

REPORT SUMMARY: APPLYING THE SCOTTISH GOVERNMENT'S STRATEGIC OBJECTIVES TO THE SCOTTISH NEPHROPS FISHERY- APPLICATION TO THE SCOTTISH INSHORE FISHERIES STRATEGY

Conflict over a scarce resource

Nephrops norvegicus (sold as scampi or langoustine) is one of the most valuable fisheries for the Scottish economy, with a landed value of £61 million in 2015 (14% of total value of Scottish landings). The Nephrops fishery is also significant in terms of its contributions to coastal employment and is an important Scottish export product.

There are two main fishing gears that target Nephrops, one is mobile (trawling) and the other is static (creels). The vast majority (over 70%) of the fishing vessels targeting Nephrops are small scale (under 10 metres in length) creelers. Despite their greater vessel numbers, creelers produce only 15% of the Nephrops as trawlers fish both inshore and offshore waters and harvest larger quantities per vessel. The two gears have different markets, with the trawl fishery producing smaller tails (scampi) and the creel fishery selling live langoustines. There is a substantial price differential between trawled (£4.80/Kg) and creel-caught (£8.71/Kg) Nephrops, and the Gross Value Added (GVA) for creel caught Nephrops is also higher (£1.01 per Kg versus 84p per Kg for trawl caught).

Gear conflict between trawlers and creelers in the Nephrops fishery (the 'prawn wars') has increased since the removal of the mobile gear ban in 1984 within 3 nM of the shore under the Inshore Fisheries (Scotland) Act. In Scottish inshore waters, gear conflict between trawlers and creelers, often in the form of lost or damaged equipment, has increased to such a degree that the Scottish government set up a gear conflict task force in 2013. Marine Scotland has also published an extensive assessment¹ of the options for change, which concluded that spatial management to support the creel fleet would generate improved environmental quality and greater economic benefits. As a further Marine Scotland study¹ explains, the trawling sector is much less dependent on local labour than in the past and employment in the static gear fleet is more fragile and geographically linked.

In light of this conflict and disparity between the economic, social and environmental features of the different Nephrops fisheries, the need for a holistic approach to determine how the government should manage access to inshore waters to derive the maximum benefit from fishing for coastal communities has become clear. When different users are in competition for a limited public resource, developing spatial-access based fishing opportunities for Nephrops would enable the Scottish Government to target 'best value' from the fishery.

Study approach

In our research paper,² we applied a range of 17 social, economic and environmental criteria to the Scottish Nephrops fishery to determine which gear type can provide best value given the objectives of the fishery. As such, our chosen criteria are derived from the Scottish government's Strategic Objectives of: Wealthier and fairer, Smarter, Healthier, Safer and stronger, and Greener.

¹ Marine Scotland Science: Management of The Scottish Inshore Fisheries; Assessing The Options for Change Technical Reports. Grid Economics. November 2014 <http://www.gov.scot/Resource/0046/00467217.pdf>

² **NEF working paper The Scottish Nephrops fishery: Applying social, economic, and environmental criteria.** Chris Williams and Griffin Carpenter (2016) The New Economics Foundation. Available for download: http://b.3cdn.net/nefoundation/21d024b2ce367cac07_ybm6bd667.pdf

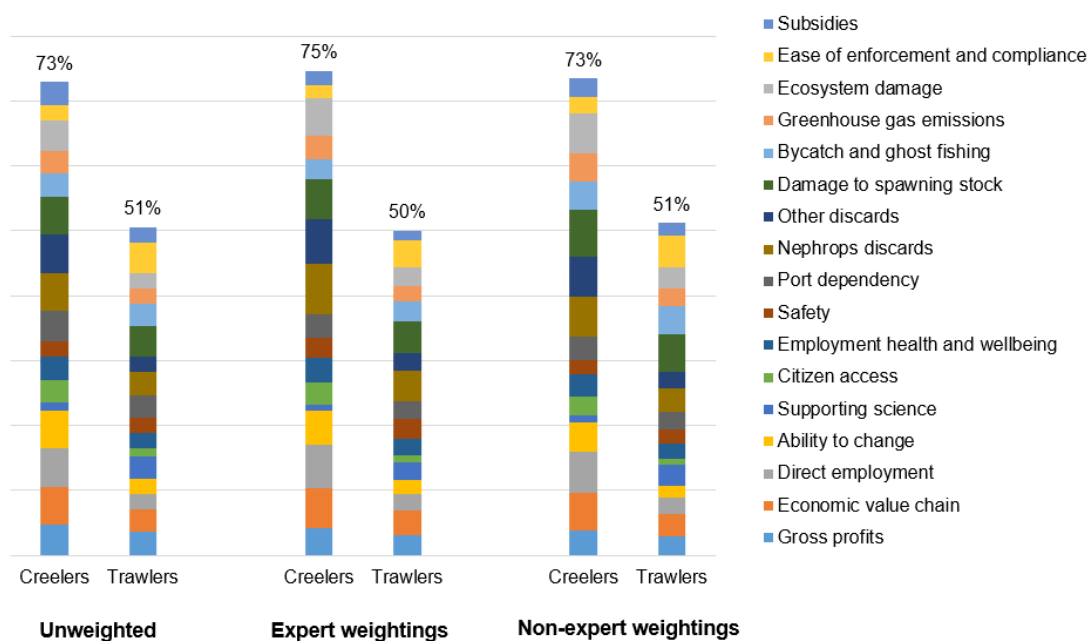
With the criteria for the study set, we then operationalised these criteria into indicators using the best available data, we then then scored the two gear types based on their performance. This multi-criteria approach shows that creelers outperform trawlers on most criteria and the total score.

Summary of indicators and scoring: 1 (low - red) to 5 (high - green).

| Strategic Objective | Criteria | Indicator | Creelers | Trawlers |
|----------------------|------------------------------------|--|-----------|-----------|
| Wealthier and fairer | Gross profits | profit/kg of landings | 4 | 3 |
| Wealthier and fairer | Economic value chain | GVA/kg Nephrops landed; GVA/day at sea; price/kg of Nephrops landed | 5 | 3 |
| Wealthier and fairer | Direct employment | jobs/kg landings | 5 | 2 |
| Wealthier and fairer | Ability to change | description of technical ability | 5 | 2 |
| Smarter | Supporting science | description of non-fishing vessel activity | 1 | 3 |
| Smarter/Healthier | Citizen access | description of ecosystem damage | 3 | 1 |
| Healthier | Employment health and wellbeing | average hours worked; average length of contract; proportion full time | 3 | 2 |
| Safer and stronger | Safety | description of safety concerns | 2 | 2 |
| Safer and stronger | Port dependency | percentage of major Nephrops ports supplied by each fleet | 4 | 3 |
| Greener | Nephrops discards | kgs of nephrops per haul | 5 | 3 |
| Greener | Other discards | kgs of discards per haul | 5 | 2 |
| Greener | Damage to spawning stock | description of catch seasons and selectivity | 5 | 4 |
| Greener | Bycatch/ghost fishing | description of bycatch and safety concerns | 3 | 3 |
| Greener | Greenhouse gas emissions | kgs of CO2/kg of landings; kg of CO2/day at sea | 3 | 2 |
| Greener | Ecosystem damage | description of ecosystem damage | 4 | 2 |
| Good governance | Ease of enforcement and compliance | description of monitoring and enforcement issues | 2 | 4 |
| Good governance | Subsidies | subsidies/kg of landings | 3 | 2 |
| Omitted | Fairness | Value generation | N/a | N/a |
| Omitted | Vessel-level inequality | Ratio of crew wages to profits | N/a | N/a |
| Omitted | Fleet dependence | kg of nephrops landed/kg of landings | N/a | N/a |
| Omitted | Historic share | kg of nephrops landed per fleet/total kg of nephrops landed | N/a | N/a |
| Total | | | 62 | 43 |

To further refine the results we surveyed experts and non-experts to assess how important they felt the various criteria were. Applying the weightings did not significantly alter the results, and the same pattern emerges with creelers outperforming trawlers under both the weighted and unweighted scenarios.

Multi-criteria analysis results using unweighted, expert weighted, and non-expert weighted scores



Study conclusions

Allocating fishing opportunities to the creel fishery in the form of preferential spatial access to crowded inshore waters would support the creeling fleet and provide a necessary lifeline for highly dependent rural communities, while fully implementing Article 17 of the EU's Common Fisheries Policy. While spatial access is the most important fishing opportunity for the creel fleet, there are important effort and quota-based fishing opportunities that should also be reformed, such as community quota and creel limits. Both these proposals could take many forms but some key principles to ensure equity and sustainably should be applied and are detailed in our study.

The spatial management options for the inshore Nephrops fishery include:

- Real-time closures – for certain areas depending on stock assessments or to accommodate for spawning.
- Licence conditions – stipulating the number of creels on board or the mandatory tagging of creels to ensure creel limits are adopted and enforceable.
- Use of automated creel tags – has been trialled and appears to be effective in terms of providing data on the number of creels in use as well location, date, time of shooting/hauling, etc.
- Vessel Monitoring Systems – to make monitoring and enforcement of spatial measures possible and lower the cost of monitoring (could be funded via the European Maritime and Fisheries Fund).
- Creel/vessel limits – within certain areas at certain times.
- Access criteria for certain areas – to ensure highest societal value is captured.

These options could also be applied to access criteria for Marine Protected Areas.

Implications for the Inshore Fisheries Strategy

The Inshore Fisheries Strategy provides a major opportunity to enact wider social, economic and environmental objectives. In the medium- to long-term, and well within the scope of the upcoming Inshore Fisheries Bill, granting preferential access to specific locations to those who demonstrate they fish with lower impact gears (e.g. selectivity and fuel use) would encourage others to switch gears, or innovate, in order to also meet the access criteria, thereby improving performance more widely.

To generate best value from the Nephrops fishery, while at the same time significantly reducing gear conflict, the Scottish government should provide preferred spatial access to the creel fishery under criteria-based spatial management regimes.

Comparison of Regional Inshore Fisheries Groups (rIFGs)

| IFG (post April 2016) | IFG (pre April 2016) | Discarding | Ecosystem damage | Bycatch | Economic impact | Net economic value | Issues with fishing pressure | Issues with stock biomass |
|--|---------------------------|------------|------------------|-------------|-----------------|--------------------|------------------------------|---------------------------|
| West Coast rIFG | South West | High | High | Medium | High | High | High/High | Low/Unknown |
| West Coast rIFG | North West | Medium | High | Medium | Low | Low | High/low | Low |
| Outer Hebrides rIFG | Outer Hebrides | Medium | High | Medium | Low | Low | High/low | Low |
| North & East Coast rIFG | Moray Firth & North Coast | Low | Likely high | Likely high | Medium | Medium | High | Low |
| Orkney Management Group | Orkneys | Unknown | Medium | Likely high | Low | Low | Low | Unknown |
| North & East Coast rIFG | East Coast | High | Likely high | Likely high | High | High | High | Low |
| Shetland Shellfish Management Organisation | Shetland | Unknown | Unknown | Unknown | Medium | Medium | Low | High |

From our study, the broad conclusion was that spatial management is most urgent in the North & East Coast RIFG (in particular the East Coast) as well as the West Coast RIFG (in particular the South West). Regardless of which areas are priorities for spatial management regimes, it would be prudent to look at likely displacement issues in conjunction with any spatial exclusions for particular gears.

The Inshore Fisheries Strategy provides an immense opportunity to use a criteria-based approach to inshore fisheries management. Following the results of our research it is clear that Scotland is missing out on potential value, while also having to invest time and resources trying to deal with the significant challenge of gear conflict. Combined with the ongoing and upcoming designations of Marine Protected Areas (MPAs - in themselves a form of spatial management), a transparent and objective approach to determine access criteria will help government bodies evaluate what type of inshore fishery would make best use of the marine resources and also what type of fishing activity is compatible with MPAs.

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ⁱ The Impact of Sea Fishing on Social Well-being in Scottish Fishing Communities Report for the Marine Analytical Unit, Marine Scotland www.gov.scot/Resource/0043/00435584.doc