Topic Groups

ETP Bycatch Mitigation Meta - Analyses for Large Pelagic Fisheries (Pelagic) – First year

Conveners

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Terms of Reference

A WGFTFB Topic Group convened by Eric Gilman, Liming Song, Antonello Sala, Martin Hall, and potentially additional co-leads, will be formed in 2020 to develop an open source database to support robust meta-analyses of endangered, threatened and protected (ETP) species bycatch mitigation in pelagic fisheries. Due to the larger sample size plus the number of independent studies, correctly designed meta-analyses can provide estimates with increased precision and accuracy overestimates from single studies, with increased statistical power to detect a real effect. The Topic group has the following Terms of reference:

1. Develop a database of records from compiled literature to support robust meta-analyses on the relative risk of ETP capture by gear design factor. Each database record would include summary statistics required for inclusion in a meta-analysis, including the number of captured organisms by species or higher taxonomic grouping and amount of observed effort, by treatment (e.g., number of leatherback sea turtles caught on pelagic longline circle hooks, and number of circle hooks observed). These records would be derived from publications and grey literature, including from research experiments, at-sea observer programs, electronic monitoring programs, survey fishing, and logbook data. The database would be open source and designed to be a living document, supporting continuous entry of new records making it efficient to conduct up-dated meta-analyses as new records accumulate.
2. During 2020 the Topic Group will have: a) Compiled sufficient records to complete a meta-analysis on the pooled (overall) relative risk of capture of ETP species by pelagic longline bait type (small species of fish, squid species, pieces of incidental catch large pelagic species); and b) Will have developed a database structure and entered records from pelagic trawl fisheries.
3. By the WGFTFB 2021 annual meeting, the Topic Group will have finalized and published the database for pelagic longline and pelagic trawl fisheries.

Passive fishing gears (Passive) – Second year

Conveners

Peter Ljungberg (Sweden, peter.ljungberg@slu.se), Isabella Kratzer (Germany, isabella.kratzer@thuenen.de), and Lotte Kindt-Larsen (Denmark, lol@aqua.dtu.dk)

A WGFTFB Topic group convened by Peter Ljungberg, Isabella Kratzer, and Lotte Kindt-Larsen was formed in 2019 on passive gears and will continue the work to 2020.

Terms of Reference

1. Summarize current and past work in relation to fish pot and trap development, plus gillnet and longline modifications in order to avoid bycatch of protected species (hereunder marine mammals, sea birds and sea turtles).
2. Discuss and describe methods and their limitations, hereunder catch efficiency and depredations risks. Furthermore compare newly developed bycatch mitigation efforts and their efficiency to standard gear and compare different types of passive gears (e.g. gillnets vs. fish pots/traps) and the processes of depredation.
3. Identify and make recommendations on how to improve passive gears including unwanted bycatch, high variability in catches and mitigation of depredation from different predators.
4. Identify potential synergies in developing new approaches to promote sustainability (economically and ecologically) of passive gears.

Justification

Passive fishing gears such as gillnets, longlines, traps and pots, belong to the most common fishing methods worldwide. These methods have naturally advantages like efficiency, simple use and size selectiveness. Nevertheless, they have been criticized due to bycatches of higher taxa like sea turtles, sea birds and marine mammals, ghost fishing and their vulnerability to depredation by marine mammals.

In recent years, a lot of effort has been put into the optimization of fish traps and pots, mainly due to gillnet-raiding seals and studies on how to mitigate bycatch in gillnet and longline fisheries have been carried out with differing success, but a scientifically proven management tool or technical solution working across taxa has yet to be developed.

The “Passive” topic group will thus aim to investigate selectivity, efficiency and sturdiness of passive gears, such as gillnets and longlines (mainly species selectivity), fish pots and large-scale fish traps (mainly efficiency and sturdiness). It will document and evaluate current and past work regarding gillnet and longline modifications as well as fish pot and fish trap development. This will include a wide range of fields such as species behaviour, gear design and hydroacoustics. Ongoing and future projects regarding enhanced economical, ecological and social sustainability of passive gears will be discussed and potential synergies identified that will hopefully stimulate new ideas and innovation.

Evaluating the application of artificial light for bycatch mitigation (Light) – Third year

Conveners

Noëlle Yochum (USA, noelle.yochum@noaa.gov), and Junita Karlsen (Denmark, juka@aqua.dtu.dk)

A WGFTFB Topic Group convened by Noëlle Yochum and Junita Karlsen was formed at the 2018 meeting in Hirtshals Denmark, to evaluate the application of light as a mechanism for bycatch mitigation. At the 2019, ICES-FAO WGFTFB meeting the 'Light' Topic Group of experts the group meet for the second year and the final year for the Topic Group is planned to be 2020.

Terms of Reference

1. Describe and summarize completed and ongoing research, successes and 'failures', related to the ap-plication of light for bycatch mitigation.
2. Identify patterns with respect to species and fishery/ gear types, noting fish behaviour in response to light (attraction, repulsion, guidance), and other variables that play a role in the efficacy of using artificial light for bycatch mitigation (e.g. vision, depth, etc.).
3. Describe best sampling techniques for testing the application of artificial light under varying circumstances, including guidance for dealing with common experimental challenges.
4. Highlight areas of needed research in the field of fish behaviour with respect to light, and fisheries that might benefit from the application of artificial light.

Justification

Essential to the study of fishing gear design and use is fish behaviour. The success of bycatch mitigation is linked with understanding how fish interact with fishing gear and respond to the micro-environment in and around the gear. A component of fish behaviour that is increasingly being evaluated is the reaction of fish to artificial light. To that end, from 2012-2014, Heui-Chun An, Mike Breen, Odd-Børre Humborstad, and Yoshkiki Matsushita convened a WGFTFB Topic Group (TG) titled "Use of Artificial Light in Fishing". The focus of this TG was to evaluate the use of artificial light to affect fish behaviour and stimulate catch, and to research and synthesize information on fish vision and behaviour with respect to light. They also summarized the use of artificial light in fisheries globally and regionally.

The aim of the 2018-2020 'Light' TG is to build on the foundation that has been laid, and to focus on the use of artificial light to enhance bycatch mitigation (e.g. illuminating escape ports or the footrope in trawl gear). Specifically, this TG will focus on creating a community of researchers using light as a fisheries selectivity tool, will develop resources to support this community, and will aggregate and synthesize information from global projects.

Through collective review of this research, we will identify variables that play a role in the efficacy of using artificial light for bycatch mitigation (e.g. species, gear type, fish behaviour). We will also discuss common experimental, technological, and analytical challenges when doing this research, and identify gaps in knowledge and other fisheries that might benefit from the application of artificial light.

Through the analysis of completed and on-going research, and collective knowledge of the TG experts, we will also consider guidelines for conducting research on the application of artificial light for bycatch mitigation. We hope that these meetings will also foster an exchange of ideas and support, and stimulate innovation.