# DAG: science & information gathering focus – 4 April 2011

**Present:**

Giles Bartlett – WWF
Peter Duncan – MCS
Philip MacMullen – Seafish (co-ordinating)
Jonathon Moore – Client Earth
Jim Portus – SWFPO
Rob Enever – NE

## 1. Introductions

Each of those present described their interest in the subject area and their expectations for the outcomes of the meeting

It was noted that the next ICES Annual Science Conference (September, in Hamburg) had a theme session devoted to integrating social, economic and biological information in the context of the interplay between science and management and the role of each player.

## 2. Scoping discussion: terms of reference

After the introductions the ToRs were agreed to be a re-think of what's needed in terms of fishery dependent data and other information. The justification was that the existing systems for gathering, collating and analysing information on fisheries and the marine environment were not delivering the means for effective management.

## 3. Seafish Science: *a proposed clearing house for fisheries dependent data*

The group discussed a proposal from Seafish to establish a unit provisionally named Seafish Science. This was in recognition of the challenges already posed to the existing establishment by the data generated by the Registration of Buyers and Sellers legislation. Future initiatives to generate data from the fleet would create a much greater burden. Seafish propose to use levy and external funds in order to identify the range of data that could be generated by the fleet, the existing and likely future data needs created by new management systems. Critically, Seafish Science would also examine means of bridging the gap between suppliers' potential and users' needs and creating the means by which data could best be stored, collated and analysed.

This group endorsed the proposal as have many other interested organisations.

## 4. Benchmarking catch & discard levels: *is it feasible or necessary?*

It was agreed that, if the existing system was not delivering the necessary outputs, and a new approach was needed, there was little point in trying to establish benchmarks against which future performance could be judged. This had been a feature of the Commission's previous strategy for eliminating discards and was found wanting by STECF.

There should be clarity on what benchmarks are needed and to what scale they should be reported on so that clear objectives are proposed. Experimental design and data collection should follow this. Existing systems are delivering some of the necessary outputs - not sure a totally new approach is needed. We know where discards occur, which fleets they are in, the year-on-year trends in discarding (see attached paper), which species, which gear types etc and in many fisheries, we know how to mitigate discards. In England and Wales, benchmarks have been assessed, and declining discards have been reported.

What is needed is better join-up with European data collectors – an EU discard atlas was proposed previously. Eg. 86% of fish landed in ICES VII are caught by fishing vessels not registered in England and Wales. Even greater percentage for North Sea. Better information on the discard practices of the <10m fleet. 85% by number and currently not part of DCR 1639/2001 is also needed. As well as standardisation of data collection between countries (e.g. England and Scotland) and better observer coverage in fleets with "low" coverage.

## 5. What, how and why?

*The range of possible useful data*: data that could now be gathered included  water and air temperature, dissolved oxygen, time, depth, salinity, total catch monitoring – commercial and other species including charismatics – discards, position, gear type, effort levels, soak times and other environmental observations.

Rob Enever commented on self sampling programmes. They are successful when the fishery is basic (eg single species, minimal bycatch) and unlikely to work for multi-species high resolution data. I think we need to establish what questions need answering.

Many fisheries are characterised with respect to discarding. We know mobile gears contribute to ~90% of our discards. Lets target our monitoring and management needs on a risk based approach ie Produce a manual - fisher A, who fishes in area X targeting species Y could benefit from gear modification Z. *"It has been estimated that, over the past decade, the European Union (EU) has contributed about €8 million annually to more than 400 projects on gear selectivity, discard reduction, and quantification of impacts of fishing gears on habitats (Fischler, 2004)".*

Where are these results? – buried in the inaccessible scientific literature? , could a fisher use these results to better reduce bycatch in his fishery?

Discard mitigation could be tackled on a fisheries-by fisheries approach. E.g. successful gear modification in a fishery targeting species X in area Y might not be successfully implemented in the same fishery in area Z. To this end, it might be

worth identifying EVERY fishery in the UK down to targeted species level. Once each fishery is identified it would be useful to identify the discard risk associated and target mitigation measures to those high risk or perceived high risk fisheries (in the absence of empirical data).

Eg. Does the fishery discard species of conservation importance, is the fishery trying gear modifications, has a gear modification been designed for this type of fishery, is it being used, why are the fishers discarding (legislative or market driven), etc etc etc

*Data gathering methods*: methods available include standard (EU compliant) and high resolution VMS, data storage tags (DSTs), RFID tags, fisher catch sampling, variations on the remote electronic monitoring (REM) theme (mainly video-based), species recognition and measuring software (prototypes currently available) and electronic logbooks. Deploying these technologies can now enable catch and environmental data to be transmitted real-time. The costs of all are falling rapidly and should soon reach the point where REM could be installed on virtually all vessels.

*Data usage, ownership and anonymity:* it is clear that data are needed to support not only the reformed CFP and the Data Control Regulation, but also the Marine Strategy Framework Directive, the Habitats Directive and commitments under the FAO Code of Practice on managing bycatch and discards. Our own Marine Act and the status of MCZs may also raise the need for data. These are all mainly statutory requirements and, currently, there is extremely limited capacity to generate the data needed for these purposes. If member States fail to provide adequate data, or the Commission doesn't play its part in the process, there may be legal ramifications.

Some data may be commercially sensitive, some may be legally sensitive and some may have intrinsic value. In all these circumstances there may be a need or desire to protect or anonymise the data or to assert intellectual property rights. Those setting up systems to collect, collate, analyse and use information will have to determine the degree to which any or all of these conditions may apply.

*Scale & standards*: any attempt at quantifying and managing discarding requires some consideration be given to issues of scale. This is because, at one extreme, individual métiers will present specific characteristics that demand specific solutions. At the other extreme, any proposals to quantify and manage discarding must apply across all member states and must conform to common standards of resolution, accuracy and transparency.

At the micro-scale it will be necessary to build a consensus with practitioners as to the identity of individual fisheries. One tool that may be useful in this respect is the 'Nantes matrix' which can perform search functions at a range of scales. See scaling matrix adopted by ICES? (and based on Nantes).

The question of standards raises some interesting issues both for discards and broader management arrangements. Where results-based management is being adopted, standards such as those established under the Magnuson-Stevens Act[1] become critically important. There has to be some evaluation of effectiveness

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[1] See: http://www.nmfs.noaa.gov/sfa/magact/mag3.html#s301

against agreed metrics. The same tests have to be applied to the robustness of systems dealing with discarding.

*Incentives*: studies have been carried out into potential incentives for behaviour that could reduce discarding and systems have also been introduced which contain incentives. Management may stipulate maximum discard levels and remove fishing opportunities if these are exceeded. Extra catch entitlement may be made available where total catch monitoring is combined with strict catch limits or where intrinsically low impact/low discard gears are used. Discards may (and certainly should) be counted against quota and, combined with total catch monitoring, certain species or size grades may be weighted to provide disincentives for catching them. The tax regime, or grant/loan-making schemes, may be deployed to reduce the cost of adopting new technology. Finally, the market can exert feedback through the supply chain by sourcing preferentially from certain gear types or by specifying the use of discard-reducing gear modifications.

*Costs*: discard management schemes that require all catch to be landed can generate income for the maintenance and improvement of the schemes. In Norway, fishermen receive 20% of the sale proceeds of their 'surplus' catch which roughly covers their costs of bringing it ashore in good condition. The other 80% goes towards monitoring or research costs. Using the fishing industry to collect data would be cheaper than scientific observers, but what level of information do we need to answer our questions? Would the fishing industry be able to deliver that?

Building industry capacity to generate comprehensive datasets is likely to be a far cheaper option for environmental/fisheries monitoring than the more widespread use of observers or research vessels

*Unaccounted mortality*: the single most pernicious aspect of discarding is that it is not adequately monitored so stocks are managed without accurate data on fishing mortality (F). Fishing activity may also result in mortality that is not identified or accounted for. Studies have shown that some selectivity devices on towed gears can induce significant 'escape mortality' and very high mortality of pelagic specie slipped from purse seines has also been documented.

Introducing discard bans over a very short frame introduces the very real risk that measures may be hurriedly introduced to increase selectivity. The use of inappropriate measures may result in fish no longer being brought on board but nonetheless dying anyway.

*FAO Guidelines*: the recently-published FOA report provides the basis for a systematic approach towards monitoring and managing discards and bycatch. The EU is a signatory to it and It should be seen as *inter alia* a 'best practice guide'. Section 5 deals specifically with data. It requires states and RFMOs to establish appropriate and reliable monitoring and assessment techniques to determine impacts and monitor performance over time and describes how standardised capacity must be built by:

- developing strategies for the long-term collection of accurate and detailed data taking into account fishery-specific aspects including spatial and temporal variability in bycatch and discard mortality;
- implementing data collection procedures and protocols appropriate to the scale and type of each fishery;

- establishing research and management priorities on a fishery-by-fishery basis;
- expecting bycatch and discard data collection standards to involve input from fishers, scientists, industry, resource managers, IGOs, NGOs and other relevant stakeholders;
- designing and testing sampling protocols to provide the desired accuracy and precision of data at the lowest cost; and
- integrating the collection of economic and social information with oceanographic and biological information.

It then requires that states and RFMOs should benchmark the status quo, assess the impacts of bycatch and discards and the biological and economic impacts of bycatch management and discard reduction measures, and consider how different types of data from various sources can best be integrated.

It appears that few states or RFMOs are anyway near compliant with these requirements. This issue is very complex and requires a greater understanding of survival rates – could have huge ramifications to elasmobranches (high post capture survival) and other species of conservation importance.

*Reference fleets*: a potent means of monitoring typical catch profiles is the establishment of fishery-specific reference fleets. A set percentage of effort is chartered and fishes normally but with rigorous monitoring of the total catch. The marketable catch is sold and used to offset the charter cost. The catch data are useful in an absolute sense as describing the métier's impact but can also be used as a check against any data that may be generated by vessels through self-sampling or other kinds of total catch monitoring. In this way the use of observers can then be targeted to ensure that catch monitoring is carried out as accurately as is practicable; observers can also be trained to assist crew in developing their sampling skills where they are shown to be generating atypical catch data. Question – with the variation in discard data would a reference fleet be able to tease out atypical catch data – reference fleet would have to be very large to do this – in which case, what would be the point in self-sampling.

*Under 10m sector*: the inshore fleet, comprising mainly <10m vessels, employs a majority of fishermen and takes a substantial proportion of the UK's TACs (varying between regions of the UK). Despite this there is no requirement for this class of vessel to report catches under the Data Control Regulation. The inshore fleet generally works in or around the areas of highest biodiversity in the marine environment and where there is also likely to be the highest proportion of areas designated under conservation legislation. It will therefore be extremely important to report, understand and, where appropriate, mitigate human impacts in these areas. Fishing operations will be one cause of those impacts but, equally, fishing-derived data may help to unravel the significance of other causes – for example aggregate dredging, energy generation, sonic phenomena or temperature change.

Question could be how to propose fishing derived data may help unravel human impacts through aggregates dredging, energy generation and climate change?

*Discard survivals*: it is known that many bycaught marine species are dead or moribund at the point of discarding; equally there is evidence that certain species

have high rates of post-capture survival. Traditionally this subject has been approached by highly capital-intensive experiments that involve maintaining control populations of fish, some of which are very difficult to keep in captivity. We need to know more about this important area because it is central to the argument about banning discards by landing all that's caught. If elasmobranchs, shellfish, flatfish and charismatics are as robust as they appear then it would be perverse to insist upon killing them rather than releasing them alive. New approaches to survival work are being developed based upon indicators like reflex actions and the degree of apparent injury. These need to be supported so that policy can be based firmly on evidence rather than assertion.

*Selectivity vs balance*: an emerging argument over the last decade, tangential to this note but still relevant, is whether selectively removing certain species from the environment is causing ecosystem imbalance. The corollary is that it may be better to remove entire 'chunks' without selecting any particular portion. There is no clear answer to the question because 'the question of balance' depends also upon how much elasticity there is in food webs and what proportions of species at a given trophic level can be removed without causing disproportionate or irreversible change. As we attempt to negotiate continuing fishing access to conservation areas there is a clear need to understand the impact of removals on the conservation status of features of interest. Comprehensive catch data will assist this process so that the best balance is achieved between conservation and extraction.

## 6. Next steps

The theme group suggests that the following actions should be taken predicated on the imperative need to identify and quantify discards and associated fishing-related mortality of marine species:
- the UK should press the European Commission and Parliament to introduce and comply with the provisions of the FAO Guidelines on bycatch management and reduction of discards;
- an inventory of fishing metiers should be assembled based on agreed levels of scale and complexity;
- the impacts and interests of the <10m sector must be included in any strategic approach;
- note should be taken of the urgent need to build data generating capacity in order to manage fisheries and the marine environment better and to satisfy the requirements of a number of national and European commitments;
- a strategic review should be made of data needs and potential sources, taking into account FAO guidelines on accuracy and precision;
- work on currently unidentified or unquantified sources of fishing-induced mortality, including survival studies, should be prioritised;
- any framework for managing and reducing discards should incentivise best practice and the generation of quality data; and
- the concept of 'Seafish Science' should be further developed capitalising on current initiatives on participatory research and joint industry:science data collection[2].

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[2] See for example the EU supported GAP project ( www.gap1.eu ); contract SI2.491885, Ref.FISH/2007/03 Lot1; and various EFF-funded industry:science projects