

Effort management in VII *Nephrops* fisheries

A scientist's perspective

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In its non-paper on “Spatially-structured management of *Nephrops* in Zone VII”, the Commission sets out two potential options for management based on inputs (effort) and out-take (TACs). The scientific advice has advocated “Functional unit” management for many years. The *Nephrops* populations and fisheries on different mud patches have different productivities and dynamics and should, where possible, be managed separately. What every management framework is put in place for *Nephrops* it is important that it can achieve the following long term management objectives:

- 1) It allows fishing mortality to be controlled at a level that ensures that MSY policy objectives are achieved (sustainability, efficiently and profitably are mentioned in the NP).
- 2) It takes into account the inherent uncertainty in the scientific advice and assessments and the varying knowledge base for the different stocks within VII.
- 3) Is operationally effective, simple and transparent
- 4) In an accordance with the ecosystem approach to fisheries management

Theoretically *Nephrops* fisheries are a perfect example of a species where effort management might work very effectively. The stocks are contained within discrete mud patches, so area based effort management at an appropriate geographic scale could be achieved. Many of the *Nephrops* fisheries in VII are tending towards a single species fisheries (i.e.>80% of landed weight). Therefore management of the *Nephrops* component of the fishery with appropriate by-catch limits would be the cornerstone of any integrated fisheries management plans. The fishery is technically well developed so rapid increases in efficiency per unit effort are unlikely. Catchability appears to be relatively stable over time (the underlying seasonal patterns in catchability could be taken into account). Finally and most importantly there are several examples of rapid and unsustainable expansion of effort on the most vulnerable stocks or stock components. It is often the case that these components are not precisely assessed and a more adaptive effort management regime would be beneficial (e.g. Porcupine Bank).

Within the NP Coin point to a number of problems associated with the effort management option including the need to establish effort keys, systems based on VMS (and how to include <15m vessels), engine power complications and incentives for more efficient fishing. The NP discusses whether effort in TR2 and TR1 with some form of landing threshold is included in the effort management system but it also highlights the need for a simple system. I feel many of the problems above could easily be addressed with a concerted effort to make the data available and brainstorming the various options and pitfalls.

What would an effort management system look like?

I would favour a baseline calculation using VMS effort within the known *Nephrops* grounds as shown in Figure 1. Effort by TR1 or TR2 (and any other gears) for >15m vessels within defined polygons could easily be calculated as could their *Nephrops* and non *Nephrops* retained catches to establish baseline effort levels (using the methods described in Gerritsen and Lordan, 2010). If there are any TR1 or TR2 gears operating on *Nephrops* grounds with minimal *Nephrops* landings then these could be excluded from the effort management system. Effort uptake could be monitored and constrained using the same system. Landings would be reported as normal though logbook but would not be limited by quota restrictions.

Process control systems and algorithms could be developed to manage the effort collectively and/or individually reducing the administrative overheads on member states and fishermen. Allocation of effort to individuals and erosion of perceived “quota entitlements” would be the main stumbling block in the transition to a full effort management system. This transition could be a way to replace the current quota management systems (which are widely criticized) and develop new modern management framework that is fit for purpose.

What are the advantages and disadvantages of an effort management system?

As in any management system there are advantages and disadvantages. These will need to be weighted up and evaluated fully by the key stakeholders involved. In most cases the devil will be in the detail and a potential advantage could become a disadvantage if it is not implemented properly and visa versa. In the table below I have outline a non-exhaustive list of what I perceive the main advantages and disadvantage of an effort management system for *Nephrops* in VII to be. It is important for the NWWRAC to consider both the Functional Unit TAC and effort management system fully and I would advocate a horizontal workshop on the issue.

Potential Advantages	Disadvantages
Makes the <i>Nephrops</i> stocks and fisheries (many of which are relatively stable & sustainable) the focus of effort management	Would need to integrate other management objectives e.g. cod recovery. There is a risk that the system may become overly complex or that effort is reduced below MSY levels in <i>Nephrops</i> fisheries with limited success in achieving other management objectives.
Effort buckets become the cornerstone of localized fisheries management plans.	Requires fisheries management plans to be developed and implemented
Lower incentives for discarding and high grading	Accurate catch reporting would still be need for assessment purposes
Increased economic efficiency	Effort management will favor more efficient vessels
Easily controlled	There is an inherent dislike of effort control amongst the industry
Could be very simple to implement and track.	Could lack flexibility unless some adaptive framework could be developed
Could be very transparent using integrated VMS and logbook data together with process control algorithms	Would need U15m vessels and the minor creeling effort to also be integrated and managed in some way.
Responsible fishing practices could be incentivized easily	
Better control of fishing mortality	Current scientific advice is based on Landings and Fmsy considerations rather than effort.
Offers better protection for vulnerable/poorly known stocks	Reduces fishers flexibility to move between areas (note this may also be true in an FU TAC system)
Could lead to increase stability & profitability in <i>Nephrops</i> fisheries	
Could avoid area misreporting of catches	

Final thoughts

Effort management appears to be the favored option of the Coin based on their non-paper. Implementing effort management by FU will probably not be something that could be achieved in 2011 but might be implementable 2012 or 2013. The pros and cons need to be weighed up and teased out further nationally and by the NWWRAC at a focus group. The NP points to the ICES and STECF advice for large catch reductions in FU17 and FU15 in 2009. This advice has changed for 2010 with catch advice for all FU (except FU16 Porcupine Bank) in line with recent landings levels (ICES, 2010). The situation with the Porcupine Bank stock is similar to last year albeit more positive with indications of incoming recruitment and a seasonal closure now in place. Delaying implementation of FU management in the short-term until a proper debate can be had is therefore not likely to have a catastrophic impact on the Nephrops stocks in VII.

References

- ICES, 2010. ICES advice June 2010: Nephrops in Subarea VII. ICES Advice 2010, Book 5 pp223-266. <http://www.ices.dk/committe/acom/comwork/report/2010/2010/Nep-VII.pdf>
- Gerritsen, H. and Lordan, C., 2010. Integrating vessel monitoring systems (VMS) data with daily catch data from logbooks to explore the spatial distribution of catch and effort at high resolution. ICES Journal of Marine Science, Accepted for publication 15th July 2010.

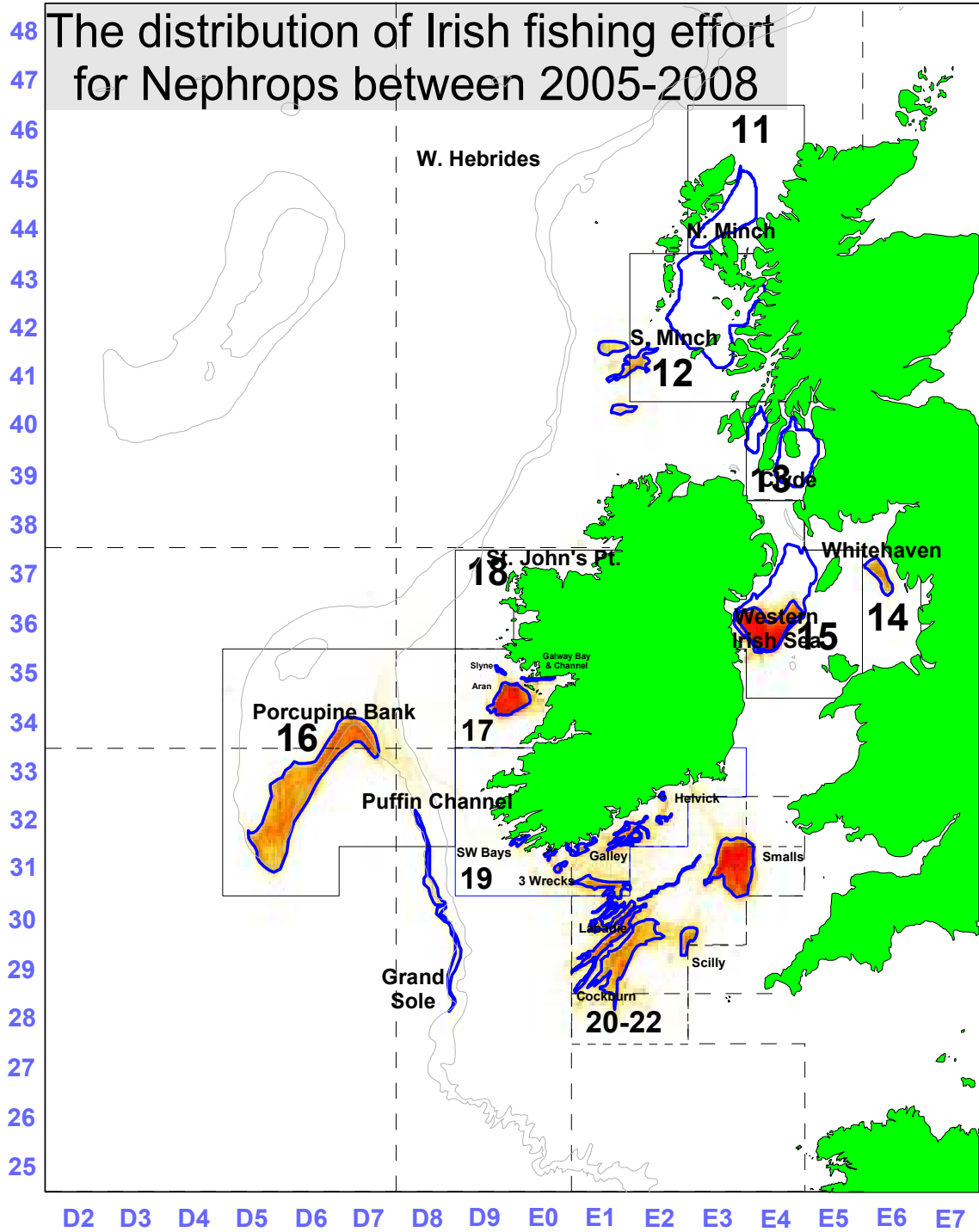


Figure 1 Spatial distribution of Irish VMS effort targeting *Nephrops* (i.e. >30% retained catch/day) with Otter Trawls (OTB) and the known *Nephrops* grounds around Ireland (bounded by a blue polygons).