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TECHNOLOGICAL APPROACHES TO ADDRESSING TUNA MORTALITY ASSOCIATED WITH FAD FISHING

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Abstract

The authors participated in the Global FAD Science Symposium, March 20-23, 2017 in Santa Monica, California and are presented without affiliation. This paper is one of several from the Symposium and does not represent an exhaustive discussion of the issue but includes points agreed by participants. The participants recognized that impacts of FADs and FAD management cannot be considered entirely independently of harvest strategies, issues related to fishing capacity, ecosystem structure, or management of all other fishing gears in tropical tuna fisheries. None of these points alone will address the management challenges associated with FAD use. The effectiveness of any of these points will depend on the levels of implementation and compliance and need to be connected to processes in the RFMOs. Participants underlined the need for data harmonization, standardization, and availability and stressed the need to develop standardized language and definitions to support consistent interpretation of what conservation and management measures intend to achieve across ocean basins. Participants noted that "best practices" are not necessarily "most practical" and will need to be assessed to determine which are most appropriate to apply in any particular management setting or geographic area. Finally, participants stressed the need for ongoing and close collaboration among scientists, managers, and industry in driving innovative solutions within and across RFMOs. The points presented here are not in an order of priority; priorities and solutions may change on a regional basis.

Introduction

Continuing improvements in FAD technology since the devices were embraced by the global tuna purse seine fleet in the mid-1990s has increased the efficiency of vessels and the catches of the main targeted species of skipjack tuna. At the same time, this trend has contributed to the undesirable impacts on juvenile and small bigeye and/or yellowfin tunas. This paper presents points agreed by participants at the Global FAD Science Symposium[1], where key information and suggested next steps were discussed on the potential for technology from echosounder buoys to be used to develop new approaches to mitigate the catch of juvenile and small bigeye and/or yellowfin.

Key information

Since the introduction of echosounder buoys about 10 years ago, the global purse seine fleet has rapidly moved to deploy them in greater numbers in FAD-associated fishing operations. Once simple floating objects, FADs are now sophisticated instruments, linked via satellite to purse seine operations that can track the global positioning devices on the buoys as they drift along the surface of the ocean. The introduction of echosounder devices on 75 to 100 percent of the buoys used in many fleets and their accompanying computer algorithms translates acoustic returns from the fish into a rough indication of total biomass in proximity to the FAD that is then displayed as an image to vessel operators in real time. At this time, the technology cannot reliably estimate species and size composition. Estimates of total biomass also can vary from the tonnages actually caught. Buoys of different manufacturers have different

levels of reliability and range. However, improvements in the technology are feasible. Assessing species composition via echosounder buoys and acoustic equipment is increasingly promising as a means to mitigate the catch of undesirable species. With the ability to discriminate among species under a FAD, an operator could avoid large aggregations of juvenile and small bigeye and/or yellowfin, choosing to fish only on large aggregations of skipjack.

Next steps

Sharing information among scientists, vessel operators and buoy manufacturers would lead to the greatest improvements in the technology. Greater understanding of the acoustic properties of tunas is required to distinguish reliably among species and size. The lack of a swim bladder in skipjack holds promise for distinguishing that species from the other tropical tunas in a mixed aggregation, but more research is needed to identify a path forward to distinguish bigeye from yellowfin and to identify different size classes of these species. To be useful in providing information for the purpose of mitigating undesirable catch, biomass estimates need to be improved and displayed in an objective system that does not rely on the interpretative skills of a skipper to be reliable. In addition, vessel operators need incentives to make 'good choices' based on the biomass information displayed. Incentives could be regulatory – prohibitions on setting on large quantities of juvenile and small bigeye and/or yellowfin – or market- based.