

## FAD MANAGEMENT OBJECTIVES SHOULD BE DEFINED AND IMPLEMENTED AT ICCAT

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### SUMMARY

*Tropical tuna fisheries management at the International Commission for the Conservation of Atlantic Tunas (ICCAT) has recently shifted to address the growing use of fish aggregating devices (FADs) in purse seine operations targeting skipjack, bigeye, and yellowfin tunas. FAD use presents a series of challenges beyond those associated with the targeted stocks. FAD management, therefore, requires a set of specific, quantitative management objectives that simultaneously define ICCAT's general philosophy for FAD management and provide a measuring stick against which scientists can test the effectiveness of implemented or proposed actions. This need for objectives has been stressed by scientists, industry, and environmental NGOs in several meetings in 2017. ICCAT should develop and incorporate FAD management options into its tropical tuna measures, as soon as possible. Draft general objectives are provided here. These gear-specific objectives should not take the place of stock objectives, but instead the two should be developed and implemented simultaneously. This was a primary conclusion of the 2017 Global FAD Science Symposium and the 2017 Joint tRFMO FAD Working Group Meeting.*

### RÉSUMÉ

*La gestion des pêcheries ciblant des thonidés tropicaux par la Commission internationale pour la conservation des thonidés de l'Atlantique (ICCAT) a récemment été modifiée afin d'aborder l'utilisation croissante des dispositifs de concentration des poissons (DCP) dans les opérations de senneurs ciblant le listao, le thon obèse et l'albacore. L'utilisation de DCP pose une série de défis allant au-delà de ceux liés aux stocks ciblés. La gestion des DCP nécessite donc un ensemble d'objectifs de gestion quantitatifs spécifiques qui définissent simultanément la philosophie générale de l'ICCAT de gestion des DCP et fournissent une pierre de touche à l'aune de laquelle les scientifiques peuvent tester l'efficacité des mesures mises en œuvre ou proposées. Ce besoin d'objectifs a été souligné par les scientifiques, l'industrie et les ONG environnementales lors de plusieurs réunions en 2017. L'ICCAT devrait élaborer et intégrer des options de gestion des DCP dans ses mesures concernant les thonidés tropicaux dès que possible. Des projets d'objectifs généraux sont fournis dans le présent document. Ces objectifs spécifiques aux engins ne devraient pas remplacer les objectifs liés au stock, mais ils devraient tous deux être développés et mis en œuvre simultanément. Il s'agissait de la conclusion principale tirée lors du Global FAD Science Symposium de 2017 et de la réunion du groupe de travail conjoint sur les DCP des ORGP thonnières de 2017.*

### RESUMEN

*La ordenación de las pesquerías de túnidos tropicales en la Comisión Internacional para la Conservación del Atún Atlántico (ICCAT) ha dado un giro recientemente para abordar el creciente uso de dispositivos de concentración de peces (DCP) en las operaciones de cerco que se dirigen al listado, patudo y rabil. El uso de DCP presenta una serie de problemas que van más allá de los asociados con los stocks objetivo. Por lo tanto, la ordenación de los DCP requiere un conjunto de objetivos de ordenación específico y cuantitativo que defina simultáneamente la filosofía general de ICCAT en la ordenación de los DCP y proporcione*

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*una herramienta con la cual los científicos puedan probar la eficacia de las acciones implementadas o propuestas. Esta necesidad de objetivos ha sido resaltada por los científicos, la industria y las ONG medioambientales en diversas reuniones celebradas en 2017. ICCAT debería desarrollar e incorporar opciones de ordenación de los DCP en sus medidas relacionadas con los túnidos tropicales lo antes posible. En este documento se facilita un borrador de objetivos generales. Estos objetivos específicos de los artes no deberían ocupar el lugar de los objetivos relacionados con el stock, sino que ambos conjuntos de objetivos deberían desarrollarse e implementarse de forma simultánea. Esta fue una de las conclusiones principales del Simposio global sobre DCP de 2017 y de la reunión del Grupo de trabajo conjunto sobre DCP de las OROP de túnidos de 2017.*

#### KEYWORDS

*Fish aggregating devices, FADs, Management objectives, Tropical tunas, Purse seine, Atlantic bigeye tuna*

## Introduction

The management of fish aggregating devices (FADs) – their deployment, use, and recovery – has presented a challenge to the International Commission for the Conservation of Atlantic Tunas (ICCAT). For most of ICCAT’s history, fisheries management decisions have involved measures intended to manage individual stocks at or around the level capable of producing maximum sustainable yield (MSY), as laid out in the ICCAT Convention text (ICCAT 2007). The widespread expansion of FAD use (Fonteneau *et al.* 2007; Gershman *et al.* 2015; Maufray *et al.* 2017), however, produces a series of management issues that are not readily addressed by this management strategy (Dagorn *et al.* 2013; Davies *et al.* 2014). These issues include, among others: a decrease in average size of targeted tunas (Fonteneau *et al.* 2000), leading to a subsequent decrease in MSY and increase in the spawning biomass required to support MSY (Scott and Sampson 2011; ICCAT 2017); an increase in the number of interactions between purse seine operations and silky sharks, oceanic whitetip sharks, and other sensitive shark species (Gilman 2011; Poisson *et al.* 2014); an increase in the amount of bony fish (non-tuna) bycatch that is taken during purse seine operations (Amande *et al.* 2010); an increase in the amount of entanglement of non-target species in the gear (FADs) itself (Filmalter *et al.* 2013); an increase in beaching or grounding of purse seine fishing gear (FADs) in coastal habitat (Maufray *et al.* 2015; Davies *et al.* 2017); and a potential change to pelagic habitat that results from large amounts of new manmade structure in the open ocean (Marsac *et al.* 2000; Hallier and Gaertner 2008; Fonteneau 2015).

To date FAD management has been implemented only on an *ad hoc* basis as issues arise. Much of ICCAT’s movement on FAD management has only happened as a result of intense public campaigns by environmental non-governmental organizations. These actions, while important, are not specifically driven by an overarching philosophy that defines how ICCAT intends to manage FADs moving forward. ICCAT should define this philosophy, in the form of FAD management objectives. These objectives should be specific and quantitative and should encompass a wide range of FAD-related issues.

## Why declare FAD management objectives?

Well-defined management objectives are a fundamental part of fisheries management and are gaining momentum as the first step in adoption of a successful harvest strategy or management procedure (Rademeyer *et al.* 2007; Punt *et al.* 2014; Pew 2017). These objectives have the added benefit of creating a framework around which new management measures can be considered. Setting management objectives, however, should not be limited to reference-point-based management of individual stocks. As stated above, FAD management must deal with a series of issues that are not associated with the management of target stocks around reference points. Some of these issues do not directly involve fishing activities (e.g., FAD beaching). In these cases, FAD management objectives can serve as guidelines for future ICCAT decision making. These gear-specific objectives should not take the place of stock objectives, but instead the two should be developed and implemented simultaneously. This was a primary conclusion of the 2017 Global FAD Science Symposium (Hampton *et al.* 2017) and the 2017 Joint tRFMO FAD Working Group Meeting (Joint WG 2017).

FAD management objectives have another significant benefit for tuna fisheries management: they provide scientists a measuring stick to use when testing the success of existing management measures or the potential effectiveness of proposals. Scientists have stressed the need for FAD management objectives at several recent international meetings (e.g., Hampton *et al.* 2017; Joint WG 2017), where they rightly pointed out that they are unable to estimate or measure the ‘success’ of a proposed or implemented FAD management measure without knowing what ‘success’ means to fisheries managers. Management objectives represent ICCAT Commissioners’ definition of how successful management would look. Setting these objectives is an opportunity for fisheries managers to help scientists define how they should test the effectiveness of FAD management.

The lack of a measuring stick for scientists is not a theoretical problem. In recent versions of ICCAT’s Recommendation on a Multi-Annual Conservation and Management Program for Tropical Tunas (“tropical tuna recommendation”), ICCAT has adopted several FAD management actions and has asked the Standing Committee on Research and Statistics (SCRS) to provide scientific advice on the success of these actions by 2018 (ICCAT 2015). In 2015, ICCAT adopted an area/time closure for FAD use and tasked the SCRS to “evaluate the efficacy” of this policy “for the reduction of catches of juvenile bigeye and yellowfin tunas” (ICCAT 2015, page 5). ICCAT did not, however, define what reduction of juvenile tuna mortality is required for the closure to be considered effective. That same year, ICCAT adopted a limit of 500 FADs active at any one time per vessel fishing in the Convention Area and tasked the SCRS to provide advice on this “provisional limit” (ICCAT 2015, page 5). However, the Commission did not provide context on the purpose of the limit, nor did it define what the SCRS’s advice is meant to address. Each of these issues would be addressed by management objectives.

### **Development of FAD management objectives at ICCAT**

Setting FAD management objectives at ICCAT should follow a two-part process: 1) general objectives that detail ICCAT’s philosophy for FAD management should be defined and included in the tropical tuna recommendation at the beginning of Part IV on FAD management; 2) quantitative objectives should accompany each individual management action in order to clearly define its purpose. The general objectives will provide the framework around which management actions can be considered, while the quantitative objectives will provide the measuring stick that scientists require to answer questions about the effectiveness of any proposed or implemented actions.

General FAD management objectives should be broad enough to cover a wide range of potential issues associated with FAD fishing, including impacts on other tropical tuna fisheries that do not use FADs and risks to marine habitat. Potential general objectives that serve these purposes are provided below:

- To maximize fishing efficiency of purse seine fisheries targeting skipjack, while avoiding adverse impacts to the fishing opportunities of fleets that use other gear or other fishing strategies while also targeting skipjack;
- To minimize the impact of FAD fishing on the productivity of bigeye and yellowfin stocks that result from the capture of high numbers of juveniles that aggregate with skipjack on FADs;
- To minimize the impact of FAD fishing on non-target species, where appropriate, particularly those of conservation concern;
- To minimize the impact of FADs and FAD fishing on pelagic and coastal ecosystems, including by preventing the beaching or grounding of FADs in sensitive habitats or the alteration of pelagic habitat.

This general language provides a management framework on which specific measures can be built. These or similar general objectives should be placed at the beginning of Part IV of ICCAT’s tropical tuna recommendation.

Quantitative objectives should accompany individual management actions, particularly when the Commission tasks the SCRS to test their effectiveness. Setting quantitative management objectives is not without precedent at ICCAT. In the northern Atlantic albacore management measure, the management objective of the total allowable catch (TAC) is “to maintain the stock in the green zone of the Kobe plot, with at least 60% probability, while maximizing long-term yield from the fishery...and minimizing inter-annual fluctuations in TAC levels” (ICCAT 2016, page 2). This quantitative language should lead to more specific and relevant advice from the SCRS to the Commission on what the TAC should be. This process could be replicated for FAD management.

For example, in 2015 ICCAT adopted a bigeye TAC that has only a 49% chance of recovering the stock and ending overfishing by 2028 (ICCAT 2015). If the simultaneously adopted FAD area/time closure or limitation on number of active FADs are meant to improve this probability of recovery, managers should include language on what improvements ([x]%) would be required for scientists to deem these additional measures successful or, alternatively, language on what future improvement ([x]%) should be the goal of proposed new measures. This language is critical for promoting science-based management and strengthening the collaborative relationship between scientists and managers. Similar quantitative objectives should be developed for other FAD management measures.

## Conclusions

FAD management is the first case at ICCAT where the objectives are not simply stock-specific. Scientists have recently been vocal in their call for FAD management objectives, and stakeholders ranging from industry to environmental NGOs agree that they would improve the way FADs are managed around the world (Hampton *et al.* 2017). In addition to defining ICCAT's philosophy for FAD management, these objectives provide a framework within which new management actions can be developed and a measuring stick against which scientists can test their effectiveness. Should ICCAT take the necessary steps to define and include FAD management objectives in future tropical tuna measures, it could quickly become the world leader with respect to managing the impacts of FAD fishing on the marine environment. This process would also address the *ad hoc* nature of FAD management at ICCAT and would focus ICCAT's efforts toward achieving clearly defined management goals.

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