

Review of drifting FAD Closures across tuna RFMOs, their histories, context and socioeconomic considerations

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Context and history for proposed FAD Closure in the Indian Ocean

Over the past decade it has become common practice to implement either drifting FAD (dFAD) or more complete Fishing Closures covering the entire Area of Competence ⁽¹⁾ of tropical tuna RFMO covering periods of 72 days or more. As such, FAD Closures have become standard and important conservation measures across all tropical tuna RFMOs globally, except for in the Indian Ocean under the IOTC to date.

In all instances, these closures have been initially applied as precautionary management measures seeking to address the stock and habitat damage caused by dFADs that continues to be a key concern raised by a wide range of scientists over many decades. Fishing around drifting FADs is the largest driver of juvenile bigeye and yellowfin tuna harvests in the Indian Ocean and globally, making it logical that halting the use of dFADs through FAD Closures would help to mitigate the negative stock and habitat impacts caused by these devices.

A persistent lack of operational and data transparency among tuna purse seine fleets ^(2,3) is another reason why dFAD closures have generally been developed and initiated as precautionary measures ⁽⁴⁾. It is therefore particularly unfortunate that calls for a scientific approach to be applied, is often hampered by a lack of scientific data sharing by CPCs involved in purse seine fishing using dFADs.

Impacts on stocks

Scientific stock assessment reports have consistently flagged concern about high levels of juvenile tuna catch caused by dFAD use across all tropical oceans (IOTC ⁽⁵⁾, ICCAT ⁽⁶⁾, WCPFC ⁽⁷⁾, IATTC ⁽⁸⁾), and the disproportionate impact this has on stock health. Furthermore, scientific assessments of Indian Ocean tuna stock conditions have consistently determined the yellowfin stock to be overfished with ongoing overfishing ⁽⁹⁾, with the Indian Ocean bigeye tuna stock now being in the same concerning state ⁽¹⁰⁾. The yellowfin tuna stock has been in an overfished state since 2015 (appendix XI) ⁽¹¹⁾. With dFAD management continuing to be ineffective in the Indian Ocean, these concerning stock conditions should be expected as inevitable by fisheries managers and scientists who have a duty to achieve sustainable fisheries management through the IOTC.

Relative impacts of different fleets as drivers of FAD Closures

Tuna stock declines have required the use of anchored FADs (aFADs) as a necessity to maintain food security and market competitiveness among coastal small-scale fisheries that compete directly with highly subsidized and technologically advanced purse seine fleets that deploy and use dFADs. While the use of anchored FADs can contribute to high percentages of juvenile yellowfin and bigeye tuna within harvests, the fact that purse seine fleets using drifting FADs account for 47.6% of yellowfin tuna juvenile harvests throughout the Indian Ocean ⁽¹²⁾ indicates that these fleets are the primary drivers of tuna overfishing in this region. Purse seine fleets are also the largest harvesters of Indian Ocean tuna overall and they harvest 97% juvenile yellowfin alongside almost 100% juvenile bigeye tuna when using dFADs ⁽¹²⁾. Purse seine fleets, and associated juvenile tuna catches, dominate harvests across all other tropical tuna RFMO's, which is why the "FAD Closures" applied in other oceans only apply to drifting FAD designs. Furthermore, the IATTC fishing closure only applies to purse seine vessels in capacity classes 4-6 (>213 tonnes carry capacity). This scientifically informed approach also recognizes the vast difference in beneficiaries of the types of fisheries operating around drifting and anchored FADs, while duly considering their circumstances and reliance upon FAD associated harvests. For example, aFADs often critically enable small-scale fishing communities in developing coastal states to maintain their food security and livelihoods. By contrast, industrial tuna purse seine fleets primarily pursue profit maximization for typically foreign beneficial owners located in the developed world ⁽¹³⁾.

Growth overfishing and other damage implications/solutions

Industrial scale harvesting of so many juvenile yellowfin and bigeye tunas through the use of drifting FADs contradicts the “spawn at least once principle” ⁽¹⁴⁾. This is a core component of sustainable fisheries management to avoid compromising the capacity of a stock to reproduce, support maximum sustainable yields, and to recover if in an overfished state. Impacts caused by dFADs go far beyond high juvenile catches, and despite often-repeated claims about the compliance of dFADs with existing regulations, studies have shown persistent non-compliance with IOTC’s conservation measures related to the effective management of these devices ⁽¹⁵⁾. The continued use of entangling dFAD designs, often with sub-surface structures up to 100m in length, constructed largely of plastic materials, means that large-scale ghost fishing ⁽¹⁶⁾, marine pollution ⁽¹⁷⁾ and direct damage to sensitive coastal habitats such as corals continue long after they’ve been lost, abandoned or discarded.

Further delays in addressing these concerns will increase the conservation and financial burden of small island developing states (SIDs) and other developing coastal states that are impacted by ongoing overfishing and ecosystem and habitat impacts associated with dFADs.

FAD and Fishing Closures in other oceans

A summary of drifting FAD Closures, the IATTC industrial purse seine Fishing Closure and other Area Closures implemented by tropical tuna RFMOs globally is presented in Table 1. From this summary, it is evident that the IOTC is lagging in its implementation of a FAD Closure. This concerning situation pairs with strong global precedent for FAD Closures being successfully applied as precautionary measures to mitigate the well-researched adverse effects of excessive juvenile harvests upon the productivity, and thus recovery potential, of fish stocks globally.

Previously, a 1-month fishing closure was implemented in 2011 and 2012 in a high seas area off Somalia (IOTC Resolution 10/01 ⁽¹⁸⁾). A subsequent report by the IOTC Scientific Committee ⁽¹⁹⁾ highlights that the short period of that closure, and the relatively small closure area, paired with the redistribution of fishing effort to alternative fishing areas, meant that fishing pressure on Indian Ocean tuna stocks was not sufficiently reduced to lead to stock recovery. To address these issues, the IOTC should logically aim to urgently apply a FAD Closure covering the RFMO’s entire area of competence, as is already done by all other tuna RFMOs effectively implementing FAD Closures in all other tropical oceans.

Due to the precautionary nature of dFAD closures in other t-RFMOs, it is not usually implemented based on rigorous analysis of scientific data. In fact, the ongoing lack of dFAD fishing data submissions often compromises the ability to make scientifically informed management decisions. Data issues were highlighted a few years ago when it became evident that purse seine fleets were only submitting required data to the IOTC Compliance Committee, but the same data was not all being made accessible to the IOTC Scientific Committee to help them assess the sustainability of purse seine fishing operations. Some entities now leverage this compromising of scientific assessments, and unproven benefits of the small 1-month area closure, to claim that FAD Closures are ineffective in the Indian Ocean. They do this while simultaneously suggesting that FAD Closures need to be science driven at IOTC, rather than precautionary, with the maintained lack of data provision delaying the application of the proposed Indian Ocean FAD Closure. It is noteworthy that the first stock assessment of the Atlantic bigeye tuna stock following implementation of the ICCAT ocean-wide FAD Closure in 2020 showed that overfishing of that stock had been halted.

Table 1: Summary of drifting FAD, fishing and other area closures applied by tRFMOs globally to mitigate juvenile catch and other impacts

Years active	2017	2018	2019	2020	2021	2022	2023
ICCAT	Recommendation 16-01 ⁽²⁰⁾ – 2-month closure (1 Jan - 28 Feb) but only in following areas: Southern limit: parallel 40 South / Northern limit: parallel 50 North latitude / Western limit: meridian 200 West longitude / Eastern limit: the African coast			Recommendation 19-02 ⁽²¹⁾ - 2-month ocean-wide closure for 2020 (1 Jan - 28 Feb), 3-month (72 day) closure for 2021 (1 Jan - 31 March). Prohibited to deploy dFADs 15 days prior to the start of closure period. Seasonal closures ⁽²²⁾ in Mediterranean Sea to reduce albacore and swordfish juvenile mortality. Closures in the Gulf of Mexico ⁽²²⁾ to reduce bluefin tuna spawning stock and juvenile mortality.			Recommendations 21-01 ⁽²³⁾ and 22-01 ⁽²⁴⁾ – 72-day closure running 1 Jan - 31 March. Prohibited to deploy dFADs 15 days prior to the start of closure period.
Years active	2011	2012	2019	2020	2021	2022	2023
IOTC	IOTC implemented seasonal closures ⁽²⁵⁾ in an area extending from the Somali Exclusive Economic Zone (EEZ) 0° - 10° North and 40° - 60° East. This relatively small area was only closed to the longline fishery during February and the purse seine fishery during November.		Nil	Nil	Nil	Nil	Resolution 23/02 ⁽²⁶⁾ proposed a 72-day FAD Closure which is now non-binding due to objections ⁽²⁷⁾.

Years active	2009-2013	2010 – current				2022	2023
WCPF C	<p>CMM 2008-01⁽²⁸⁾- 2-month closure from 1 August - 30 September. Vessels without observers onboard must cease fishing entirely and return to port. Some CCMs were offered an option that vessel can recude catch by 10% compared with 2001-2004 average levels.</p> <p>PNA nations also had a 3-month FAD closure in their EEZs from 1 July - 30 September each year.</p> <p>Purse seine fishing prohibited in two of four ABNJ “pockets” ⁽²⁹⁾.</p>	<p>CMM 2009-02 ⁽³⁰⁾- Same closure period as in CMM 2008-01 ' no purse seine vessel shall conduct any part of a set within one nautical mile of a FAD'. This period was kept in place until 2022 when CMM 2021-01 was implemented, but some elements of this CMM remain in place.</p> <p>Vessels also cannot be used to aggregate fish and FADs should not be removed from the water unless they are kept onboard, and vessels do not conduct a set for the next 7 days within a 50 nautical mile radius.</p> <p>2020 ⁽³¹⁾– In season high-seas FAD Closure for purse seine fisheries.</p>				<p>CMM 2021-01 ⁽³²⁾- A 3-month FAD closure (no deploying, fishing on or servicing FADs) from 1 July to 30 September each year for all purse seine vessels, tender vessels, and any other vessels operating in support of purse seine vessels fishing in exclusive economic zones and the high seas.</p> <p>Aside from Kiribati and Philippines vessels, there is an extra 2-month closure (either April-May or Nov-Dec) for which CCMs should decide their months of application and notify the secretariat of by 1 March each year.</p> <p>Specifies (in 2009-02 P5, which is referenced) that vessels cannot be used to aggregate fish and (in P7) that FADs should not be removed unless they are kept onboard, and vessels do not conduct a set for the next 7 days within a 50 nautical mile radius.</p>	
Years active	2017	2018	2019	2020	2021	2022	2023
IATTC	Nil	<p>Resolutions C-17-02 ⁽³³⁾ and C-19-01 ⁽³⁴⁾ - 72 day fishing closures for all purse seiners during one of two periods (29 July - 8 Oct or 9 Nov - 19 Jan).</p> <p>Corralito area also closed in addition from 8 Oct - 9 Nov each year.</p>				<p>Resolutions 21-04 and 22-05 ⁽³⁵⁾ - Each purse-seine vessel of over 182 metric tons carrying capacity (IATTC size classes 4, 5 and 6) that fishes for tunas in the EPO shall cease fishing from either (1) 29 July to 8 October 2023; or (2) 9 November 2023 to 19 January 2024.</p> <p>For the years 2023 and 2024, CPCs shall ensure that vessels that exceeded during the previous year the annual catch limit of 1,200 metric tons of bigeye tuna shall increase the closure period during the following year by 10 additional days the closure period established in paragraph 3 of this resolution.</p> <p>The purse seine fishery within the area of 96° and 110°W and between 4°N and 3°S, known as the “Corralito Area” shall be closed 9 October to 8 November.</p>	

Socio-economic considerations for FAD Closures

Recent rebuttals against the implementation of a FAD Closure in the Indian Ocean have cited loss of revenue for the purse seine industry and potential reductions of employment within the cannery's these fleets supply in the Indian Ocean region as major concerns. Of course, the proposed Indian Ocean FAD Closure does not intend to drive job losses in the region, and it is important to compare the actual application of Closures in other oceans to provide insights into what is possible and likely to happen if a FAD Closure is implemented in the Indian Ocean. It is also important to acknowledge that purse seine fleets fishing for free schools of tuna, and fishing around natural floating objects, can continue during a FAD Closure to maintain cannery supplies. Such fishing without dFADs would have obvious benefits such as reduced impacts on juvenile tunas, stocks and habitats. All canneries also have cold storage facilities in place to compensate for tuna supply inconsistencies, while it is also already common for canneries to receive derogations of tuna harvests from other oceans to maintain their production whether or not a FAD Closure is in place. Ultimately, the FAD Closure proposed at IOTC is not a purse seine Fishing Closure, even though a Fishing Closure has already been applied through IATTC since 2018 without leading to industry collapse.

Given context provided through this paper, it is logical and no coincidence that yellowfin and bigeye tuna stocks are in the worst conditions globally within the Indian Ocean, where the application of effective drifting FADs management remains pending. Ineffective dFAD management has already come at a great cost to fishers' profitability, livelihoods and food security throughout the Indian Ocean region, and this cost has been most sorely felt by impoverished coastal communities most dependent upon healthy tuna stocks and marine habitats to support their daily needs. Closures in all other tropical oceans were initiated to deal with longstanding scientific concerns about the juvenile tuna harvests and habitat damage caused by drifting FADs. The Indian Ocean scenario is no different, with both yellowfin and bigeye tuna fisheries being overfished. This region's largest juvenile and overall tropical tuna harvest volumes are taken by industrial scale purse seine fisheries using dFADs. With this in mind, many stakeholders consider it just and fair that the conservation burden to enable stock recovery should be borne most by the purse seine fleets and their supporting industries that have been the largest drivers of overfishing tuna stocks over recent decades. As already seen in other oceans, the tuna purse seine and canning industries can effectively adjust their operations to facilitate a FAD Closure, while it's also important to recognize that the benefits of future stock recovery, aided by a FAD Closure, will also pay the greatest financial dividends to these large industrial fleets.

Furthermore, impoverished coastal communities do not have the same level of financial and nutritional security to enable their proactive reaction to the ongoing tuna stock declines, or to reduce their harvest rates and go hungry instead to enable stock recovery. They need to meet their daily needs through tuna fishing while industrial purse seine fleets, and the canneries they supply, focus on maximizing profits for investors that are far from higher above the bread line than most coastal community stakeholders bordering the Indian Ocean.

None of the Closures for 72 days or more already applied elsewhere has led to the demise of purse seine fisheries or the canneries they supply tuna to in those regions. Both the fishing and canning industries have already successfully adapted their practices to continue profitable operations while absorbing impacts of FAD Closures elsewhere. The same reaction should be possible in the Indian Ocean. There is also already precedent for successful fishing practice adjustments in the Indian Ocean, with purse seine fisheries and industries previously adapting their operations to successfully fish more sustainability (less dFAD fishing) when piracy concerns drove adjustments to their fishing areas in the northwest Indian Ocean. Purse seine fleets targeted more adult tuna in free schools while even having some notably high tuna catches within that period.

While employment within canneries receiving tuna from industrial purse seine fleets provides some important contributions to local economies and livelihoods in three Indian Ocean countries, these establishments do exist within a much broader regional socio-economic context. Key messages from 2022 as the UN International Year for Artisanal Fisheries and Aquaculture (IYAFA) included sustainability, equality, food security, livelihood resilience and economic value for all. About 94% ⁽³⁶⁾ of all people engaged in employment and subsistence activities in capture fisheries operate in small scale fisheries. Prioritizing relatively few and isolated cannery jobs and industrial fleet profitability over enabling stock recovery via application of a FAD Closure represents an injustice that discredits the vital

role these stocks play in supporting the daily livelihood support and nutrition needs of the millions of other people requiring healthy tuna stocks throughout the entire Indian Ocean region.

This also fits within a broader global context within which 492 million people show dependence upon small scale fisheries and 379 million household members have a reliance upon small scale fishery harvests and trade ⁽³⁶⁾. Small scale fisheries account for around USD 77 billion in financial benefits globally that largely support critical daily needs of impoverished communities in developing coastal states. It's also critical to recognize that until a FAD Closure and other conservation measures address and then reverse the unsustainable history of overfished tuna stocks and habitats in the Indian Ocean, the costs of addressing these issues will continue to climb. This is also true for cannery workers and purse seine fishing businesses, making it strategic and logical to implement a dFAD Closure and reverse overfishing as soon as possible as a means of also minimizing the overall conservation and linked financial burden that ultimately will need to be addressed to achieve healthy stocks, habitats and reliant communities throughout the Indian Ocean.

Conclusion

The IOTC's drifting FAD management measures are clearly outdated and not being applied in practice ⁽¹⁵⁾. Socio-economic considerations as we prepare to implement a FAD Closure in the Indian Ocean must not only consider industry profits and relatively few employment opportunities within canneries in a few countries, but rather how to equitably distribute the conservation burden for recovering overfished tuna stocks while recognizing the needs of many millions of coastal people relying upon Indian Ocean fisheries to meet their daily needs. Resolution 23/02, endorsed through a vote in February 2023, aimed to bring IOTC dFAD management into alignment with modern regulations already endorsed and applied in all other tropical tuna RFMOs. Unfortunately, that Resolution is currently not binding due to objections.

The precautionary application of FAD Closures has helped halt overfishing and contributed to healthier tuna stock conditions in other oceans, while the lagging IOTC dFAD regulations are contributing to the concerning statuses of yellowfin (overfished since 2015) and bigeye (overfished since 2022) tuna stocks in the Indian Ocean. Given the scale of harvests driven by dFAD use, this is an inevitable outcome that is being accelerated and amplified by ongoing technology and capacity creep among purse seine fishing fleets. High juvenile harvest volumes driven by dFAD use have now been a key concern for stock health among fisheries scientists for at least a decade. Without improved dFAD data contributions from purse seine fleets, fisheries managers in the IOTC should follow the lead of other RFMOs in applying an ocean-wide FAD Closure covering a comparably long period of time (e.g. 72 days) as a precautionary measure as soon as possible. This will help to facilitate the recovery of multiple stocks and marine habitats that continue to be degraded in the meantime.

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