

Discarding in fishing: Making sense of a complex issue

Introduction

This note explains what discards are, why they occur, their significance and what can be done about them. The idea came from the Discard Action Group, one of the 'issue forums' that Seafish runs in order to resolve problems affecting the whole seafood supply chain. This group was established to start a cross-industry dialogue in response to the European Commission's proposals to minimise or ban discarding.

This is a revised edition of the note brought out in order to bring the material up to date. Discarding has moved up the political agenda again: in a global context European discards are still disproportionately high; the Commission is further developing its policy aimed at minimising discards across Europe; and the wasteful nature of discarding is increasingly seen as unacceptable throughout the supply chain.

An important addition to this note is the appendix that describes the initiatives taken over the last couple of years in order to reduce discarding in UK fisheries. Whilst many of these are the result of legislative change, a large number have been initiated by the fishing industry. Indeed, as this note goes to press, the Commission seems increasingly to accept that some of the UK initiatives have potential applicability over a much wider geographical range.

It's important to emphasise at the outset that discarding is not a universal problem affecting all fisheries: there are some fisheries that are almost 'clean', some where discarding is high and some where discarding

is a good thing to do. An example of this last case is where shellfish may be landed that are undersized, or of market size but poor quality because they've recently moulted. Species like crabs survive very well after being returned to the sea.

A key point is that we cannot generalise about discards. What Seafish can do is to present a balanced view of the issues and to help the industry move towards 'best practice'.

Seafish has produced other fact sheets like this one. Many of the topics covered are related and readers may find it useful to check what's available in order to build a more complete picture of the UK seafood industry see:

<http://www.seafish.org/b2b/subject.asp?p=170>.

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Definitions – what are discards?

Discards are those parts of the catch that are returned to the sea. Within this very broad definition are several possible interpretations of the term. 'Discards' can be counted in various ways, for example:

- only commercial species,
- all fish species
- all animal species, including invertebrates
- all species, including plant life

Discard rates can also be described in terms of numbers of animals or their weight. Using numbers, especially together with size, can give an idea of the waste of growth potential. Discarding many small dead fish of commercial species clearly removes any prospect of catching them later, when they have grown bigger, and had a chance to breed.

The terms 'discard' and 'bycatch' are used differently in different parts of the world. 'Discard' is sometimes used in the same way as 'bycatch'. This can lead to confusion.

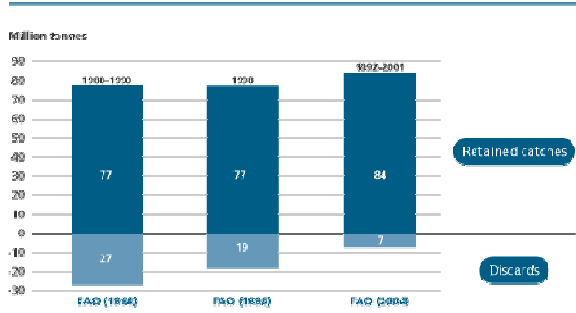
'Bycatch' is used here to mean the catch of non-target species and undersized fish of the target species. Bycatch of commercial species may be retained or discarded along with non-commercial bycatch.

A glossary at the end of these notes provides the definitions used by the Food and Agriculture Organisation (FAO) of the UN.

A global overview

An internet search for information on discards and/or bycatch can throw up a bewildering range of figures. The best source of information is FAO. In their 2005 review *Discards in the World's Marine Fisheries* (1) FAO estimates that the global total is around 7.3 million tonnes. Many websites (see for example refs 2 and 3) carry a figure of 27 or even 39 million tonnes – how can there be such a difference? The FAO review explains that the higher figures come from an earlier FAO publication (4) based on methods that are no longer considered appropriate. It comments: "Thus, it is disturbing to note that so many scientists revert to 15-year old data in order to document possible current discard levels. These old estimates are frequently cited by various advocacy groups to decry the state of the world's fisheries and the use of terms such as 'dirty fishing' merely undermines the considerable efforts and investments of many responsible fishers, dedicated gear technologists and fishery managers to find solutions to long-recognised problems associated with certain fisheries and fishing gears."

Comparison of discard estimates and retained catches



So, there's information, and there's also disinformation. Global totals are also of limited value. There is no single global solution: discarding is fishery-specific.

That said it is generally the case that towed gear fisheries (typically those using bottom trawls) have high levels of discarding relative to static gear fisheries. But it may also be the case that low discard fisheries have a more significant impact than high discard fisheries because of the species involved. The FAO review does, however, point out that fisheries in the North East Atlantic (including the North Sea) and the Northwest Pacific have disproportionately higher discards compared to other sea areas.

What causes discarding?

There are many different reasons for discarding but they fall into two major categories: what is being caught may have little or no market value, or fish must be discarded due to management regulations – so called 'regulatory discards'. Both sets of conditions can change by season or fishing area, even within one fishery.

Market conditions may result in fish being discarded because they are:

- completely non-commercial, that is they have no economic value;
- of a marketable species but of low value and not worth keeping; or
- mechanically damaged fish, maybe bruised or otherwise of such reduced value that they are not worth keeping.

Management regulations restrict the retention of fish that are:

- of commercial species but below the legal minimum landing size (MLS);
- restricted by quota so that there's no entitlement to land them; or
- non marketable because of catch composition restrictions (there are rules controlling the relative proportion of species that may be held or landed in some fisheries).

A combination of market forces and management regulations may result in the discarding of fish that are:

- valuable but not as valuable as (usually) larger fish of the same species. This discarding of lower value commercial catch to maximise the value of quota is referred to as 'high grading'.

When is discarding problematic – and when is it not?

The level of discarding varies widely between fisheries, and within fisheries. Some fisheries are almost completely 'clean', others may discard more than they retain, and in some fisheries discarding is a good thing. Assessing how much of a problem discarding poses, and to whom, can be complex.

'Good' discarding occurs when the creatures that are returned to the sea survive. Undersized or 'soft' shellfish like crabs and lobsters survive well and fish like sole, plaice and dogfish also have high survival rates.

Otherwise discarding wastes resources. The level of waste may be biologically significant or it may not be significant. The most important thing is to know how much discarding is occurring in our fisheries and which species are affected because:

- we must know the level of fishing mortality of commercial species. If we don't know, we can't manage the stocks properly, and
- we also need to understand the impacts that fishing has on the wider marine environment including important predator and prey species.

When we know the size and shape of an issue we can decide whether it is a problem and, if so, how to deal with it effectively.

Sometimes very low levels of discarding can be highly significant. They can be biologically significant if the species involved is endangered in some way – for example albatrosses, basking sharks or some species of turtles – or the species may be 'charismatic'. Marine mammals usually fall into this category. People tend to value them more highly than other species and don't like to see them dying in fishing gear or from other causes. This often involves values relating to animal welfare rather than conservation. The population of the species concerned may not be threatened in any way. In such cases it may be a question of deciding what is in the public's best interests.

What solutions are there to discarding?

There are many potential solutions available but it is very important that the reasons for any particular discarding problem are fully understood. Solutions have to be appropriate to the circumstances of each fishery.

Gear selectivity

Much discarding occurs because fishing gears are not selective enough. Many fisheries are based on a mixture of species and fish that are not wanted can be caught inadvertently. Other species – like turtles or dolphins – may be feeding in the same area and get caught incidentally.

Some selectivity problems can be solved relatively easily. If the unwanted creatures – like turtles – are very different from the target species, then a sorting grid can be used as shown in the illustration (page 5). The same can be true when trying to separate prawns and fish. Life starts to get difficult however when there's a mix of species that are fairly similar and each species has a different MLS.

Traditional minimum mesh size (MMS) regulations don't work well where there is a mixture of, for example, cod, haddock, whiting, plaice, sole and monkfish. These are species of different shapes

and with different minimum permitted sizes and no single mesh size will retain all legal fish and release the rest. For example, if the mesh size is effective for cod then virtually all the haddock, whiting and sole will escape.

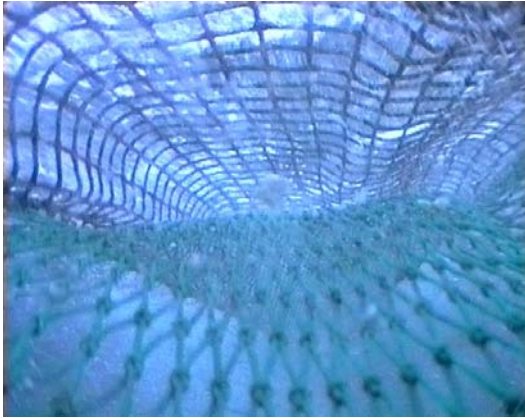
Over the years fishing gear technologists have tried many different ways of making fishing gears more selective. The best route is to design fishing gear that doesn't catch unwanted species, or individuals, in the first place, but this is often not possible. If unwanted creatures are caught then there are ways of creating escape opportunities for them. These may involve:

- using behavioural differences between species to guide them to different parts of the gear, as in the separator trawl (see page 5);
- inserting 'windows' of 'square mesh' or other devices at strategic points in the gear;
- taking advantage of the different body shapes or sizes between, for example, flat and round fish; fish and langoustine; or fish and sea mammals or turtles.

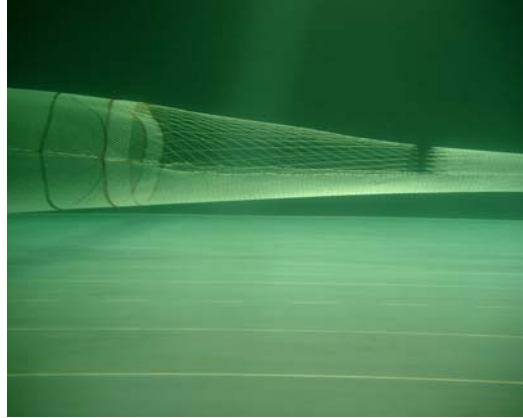
Whatever techniques are used, it is important that they result in the least possible stress to, and contact with, the escaping animals. So-called 'unaccounted mortality' can occur when fish are damaged whilst escaping and become more vulnerable to infection or predation.

Technical solutions to selectivity can also make fishing unprofitable. Fishermen have to make a profit to survive so, when selectivity devices are being developed, it is critically important that fishermen are closely involved.

Examples of some of these technical measures are shown in the pictures below.



Close up of square mesh panel



Large mesh panel allows unwanted species to escape



Catch from standard nephrops trawl



Catch from coverless nephrops trawl

Regulatory controls

Regulatory discards can also be reduced and there are very many ways in which this can be done – depending on the regulation/s that cause the situation in the first place. As examples, it is possible to have swapping or short-term leasing of quota entitlement. Access to the extra entitlement may depend on a market-based system or a bank of spare quota held by the State. In either case the

cost of each unit is often so high that there's little incentive to catch over-quota fish.

Minimum landing sizes can also be adjusted so that edible fish, that would only be discarded dead, can instead be landed legally. A possible disadvantage of this approach is that small fish might then become the subject of 'high grading'.

Other countries have experimented widely with measures relating to TACs and quotas, mainly to make them more flexible and able to cope with natural variations in catch rates. Swapping or leasing quota entitlement is mentioned above but it is also possible to have multi-annual quotas, rollovers, quota banks held by a third party, 'equivalent species' swaps and so on.

Some management regimes operate mainly 'input' measures to control catches in the form of 'days at sea' allowances. In these schemes it may be permissible to land everything that is caught with time limits being the main constraint to overfishing.

Spatial management of effort

Spatial management of effort can also be a very effective means of avoiding small or otherwise unmarketable fish. Such schemes depend upon vessels reporting in when they start to encounter such fish at levels over a given threshold. Once the nature and extent of the concentration of fish has been established, measures can be taken either to close the area for a given period or for specific selectivity devices to be mandated for the area. Area closures have recently been applied very successfully in the North Sea at the initiative of the Scottish Fishermen's Federation and are becoming more widely adopted. They are described in the appendix.

Other recent initiatives, also described in the appendix, have included enabling individual vessels to devise their own strategies for discard reduction, particularly under the cod recovery plans.

How can discarding be reduced, who are the players and what are their roles?

As noted above the fundamental significance of discarding is that it can undermine the integrity of fisheries management. It's in everyone's interests that management is

carried out properly but the costs of comprehensive catch sampling in a diverse fleet of mainly small boats is prohibitively high. In short we cannot expect government to finance the gathering of all the data that are needed to support effective management.

This is where a new role for the fishing industry begins to emerge because industry and science can work in partnership for their mutual benefit because:

- the fishing fleet is the natural sampling platform for discard monitoring and fishermen are skilled, resourceful and increasingly becoming involved in the management process;
- self sampling (by fishermen) allows discarding hotspots to be identified very rapidly. It enables a better understanding of the dynamics of discarding (for example through relating discarding practices to other factors such as market conditions). It can also lead to much more accurate figures for total fishing mortality;
- as a corollary it can also help to identify where discarding isn't a problem so that research and other resources can be applied where they are most needed.

Finding the solution to any particular discard 'challenge' is clearly a complex process involving a number of options, experimentation, flexibility, cooperation and mutual trust. Introducing a blanket discard ban cannot be the solution for all fisheries.

Pursuing a longer-term approach requires appropriate resource allocation, training programmes and transitional arrangements so that the fishing industry becomes, and is seen to be, a part of the continuing solution to the waste of discarding. We are already seeing this process starting with the UK industry initiatives on cod in the North Sea.

Voluntary reporting of high catch rates of small cod triggers a formal, but still voluntary, short-term closure of the affected areas. In England a scheme involves certifying bycatch reduction devices that then confer extra entitlements on fishermen. In the Irish Sea fishermen have taken up the option of extra days at sea per month in return for providing discard and other data.

So it seems clear that each fishery needs unique management of discarding – the means to address it must be fishery-specific, but the standards to be achieved must clear. Too much flexibility risks providing a mask for less effective action. There are several steps to go through:

1. There must be accurate measurement of the amount discarded identified by species, size and sex composition; these data have to be gathered at sea and should involve fishermen very closely.
2. If effort and/or capacity are above some optimum level then the best way to reduce discarding in the first instance is to eliminate the excess; further cuts, purely to reduce discarding, are unlikely to be efficient.
3. The potential for introducing new technology and/or operating practices by fishermen must be exhaustively explored. A lot of this potential may lie outwith the competence of statutory management so active participation by fishermen is essential. This should help to ensure usable outputs and the best level of acceptance by practitioners.
4. Incentives, extension work and product/market development also need to be introduced in order to support change and increase bycatch utilisation.
5. The use of closed areas should be considered carefully because of the attendant risk of effort displacement.

Industry-driven, short term closures to avoid concentrations of unwanted catch can be effective as can seasonal closures of spawning grounds.

6. Legislating for these measures can be very bureaucratic, and introducing direct limits on discard levels can be effective but only where the limits can be enforced.

Are discard bans practical?

This question is particularly germane because the Commission is keen to put as much pressure as possible on discard reduction. It wants to internalise the costs of discarding so that fishermen have a strong incentive not to catch those fish in the first place; and it wants member states and their respective industries to come up with their own ideas as to how they can bring discarding down to the lowest practical level.

Having said that, introducing – or imposing – comprehensive discard bans within a short time scale is unlikely to be effective or useful. Bans are not enforceable in many fisheries and will often simply raise complications with few accompanying solutions:

- curiously, there has been no critical review published on the functioning of a discard ban;
- a ban should allow the complete counting of catches, yet discarding will probably continue unless there are observers who can gather data and monitor compliance;
- a ban can force discarding underground, resulting in worse data, especially if it is assumed that the data are sound;
- banning high-grading can make sense where there is adequate compliance,
- discard bans are likely to be far more useful when they develop from within a fishery, rather than being imposed by a management agency.

This starts to go to the heart of the issues because most opportunity for progress lies in individual fishermen's actions, gear usage and technology that are not easily subject to management control. There is a need for commitment from individuals that may not be easily achieved and that may need to be considered as 'generational' change.

In this sense real progress needs a change in what is usually meant by 'fisheries management':

- where 'command and control', entirely prescriptive, management has been used to achieve resource conservation, the result has usually been systemic failure;
- that failure has been particularly severe with the management of discarding since it largely occurs beyond the control of management agencies;
- so it follows that management agencies (policy) and the fishing industry need to adopt common goals that include both conservation and the economic well-being of the industry;
- the agencies' role is to operate at large scales of time and space, whilst individual fishermen work over relatively smaller scales, with support from the agencies.

Looked at in the round, discard management seems to be most effective in jurisdictions like Norway and Iceland where fishing interests have economic significance and political strength and are empowered rather than driven. That type of success both derives from, and results in, a healthier relationship between ecosystems, fishermen, managers and the general public.

Conclusions

- Defining 'discards' is not always easy, we need to be clear what we're talking about to avoid confusion.
- Discards are not an inevitable feature of fisheries; their extent, and their biological significance, are almost always fishery-specific.
- The 'significance' of discards can be based on criteria other than stock status; potential economic loss and animal welfare can make discarding an ethical issue and where discards survive the process discarding can have a positive impact.
- It is often possible to make fishing gear more selective so that bycatch and discards are reduced but marketable fish may also be lost. Industry involvement is important so that practical designs are produced and uptake is maximised.
- Fishermen have an important role to play in sampling their own catches. This can produce more accurate figures on fishing mortality and result in discard reduction efforts being targeted better.
- The 'European dimension' makes discard reduction more complex in mixed fleet, mixed species fisheries. There are plenty of good examples to draw upon from other parts of the world, however, and they show us the sorts of steps that need to be taken.

Discard reduction is a long-term process that involves a critical re-assessment of what fisheries management is for and how it works. Managers and the industry have to develop a shared vision of what they want to achieve.

References

- (1) Kelleher, 2005: Discards in the World's Marine Fisheries – an Update; FAO Technical Report 470.
- (2) www.oceana.org/index.php?id=612
- (3) <http://www.jncc.gov.uk/page-1563>
- (4) Alverson *et al*, 1994: A Global Assessment of Fisheries Bycatch and Discards; FAO Fisheries Technical Paper No 339.

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The Seafish Guide to Discards can be downloaded from the Seafish website.

NEW INITIATIVES IN 2008 TO REDUCE DISCARDS (BY REGION)

Scottish waters

Scotland has shown a strong lead in identifying and adopting innovative conservation measures in the North Sea.

- **Conservation Credits Scheme:** Launched in Feb 2008 this landmark scheme rewards Scottish fishermen with extra days at sea when they sign up to initiatives which have an appreciable impact on the conservation of fragile fish stocks. These measures include the use of selective fishing gear and the Real Time Closure (RTC) programme.
- **Voluntary Real Time Closure scheme implemented from 1 Jan 2008 to protect spawning cod (from 1 Feb 2008 in English waters):** When a high abundance of spawning cod is identified, a limited area (7 by 7 miles) is closed for 21 days. From July 2008 the scheme was expanded to include all cod. Under this scheme there have been 17 closures so far in 2008 and compliance has been excellent.
- **Seasonal closure:** A first ever 'seasonal closure' at the Long Hole in the Fladen grounds, 100 miles north east of Fraserburgh is due to come into force at the beginning of December, to reflect the very high abundance of cod in the area at that time of year.
- **Controls on net sizes:** Making fishing nets more selective so that only fish above the minimum landing sizes are caught. Measures introduced in 2008 under the Conservation Credits Scheme include:
 - A "one-net rule" was introduced from 1 Feb 2008 so that vessels carry only one regulated gear mesh size per trip.
 - Twin-rig vessels using 70-89mm demersal gear must, from 1 Feb 2008, use either 80mm x 4mm single twine with a 110mm square mesh panel (SMP) at 15m to 18m from the codend OR use 95mm x 5mm double twine with a 90mm SMP at 15m to 18m.
 - Single trawl vessels using 70-89mm demersal gear must, from 1 July 2008, use either 80mm x 4mm single twine with a 110mm SMP at 15m to 18m from the codend OR use 95mm x 5mm double twine with a 90mm SMP at 15m to 18m.
- **Selectivity trials:** there are six selectivity trials in Scottish waters in 2008 (four under the Scottish Industry Science Partnership (SISP) and two further trials directly funded by the Scottish Government):
 - Increasing the selectivity of North Sea nephrops gear using 100-120 SMPs.
 - Measuring the effect on selectivity of different mesh sizes/ positions of SMPs.
 - Selectivity of nephrops gear using SMPs on small vessels on North Sea inshore grounds.
 - Reducing cod by-catch through incorporation of large meshes in lower wings and belly sheet (ie "the Orkney gear" or Scottish version of the Eliminator trawl).
 - Nephrops size selectivity using grids/meshes/SMPs. Depending on the results of earlier trials, further data on appropriate gear designs will be collected later in 2008.
 - Selectivity of whitefish mixed fisheries, especially cod selectivity. Depending on the results of earlier trials, further data on appropriate gear designs will be collected later in 2008.
- **Observer programme:** Under the Scottish Conservation Credits Scheme the Scottish Government is funding a £500,000 two-year independent observer programme to deliver

500 observer days a year from July 2008 to provide further data on discards. This will cover:

- Cod catch/discard rates on 10% of trips for specified vessels.
- West of Scotland reference fleet to observe nephrops fishery and examine commercial viability of gears designed to reduce whitefish discards.
- Commercial trial of 'Orkney gear': selective whitefish gear based on the 'Eliminator' trawl with large mesh in sides and belly to reduce cod by-catch but maintain commercial viability.
- Examine viability of potential spatial measures designed to reduce cod catches in the monkfish fishery around the shelf edge in area VIA.
- Examine viability of further spatial measures designed to reduce cod catches in the nephrops fishery in the Fladdens (area IVa).
- Additional sampling to support the Real Time Closures scheme.
- **Discard summit (25 Sept 2008 in Edinburgh):** To address the key issues and highlight time-lag between the collation of scientific advice compared with the real-time situation on the fishing grounds. This year it is absolutely clear that the cod stock is recovering fast, but the quota does not match the abundance, meaning fishermen have no option but to dump good quality marketable fish despite their best efforts to try and avoid cod.

English waters

- **Voluntary Real Time Closure scheme implemented from 1 Feb 2008 to protect spawning cod (from 1 Jan 2008 in English waters):** When a high abundance of spawning cod is identified, a limited area (7 by 7 miles) is closed for 21 days. From July 2008 the scheme was expanded to include all cod. Under this scheme there have been 17 closures so far in 2008 and compliance has been excellent.
- **Selectivity measures:** Fishermen using demersal towed nets (not including beam trawls) in the mesh size range 80-99mm will be required to use one of the two enhanced gear selectivity devices if they wish to qualify for the additional days at sea supplement. These devices are proven to reduce discards of cod and whiting.
- **Selectivity Options introduced in 2008:** There are various trials underway in English waters:

Reducing whiting discards

- **May 2008** - trials with industry using additional secondary SMPs.
- **Sept/Oct 08** – further trials with industry using additional secondary SMPs.
- **Sept/Oct 08** – trials with industry to evaluate a twin crown cutaway trawl.
- **Sept/Dec 08** - Further trials with industry using the Eliminator trawl.

Cod protection

- **Sept/Dec 08** - Further trials with industry using the Eliminator trawl.
- **2008** Cod avoidance programme.

Sampling of catches and discards onboard commercial vessels

- **2008** Standard DCR programme (600 observer days at sea per year).
- **2008** Evaluating onboard camera system to monitor catches and discards.

Other supporting activities

- **Oct 2008** Selectivity studies on bass.
- **Oct 2008** Selectivity studies on gill nets.
- **2008** Science and industry collaboration under the Fisheries Science Partnership.

- **Environmentally Responsible Fishing Project:** Defra is running a one year study to monitor the catches and discards of inshore fishing vessels less than 15 meters in length. Thirty one vessels are involved in the trial from three ports: Hartlepool, Lowestoft and Thames Estuary.
- **North Sea Regional Advisory Council (NSRAC):** published a position statement on cod discards on 30 Oct 2008 which examines a number of options to prevent the mismatch between 2007 and 2008 quotas and the cod available which has resulted in the widespread discarding of marketable cod. The RAC has suggested the following features should govern the management of the North Sea cod fishery in 2009:
 - Recognition that the TAC for cod in 2008 has been out of line with the availability of marketable fish on the fishing grounds, resulting in widespread discarding.
 - All parties should be committed to eliminating the discarding of marketable cod in 2009.
 - On the basis of ICES projections, discarding of cod will be at a higher level in 2009 than this year, if a similar TAC setting rule (15% increase) is applied because the stock is recovering at a faster rate.
 - If a TAC for North Sea cod is set for 2009 at the highest level consistent with ICES projections, the NSRAC could consider a prohibition on the discarding of marketable cod. (Denmark already applies such a measure).
 - If the TAC for North Sea cod is set towards the upper range of ICES projections for catches in 2009, it will be incumbent upon the fishing industry and member states to ensure the establishment of extensive accompanying measures to reduce or eliminate discards of marketable cod.
 - A reduction in days-at-sea would not directly address the problem of discarding to any significant degree as restricting time at sea does not constrain the level of discarding when the vessels are at sea.
 - The widespread implementation of “cod avoidance” measures to accompany an increased TAC should, all other things being equal, result in a lower fishing mortality for cod than would be the case if there is a low TAC, high discarding and minimal cod avoidance activities.
- **Cod Avoidance plans:** The NSRAC is keen to see the intensification of cod avoidance activity in 2009, to build on the start made on cod avoidance in 2008. This includes:
 - Conservation Credits/Real Time Closures to protect aggregations of juvenile and spawning cod.
 - The successful Real Time Closure programme introduced for the Scottish, English and Danish demersal fleets during 2008 which has secured demonstrable operational changes in line with the objectives of cod recovery.
 - Individual Vessel Cod Avoidance Plans: A pilot project in the English fleet testing the efficacy of cod avoidance plans in ensuring that vessels operate to restrict catches of cod to their quota allocations, through spatial, temporal and gear adaptations.
 - Technical Measures such as the eliminator trawl, which allows effective fishing for haddock and whiting whilst eliminating cod from the catch, and semi-pelagic fishing that similarly has very low discard rates.
 - Equivalent measures in fisheries in which cod is a by-catch.

Irish waters

There are a number of ongoing industry initiatives to investigate technical discard mitigation measures in the Irish Sea nephrops fishery.

- **Anglo Northern Irish Fish Producers' Organisation:** recently completed and extended a study, in collaboration with scientific research laboratories, to investigate a range of technical measures to reduce discarding in the Northern Irish Nephrops fishery.
- **ANIFPO:** plans to continue trials with further modifications in 2007. Trials will focus on the suitability and effectiveness of increasing the mesh size of the current square mesh panel (from 80 to 120mm) and situate the panel closer to the cod-end which has been demonstrated to reduce the capture of sub-legal cod as well as other species of interest.
- **Selective gear trials:** Irish fishermen have been involved in a number of selective gear trials and one of these industry initiatives led to the development of the inclined separator panel, which is included in the Technical Conservation measures currently in place for the Irish Sea. Recent discussions with Irish fishermen have demonstrated a willingness to continue this research including testing the suitability of the 120mm square mesh panel on a voluntary basis. Research conducted in the North Sea by both Scottish and Norwegian researchers have shown that this improves cod selectivity considerably; giving results that are comparable with a 120 mm diamond mesh cod-end and this device seems appropriate for Irish Sea fisheries.
- **Irish Sea enhanced data collection programme:** The collection of additional discard data will provide additional information to determine the effectiveness of such trials and it is envisaged that further selectivity trials and voluntary use of selective gears will become an integral part of the pilot project. The project was approved in Dec 2006. The aim is to:
 - Obtain estimates of total catches (removals) of key Irish Sea fish stocks which are sufficiently accurate that they can eventually be used in annual ICES stock assessments.
 - Engage the fishing industry in the collection of high resolution data collection.
 - Improve precision of current discard programme in ICES area VIIa through enhanced coverage and provision of high resolution effort and total catch data for improved discard raising procedures.
 - Provide higher resolution spatial and temporal discard data to assist in developing appropriate discard mitigation strategies for the Irish Sea.
 - Link with and enhance existing national and EU programmes e.g. Discard Atlas; EU pilot project on discard implementation issues (FISH/2006/15); English and Irish discard mapping programme.

Welsh waters

Discards are not a major issue for the Welsh fishing fleets as it is primarily a shellfish fleet. 'Soft' shellfish like crabs and lobsters are generally fished to quota and any surplus are returned to the sea alive, and survive.

Initiatives

- **Gear selectivity trials for palaemon prawns:** The main UK fishery for palaemon prawns is West Wales. Communication with prawn buyers suggests that market demand is strongest for large mature prawns, rather than landings of mixed sizes (including juveniles). Cardigan Bay Fishermen's Association, supported by the Countryside Council for Wales (CCW) and the Welsh Federation of Fishermen's Associations have conducted gear selectivity trials for palaemon prawns resulting in:
 - ✓ Regulation of mesh size of the pot ends
 - ✓ Regulation of mesh size across the whole pot
 - ✓ Requirement for catches to be riddled aboard the vessel with undersized returned immediately and carefully to the sea.
- **North Wales spurdog longline fishery:** Spurdog are a bycatch in various trawl and gillnet fisheries, and are an important component of inshore, longline fisheries in certain parts of England and Wales. A Fishery Science Partnership (FSP) project involving the fishing industry, Defra and Cefas scientists aims to (a) evaluate the role of spurdog in longline fisheries and examine the catch rates and sizes of fish taken in a longline fishery, (b) to provide biological samples so that more recent data on the length at maturity and fecundity can be calculated, and (c) to tag and release a number of individuals to inform on the potential discard survivorship from longline fisheries. (The tender closing date was October 2008.) The results will:
 - ✓ increase understanding of the discard survival of fish caught under commercial conditions.

Data collection

- 2008 Publication of all national discard data in scientific literature.
- Annual Fisheries Research Services (FRS) discards survey. FRS conducts an extensive observation and sampling programme to provide discard data across a range of fisheries and gear types.