A fact sheet from THE PEW CHARITABLE TRUSTS | July 2018

Additional FAD Management Measures Needed in International Fisheries

No tuna regional fisheries management organization has sufficient best practices in place to limit ecological impact

Overview

Tuna fishermen around the world use fish aggregating devices (FADs)—man-made floating objects that many species gather beneath—to increase their catch. However, these devices also lead to large amounts of bycatch and often become marine debris, in large part because the international organizations that regulate these fisheries have limited FAD management measures in place.

FAD use has increased significantly in recent decades, boosted by technologies that also have made FADs more effective. Each of the tropical tuna regional fishery management organizations (tRFMOs)—the Inter-American Tropical Tuna Commission (IATTC), the International Commission for the Conservation of Atlantic Tunas (ICCAT), the Indian Ocean Tuna Commission (IOTC), and the Western and Central Pacific Fisheries Commission (WCPFC)—have begun to grapple with how best to manage FAD use, but current measures remain inadequate.

The Pew Charitable Trusts reviewed the FAD management measures in place across these organizations and found widely divergent approaches. None of the tRFMOs has yet put a comprehensive plan in place.

These management organizations should take advantage of tested and available strategies and best practices, depending on their individual needs and constituencies. This brief lays out the basic concepts in four categories of issues that should be addressed immediately—information sharing, tuna management, bycatch mitigation, and debris reduction. It also includes a comparison of what each tRFMO now has in place.

Although all of these policies may not be needed for every fishery, each tRFMO should immediately adopt a FAD management approach that mitigates the impact of these devices and ensures their sustainable use.

A worsening problem

The lack of tRFMO regulation has allowed FAD use to expand rapidly since the 1990s. Although precise numbers are unknown, a 2015 Pew study estimated that as many as 121,000 FADs may be deployed annually.[1]

Fishermen deploy FADs at sea because tuna gather beneath them. A typical design includes a raft with netting that hangs as deep as 100 meters below the surface. A satellite-linked buoy relays the location to a fishing vessel. More sophisticated buoys include echo-sounders that can tell fishermen the amount of tuna under the FAD and, in some cases, the species.

These drifting devices have boosted the efficiency of purse seine vessels that use huge nets to encircle and catch large numbers of skipjack tuna. That has increased the worldwide supply of this important source of protein and supported many livelihoods, but it has also taken a toll on other tuna populations and marine species.

For example, small and juvenile bigeye and yellowfin tuna also gather around FADs. Although fishing vessels may not be seeking these fish, FAD use can lead to unsustainable catches of one or both of those species—depending on where the fishing is occurring—if not properly managed. That reduces their populations and their productivity. This has happened across the globe with bigeye in the Atlantic Ocean and yellowfin in the Indian Ocean, for example, where both are experiencing overfishing and are overfished.

A purse seine vessel with net is docked in Majuro, Marshall Islands.

FAD materials sit on the deck of a purse seine vessel in Pohnpei, Federated States of Micronesia.

In the Pacific, bigeye's status also remains a concern. In the eastern Pacific, this species is experiencing overfishing, while in the ocean's western waters, the stock is thought to be healthy now although high numbers of juvenile fish are being caught.

FADs also cause the deaths of threatened or protected species such as sharks and turtles, which can get entangled in the webbing or are caught incidentally in the purse seine nets. And FADs pollute and damage habitats when this gear is lost or abandoned at sea. Legal ownership is often unclear, in part because vessels fish on any FAD they find, whether they deployed it or encountered it by chance. As a result, fishermen often treat FADs as disposable, so they wash up on beaches and coral reefs and contribute to plastic pollution.

Strategies available to reduce FADs' adverse impacts

The tRFMOs have made slow progress in regulating these devices, but a number of strategies are available that they have yet to widely implement that can better manage the range of FAD impacts.

The selected strategies outlined here are some of the best practices identified in 2017 by experts at an independent Global FAD Science Symposium and mirror some of the conclusions from the first Joint tRFMO FAD Working Group meeting, which brought together representatives from three of the four tropical tuna RFMOs to identify priorities and actions to manage FADs.[2]

Pew selected the strategies for inclusion in this brief from a longer list developed at those meetings based on three criteria: They can be applied in the tRFMO context, they are feasible as regulatory policies, and they do not require development of new technologies to be put in place in the near term. These strategies do not represent an exhaustive list but are offered as a starting point for discussion.

They are presented in four categories of issues that should be addressed immediately: information sharing, tuna management, bycatch mitigation, and debris reduction. The list does not include some worthy strategies, such as requiring the use of biodegradable materials as much as possible in building FADs, that require further technological development, testing, or clarification of terms to be fully realized.

Improvements to FAD management should be made in tandem with other actions required to ensure fisheries are sustainable, regardless of the gear used. For example, fishing pressure on a stock from all gears must remain within the scientifically advised levels, and effective compliance systems must be fully implemented.

To improve information collection, tRFMOs could:

- **Require industry to share electronic position data from buoys with scientists and/or fishery authorities (i.e., FAD tracking). Unique physical identifiers could also be required on the raft.** These steps would allow tRFMOs to improve scientific understanding about the use and impact of FADs, monitor compliance with existing rules, increase accountability for FAD impacts, and develop improved measures.

Tuna caught and frozen by a purse seine vessel is transshipped to a carrier vessel that will take it to be processed.

To improve tuna management, tRFMOs could:

- **Cap the amount of FAD fishing and provide incentives to shift fishing effort to free schools** to reduce the unsustainable catch of juvenile bigeye and yellowfin tunas. Steps could include setting annual science-based limits on the number of FAD sets or catch limits for bigeye and yellowfin tunas in the purse seine fishery along with appropriate management of other gears catching the same stocks. Economic incentives may complement a strategy to encourage greater effort on free school fishing. Today, some tRFMOs institute prohibitions on FAD use in certain waters or at certain times, which is often ineffective because fishing can increase in other areas or during periods when FAD fishing is allowed. Greater free school fishing also would reduce the impact on non-target species such as sharks and turtles often caught around FADs.
- **Develop and implement science-based FAD deployment limits** to better manage the proliferation in the number of FADs and harm to ecosystem dynamics. Restrictions could be for particular waters or vessels. Although the four tRFMOs have capped the number of FAD buoys that can be monitored by an individual vessel at any one time, these limits do not appear to be restrictive enough to affect the behaviors of fishing fleets as a whole. Limits on deployments also would help reduce marine debris associated with unrecovered FADs.

To mitigate bycatch, tRFMOs could:

- **Require use of non-entangling FADs** to avoid killing sharks and turtles that get caught in the webbing material of the rafts. Experience with fleets deploying non-entangling FADs demonstrates that they do not reduce the catch of targeted tunas, but can effectively curtail entanglement of sharks and turtles.
- **Require the release of sharks and turtles from purse seine nets before hauling them in** to minimize mortality.
- **Require use of published safe-release techniques for sharks brought on deck and mandate revival techniques for turtles** to improve the survivability of the animals.
- **Require non-target bony fish to be kept and landed** to avoid waste of bycatch species that may have value in local markets.

To reduce debris, tRFMOs could:

- **Develop and implement science-based FAD deployment limits** to minimize the contribution to marine debris and mitigate the probability that lost or abandoned FADs wash up on coastlines or coral reefs. Most deployed FADs are never fished upon.
- **Require FADs to be recovered by removing them from the water,** such as via partnerships with coastal authorities/communities, and the use of systems that can help intercept FADs before they beach. They also should establish cleanup funds to reimburse the costs of removing FADs that do end up on shore.

Comparing measures in place in the RFMOs that manage tropical tunas

The following assessment compares published FAD-related regulations at each tuna RFMO against the strategies laid out in this brief. It gives tRFMOs the benefit of the doubt by assuming 100 percent compliance by members with these rules. The assessment, however, does not reflect situations in which a fleet or States have adopted FAD policies outside of tRFMO management measures. To meet the criteria, a strategy must be mandatory; voluntary measures are assessed as not meeting the criteria.

Table 1

Tuna RFMO Rules to Manage Fish Aggregating Devices

Limited progress, primarily in bycatch mitigation

		IATTC	ICCAT	IOTC	WCPFC
Information sharing	FAD tracking and marking of the raft	**O**	**X***	**X**	**O**†
Tuna management	Science-based FAD set or purse seine catch limits	**X**	**X**‡	**X**§	**X**
	Science-based deployment limits	**X**	**X**	**X**	**X**
Bycatch mitigation	Mandatory use of non-entangling FADs	✓‖	✓	✓	**X**
	Release of sharks and turtles prior to hauling the net	✓ sharks ✓ turtles	**X** sharks ✓ turtles	**X** sharks ✓ turtles	**X** sharks ✓ turtles
	Safe handling/ revival if brought on deck	✓ sharks ✓ turtles	**O**# sharks ✓ turtles	**X** sharks ✓ turtles	**X** sharks ✓ turtles
	Retain non-tuna bony fish	**X**	**X**	✓	**X**
Debris reduction	Science-based deployment limits	**X**	**X**	**X**	**X**
	Recovering FADs	**O****	**X**	**X**††	**X**

X=does not meet criteria **O**=some "best practice" elements are in place ✓=meets criteria

* ICCAT FAD logbook forms, in a footnote, state: "... if FAD marking and associated beacon/buoy ID are absent or unreadable, the FAD shall not be deployed." This assessment scored that reference to a marking scheme as insufficient to partially meet the criteria.

† Not reflected in this assessment of WCPFC measures is a program undergoing a trial by coastal States in the Parties to the Nauru Agreement to electronically track and monitor buoys on FADs because it is outside of WCPFC arrangements.

‡ Although ICCAT has a total allowable catch (TAC) for bigeye and yellowfin, it is assessed as not meeting criteria because it lacks allocation among fishing gears.

§Although IOTC has a TAC for yellowfin, it is assessed as not meeting criteria because the reductions specified in the rebuilding plan do not meet scientific advice.

‖ Pending a 2019 start date for mandatory implementation of non-entangling FAD designs.

Silky shark, which accounts for the majority of shark encirclement in the purse seine fishery, is required to be released unharmed (Rec 11-08), with purse seine vessels required to endeavor to take additional measures to increase their survival rate, although those measures are not specified. For other sharks, live release is encouraged (Rec 04-10).

** One FAD must be recovered for every set made by Class 6 purse seine vessels (the largest category in the Eastern Pacific Ocean) during the 15 days before the purse seine closure period. Although the impact with respect to debris mitigation is not known, this is a partial measure toward a best practice.

†† The Seychelles FAD recovery program is not reflected in the assessment because it is outside of IOTC management; the Spanish purse seine association (OPAGAC), the Seychelles Fishing Authority, Island Conservation Society, and Islands Development Company are partnering on a FAD watch and recovery effort.

The smaller skiff attached to the back of this purse seine vessel in Ecuador helps set the net during fishing operations.

Conclusion

Pew's analysis shows that none of the four RFMOs that manage tropical tunas currently takes a comprehensive approach to managing FAD use. Progress has been made on reducing the impact on sea turtles and requiring the use of non-entangling designs. Still, the WCPFC, the tRFMO area where the greatest number of annual FAD deployments probably occurs, does not have a measure in place requiring non-entangling designs to be used for this gear.

Significant ecological effects remain to be addressed, particularly regarding the incidental and unsustainable catch of bigeye and yellowfin, and recovery of lost and abandoned FADs. Information on FADs should be improved through the sharing of satellite buoy data and marking of rafts. Additionally, where the tRFMOs have adopted strategies to mitigate FAD impacts, those strategies should be reviewed periodically to assess what works and identify opportunities for improvement. tRFMOs should share lessons learned through efforts such as the Joint Tuna RFMO FAD Working Group.

Proven and promising strategies have been identified to manage FADs. The four tropical tuna RFMOs should now agree to take steps that allow for FAD use within safe biological parameters and to adopt measures appropriate to their fisheries. Policymakers can safeguard the health of the marine environment; they just need the will to implement these solutions.

Endnotes

1 Because vessels are not required to report the number of FADs they deploy to international authorities, the precise number of deployments is not known. A Pew report estimated a range of 81,000 to 121,000 FADs were deployed in 2013. See Dave Gershman, Amanda Nickson, and Megan O'Toole, "Estimating the Use of FADs Around the World: An Updated Analysis of Fish Aggregating Devices Deployed in the Ocean" (2015), The Pew Charitable Trusts, http://www.pewtrusts.org/~/media/assets/2015/11/global_fad_report.pdf.

2 For more information on the agreed points of the Global FAD Science Symposium, see the paper "What Does Well-Managed FAD Use Look Like Within a Tropical Purse Seine Fishery?" at http://www.pewtrusts.org/-/media/assets/2018/06/gtc_what_does_well_managed_fad_use_look_like_within_a_tropical_seine_fishery.pdf, which was one of five produced by the symposium. The meeting chair's report of the first Joint Tuna RFMO FAD Working Group meeting can be found at http://iccat.int/Documents/Meetings/Docs/2017_JFADS_REP_ENG.pdf.

For further information, please visit:

pewtrusts.org/tuna

Contact: Leah Weiser, communications officer
Email: lweiser@pewtrusts.org
Project website: pewtrusts.org/tuna