INTER-AMERICAN TROPICAL TUNA COMMISSION

***AD-HOC* PERMANENT WORKING GROUP ON FADS**

9TH MEETING

La Jolla, California (USA)
28-29 May 2025

DOCUMENT FAD-09-03

OPTIONS FOR AN IATTC FAD REGISTER

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SUMMARY

Fish aggregating devices (FADs) are man-made objects deployed in the eastern Pacific Ocean (EPO) to attract tuna. Their use has become predominant in the purse-seine fishery due to their efficiency. However, FAD fishing also poses several potential ecological concerns, including higher bycatch rates, increased capture of juvenile tuna, altered natural species behavior, and the potential for marine debris if unrecovered.

A FAD register aims to enhance management by improving data collection, monitoring and control of FAD deployments and recoveries. By tracking the identities of individual FADs, managers and scientists could better monitor the number of FADs in the water, their fate (e.g., recovery, stranding, loss), and other aspects related to “ownership”. However, it is worth noting that the specific objectives of an IATTC FAD registry are still undefined.

Currently, the IATTC collects extensive FAD data through 100% observer coverage on Class 6 purse-seine vessels and approximately 40% coverage on Class 1-5 vessels. In addition, additional data exists for vessels without observers, as well as the trajectories of the FADs. FADs are identified at deployment using satellite buoy IDs (Resolution C-19-01), allowing to track FAD "lifespans" at sea from deployment until recovery or loss. This existing system, which tracked around 150,000 FAD lifespans since 2019 (see FAD-09-02), already serves many of the functions of a formal register, including tracking and monitoring the number and geographic distribution of FADs and their activities over time.

The primary limitation of the current system is its inability to assign a permanent ID to the physical structure of the FAD itself. As a result, for example, if a satellite buoy is changed while the FAD is on land or onboard, the replacement goes unrecorded, and the FAD’s identity is lost. A dedicated FAD register that assigns permanent IDs could address this issue, enabling tracking across multiple deployments,

"ownership" assignment, and providing better monitoring and control over the total number of physical FADs available. However, a formal system will require additional resources and significant changes in the way the data is collected, stored and processes.

The document compares the Indian Ocean Tuna Commission (IOTC) FAD register, the only formal RFMO register established to date, with current IATTC capabilities. While the IOTC system is still in early implementation stages, it provides a reference point for potential developments regionally.

The IATTC staff believes that the current system already addresses most key scientific, management, and sustainability needs without requiring significant additional resources. The staff suggests that clarifying the target uses for a FAD register would aid in its design. While a Secretariat-led, CPC-run, or voluntary industry-led register are alternatives, they would incur additional resources and costs. At this stage, the staff does not recommend a specific alternative beyond the existing system, but presents this document as a foundation for discussions and guidance from the FAD Working Group, the Scientific Advisory Committee and the Commission (as per Resolution C-24-06), as appropriate.

1. BACKGROUND

Fishers often exploit the aggregative behavior of tunas by fishing around floating objects (Watters 1999; Hall and Román 2013). In the 1980s, fish-aggregating devices (FADs), man-made structures designed to attract tunas, began to be used in the eastern Pacific Ocean (EPO). Since then, their use has expanded significantly, and FAD fishing has rapidly become the dominant method for capturing tuna in the EPO purse-seine fishery (Lennert-Cody and Hall 1999; Hall and Román 2013; IATTC 2025).

FAD fishing offers several advantages over other fishing modes: it is highly efficient, relatively easy to plan (i.e., FADs are equipped with satellite buoys that enable remote monitoring of the trajectory and the aggregated biomass) and typically result in lower proportion of null sets, among other benefits (Lopez et al. 2014; Lopez et al. 2016; Cillari et al. 2018). However, it also poses significant ecological risks. FADs are associated with higher bycatch rates for certain species and can lead to increased capture of juvenile tuna (i.e., particularly bigeye and yellowfin). Additionally, they may disrupt normal movement patterns and behavior of species, including school dynamics. If unrecovered, FADs can also damage sensitive coastal habitats and contribute to marine debris accumulation (Maufroy et al. 2015; Sinopoli et al. 2020).

In response to these potential impacts, certain tuna Regional Fisheries Management Organizations (e.g. Indian Ocean Tuna Commission; IOTC), have discussed the utility of adopting a formal FAD register that could help improve control and monitoring of FADs, and ultimately, FAD-management.

2. GOALS OF A FAD REGISTER

Tuna RFMOs have implemented various regulations on FAD fishing. In the IATTC these include, among others, limits on the number of active FADs per vessel per day, rules for remote deactivation and reactivation, restrictions or bans on tender vessels, initiation of FAD recovery programs, transition to fully biodegradable FADs, and requirements for the deployment and identification of floating objects, as well as data collection and reporting obligations (Resolutions C-98-05, C-19-01, C-23-04, C-24-01, C-24-06).

Some organizations argue that more effective FAD management could be achieved through enhanced data collection, monitoring and control of FAD deployments and recoveries. One proposed tool to support this is the establishment of a FAD registry. The ability to track individual FADs could support efforts to monitor, as needed, the number of FADs in the water, as well as address related scientific and management questions – the fate of FADs after deployment (e.g., recovery, stranding, loss), and issues around "ownership", right and accountability of specific FADs. However, the specific objectives of a potential IATTC FAD registry remain unclear at this stage.

3. CURRENT IATTC FAD TRACKING ABILITIES

The IATTC is the only tuna RFMO with a permanent scientific staff, giving it access to exceptionally rich data on FADs. FADs are deployed at sea, where various interactions with them are recorded. Document FAD-09-02 outlines the range and frequency of these interactions based on observer data. The IATTC maintains 100% mandatory observer coverage for Class 6 purse-seine vessels and approximately 40% voluntary coverage for Class 1–5 vessels. Observers collect information on the deployment FAD identity and use of FADs encountered by the fleet, while vessels without observers are required to complete a FAD form (C-19-01).

Currently, all FADs must be identified at the time of deployment or redeployment, as required by Resolution C-19-01. This is done either by using the identification number (ID) of the satellite buoy attached to the FAD or a unique ID provided by the Secretariat. IATTC observers confirm and document the presence of this ID during deployment. At present, the satellite buoy ID is the primary means of identification used by the fleet.

In 2019, following a comprehensive review of active FAD resolutions (FAD-03 INF-A), the IATTC staff revised the observer FAD data collection form (ROF) to allow for the recording of buoy replacements and implemented improved data entry and processing procedures. Similarly, since 2018, the staff developed and implemented ROF-C, enabling detailed tracking of biodegradable FADs, including their ID, structure, materials, and degradability.

In addition to observer data, remote deactivations and reactivations of satellite buoys must be reported monthly under Resolution C-24-01. Since 2022, the provision of raw satellite buoy data—including trajectory and biomass information—has also been required (C-21-04, C-24-01). While some voluntary raw satellite buoy data exist from before 2022, a complete historical dataset for the fleet remains unavailable. Data on VMS for the purse-seine fishery is also available since 2023 under Resolution C-21-04 and C-24-01.

Thanks to these data, the IATTC staff can track the "lifespan" of individual FADs at sea using satellite buoy IDs and observer data on buoy changes across interactions. In this context, a FAD's lifespan refers to the series of recorded events on a FAD, from its initial deployment in an area without a known fish aggregation or fishing activity (a "virgin" deployment) to its recovery or final observation.

To date, the IATTC has tracked, since 2019, approximately 150,000 FAD lifespans, including over 5,000 biodegradable FADs (FAD-09-02). Only 4–7% of the observer-reported FAD records were flagged as having discrepancies that prevented reliable tracking. In summary, the existing observer-based system effectively monitors FAD deployments, interactions, and recoveries, functioning in many respects as a de facto FAD register. This could observer-based system could be complemented with the already available raw satellite buoy data to improve the understanding of ultimate FAD fate.

The main limitation of the current system is that it does not assign a permanent ID to the physical structure of each FAD—similar to a serial number on a cell phone, for example. As a result, if a buoy is changed without being recorded or while the FAD is on land or onboard the vessel, the FAD's identity of the physical structure is lost. A formal FAD register that assigns a permanent ID to the physical unit would enable tracking across multiple deployments, facilitate discussions around "ownership", and improve monitoring and control over the total number of unique physical FADs deployed. However, a formal system will require additional resources and significant changes in the way the data is currently collected, stored and processes in the IATTC.

4. EXAMPLES OF OTHER FAD REGISTERS

The only official RFMO FAD register adopted to date is the IOTC FAD register, established under Resolution

24/02. The system is currently in its testing phase, with a pilot program scheduled for the second half of 2025 involving a selected number of vessels. Full implementation is expected by January 2026. Under this system, CPCs or vessels are required to submit the information outlined in the following table prior to FAD deployment.

TABLE 1. Comparison of IOTC FAD register (Res. 24/02) and current IATTC data capabilities

IOTC FAD Register (Res. 24/02) *Buoy owners shall insert the following information concerning the deployment of instrumented buoys:*	**IATTC Analog**
a) unique instrumented buoy reference number that will allow the identification of its buoy owner;	Unique alphanumeric code of the satellite buoy: available via observer, FAD form, and/or raw buoy data reported under C-21-04 and C-24-01
b) name of the buoy owner;	Available via observer, FAD form and/or raw buoy data reported under C-21-04 and C-24-01
c) unique IOTC Vessel Register number of the purse seiner that is assigned to the instrumented buoy	Available via observer, FAD form, and/or the raw satellite buoy data reported under C-21-04 and C-24-01 and the IATTC vessel register
d) flag State of the purse seine vessel to which the instrumented buoy is assigned;	Available via observer, FAD form, the raw satellite buoy data reported under C-21-04 and C-24-01 and the IATTC vessel register
e) manufacturer of the instrumented buoy	Available via observer, FAD form, and/or the raw satellite buoy data reported under C-21-04 and C-24-01
f) model name of the instrumented buoy;	Available via observer, FAD form, and/or the raw satellite buoy data reported under C-21-04 and C-24-01
g) IOTC DFAD unique identifier;	Can automatically be generated using observer data (and complemented with satellite buoy data, as needed) (e.g. see FAD-09-02). CPCs/vessels can request this number to the Secretariat as an alternative method to identify the FAD for deployment (currently, no IDs are being requested). Not permanently associated with the physical structure of the FAD.
h) biodegradability category of the DFAD, or log when applicable, with which the buoy was deployed;	Available via observer data
i) date and time of deployment;	Available via observer, FAD form, and/or the raw satellite buoy data reported under C-21-04 and C-24-01
j) location of deployment	Available via observer, FAD form, and/or the raw satellite buoy data reported under C-21-04 and C-24-01

5. OPTIONS FOR AN IATTC FAD REGISTER

The IATTC staff believes that the system currently maintained by the Secretariat closely resembles a FAD register and, without requiring significant additional resources, is capable of addressing most key questions related to FAD science, management, and sustainability.

Refining the design of a FAD register would benefit from a clear definition of its intended uses. For instance, a system aimed at tracking the number of FADs at sea or deployed over time may differ in scope and structure from one focused on potentially monitoring "ownership" and reuse of individual physical FAD units across multiple deployments.

Potential explicit goals of a FAD register could include clarifying the norms and rules around "ownership" of a FAD (along with associated rights and responsibilities), creating or promoting incentive systems (e.g., FAD credits for deployment and retrieval), establishing rules for buoy replacement or physical marking of FADs, and monitoring the total number of unique physical FADs during deployments.

Various formats for a FAD register are possible. These include a centralized, Secretariat-led system; a hybrid register managed at the national level by CPCs; or a voluntary, industry-led system. Preliminary considerations, advantages and disadvantages for each of these options are outlined in Table 1. All of them would likely entail higher resources and costs compared to the current IATTC tracking system. Therefore, any proposal or alternative—particularly one that is more resource-intensive—should clearly demonstrate how it would lead to improved outcomes or specific objectives.

TABLE 2. Preliminary considerations of a dedicated FAD register for the IATTC.

	Current IATTC system	**Centralized system (RFMO led)**	**National system (CPC led)**	**Voluntary system (Industry led)**
Advantages	All necessary data already available Few additional resources needed Highly transparent	Consistency and completeness across all fleets Standardized format Control and compliance in-house Could serve as a bridge to the other data already available in-house	Leverages existing national structures (if any) CPCs can customize their systems (with or without the need to develop a new system)	Flexible and agile Reduce paperwork (if software is developed) May share the cost burden Scalable and pilot testing
Disadvantages	The physical structure or unique FADs cannot be tracked once retrieved from the water (but can be tracked while at sea, unless unobserved changes in satellite buoys occur).	Need time, and additional funding and legal obligations and frameworks (e.g. Resolutions) If self-reported, data quality might be compromised If sensitive data are reported, may be time-delayed Heavier burden in the Secretariat Additional compliance	The Secretariat may need to harmonize and process data (unless guidelines and a format are adopted) Standardized formats would be needed Reporting quality and levels may vary Data fragmentation or duplication may occur when FADs are used by different flags	Coordination and standardization challenges may exist Increase paperwork (if software if not developed) No legal requirement, data quality and levels may be affected Data fragmentation or duplication may occur when FADs are used by different flags/companies Data may not be

		efforts Coordination with WCPFC may be needed		accessible (unless reported) and incur in science and monitoring challenges Transparency challenges
Additional considerations	Not a FAD register per se, but the staff considers that the existing system covers the main objectives of it without incurring in additional costs or significant losses.	Example, although not implemented yet – IOTC Could be implemented as a digital database or web portal, possibly integrated into the existing data systems	Each CPC maintains its own national FAD register, and periodically submits consolidated data to IATTC. This is, somehow, the case of IOTC and ICCAT, where a significant fraction of the information is collected by the CPCs and reported to the Secretariat later. Similar example: PNA's register (carriers to register buoys and report to PNA's, with enforcement via licensing) Coordination and standardization challenges	Fishing companies or third-party organizations could set up a digital platform where vessels register each FAD. Participation could be encouraged through market incentives. Coordination and standardization challenges may exist Not a substitute for an hypothetical long-term mandatory program Industry led voluntary programs exists; e.g. ISSF's Proactive Vessel Register (PVR)

6. CONCLUSION AND RECOMMENDATION

At this time, the IATTC staff does not recommend a specific FAD register beyond the system already in place. This document is intended as a preliminary assessment to support discussions within the FAD Working Group and the Scientific Advisory Committee (as per Resolution C-24-06), with the goal of clarifying the objectives, structure, and requirements of such a system, should the Commission deem it necessary.