

Theme Session M Report

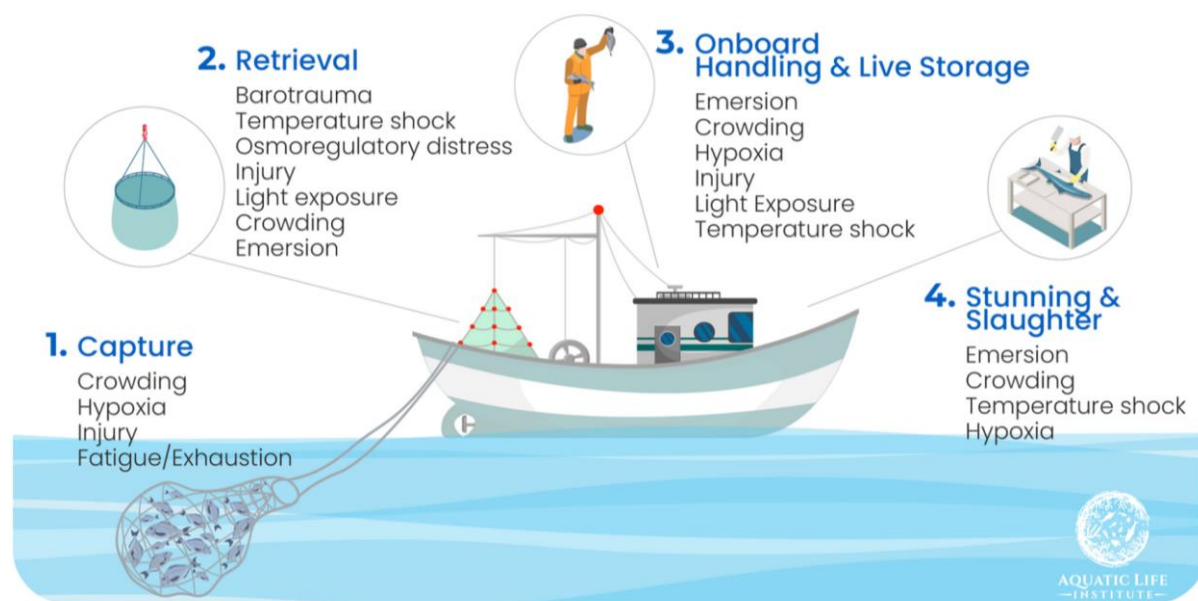
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Welfare conscious and sustainable fishing in the 21st century

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Background

Interest in the welfare of wild-caught animals from both commercial and recreational fisheries is increasing, due to growing consumer demand for ethically sourced seafood. The landed catch from commercial fisheries is estimated to include between 1.1-2.2 trillion animals globally. Stress and injury from capture and handling has detrimental effects on both the survival of any released unwanted catch and the quality of the landed catch (Fig. 1). Harvesting sustainable seafood in the 21st century should therefore embrace welfare-responsible practices that minimise injury and stress to the catch during capture and handling. This will minimise bycatch, maximise survival of released animals, while also providing tangible benefits for the fishery by improving product quality and shelf-life. To address this, industry innovators and blue stewards are raising awareness of catch welfare and designing modified fishing gears, and operational, handling and slaughter practices.



Adapted from Davis (2002), Broadhurst et al. (2006), Breen and Catchpole (2020)

Figure 1. An overview of the potential hazards (stressors) affecting aquatic animals at different phases of the capture and handling process (from Xu, 2024).

Session synopsis

The theme session stimulated interest from a broad spectrum of stakeholders, including research, industry and NGOs, with 17 presentations and 11 posters, and over 80 attendees at the session. To illustrate how reducing stress and injury through good welfare practices can have beneficial effects on both sustainability and product quality, this theme session grouped presentations into four sub-sessions, with associated discussion panels:

1. Introduction: Concepts & Principles

Three opening presentations introduced key concepts and definitions. The opening presentations emphasised that because capture fisheries are not benign, with most animals experiencing some degree of stress and/or injury, the most constructive approach to better understanding welfare related issues is to adopt a functional-based definition of welfare; i.e. where an animal's welfare status is considered compromised when its biological systems are being forced to function beyond their capacity to cope. This allows the development of objective animal-based measures of welfare status which, when applied in a risk assessment-based framework, can be used to identify critical risks to an animal's welfare during the capture and handling process, and mitigate them by minimising any associated stress and injury. Examples of how this approach is being applied to investigate welfare in several fisheries was presented from the Care-Fish project, including: bottom-set gillnets, longlines, pots & traps and purse-seine. The Aquatic Life Institute, an NGO advocating aquatic animal welfare, explained how interest in the welfare of wild-caught animals from both commercial and recreational fisheries is increasing, due to growing consumer demand for ethically sourced seafood. Consumers see fish not just as a commodity, but as individuals that deserve fair treatment, care and protection to alleviate any pain or suffering in the human seafood production process. Discussion included whether it is constructive to consider sentience of animals in wild capture fisheries, including the subjective nature of "pain" and "suffering". It was recognised that while research into animal sentience is important, its validity and therefore relevance is still scientifically debated regarding aquatic animals. As such, the more constructive approach to improving aquatic animals' welfare is to focus on reducing stress and injury using established empirical and objective metrics of the stress response.

2. Welfare Assessment

The object assessment of animal welfare uses many metrics with established links to welfare outcomes, including environmental and operational parameters, describing relevant stressors, as well as physiological and behavioural measurements of individual animal's stress responses to those stressors. This session showcased studies assessing welfare status in several different fisheries, including: haddock in a live capture demersal seine fishery in Norway; Nephrops in a trawl fishery in Scotland, UK; Bluefin tuna in a tag and release recreational fishery in England, UK; and Sparids in a gillnet fishery in Portugal. These also demonstrated how better understanding of the processes and practices affecting welfare can lead to effective and practical mitigations. However, methods for assessing welfare are still very much in development and the final presentation gave a cautionary note on how vitality assessments (using behaviours, reflexes and injuries as welfare descriptors) have limited capacity to predict the survival of stressed animals. Concluding, using vitality as a stand-alone proxy for survival may be insufficient, because some vitality scores are not independent of environmental variables.

3. Pelagic Fisheries

Pelagic fisheries affect the welfare of enormous numbers of fish with regards to both individual catches and the total catch each year. The large-scale, industrial fisheries face considerable welfare challenges, including the sheer volume of catches, the pumping and brailing process, as well as the humane slaughter of large numbers of fish. In three scoping studies looking at pelagic trawl and purse seine fisheries for mackerel and herring, it was demonstrated that sensitivities towards the capture and handling processes were species specific. Reducing crowding durations and opting for smaller catch sizes showed potential for reducing stress and injury.

4. Demersal Fisheries & Technological Solutions

Several technological innovations to improve catch welfare during capture in demersal trawls were presented. These included affordable camera systems from CatchCam (formerly SNTech) to enable fishermen to better understand the interaction between the catch and their fishing gear, particularly in association with technology to promote selectivity. At the other end of the technological scale were examples of active selection systems, “Smart-Trawl” and “Game of Trawls”, that both use stereo-cameras and AI technology to identify unwanted catch and activate mechanical openings (of different designs) that facilitate their release. The lined “flo-mo” codend from New Zealand showed great potential to reduce stress, fatigue and injury in the catch in the codend by reducing their exposure to excessive water flow. During the discussion all the presenters confirmed that fishers were mostly positive to these innovations, but it was recognised they were primarily working with fishers who are innovative and generally engaged in research. Finally, an innovative new system was presented for electrically stunning and killing flatfish in a single step. To date, most electrical stunning systems have been shown to only temporarily render animals unconscious for short periods, requiring the quick application of a suitable killing method. This innovative stun-and-kill system could enable the development of humane slaughter practices in commercial fishing operations.

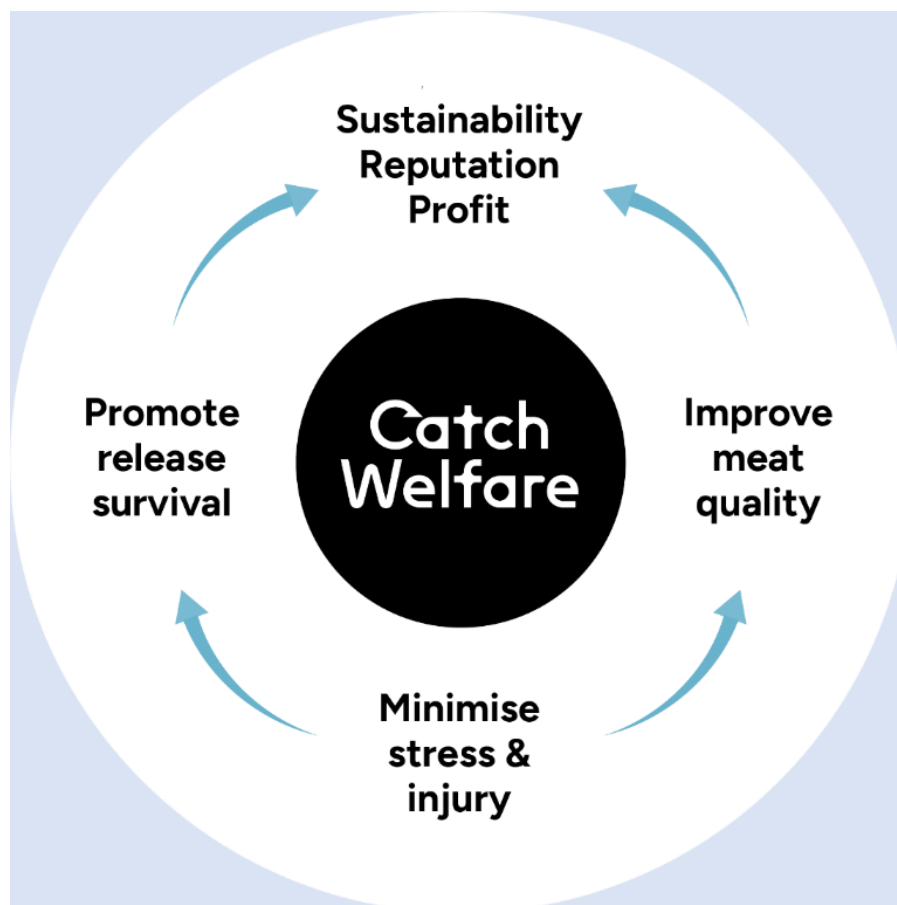


Figure 2. The link between good catch welfare and sustainability (from Breen et al, 2024).

Conclusion

Better welfare of aquatic animals during capture is not just an ethical issue, it has clear potential benefits for food security and the sustainability of exploited stocks, through increased survival of released animals and reduced spoilage in fisheries products (fig 2). It also has the potential to benefit the economic sustainability of the fishing industry through improved productivity, profitability and reputation, as well as access to new markets. Furthermore, discussion during this session highlighted the need for improved animal welfare practices during ICES coordinate stock assessment surveys. All

of this will require the further development of objective methods for empirically assessing the beneficial impacts of implementing welfare conscious fishing practices. Clearly, there is much to be learned from collaboration with the aquaculture industry and supporting welfare science. To this end, there was a call for ICES to take a more active role in the coordination of these welfare related scientific activities by establishing an expert group.