Theme session N

Technical approaches to reduce the environmental impact of fishing

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The use of natural resources unavoidably comes with environmental impact, which is usually perceived to be negative. Technical measures to reduce this impact are often the least painful solutions to mitigate the conflict between use and conservation, as they usually don't require much change in fisher behaviour. For example, the introduction of a discard ban might be more easily accepted if there are improvements in selectivity to avoid catching unwanted fish. These solutions require good ideas and a clear definition of the aims, but also thorough testing, and should be supported by the creation of right incentives. Gear changes can even have adverse effects if the aims are not clearly defined. A good example is the recent increase of mesh size in one Baltic fishery unintentionally leading to higher discards. This could have been avoided if testing would have involved proper population modelling. There are other examples where technical solutions are developed and sometimes implemented without a systematic approach to the problem – for example avoiding seabird or harbour porpoise bycatch requires insights into their behaviour. An increasing number of developments now use such an approach, such as the Dutch project to evaluate the effect of the use of pulse trawls (ultimately aiming at reducing the impact further).

Other technical measures, such as spatial or temporal ones, require the same careful consideration of the objective and how to achieve it. A key issue would be the likely displacement of fishing effort by a closure that could actually lead to ecosystem impacts elsewhere, possibly greater than the benefits of the closure itself.

Wider management measures can also have unexpected impacts, for example the Landing Obligation, which could be considered in the same context.

The Theme Session outcomes:

The session provided a wide ranging show case of where technical measures can be applied in modern Ecosystem Based Fisheries Management.

The biggest single theme was centred around pulse trawling. This has been a recent subject of controversy for the industry and NGOs. The presentations (50,246,339, & 538, and poster N49) illustrated how pulse compared favourably to traditional beam trawls and ranged from bio-geochemical changes to physical impacts on fish. This was also the main discussion point in the first open discussion part of the theme session. Generally the perception was that pulse was a valuable potential tool for mitigating many of the ecosystem impacts of beam trawls, although the issues of gear competition, and the still developing understanding of all the ecosystem impacts was recognized.

Three presentations looked at ways of reducing the bycatch of vulnerable species such as seals, sharks and dolphins in a range of nets (33,188 & 401). Particularly interesting was research on using gear based measures in combination with other approaches including spatial and temporal closures (542, 573, 634).

The role of species and size selectivity remains important in the field of gear development, although it was instructive that this type of work did not predominate in the session. Equally, these did not follow the traditional selectivity curve approach but were more innovative, including avoiding herding (N83), divided gear (N575) & use of light (N167), as well as considerations of how to use selectivity data more appropriately in assessment and management (N133). Selectivity issues were also addressed in three posters (61,127 & 539).

The issue of "ghost fishing" and the impact of lost or abandoned nets was addressed in two presentations. One looked at the use of biodegradable net materials (N58), while the other looked at net marking (N239).

Most papers in this session represented some aspect of the idea of mitigating the impacts of fishing gears on the marine ecosystem. Two addressed these impacts specifically. One looked at sediment re-suspension (N307), and the other at a wider range of ecosystem impacts. The latter (N243) was notable in looking at ecosystem impacts of *improving* the selectivity. Poster N574 considered how to mitigate ecosystem impacts of FADs.

Discussion in the second session focused on the developing role for gear technology beyond selectivity trials, to encompassing ecosystem impact mitigation, and other was the methods could be used in EBFM. The conveners also focused discussion on the idea of a three step approach to the application of gear technology:

1. Start from defining the actual objective needed in an EBFM context. This could be done with ecosystem experts and IEA practitioners.
2. Determine what the BEST approach would be to achieving that objective. This could involve gear technology, but could also include other technical measures e.g. spatial or temporal management, or ideally combinations of these. For instance, an improved selectivity might be achieved with a gear modification, but may also be done by closing an area to fishing, or simply change how and when fishing is carried out.
3. Finally, the appropriate gear technology can be developed in collaboration with all the other parties.