion counts as 17.3 years' loss (Figure A1.14).

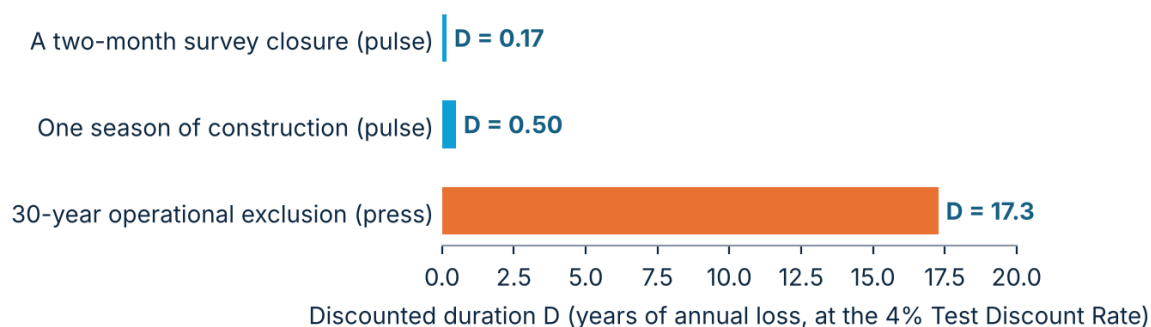


Figure A1.14 Discounted duration of the loss: survey and construction pulses against the operational press.

$$\text{Loss of income } \Delta \tilde{C} = \Delta K \times (1 + \alpha) \times D$$

α (knock-on loss in the port): a further 18 to 38 cents for every €1 the boats lose is lost at Clogherhead, and 22 to 33 cents at Howth

$\Delta \tilde{C} = \text{€}1.7\text{--}6.6\text{m a year}$; over a 30-year exclusion ($D = 17.3$) about €29–114m in present value

What this tells us

The port adds between a fifth and two fifths to the direct loss, mainly through local suppliers and household spending. The duration matters far more: treating the array's effects as temporary understates the loss of income by a factor of about one hundred.

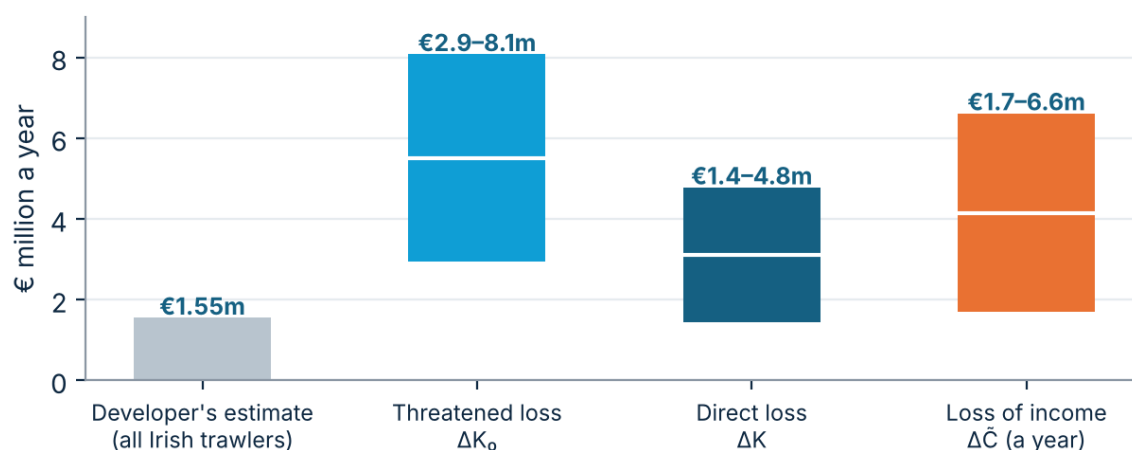


Figure A1.15 Running estimate, step 3: loss of income each year.

Which port each vessel's catch is landed into will be confirmed from the sales notes. Until then the two ports are shown side by side, and the range covers both.

Step 4: Welfare loss

Can the households absorb it? The same euro of lost income does more harm to a household with nothing to fall back on. The ten owners who answered this part were asked how much of one month's lost earnings their own household, and a typical crew household, could cover from savings, credit or other income (Figure A1.16). Nine of the ten said a crew household could cover none of it, and the tenth said 1% to 10%. Three owners could cover none of a month for themselves: the others between a quarter and three quarters. Nine of the ten said their household could manage on reduced income for less than a month before cutting essentials.

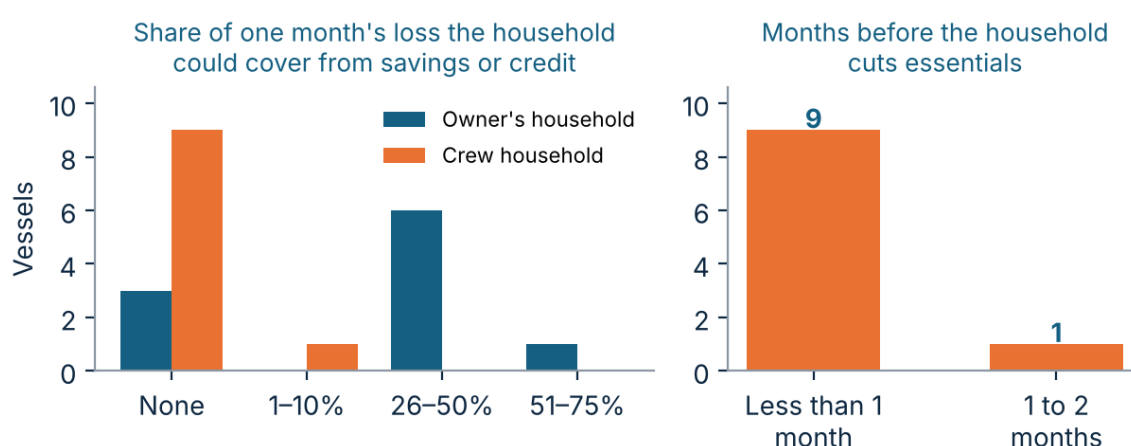


Figure A1.16 Household resilience: share of one month's loss the household could cover, and months before essentials are cut.

Dependence sharpens this. With between a quarter and three quarters of their income coming from inside the array, these are not households losing a small part of a varied living. Crew are paid on a share system, receiving 30% to 49% of the net, mostly 40% to 49%, so close to half of every euro lost falls directly on crew households. For them θ , the share they can absorb, is close to zero. The welfare weight ω depends on household income. Where the crew wage is the only income of a family of three to five, it is below the CSO median, and each euro lost carries a weight of about two to three. Where the household has other income, the weight is nearer one. Owners' households vary. Five have incomes above €80,000 and four €50,000 to €80,000, most supporting four or five people, and these carry a weight of about one. One, with €30,000 to €50,000 supporting four people, sits close to the at-risk-of-poverty line, and its owner has nothing to absorb a lost month.

$$\text{Welfare loss } W = \Delta \tilde{C} \times (1 - \theta) \times \omega$$

Crew households: $\theta \approx 0$;

ω from the crew wage and household income (Green Book, $\eta = 1.3$, against the CSO median of €31,767)

Owner households: $\theta \approx 0$ once the first month is past; $\omega \approx 1.1$ from their stated incomes and household sizes

These buffers were measured against a single lost month. Against a press that lasts for the life of the array they will be spent, and the loss then moves onto the vessel's debt. One owner who described an earlier interruption shows how this happens. The vessel kept every fishing day and every crew member, and its profit recovered within one to three months. To get there, it held only half to three quarters of its gross profit and of its crew wages, paid a wage subsidy of 11% to 25% of the wage bill to keep the crew, borrowed most of a month's running costs, and extended its loan. That was a pulse, and it ended. Under the press of the built array the same pressure does not end.

Putting a figure on the welfare loss. The loss of income is divided between the households that carry it. Crew are paid 30% to 49% of the net, mostly 40% to 49%, so they carry about 45% of the vessel's direct loss and owners the rest. The knock-on loss in the port falls on other local households, which are given a weight of one. For a 'press' impact that lasts the life of the array, neither crew nor owners can absorb any of it: the crew buffer is nil, and the owners' lasts less than a month.

The crew welfare weight depends on the crew wage. The STECF Annual Economic Report gives an average wage per full-time equivalent of €41,300 for demersal trawlers of 12 to 18 metres, €55,200 for 18 to 24 metres and €49,500 for 24 to 40 metres (2021). Spread over the seven crew these vessels actually carry, rather than about five full-time equivalents, that is about €37,000 to €38,000 per person. The 2023 fleet-wide average was €34,416 per job. The analysis is therefore run with a crew wage of €30,000, €35,000 and €40,000, and, for €35,000, with and without a second household income of the same amount (Table A1.2).

Table A1.2 Welfare loss under crew wage and household income scenarios: thirteen vessels, one year of the built array

Crew household	Equivalised income	Crew w	W low	W central	W high	R_micro
€30,000, sole earner	€12,900	3.2	€3.2m	€6.2m	€11.6m	0.53–0.57
€35,000, sole earner	€15,100	2.6	€2.8m	€5.5m	€10.4m	0.60–0.64
€40,000, sole earner	€17,200	2.2	€2.5m	€5.0m	€9.5m	0.66–0.70
€35,000 plus a second income of €35,000	€30,200	1.1	€1.8m	€3.7m	€7.0m	0.94
Loss of income $\Delta \tilde{C}$ for comparison			€1.7m	€3.4m	€6.6m	



Figure A1.17 Welfare loss each year under the four crew household scenarios. The bar shows the range from the low to the high case and the line the central case, against the central loss of income.

In every scenario the welfare loss is larger than the loss of income. A crew family living on one fishing wage, a family of four on €30,000 to €40,000, sits below the at-risk-of-poverty line of €19,060 equivalised, and each euro it loses carries a weight of two to three. With a second income of €35,000 the household sits near the median, its weight falls to about one, and the welfare loss is only slightly larger than the loss of income. The two cases bracket the likely position: a central welfare loss of €3.7 million to €5.5 million a year, or €63 million to €96 million in present value over a 30-year exclusion. The sole-earner case is the one supported by the owners' own answers, since nine of ten said a crew household could cover none of a lost month.

These figures are lower bounds in one respect: they leave out the additional penalty that applies when a household is pushed below the level needed to meet essential costs, which nine of ten owners said would happen within a month. They are generous in another: where crew households have a second income, they could absorb part of the loss themselves. The share of crew households with a second earner is the single most useful piece of evidence still to be gathered.

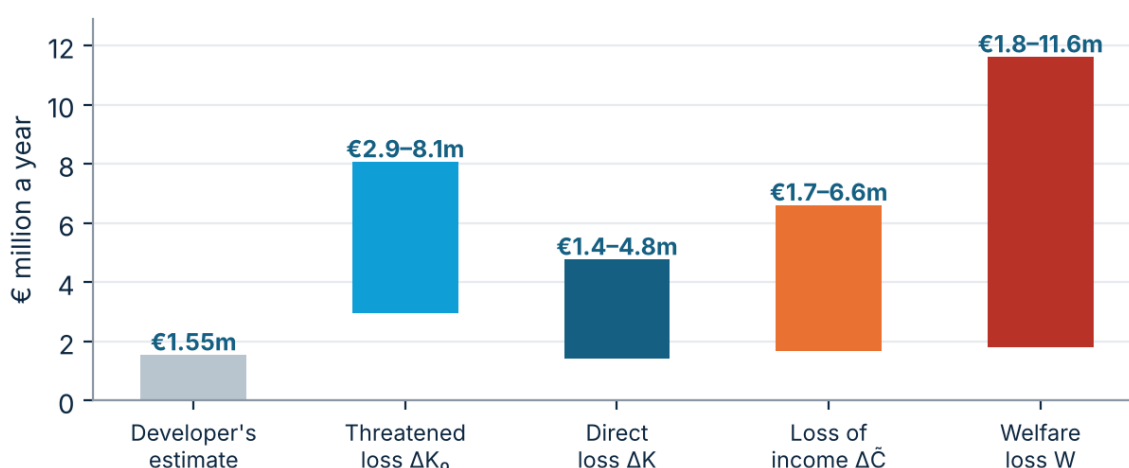


Figure A1.18 Running estimate, step 4: from threatened loss to welfare loss, each year.

The threshold the owners fear is losing the crew. Asked to rate the consequences of past survey and construction events, twelve of the thirteen rated crew leaving the vessel at 5, could force me out, eleven rated difficulty rehiring

and ten reduced crew earnings the same way. A Nephrops trawler that cannot hold its crew cannot fish, however good its ground.

The owners' own judgement of significance points the same way (Figure A1.19). They rated the effects of the built array at 4.5 out of 5, and repeated and overlapping works at 4.6. Four of the 53 effects, the repetition of the loss across construction seasons, coincidence with the other east coast projects, cumulative spatial squeeze and the effects on Nephrops and the mud habitat, were rated 5, could force me out, by every vessel that rated them.

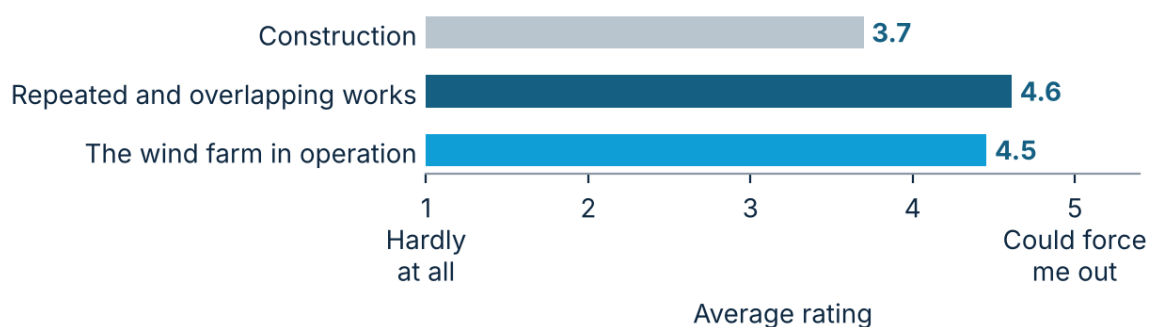


Figure A1.19 Average rating of the effects of the works, by phase (1 = hardly at all, 5 = could force me out).

What this tells us

For crew households the welfare loss is larger than the income loss: each euro lost costs one to three euros of welfare, and nine of ten households cross the line into cutting essentials within a month. The significance of the effect lies in who bears it, not only in how many euro are lost.

4. What the steps add up to

The Developer's assessment stops at the first step, with a threatened loss of €1.55 million a year for all Irish trawlers. Following the loss to the end of the chain, for just thirteen of the vessels that fish the array:

- **Threatened loss:** €2.9 – €8.1 million a year, against €13.0 million a year recently landed from the whole Irish Sea by Irish demersal trawlers and concentrated in the April to July peak.
- **Direct loss:** €1.4 – €4.8 million a year after moving gear, with extra costs of €10,000 or more a month for most vessels and lower catch rates on crowded alternative grounds.
- **Loss of income:** €1.7 – €6.6 million a year to the economies of Clogherhead and Howth.
- **Welfare loss:** €3.7 – €5.5 million a year in the central case, against €3.4 million of lost income, or €63–96 million over a 30-year exclusion. It is larger than the loss of income in every scenario tested, because almost half of the loss falls on crew families with no buffer and, on one fishing wage, incomes below the poverty line.

These are indicative ranges from a small number of returns, built on stated assumptions, and they will narrow as the official data are added. They are offered to show that the assessment can be completed, and that when it is, the effect on the Nephrops fleet is likely to be significant.