Original: English

MANAGING FAD CAPACITY AND IMPACTS ON MARINE ECOSYSTEMS

John Hampton, Gerry Leape, Amanda Nickson, Victor Restrepo, Josu Santiago, David Agnew, Justin Amande, Richard Banks, Maurice Brownjohn, Emmanuel Chassot, Ray Clarke, Tim Davies, David Die, Daniel Gaertner, Grantly Galland, Dave Gershman, Michel Goujon, Martin Hall, Miguel Herrera, Kim Holland, Dave Itano, Taro Kawamoto, Brian Kumasi, Alexandra Maufroy, Gala Moreno, Hilario Murua, Jefferson Murua, Graham Pilling, Kurt Schaefer, Joe Scutt Phillips, Marc Taquet[1]

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

The contribution of FADs to the overall effective fishing effort in tropical tuna fisheries is a combination of the number of FADs deployed by each vessel, the number of purse seine vessels deploying and fishing on FADs, and the number of supply vessels managing FADs *in situ*, including by deploying or recovering them. In recent decades, the numbers of all three of these components of FAD capacity have increased, leading to a situation where tens of thousands of new FADs are deployed each year in tropical waters around the world. Below, we highlight some of the agreed points highlighting the impacts of FADs on marine ecosystems that were discussed at the Global FAD Science Symposium.[1] We focus our points on three primary topics – key information, proven and promising approaches to mitigation, and gaps in the current scientific knowledge on the issue.

Key information

FADs increase the fishing efficiency of purse seine vessels and are now deployed wherever purse seine vessels target tropical tunas. However, there are several indicators that the current level of FAD fishing and FAD deployment may be negatively impacting tuna stocks – by contributing disproportionately to the removal of small tunas – and other non-target stocks. The wider impacts of FADs on marine ecosystems are not as well understood, scientifically, but generally cover potential negative changes to the pelagic environment associated with FAD deployment, use, and loss and to sensitive coastal and continental shelf environments associated with grounding or beaching. Recent studies suggest that approximately 10% of FADs deployed in the Atlantic and Indian oceans interact with coastal ecosystems. Impacts of FAD use on the pelagic environment require further research. With the constant exchange of FADs among fishing operations (via trading, selling, or stealing), it is difficult to know how many FADs are in the water, how long they last, and who is/should be responsible for mitigation and clean-up of the impacts of FADs on marine ecosystems.

[1] For more information about the Global FAD Science Symposium or about this paper, contact Grantly Galland (ggalland@pewtrusts.org).

Proven and promising approaches to mitigation

Most of the known ecosystem impacts of FADs stem from the large number of FADs in the water and the possibility that they are lost or abandoned. Therefore, management practices that limit the number of FADs deployed, reduce the likelihood that they are lost or abandoned, and encourage their recovery will all mitigate their impact on pelagic, bottom, and coastal environments. If vessel numbers are held constant, directly limiting the number of FADs that can be deployed each year may be a promising approach to addressing some of the issues associated with their use. However, there is general agreement that if a limit to FAD deployment is assigned on a per vessel basis (as opposed to per ocean basin) that it will not be effective without also limiting the expansion in number of vessels in a fishery (both purse seiners and support vessels). In order to determine what is an appropriate number of FADs in the water and/or to enforce deployment limits, it is necessary to be able to validate the number of FADs deployed by each vessel. Electronic monitoring of FAD deployments, both by purse seine vessels and support vessels, and FAD tracking in the ocean and post-stranding, are important components of FAD management.

Though there is not a widely adopted definition of biodegradable FAD, encouraging or requiring purse seine operations to use FADs that have a minimal chance of becoming part of the global marine debris problem is a promising approach to preventing interactions between this fishing gear and sensitive marine ecosystems. Use of non-entangling FADs should also reduce the unintended take of marine life by FADs that are lost or abandoned, though there is not currently a widely adopted definition of non-entangling FAD.

Most purse seine fleets are now required to produce FAD management plans, but recovery efforts are not often included. FAD management plans should include realistic FAD recovery provisions that minimize total FAD loss or FAD encounters with sensitive habitats. FAD tracking and recovery programs are promising approaches to preventing beaching or grounding in some regions. These programs may involve partnerships between fishing operations and local groups where GPS tracking data are passed to local groups who can intercept FADs before they reach sensitive areas. Support vessels may play a similar role in FAD recovery or interception. The success of these tracking and recovery efforts requires each FAD to be equipped with an active GPS buoy that should never be deactivated while in the water and should maintain a minimum reporting frequency (determined by scientific requirements) at all times. General FAD tracking data may also be useful in identifying regions where beaching or grounding is most likely to occur, supporting establishment of new recovery programs in these potential hotspots.

Self-propelled, remotely controlled FADs could be explored as a means of preventing FAD loss and FAD encounters with sensitive habitats. This new technology is currently in the earliest stages of development but may be a promising approach to consider.

All of the above proven and promising approaches to mitigating FAD impacts on marine ecosystems should be explored and developed in the context of clear management objectives so that scientists and managers know how to examine their effectiveness.

Gaps in current scientific knowledge

Most of the current knowledge on the impacts of FADs on marine ecosystems involves beaching or grounding of FADs in coastal and continental shelf systems. Less is known about the impacts of FADs on the pelagic environment. Several studies have tried to address whether habitat perturbation due to FADs may negatively impact populations of tropical tunas and other pelagic fishes, but scientists do not definitively agree on the conclusions. More research should be conducted on this issue and on the ecological impacts of FADs in the pelagic environment, in general, to understand the effect of FADs on that ecosystem.

Reliable, consistent data on FAD deployment and use continues to be difficult to obtain for many scientists. Though purse seine fishing operations often collect this information for their own purposes or to submit to their national authorities, much of it does not make it to the RFMOs under which their activities are managed. A revision of FAD data requirements at the tuna RFMOs may be necessary to begin to address this problem.

The management of FAD capacity and the contribution of FADs to the overall effective fishing effort in tropical tuna fisheries will require some clarification of FAD ownership issues. In addition to developing a common set of definitions necessary to manage FADs across multiple ocean basins, RFMOs will need to determine who owns a FAD and is therefore responsible for any impact that it has on marine ecosystems. A FAD's ownership could be assigned to the operation that deployed it, the operation that most recently fished on it, the operation that most recently attached an active GPS tracking buoy to it, or some other stakeholder. This clarification will assist RFMOs with compliance once FAD management measures are implemented.