Information Paper on Non-compliance with dFAD Biodegradability

Information paper to the 19th Session of the IOTC Compliance Committee

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Executive summary

Recent claims made by some IOTC CPCs who are involved in tuna purse seine fisheries using drifting fish aggregating devices (dFADs) that it is 'impossible' to find the right materials to construct biodegradable dFADs, raises some serious concerns. Despite the almost 15 years of research on biodegradable materials for dFADs, and numerous examples of biodegradable materials used in maritime applications for centuries, it is hard to believe that there are compelling reasons why biodegradable dFADs have not yet been widely implemented.

The ecosystem impacts of dFADs through the entanglement of endangered, threatened and protected species, stranding events that cause the destruction of sensitive ecosystems such as corals and the long-lasting impacts of plastic pollution associated with the synthetic materials used in the construction of dFADs are well known. As far back as 2014, CPCs already committed to "develop improved FAD designs to reduce the incidence of entanglement of marine turtles, including the use of biodegradable materials" with the adoption of Resolution 12/04. The European Union (EU), a key player in purse seine fisheries in the Indian Ocean, has further made it clear that they want to see management measures for FADs that will "reduce [their] impact on vulnerable tuna stocks" and "mitigate their potential effects on target and non-target species, as well as on the ecosystem".

It is therefore especially worrying to note that the adoption of non-entangling and biodegradable dFAD designs in the Indian Ocean seems to be lagging when compared to purse seine fisheries in some other ocean areas. Thus far, there is little evidence that Indian Ocean CPCs are complying with these requirements under IOTC Resolution 19/02.

The issue of biodegradability of dFADs can be summarised as follow:

- Biodegradable materials have been around for centuries and have been widely used in shipping applications, including the fishing industry;
- Despite 15 years of research (since 2007)[1] there has not been any widescale adoption of biodegradable materials in the construction of dFADs;
- Biodegradable materials have been shown to have the neccesary longevity to last for a year which is the generally accepted required lifetime of a dFAD;
- Catch rates of tuna caught on biodegradable dFADS have been similar to those when sets were made of traditional dFADs made of synthetic materials;
- None of the dFADs encountered in stranding events in recent times in Indian Ocean coastal states are in compliance with the biodegradability requirements under Resolution 19/02.

In conclusion, there seems to be few credible excuses for the slow pace of adoption of less environmentally damaging dFADs by the tuna purse seine industry. Indian Ocean CPCs are therefore urged to adopt non-entangling and biodegradable dFAD designs as a matter of urgency. Not only to ensure they meet their obligations under international instruments such as UNFSA and UNCLOS and

[1] Moreno et al. 2017. Moving away from synthetic materials used at FADs: evaluating biodegradable ropes degradation. IOTC-2017-WPEB13-INF12, San Sebastián, Spain

the IOTC Agreement, but also to ensure full compliance of their fleets with the requirements set out under IOTC Resolution 19/02, thereby deterring IUU fishing.

Overview of the issue

The Blue Marine Foundation, the International Pole & Line Foundation (IPNLF) and the Sustainable Fisheries and Communities Trust (SFACT) challenges the notion among IOTC CPCs that biodegradable drifting Fish Aggregating Devices (dFADs) are not a possibility. **Resolution 19/02** mandates that all CPCs must encourage their purse seine fleets to transition to biodegradable, non-entangling dFADs. Whilst this may be a challenge, it is a necessary transition for the protection of vulnerable ecosystems and habitats such as coral reefs, endangered, threated and protected species such as sharks and turtles, and to also minimise plastic pollution.

As far back as 10 years ago, the non-biodegradability of FADs was recognised as an issue of concern by the IOTC Commission when under Resolution 12/04[2], the Scientific Committee was tasked to "develop improved FAD designs to reduce the incidence of entanglement of marine turtles, including the use of biodegradable materials". At the joint t-RFMO FAD Working Group meetings in Madrid (2017) and San Diego (2019), RFMOs were also urged to accelerate progress to reduce contributions of FADs to marine litter and mitigate negative impacts on coastal habitats and marine ecosystems and endangered, threatened and protected species.

Initial signs indicated that CPCs engaged in purse seine fisheries were actively pursuing solutions. For instance, in their FAD proposal to the Commission in 2019[3], the EU recommended that the use of non-plastic and biodegradable materials should be prioritised for the construction of FADs. They further suggested that CPCs should work with the Scientific Committee to ensuring that only biodegradable materials are used in the construction of FADs by 2020.

It is therefore concerning to hear about claims being made by the fishing industry and some CPCs that it is 'impossible' to find the right materials to construct biodegradable dFADs. Evidence from other ocean regions seem to refute these claims and it is concerning that the adoption of non-entangling and biodegradable dFAD designs in the Indian Ocean seems to be lagging behind purse seine fisheries in some of these areas. Thus far, there is little evidence that Indian Ocean CPCs are complying with these requirements under **Resolution 19/02** (see Table 1 below).

The European Union, one of the main players in the purse seine fishery in the Indian Ocean, has for instance set out clear positions that should be taken on the Union's behalf in the Indian Ocean Tuna Commission (IOTC)[4]. These include the following that relates to dFADs and their impacts:

- ➢ *measures to minimise the negative impact of fishing activities on marine biodiversity and marine ecosystems and their habitats, including measures to reduce marine pollution and prevent the discharge of plastics at sea and reduce the impact on marine biodiversity and ecosystems of plastics present at sea, protective measures for sensitive marine ecosystems in the IOTC Agreement area in line with the UNGA Resolutions, and measures to avoid and reduce as far as possible unwanted catches, including in particular vulnerable marine species, and to gradually eliminate discards;*
- ➢ *measures to manage the use of fish aggregating devices (FADs) notably to improve collection of data, to accurately quantify, track and monitor FADs use, to reduce impact on vulnerable*

[2] IOTC Resolution 12/04 On the Conservation of Marine Turtles

[3] Proposal IOTC-2019-S23-PropH[E] submitted by the EU, June 2019, IOTC Commission meeting, India.

[4] COUNCIL DECISION (EU) 2019/860 of 14 May 2019 on the position to be taken on behalf of the European Union in the Indian Ocean Tuna Commission (IOTC). European Parliament.

tuna stocks, to mitigate their potential effects on target and non-target species, as well as on the ecosystem;

- *measures to reduce the impact of Abandoned, Lost or Otherwise Discarded Fishing Gear (ALDFG) in the ocean and to facilitate the identification and recovery of such gear, and to reduce the contribution to marine debris*.

In this information paper, we challenge the notion that biodegradable dFADS are not an option. We highlight the fact that the transition to biodegradable and non-entangling dFADs have successfully been made in other ocean areas and pose the question to Indian Ocean CPCs on what they are doing to comply with Resolution 19/02 in terms of transitioning and adopting biodegradable and non-entangling designs and in encouraging their purse seine fleets to remove traditional dFADs from the water that do not incorporate these non-entangling and biodegradable design elements.

Table 1. *Relevant sections under resolution 19/02 that addresses the need to transition to non-entangling, biodegradable FADs.*

Requirement under Res 19/02	**Relevant section from Resolution 19/02**	**Effective date**
Biodegradability *(para 18 of 19/02)*	*To reduce the amount of synthetic marine debris, the use of natural or biodegradable materials in FAD construction should be promoted.*	1 Jan 2022
Biodegradability *(para 18 of 19/02)*	*CPCs shall encourage their flag vessels to use biodegradable FADs in accordance with the guidelines at Annex V with a view to transitioning to the use of biodegradable FADs, except for materials used for the instrumented buoys, by their flag vessel from 1 January 2022.*	1 Jan 2022
Biodegradability *(para 18 of 19/02)*	*CPCs shall, from 1 January 2022, encourage their flag vessels to remove from the water, retain onboard and only dispose of in port, all traditional FADs encountered (e.g., those made of entangling materials or designs).*	1 Jan 2022
Non-entangling *(para 17 of 19/02)*	*To reduce the entanglement of sharks, marine turtles or any other species, CPCs shall require their flagged vessels to use non-entangling designs and materials in the construction of FADs as outlined in Annex V.*	1 Jan 2020
Non-entangling *(Annex V of 19/02)*	*1. The surface structure of the FAD shall not be covered, or only covered with non-meshed material* *2. If a sub-surface component is used, it shall not be made from netting but from non-meshed materials such as ropes or canvas sheets.*	1 Jan 2020

Transitioning to better designs

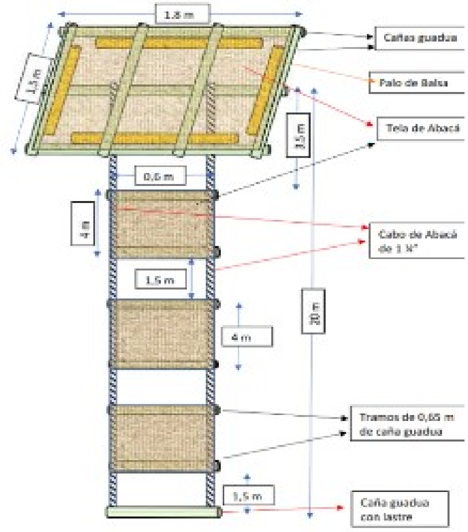

Figure 1. Non-Entangling biodegradable dFAD design (c) [TUNACONS]

dFADs have been used to improve tuna catches for decades. What began with radio beacons attached to floating logs and bamboo frames[5], quickly grew into the large-scale deployment of purpose-built dFADs, constructed using materials such as metals frames, weights and plastic netting. The detrimental impacts of dFADs on ocean ecosystems has fast become apparent due to their hyper-stabilising impacts on tuna catches, increases in bycatch of sensitive species due to their aggregating, often entangling nature, and significant contribution to ocean pollution as many are lost or abandoned at sea. The impacts of plastic-derived materials which are left at sea to slowly degrade into microplastics is also of increasing concern, highlighting the increased transfer of disease, the impacts of bioaccumulation through the food chain and the toxic impacts of these plastic materials which can lead to behavioural changes and reduced fertility, among other things. It is widely recognised that a transition to non-entangling, biodegradable dFADs is an effective solution to these impacts and should be prioritised by all those involved.

Figure 2. Biodegradable dFAD design deployed by OPAGAC fishing vessel as part of a project in Spain (c) @OpagacJulio

These transitions have been under development for almost 15 years, with scientists working on FAD research and the fishing industry becoming very aware of the impacts that dFAD pose to reefs and sensitive coastal ecosystems through stranding events[6]. One of the first at-sea projects investigating the issue was the eco-FAD project, conducted in 2011, funded by the European Union (EU) and ANABAC, one of the purse seine associations. During the project, 43 biodegradable ecoFADs with SATLINK echosounders were deployed in the Atlantic Ocean to assess their efficacy. Despite numerous problems with the retrieval of the experimental biodegradable dFADs due to the low levels of observer coverage on purse seiners to assist with retrieval and potential 'theft' of these devices by other purse seiners, it was noted that "in spite of this, the pilot trials indicated similar tuna catch yield trends between traditional and biodegradable dFADs[7]". Similar results regarding the catch rates found around traditional dFADs and biodegradable dFADs were also found in a follow-up project funded by the EU in 2017-2019.

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[5] Davies, T., Mees, C.C. & Milner-Gulland, E.J. 2014. The past, present and future use of drifting fish aggregating devices (FADs) in the Indian Ocean, Mar Pol: 45: 163-170.
[6] Moreno G., Jauhary R., Adam S.M., Restrepo V. 2018. Moving away from synthetic materials used at FADs: evaluating biodegradable ropes degradation. Coll. Vol. Sci. Papers 74(5): 2192–2198.
[7] Zudaire, I. et al. 2020. Testing designs and identify options to mitigate impacts of drifting fads on the ecosystem. Second Interim Report. European Commission. Specific Contract No. 7 EASME/EMFF/2017/1.3.2.6 under Framework Contract No. EASME/EMFF/2016/008. 193 pp.

Under this project, the European BIOFAD Project, researchers set out to test the material options and socio-economic viability of biodegradable dFADs. According to the 2020 report on the project[8], they found the lifespan of some BIOFADs were more than a year, similar to a standard non-entangling FAD (NEFAD) – the max lifespan for a BIOFAD was 483 days and for a NEFAD it was 493 days. This seemed to address some of the previous concerns around the longevity of BIOFADs when compared to traditional dFADs. Together with the fact that the trails showed that the tuna biomass and catch rates under BIOFADs did not show a significant difference when compared with standard NEFADs, the impression was created that a solution was imminent. (See Table 2 for additional findings of the project).

***Table 2**. Some of the results from the European BIOFAD Project (2017-2019)*

Issue	Extract from BIOFAD Project results[9]
Effectiveness of biodegradable dFADs to aggregate tuna	*From our results, there is no doubt that FADs using biodegradable components in the submerged structure are as effective as non-biodegradable FADs in aggregating tuna and non-tuna species. Similar aggregative patterns were observed for the non-biodegradable and biodegradable FADs, even reaching maximum biomasses earlier on biodegradable FADs compared to non-biodegradable FADs in this experiment.*
Lifetime of biodegradable dFADS (initial findings)	*By the end of August 2017, the maximum lifetime for a biodegradable FAD at sea was 6 months. Taking into account this information, we could expect to have other appropriated biodegradable FADs still alive at sea but monitored by other vessels that did not participate in this project. This preliminary result on the maximum lifetime of a biodegradable FAD at sea provides an estimate of at least the maximum time that a biodegradable FAD could be efficient for fishing. Fishers participating in the project stated that in the Western Indian Ocean, a FAD with 6 months at sea was considered old, which could provide an idea of the appropriate lifetime of a FAD in this region. However, it is known that fishers maintain FADs and make them last longer through maintenance, by replacing the components that are not efficient after a given time. It could also be the case when working with biodegradable FADs that fishers could replace the biodegradable components that are not working properly. Thus, it may be that the lifetime of the original structure is not 1 year but that material replacements can make the biodegradable FADs last longer than 12 months.*
Lifespan of biodegradable dFADs	*The lifespan of experimental FADs (BIOFAD and traditional NEFAD) was defined as the period (in days) between the day of first deployment and the day when the FAD was considered no longer active. The latter was estimated by the day when the FAD was eliminated/retrieved and/or the attached buoy was deactivated, and the Consortium was no longer able to track the FAD. This information was provided by the vessels and/or buoy suppliers.* *….. All the prototypes, for both FAD types, showed a maximum lifespan longer than 1 year (max lifespan for a BIOFAD of 483 days and for a traditional NEFAD of 493 days).*

[8] European Commission, Executive Agency for Small and Medium-sized Enterprises, Basurko, C., Murua, H., Baidai, Y., et al., Testing designs and identify options to mitigate impacts of drifting FADs on the ecosystem : final report, Publications Office, 2020, https://data.europa.eu/doi/10.2826/79656

[9] Moreno, G. et al. 2020. Compendium of ISSF research activities to reduce FAD structure impacts on the ecosystem. ISSF Technical Report 2020-13. International Seafood Sustainability Foundation, Washington, D.C., USA.

Issue	Extract from BIOFAD Project results[9]
Catch rates in association with biodegradable dFADS	*The BIOFAD efficiency in comparison with paired NEFADs was further analyzed through the catch data. In total, from April 2018 to August 2019, 68 sets were associated with these experimental FADs, 36 to BIOFADs and 32 to paired NEFADs. This is a positive result in and of itself, as the rate of fishing on BIOFAD and homologous NEFAD seems to be similar.*
The performance of biodegradable cotton rope as an alternative to synthetic ropes in dFAD construction	*The degradation of the cotton rope (i.e., component used in the submerged part of the FAD as main tail) was less pronounced compared to the cotton canvas (Figure 38). The status control for the cotton ropes showed them to be in "very good" or "good" quality until the fourth month at sea. However, in 10-20% of the observations the "absence" of this material was reported during the first, second and third months at sea. In the fifth month, the observations at the absence state increased up to 70%. ……..Overall, and contrary to the perception of the cotton canvas, and according to the feedback received during the 2nd and 3rd BIOFAD Workshops from scientists and some fishers, the absence of the cotton ropes from the BIOFAD rafts has been related to failures at attachment between the tail and the raft rather than to a high degradation of the material. If not correctly attached, these components could be lost, resulting in the reported absences.* *……… Contrary to what was expected, the synthetic alternative used as the tail in traditional NEFADs was also considered to be in "very bad" condition by the sixth month at sea.*

More recently, Spain has launched a project in the Atlantic to develop non-entangling FAD designs in their OPAGAC fishery, in partnership with AZTI and ISSF (Figure 2), in addition to their previous projects in the Pacific and Indian Oceans.

These experiments can obviously provide very valuable answers. It is however concerning that entangling dFADs that are not constructed of non-biodegradable materials continue to wash up in sensitive coastal areas. The most recent example is a dFAD found in the Watamu Marine Reserve in Kenya on 14 April 2022. Photos of the dFAD clearly show entangling netting used in its construction and very little evidence of biodegradable materials (Figure 3).

***Figure 3**. A dFAD that was found in the Watumu Marine Reserve in Kenya on 14/04/22 by local fishers. The fact that it contained entangling components and was not made of biodegradable materials shows that it was likely not in compliance with Resolution 19/02. Although it cannot be said with certainty, it appears that the dFAD may have belonged to the Spanish purse seiner, TXORI ZURI, as the instrumented buoy attached to the dFAD was marked with 'T ZURI'. The buoy ID number was 98078.*

Success story from the Eastern Pacific

The first dFAD project to see long-term results and commitments among a purse seine fishery has been developed by The Tuna Conservation Group (TUNACONS) in the Eastern Pacific Ocean. They have been working with their fisheries to develop biodegradable dFAD designs which can endure oceanic conditions and maintain their function as fish aggregators (Figure 4.). As of December 2020, the TUNACONS fleet began a process to use at least 20% of its dFADs with 100% natural and degradable material. Up to now, they have successfully deployed more than 1,400 of these fully degradable dFADs. These devices, instead of being made from metal frames and netting, are made from materials such as cabuya and jute which can withstand oceanic conditions for prolonged periods. This project demonstrates that the necessary transition to entirely degradable dFADs is possible with the appropriate fleet improvements and effort.

Figure 4. *Biodegradable dFADs from TUNACONS' biodegradable FAD project (c) @AtunaNews*

Mandatory use of biodegradable dFADs in TAAF

Additionally, the need for biodegradable, non-entangling FADs is increasingly recognised in certification schemes. During the MSC certification of the Compagnie Française du Thon Océanique (CFTO) Purse Seine Skipjack fishery, a fleet of 8 purse seiners flying the flags of Italy and France that offload their catch in the Seychelles (Victoria) and Mauritius (Port Louis) for processing in local factories, or for onward transport to a range of international destinations, it was mentioned that biodegradable, non-entangling FADs were a requirement to be allowed to fish in the waters of Mayotte and French Southern and Antarctic Lands (TAAF).

CFTO is a member of the Producer Organisation Orthongel which represents all French tropical tuna fishing companies, as well as the Italian company Industria Armatoriale Tonniera and in the certification report it was claimed that "the fishery is subject to a multi-layered management system involving the EU's Common Fisheries Policy, the flag states' (France and Italy) fisheries policies, the CFTO company policy, the PO (Orthongel) management measures and projects, the IOTC at the Indian Ocean regional level (including the High Seas) and any coastal states national measures that apply depending on where fishing takes place.

According to the report[10], "The Scattered Islands (French: Îles Éparses) consist of four small coral islands, an atoll, and a reef in the Indian Ocean, and constitute the 5th district of the French Southern and Antarctic Lands (Terres Australes Antarctiques Françaises – TAAF). Fishing activities off these islands are subject to TAAF management as laid out in Arrêté 2020-25 of 5 mars 2020. A synopsis of measures pertaining to purse seining is given below (please see Arrêté for further detail): …..*FADs should be biodegradable and non-entangling. Any entangling FAD drifting in French TAAF waters should be removed and treated as non-biodegradable waste*".

[10] Marine Stewardship Council (MSC). 2021. Public certification report of the CFTO Indian Ocean Purse Seine Skipjack fishery. Control Union, 342pp.

Attainable solutions from the past

For many centuries seafarers sailed the world's oceans without synthetic ropes and biodegradable ropes are still used to this day in many seafaring situations. Plant fibres from cotton, flax, manila hemp (from a species of banana), sisal (from agave), and coir (from the waterproof buoyant husks of coconuts) have been used for many centuries to secure the anchors of sailing ships in heavy storms, as fenders when boats have come into port, for fishing nets and to rig the sails of magnificent sailing ships.

It might be argued that some of these applications are very different from the conditions that dFADs are exposed to when constantly submerged in seawater, and that it is therefore not a comparable situation. This is certainly a misconception and possibly an excuse put forward by those who are not keen to find workable solutions. For instance, the *Oman and the Sea* exhibition website gives details on how traditional sewn boats were built that crossed the Indian Ocean. In this type of construction, planks are 'sewn' together using coir coconut fibre rope. Once completed the hull of planks and coir ropes is coated in fish oil and the holes where the ropes go through the planks are plugged with goat fat. The ropes on the hulls of these of boats were constantly submerged and in contact with seawater and lasted a lifetime.

In normal use a rope deteriorates partly from wear and tear, partly from the destruction of its fibres by bacterial action[11]. The destructive action of bacteria is far greater in dirty water than in clean water. As far back as 1936[12], experiments were conducted under a pier in England where the strength of biodegradable ropes were tested under severe conditions which included constant submersion, strong tidal currents, considerable wave action in rough weather and seas contaminated with high levels of sewage. The results showed that biodegradable ropes made of hemp, manila, sisal and coir could retain most of their strength for a year when treated with certain preservatives.

More recently, studies conducted by ISSF and other partners in the Maldives[13] on biodegradable materials that could potentially be used in the construction of dFADs showed that 100% cotton rope, although not the strongest might be preferable due to it being more ductile than other materials tested. This type of rope had a useful lifetime in sea conditions matching that suggested by fishers for dFADs i.e. around 1 year. The results from these experiments also showed that if the strength of biodegradable ropes was a key consideration, then mixed, sisal and cotton rope would be a better choice, remaining strong after 1 year at sea. This research, published almost 5 years ago, proves that biodegradable options definitely exist for dFAD construction, and that there seems to be few excuses for not phasing out synthetic ropes at a much more rapid pace that we are currently seeing.

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[11] Atkins & Purser. 1936. The preservation of fibre ropes for use in sea-water. Journal of the Marine Biological Association of the United Kingdom

[12] Atkins & Purser. 1936. The preservation of fibre ropes for use in sea-water. Journal of the Marine Biological Association of the United Kingdom

[13] Moreno et al. 2017. Moving away from synthetic materials used at FADs: evaluating biodegradable ropes' degradation. IOTC-2017 WPTT-19-50.

***Figure 4**. Traditional 'sewn' boats from Oman were built by using coir coconut fibre rope to bind planks together. The biodegradable rope used in this type of construction were in constant contact with seawater and lasted a lifetime.*

Conclusion

Tuna RFMOs around the world have been outlining regulations in their regions mandating non-entangling or biodegradable designs (Figure 5). Since the beginning of 2022, developments towards full biodegradability among fleets of the Indian Ocean has become a priority according to Resolution 19/02.

***Figure 5.** Biodegradable dFAD when biodegradable designs were mandated in the Eastern Pacific in January 2019. (c)@pxgv*

Whilst this is sometimes enforced or driven by external parties, it is up to CPCs to drive these transitions among tuna fishing fleets. The lack of biodegradability and the ongoing absence of non-entangling designs among the derelict dFADs that are encountered when washing ashore in Indian Ocean coastal states, indicate that it is likely that CPCs are either, not actively encouraging their flag vessels to transition to biodegradable and non-entangling designs as outlined in resolution 19/02, or purse seine owners are not proactively implementing these types of dFADs.

Based on the results of the various experimental trails with biodegradable dFADs, there is clear evidence that catch rates are not impacted by transitions to these types of FADs. The initial aim of many of the trails was also to find a design and materials that would have a lifetime of about a year when floating in the ocean. However, feedback from fishermen participating in the BIOFAD project was that dFADS that had been in the water for 6 months in the western Indian Ocean were considered as 'old' and often at the end of their lifetime. It is also a well-known practice of these fishers to make traditional dFADs last longer by replacing some of the components that are not efficient after a given time. So, even if biodegradable dFADs did not have the same lifetime expectations as traditional FADs, an obvious solution would be to replace the biodegradable components that are not working properly, maybe after 6 months, which would make the biodegradable dFADs last longer than 12 months.

It is however very encouraging to see that in the BIOFAD project the maximum lifespan of a biodegradable FAD was 483 days, with a mean lifespan of 242 days for the longest lasting of the BIOFAD prototypes.

The successful transition to biodegradable FADs by TUNACONS in the Eastern Pacific and the fact that French purse seiners supposedly use only biodegradable dFADS when fishing in the TAAF area around Mayotte, together with the availability of biodegradable materials that meet the requirements of dFAD operators in terms of longevity and the fact that no discernible impacts on catch rates have been observed when using biodegradable dFADs, shows that there is no excuse why the biodegradability requirements under Resolution 19/02 should not be adhered to. It would therefore be good to understand from Indian Oceans CPCs whose flag vessels fish on dFADS what they have done to encourage the adoption of biodegradable FAD designs in their fisheries. Furthermore, what steps have these CPCs taken to encourage their flag vessels to remove non-biodegradable dFADs from the water?

In conclusion, there seems to be few credible excuses for the slow pace of adoption of less environmentally damaging dFADs by the tuna purse seine industry. Indian Ocean CPCs are therefore urged to adopt non-entangling and biodegradable dFAD designs as a matter of urgency. Not only to ensure they meet their obligations under international instruments such as UNFSA and UNCLOS and the IOTC Agreement, but also to ensure full compliance of their fleets with the requirements set out under IOTC Resolution 19/02, thereby deterring IUU fishing.