

Fish discard patterns

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Discards are the portion of the catch from commercial fisheries that is dumped or thrown overboard at sea, dead or alive (Kelleher 2005). Although discarded fish enter the food chain, such that they can be a food source for scavenging marine life, they are more generally considered to be a waste of valuable, and often vulnerable, marine resources. The discard problem was, therefore, addressed in the 2013 reform of the European Common Fisheries Policy (CFP) which introduced a 'landings obligation' (a.k.a. discard ban). This will be phased in to all fisheries in Europe from 2015 to 2019.

In this paper we look at the patterns of fish discards, namely those of the principal whitefish species (cod, haddock and whiting), in Scottish trawl fisheries, updating the information provided in Fernandes *et al.* (2011). Scotland has a relatively large share of the European fish catch (7% of total landings from a country with 1% of the population); it also has the longest standing and most comprehensive discard sampling programme, run by Marine Scotland Science. We examined trends in discard rates from this programme from 1987 to 2013 and also determined absolute estimates of total discard quantities in the recent time period (2012-2013).

Two main fisheries in two areas were considered: the Scottish prawn fleet and the Scottish fish fleet, operating in the North Sea and the west of Scotland. Discard rates were particularly high in the Scottish prawn fisheries, especially those on the west of Scotland, where recently for example, they have often discarded all of the whiting that they catch. We also examined the spatial distribution of discards as well as the precision of discard rates. These analyses are important in helping to implement the landings obligation effectively, as well as providing evidence for the impact of discarding on the status of certain key fish stocks.

We acknowledge the staff of Marine Scotland Science who collected the discard data at sea on fishing vessels, as well as the co-operation of the fishing industry whose participation in the programme is entirely voluntary.

References

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Hind-casting the quantity and composition of discards by mixed demersal fisheries in the North Sea

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Many commercial fisheries seek to maximize the economic value of the catch that they bring ashore and market for human consumption by discarding undersize or low value fish. Information on the quantity, size and species composition of discarded fish is vital for stock assessments and for devising legislation to minimise the practice. However, except for a few major species, data are usually extremely sparse and reliant on observers aboard a small sample of fishing vessels. Expanding these data to estimate total regional discards is highly problematic.

Here, we develop a statistical modelling method for utilising additional information from scientific trawl surveys to model the quantities of fish discarded by the commercial fisheries. As a case-study, we apply the model to the North Sea over the period 1978-2011.

Our results show a long-term decline in the overall quantity of fish discarded, but an increase in the proportion of catch which is thrown away. The composition of discarded catch has shifted from predominantly (~80%) undersized roundfish, to >50% flatfish. Undersized plaice constitute the largest single fraction of discards, unchanged from the beginning of the 20th century. Overall, around 60% of discarded fish are rejected on the basis of size rather than for reasons of species value or quota restrictions.

The analysis shows that much more information can be gained on discarding by utilizing additional sources of data rather than relying solely on information gathered by observers. In addition, it is clear that the reducing fishing intensity and rebuilding stocks is likely to be more effective at reducing discards in the long term, than any technical legislation to outlaw the practice in the short term.

Selective fishing gears to reduce the capture of unwanted fish.

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Abstract

With the onset of the forthcoming landing obligation there will be a greater need to avoid the capture of unwanted fish. One approach available to the fishing industry is the use of more selective gears. Many such gears have been developed in recent years, both in Scotland and internationally. Here we will briefly discuss some of the options presently available in relation to both species and size selective fishing gears. We will highlight the multispecies nature of the Scottish fisheries, the problems this poses and demonstrate some of the available gear options that could potentially be used to reduce the capture of unwanted fish in the first instance.

How will the change in discarding policy affect the Scottish Nephrops fisheries?

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On behalf of the MASTS Nephrops discards workshop participants

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The majority of *Nephrops* (langoustines) landed in Scotland are caught using trawl gears. With the decrease in whitefish stocks, particularly on the west coast, *Nephrops* now represent one of the most valuable fisheries in Scotland. Following on the high profile public campaigns against discarding of fish the European Commission have proposed introduction of a 'landings obligation' for fisheries managed within the Common Fisheries Policy. The aim of this policy change is to eliminate, or at least reduce substantially, the levels of discarding in the European fisheries. This major policy change will affect nearly all fisheries including the *Nephrops* trawl sector. In this talk I will summarise the findings from a recent MASTS workshop which was held to examine how the policy change will impact this sector. The talk will consider the policy change itself, what we know about present discard levels and the problems the policy change will generate for the sector. I will also consider some of the potential solutions and highlight the areas of research which will be required over the next few years to support successful implementation of the policy.

Real-time spatial management approaches to reduce bycatch and discards: experiences from Europe and the United States

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Spatial management measures are currently being used to manage discards and bycatch, given the spatial heterogeneity of fish distributions. However, permanent fishing closures are often poorly implemented, unresponsive to stock dynamics and do not achieve their management objectives. Recently, real-time spatial management tools for managing discards and bycatch implemented under either a comanagement or self-governance approach have been introduced in Europe and the US. Real-time catch and discard information is shared among fishers to incentivise and encourage vessels to leave areas of high bycatch or discard. A framework is developed to characterise governance, implementation and management attributes associated with voluntary, private and regulatory real-time spatial management tools. Challenges and management practices in ten case studies are reviewed providing insights for designing these spatial management tools. The results illustrate that real-time spatial management approaches could create incentives for fishers to develop, use and share information and technology in response to the introduction of the landings obligation.

Likely economic impacts under the CFP landings obligation and the challenges that lie ahead

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A key element of the newly reformed Common Fisheries Policy (CFP) of the European Union (EU) is the progressive elimination of discards in all EU fisheries through the introduction of a landings obligation, starting in 2015. The landings obligation will apply to all species subject to quotas, but there are some exemptions and flexibilities built into the system, such as quota uplift, the use of target quota to cover choke species and the 'de minimis' allowance to continue discarding in exceptional circumstances.

Drawing on work recently carried out by Poseidon Aquatic Resource Management on behalf of the UK Discards Action Group (DAG) and the European Commission's Scientific, Technical and Economic Committee for fisheries (STECF), this paper highlights some of the key economic challenges that the EU fleet will face following the introduction of the landings obligation, including 1) dealing with the restricting effect of so-called "choke" species, particularly in mixed demersal fisheries where improvements in gear selectivity will be key to ensuring many fleets remain viable, and 2) the lack of clarity surrounding the permitted flexibilities contained within the legislation.

Ultimately, the way in which the landings obligation is interpreted by the Regional Groups, the European Commission and implemented by EU Member States could make the difference between continuing to fish and going out of business for some fleets.
