

Theme Session Q – Science underpinning stock abundance survey practice, including unaccounted fishing mortality, especially ghost fishing

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The theme session was divided into three sub-themes, these were:

- Survey trawl performance
- Other survey methodologies
- Ghost fishing

It is not the intention of this report to summarise the papers presented, readers are referred to the abstracts and CM papers for details of the presentations.

Survey trawl performance

The papers presented covered a wide range of issues linked to the use of survey trawls, generally in the context of bottom trawl surveys, but including pelagic survey trawls. A number of key themes emerged.

Handling of change in surveys, practice, design and gear

Some of the papers (e.g. Q:10, 08, 03,) evaluated sources of bias and/or variance in the trawl survey CPUE results. In many cases, the studies represented what could be called “assumption testing”. For example, we might assume that better measurement of wing spread would improve the quality of swept area estimates. While this was the case, the changes can be small depending on the circumstances. A different view was expressed in the context of changing both vessel and gear in the NE US bottom trawl surveys. To handle this transition, NMFS is proposing up to 1200 paired tows to calibrate the new set-up against the old. While this represents an ideal case, such an approach is probably impossible in most countries and most situations. In many cases smaller scale evaluations of the likely impact of a particular gear or practice change could be made without such massive investments. This could be based on expert knowledge or on smaller scale, targeted but off line studies. The latter could include specific fishing or gear trials to test a particular proposed change. In many cases the outcome may well be that the change is likely to be small, even if statistical significance may not be achievable.

Impact of fish behaviour on trawl survey performance

Many of the papers (e.g. Q:22, 03, 11 & 12) highlighted the potential impacts of fish behaviour on the practice and results of trawl surveys. One example was the response of some fish species to current velocity. Different combinations of current, time of day and year could result in substantially different fish availability to the trawl. This emphasises the continued need to understand the behaviour of the fish to properly understand the results of the trawl hauls.

Other survey methodologies

The second sub theme was more diverse, and included papers on trawl, acoustic, and TV surveys, as well as otolith sampling, the use of GIS and use of environmental data. The principle of assumption testing was again the main theme that emerged. Again, the conclusions were often that the original approach has turned out to be reasonably robust. The key point is that we are now able to substantiate these assumptions.

A second theme also emerged from this session, particularly from papers Q:16, 07 & 06. This was a reappraisal of the question “How long should we tow for?”. Recent trends have generally been to use shorter and shorter tows. This is most obvious in bottom trawl surveys, but was also apparent in TV and pelagic surveys. The basis for shorter tows is generally that shorter tows allow more tows, and this helps manage variance. But shorter tows also mean more vulnerability to local patchiness, as well as differences within and between species in the time to exhaustion and hence capture. The conclusion of the attendees at the theme session was that it would now be appropriate for ICES to provide coherent advice on all the factors that need to be considered when changing tow length. This could also include advice on analytical tools to inform any decision on tow lengths. It is proposed that this could be best done using a workshop comprised of survey, fish behaviour and gear experts, as well as statisticians and stock assessment modellers.

Ghost fishing

Four presentations were given on ghost fishing along with one poster. Five themes emerged from the discussion:

- the extent and impacts of lost fishing gears vary widely. Determining the dimensions of the phenomenon may involve a process of surveying and sampling. Generally, the extent of the duration and intensity of impacts is associated inversely with the energy levels in the environment;
- most problems associated with lost or abandoned gears can be precluded by the adoption of good, responsible, fishing practices;
- technical solutions are available that can largely mitigate most problems that cannot be resolved by adopting good practices;
- further mitigation is possible through retrieval programmes but costs need to be considered against potential benefits;
- there is scope for further research into those fisheries where lost gear has a high and/or sustained impact, and into the design and evaluation of retrieval equipment.