

PACIFIC ISLAND FAD TRACKING AND MARKING PROJECT

Background

Abandoned, lost or otherwise discarded fishing gear (ALDFG), also known as ‘ghost gear’ accounts for approximately 10% of marine debris and has serious impacts on marine wildlife, habitats and fish stocks. ALDFG may result in reduced profits when it continues to fish (‘ghost fishing’) and increased operational costs for vessel owners/operators and authorities through the replacement of lost gear and retrieval efforts. ALDFG also represents a navigational and safety at sea issue.

In recent years the increased use of drifting fish aggregating devices (dFADs), particularly in industrial tuna fisheries, has led to attention on the fate of this equipment at the end of its useful life. Concerns around dFADs include their contribution to over-fishing, bycatch, and effects on fish behaviour. Additionally, dFADs can attract non-target species, such as sharks and turtles,

that become entangled and killed in the dFAD netting and rafts. When lost or abandoned, such entanglements can continue unabated and dFADs can drift into and damage sensitive nearshore habitats, such as coral reefs.

At the same time, Pacific Island nations are investing in nearshore anchored (a)FADs as they strive to improve the supply of nutritious food for their citizens. These aFADs are designed to provide artisanal fishers with access to harvest pelagic species close to shore. While aFADs are designed to remain in place with anchors, it is not uncommon for them to break free of their anchors and drift, with the potential to cause similar negative impacts as dFADs.

In 2017 a project was initiated to inform the drafting of guidelines for the marking of fishing gear being developed by the Food and Agricultural Organization (FAO) and to assess current practices around the management of fish aggregating devices (FADs) in the Pacific in the context of mitigating the negative impacts associated with FAD loss and abandonment.

Project description

This project consists of two tracks: one track partnering with a commercial tuna fishing company operating in the Pacific; and one track partnering with the Vanuatu Fisheries Department.

Key Aims:

- Work with a commercial tuna company to assess their current dFAD management practices against the FAO's Draft Guidelines on the Marking of Fishing Gear and the Global Ghost Gear Initiative (GGGI) Best Practice Framework (BPF) for the Management of Fishing Gear.
- Trial low-cost methods for marking and tracking artisanal aFADs and enhance technical understanding in an artisanal fishery for how fishing gears can be marked and / or tracked.
- Explore the feasibility for the responsible disposal, retrieval and potentially recycling/ re-use of end of life FADs.
- Provide a practical case study on aFAD management from an artisanal fishery to contribute to the FAO's development of guidelines on the marking of fishing gear

Project outcomes

Commercial FAD Management and Satellite Buoy Tracking

The tuna company we worked with manages two tuna fishing fleets in the Western Central Pacific Ocean and the Eastern Tropical Pacific (ETP). While being a leader in sustainable tuna fishing practices, they face the same challenges with FAD management as all fishing companies active in the Pacific. They agreed to work with the GGGI on this project to provide an industry perspective into the development of international guidance and best practice on the management of FADs and as part of their commitment to fostering sustainable fisheries.

CURRENT FAD POLICIES AND PROCEDURES

Similar to other commercial operators, the company regularly deploys hundreds of drifting FADs per vessel, per year in the WCPO and ETP combined, and tracks their dFADs' positions using satellite buoys. They also use aFADs in some of the areas.



The crew deploying a satellite buoy in Vanuatu.

The company adopted a Non-Entangling dFAD policy that applies to its fleet operating in the Central Pacific. The policy committed them to transitioning all dFADs to a less entangling design, as defined by the ISSF, by April 2018. Previously, this fleet dFADs included a raft structure with appendages, both of which included purse seine net remnants. The transition to less-entangling designs is complete, with operations managers now using smaller mesh netting in 'sausage' appendages and researching recycling options for old purse seine netting that is currently repurposed for dFAD construction. The company's long-term goal is to transition to biodegradable FAD designs. The company is trialing biodegradable dFADs in the Pacific in 2018 as part of their involvement in the TUNACONS ETP Fishery Improvement Project. These will be monitored for catch efficiency and durability.

The satellite buoys are marked with unique identification, but they do not mark other dFAD components, such as rafts, appendages, and floats with identification. Neither this company nor other tuna companies have programs in place to retrieve FADs that they have stopped tracking or that are lost.

SATELLITE BUOY TRACKING

As part of the project the company transferred 'ownership' to GGGI of satellite buoys they were no longer tracking for the duration of the project. The buoys were monitored and mapped to identify movements and to assess length of time from deployment to beaching or loss of satellite signal. Results were provided to them to inform FAD management decisions.

Vanuatu Fisheries Department AFAD Program

The track with the Vanuatu Fisheries Department (VFD) involves researching and testing cost-effective methods to track the position of aFADs so they can be retrieved if they break free from their anchors. The project has also been exploring how the current approaches to managing aFADs aligns with the FAO's guidance on gear marking and the GGGI BPF.

Like other Pacific Island nations, Vanuatu has increased its use of aFADs in nearshore areas to encourage artisanal fishing outside of reef systems. The VFD deployed approximately 50 aFADs recently in nearshore areas. This is a significant investment, as aFADs can cost up to US\$2,000. The goal of the project was to find a tracking device that costs less than 10% of the cost of an aFAD. Vanuatu Fisheries Department aFAD marking/tracking procedures include assigning each aFAD with a unique identifying number. The position of the aFAD is noted and kept in a database. The main buoy on the aFADs are usually marked with flags to increase visibility. Prior to this project, no physical marking or position tracking devices were deployed on aFADs. VFD does not have any programs in place to retrieve aFADs that separate from their anchors or are otherwise lost.

Pelagic Data Systems (PDS) tracking devices were selected and tested on VFD aFADs. These devices are low-cost, small and light, run on solar power, and transmit position data over the cellular network. SatLink satellite buoys with echo sounders were also employed to validate PDS position tracking and to assist VFD in assessing aggregation effectiveness of selected aFADs to inform future management decisions related to aFAD deployments.

Preliminary results indicate that PDS devices can provide accurate, real time position data in Vanuatu adequate to find an aFAD when lost, as long as the aFAD is within cellular range. Therefore, prompt deployment of retrieval vessels is important if lost aFADs are to be recovered before they drift out of cellular range. The SatLink buoys are equally able to provide position data and are not limited to by cellular ranges. The PDS device cost is about 25% of the cost of aFADs typically used in Vanuatu. The SatLink buoys without echo sounder costs is about 50% of the cost of Vanuatu aFADs.

Recommendations

The following recommendations were compiled based on interim results and feedback from the two strands of work and are intended to improve international policy with regards to FAD marking and tracking.

Reporting of lost gear

- Require fishing companies to notify appropriate authorities of coastal states when a dFAD satellite buoy is decommissioned and the company stops tracking a dFAD.
- Lost dFAD reports should be consolidated and analyzed to help inform FAD management strategies.
- International Maritime Organization provide clarification of whether abandoned dFADs are considered a violation of MARPOL V to inform development of FAD reporting and retrieval requirements.

Recovery of abandoned, lost or discarded FADS

- Require the recovery of decommissioned or end of life FADs by their owners.
- Increase cooperation between RFMOs, seafood companies, maritime stakeholders and local partners to facilitate recovery of FADs drifting into sensitive nearshore habitats.
- Develop appropriate waste handling or community reuse options for companies recovering end of life FADs.

FAD designs, marking and tracking

- Require marking of FADs with unique owner identification.
- Identify the most important components for marking, such as buoys, and rafts.
- Record deployment and ownership of the FADs with appropriate authorities.
- Require transition to biodegradable, non-entangling FAD designs.
- Establish systems to mark dFADs and assign ownership to ensure companies that deploy dFADs maintain responsibility for them through the end of their usefulness or until ownership can be formally transferred.
- Companies should alert authorities when dFADs are decommissioned and provide tracking data for those dFADs so their disposition can be ascertained.

Research and development

- Document areas of accumulation of beached FADs to inform the development of recovery programs and improved FAD management.
- Assess habitat impacts of beached dFADs in areas of accumulations to inform the cost-benefit of recovering lost dFADs.
- Develop a very low-cost tracking technology to track positions of aFADs in artisanal fisheries. Technology could rely on the cellular (depending on the quality of the local network) or satellite network and must be waterproof and be solar-powered or powered by a long-lasting battery requiring recharging no more than once a year.

Conclusions

Utilization of dFADs and aFADs to harvest tuna and other pelagic species is likely to continue in the industrial tuna industry and to grow in artisanal fisheries of the WCPO. Appropriate management of FADs is critical to ensure sustainable harvests into the future and to protect marine animals and nearshore habitats from harm caused by lost and abandoned FADs.

Position tracking technologies using satellite systems are reliable and commonly used in the industrial sector. The relatively high cost of these devices is easily borne by private companies. The use of satellite buoys and echo sounders generally increases the efficiency of fishing. However, in the artisanal sector, aFADs are often deployed by fisheries authorities and national fisheries departments. The cost of position tracking devices for these aFADs would not be paid for with profits from fishing, but, instead, would be borne by national governments. Therefore, finding a lower cost method to track positions of aFADs is needed to make the practice affordable.

For the industrial sector, even progressive tuna fishing companies struggle with managing FADs in ways that do not negatively impact animals and habitats. While viable non-entangling dFAD designs are available and are being adopted by leaders in the industry, dFADs using designs that entangle non-target species are still used. Even non-entangling designs pose risks to sensitive nearshore habitats when decommissioned dFADs drift into these habitats. Biodegradable non-entangling FAD designs hold promise to minimize negative impacts to animals and habitats. If biodegradable FADs can be designed to degrade within a year or less, it may be possible to avoid damage to nearshore habitats if they can be designed to degrade within the timeframe between decommissioning and beaching. However, research on these designs is in its nascent stage and they are unlikely to be widely adopted in the near future.

Development of programs to promptly retrieve end of life dFADs is a more proactive management approach to avoid habitat impacts at this time. Retrieval of FADs could be achieved by locating them using the satellite buoy positioning prior to decommissioning and via data sharing agreements with relevant authorities. A chartered vessel could harvest end of life FADs at the edge of a company's fishing area during key times of the year when drift is predominantly westward (fall and winter).

Or the use of geofencing capabilities could be used to alert retrieval teams/vessels when a dFAD approaches sensitive nearshore habitats.

The common practice of changing ownership of dFADs and decommissioning satellite buoys when dFADs drift out of fishing areas prohibits assigning ownership responsibility for recovering lost dFADs. Strategies to mark dFADs and assign ownership should be established to ensure companies that deploy dFADs maintain responsibility for them through the end of their usefulness or until ownership can be formally transferred. Currently onboard observers on purse seine vessels in the WCPO document deployment of dFADs and gather other important information about dFAD maintenance, design, and marking. Because dFAD satellite buoy activation and deactivation is usually accomplished remotely, observers do not know nor do they record when a dFAD satellite buoy is decommissioned, signaling dFAD abandonment. Companies should notify appropriate authorities when dFADs are being decommissioned, or better yet, continue to track dFADs until eventual retrieval.

For the artisanal sector, marking and tracking aFADs would facilitate recovery of lost aFADs and components. Currently, lost aFADs cannot be traced back to the deploying agency. Marking the aFADs and components, such as floats, with unique identification numbers and with the name of the deploying agency might facilitate notification when components were found. Tracking the position of aFADs would facilitate retrieval when lost, allowing fisheries agencies to recover aFADs and reuse their components.

However, the cost of position tracking devices available on the market today is still higher than most fisheries agencies can afford, especially considering the increasing numbers of aFADs deployed. Where position tracking devices are deployed on aFADs, agreements should be sought with local fishers or other partners to retrieve the aFADs when they break away from their anchors.

In collaboration with



Fisheries Department of Vanuatu



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