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Drifting Fish Aggregating Devices (FADs) Deploying, Soaking and Setting – When Is a FAD 'Fishing'

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Drifting Fish Aggregating Devices (FADs)

Deploying, Soaking and Setting – When Is a FAD 'Fishing'?

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Abstract

This article describes the proliferation of drifting fish aggregating devices (FADs) and analyses subsequent legal questions that arise for fisheries and marine litter management over who is responsible for FADs during their drifting stage. This follows recent concerns about unlicensed FADs drifting through closed areas. This article analyses a case study of the Western and Central Pacific Fisheries Commission (WCPFC) in order to determine State obligations to manage drifting FADs. Analysis concludes that a drifting FAD in the WCPFC Area is 'fishing' from deployment to recovery, thereby creating obligations to monitor, control and report drifting FADs, consistent with broader obligations for coastal and flag States. The article recommends strengthening regional management in three ways: implement regional drifting FAD monitoring systems; control deployment of drifting FADs so as to promote recovery and minimize lost gear; and define appropriate responses for FADs that drift into national or closed waters without a license.

Keywords

drifting fish aggregating device – fish aggregating device (FAD) – Western and Central Pacific Fisheries Commission (WCPFC) – definition of fishing – tuna fisheries management – Parties to the Nauru Agreement

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Introduction

Marine capture fisheries have long exploited the natural tendency of certain fish species to aggregate around floating objects such as driftwood and seaweed.[1] One such group of species are the tropical tunas skipjack (*Katsuwonus pelamis*), bigeye (*Thunnus obesus*) and yellowfin (*Thunnus albacares*). These high-demand species are globally traded, worth approximately US$32 billion per year, and provide critical revenue to the numerous developing coastal States that license fleets to fish within their exclusive economic zones (EEZs).[2] As industrial global tuna fisheries have developed over time, fishing fleets have become increasingly efficient and dependent on technological developments in remote sensing and fishing gear. One of the ways they have become more efficient is through the use of purse seine nets and drifting fish aggregating devices (FADs) attached to satellite location beacons. However, the global proliferation of drifting FADs is increasingly challenging fisheries management and contributing to marine litter.[3] Recent concerns about FADs drifting through areas closed to fishing have raised questions about the legal status of a drifting FAD when it is aggregating fish and the associated fisheries management obligations and responsibilities that arise.

This article describes the three stages in the life cycle of a drifting FAD: the deployment of the FAD; its time spent 'soaking' as it drifts across the ocean; and its conclusion when a fishing vessel sets on the school aggregated under the FAD and hauls the FAD aboard and/or redeploys the FAD. The article then analyses international fisheries law, focusing on a case study of the Western and Central Pacific Fisheries Commission (WCPFC), in order to determine State obligations to manage drifting FADs. The analysis studies the definition of fishing as it relates to drifting FADs and then considers the resulting

1 Acknowledgements: The authors would like to thank the Pew Charitable Trusts and the Nippon Foundation Nereus Program for research funding. L Dagorn, KN Holland, V Restrepo and G Moreno, 'Is it good or bad to fish with FADs? What are the real impacts of the use of drifting FADs on pelagic marine ecosystems?' (2013) 14, *Fish and Fisheries* 391–415.

2 R Gillett, *Fisheries in the Economies of Pacific Island Countries and Territories* (Pacific Community, Noumea, 2016); G Galland, A Rogers and A Nickson, *Netting Billions: A Global Valuation of Tuna* (The Pew Charitable Trusts, Washington, DC, 2016).

3 T Davies, D Curnick, J Barde, and E Chassot, *Potential Environmental Impacts Caused by Beaching of Drifting Fish Aggregating Devices and Identification of Management Solutions and Uncertainties* (IOTC-2017-wgfad01-08 Rev_1, Indian Ocean Tuna Commission, 2017); K Richardson, D Haynes, A Talouli, and M Donoghue, 'Marine pollution originating from purse seine and longline fishing vessel operations in the Western and Central Pacific Ocean, 2003–2015' (2017) 46 *Ambio* 190, doi:10.1007/s13280-016-0811-8.

obligations placed on parties to the United Nations Convention on the Law of the Sea (LOSC),[4] the United Nations Fish Stocks Agreement (UNFSA)[5] and the tuna regional fisheries management organisations (RFMOs) that manage these fishing activities in their respective Convention Areas. The article questions whether a drifting FAD is 'fishing' when it is soaking in the water aggregating fish. If it is fishing, do the RFMO and its members then have an obligation to monitor, control and report on drifting FADs?

Purse Seine Fisheries for Tuna and Drifting Fish Aggregating Devices

While early purse seine fisheries utilised helicopters, spotter planes and bird radar to find free-swimming schools of tuna, modern fleets now deploy drifting FADs to aggregate the fish separately, saving on fuel costs for the fishing vessel.[6] A FAD is a floating object, either naturally created, such as a floating log, or artificially created by fishers in order to aggregate fish through the creation of a habitat. FADs can be anchored or drifting, and many include sub-surface structures such as old nets. This article focuses on the drifting FADs used by the pre-dominantly industrial fishing fleets that utilise attached satellite beacons to monitor their location. Unlike opportunistic purse seine sets on randomly drifting natural logs, drifting FADs are explicitly deployed with the intent to aggregate fish for subsequent capture. In order to support the successful re-capture of the drifting FAD and its aggregation of fish, vessels equip the drifting

4 United Nations Convention on the Law of the Sea (LOSC) (Montego Bay, 10 December 1982, in force 16 November 1994) 1833 *UNTS* 396.

5 Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (UNFSA) (New York, 4 August 1995, in force 11 December 2001) 2167 *UNTS* 3.

6 A purse seine is a large net which encircles mid-water schools close to the surface. A large vessel will deploy a number of small vessels to assist with setting the net. Once complete, the lower part of the net is enclosed to prevent escapement and the net is cinched to the side of the purse seiner so that the catch can be brailed into the holds. Purse seine vessels are the largest of the fishing vessels targeting tuna and have increased in size significantly since their first widespread use in the 1970s. K Cochrane, *A Fishery Manager's Guidebook: Management Measures and their Application* (United Nations Food and Agriculture Organization, Rome, 2002).

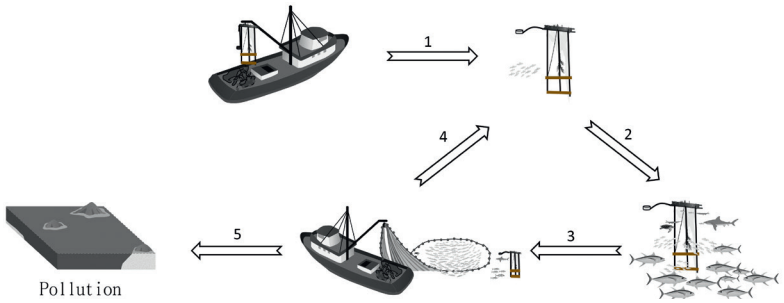

FIGURE 1 The life cycle of a FAD at sea. 1) The FAD is deployed by a purse seine or support vessel. 2) The FAD drifts at sea and begins to aggregate small fish. 3) Larger predators such as tuna and sharks aggregate under the FAD, attracted by the smaller prey. The FAD is then (4) harvested by a purse seine vessel and either collected or redeployed for future aggregating, or (5) abandoned or lost at sea, ultimately becoming marine or terrestrial pollution[7]

FAD with global positioning satellite (GPS) technology to monitor its location, and sonar equipment to monitor fish aggregation.[8]

Fishing vessels or their support vessels will deploy a drifting FAD with extensive knowledge of drift patterns so as to target productive fishing grounds and maximise aggregations of target species. The drifting FAD will 'soak' (i.e., drift) for an extended period of time, from several weeks to months, before a vessel rendezvous with the FAD and sets its net around the school of fish aggregated under it. This soak period allows time for fish to find the FAD and aggregate underneath.

FAD size and shape are highly variable and are often based on the vessel captain's preferred design, but typically consist of a raft with sub-water appendages which can hang more than 100 metres below the surface.[9] They are

7 The symbols in all the figures were developed from the Integration and Application Network, University of Maryland Center for Environmental Science, available at http://ian.umces.edu/imagelibrary/, accessed online 14 February 2019.

8 Western and Central Pacific Fisheries Commission (WCPFC) Secretariat, 'Para. 24 of CMM 2008-01 FAD Management and Monitoring' presented at Fifth Regular Session of the Scientific Committee of the Western and Central Pacific Fisheries Commission (WCPFC-SC5-2009/FT-WP-1, Port Vila, Vanuatu, 22 July 2009); D Itano, 'Documentation and classification of fishing gear and technology on board tuna purse seine vessels' presented at Sixteenth Meeting of the Standing Committee on Tuna and Billfish (Mooloolaba, Secretariat of the Pacific Community, 2003).

9 L Escalle, S Brouwer and G Pilling, 'Report from Project 77: Development of potential measures to reduce interactions with bigeye tuna in the purse seine fishery in the western and central Pacific Ocean ('bigeye hotspots analysis')' presented at Thirteenth Regular Session of

typically constructed of whatever material is cheaply available such as old purse seine netting, plastic drums, bamboo and/or PVC pipe. A 2018 analysis of FAD materials in the western and central Pacific Ocean (WCPO) found that less than two per cent were totally constructed of natural materials and that over one third were entirely made from artificial materials.[10]

Drifting FADs have become an integral part of the tropical tuna purse seine fishery with their use increasing across all tropical oceans over the past 20 years.[11] In the WCPO, which represents around half the global skipjack catch, FADs more than double the average set tonnage.[12] The ability to track a FAD across open ocean and, in the case of modern FAD buoys equipped with echo sounders, to determine when the FAD is ripe for harvest have led to a dramatic increase in the number of FADs being used by industrial fisheries.[13] Atlantic and Indian Ocean tuna fisheries experienced a fourfold increase in the number of drifting FADs between 2007 and 2013, with drifting FADs now contributing to more than 50 per cent of all floating objects.[14] In the Indian Ocean, over 80 per cent of the purse seine catch is now made on sets around FADs.[15]

In 2013, the Pew Charitable Trusts estimated that as many as 121,000 FADs were deployed around the world.[16] More recent estimates from the WCPFC calculated similar levels with up to 65,000 deployed in the WCPO in 2017.[17]

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the Scientific Committee to the Western and Central Pacific Fisheries Commission (SC13-MI-WP-07 Rev.02, Rarotonga, Cook Islands, 9–17 August 2017).

10 L Escalle, S Brouwer and G Pilling, 'Evaluation of dFAD construction materials in the WCPO' presented at the Fourteenth Regular Session of the Scientific Committee to the Western and Central Pacific Fisheries Commission (SC14-PP-EB-IP-01, Busan, Republic of Korea, 8–16 August 2018).

11 Dagorn *et al.* (n 1); A Fonteneau, E Chassot and N Bodin, 'Global spatio-temporal patterns in tropical tuna purse seine fisheries on drifting fish aggregating devices (dFADs): Taking a historical perspective to inform current challenges' (2013) 26 *Aquatic Living Resources* 37–48; T Davies, C Mees and E Milner-Gulland, 'The past, present and future use of drifting fish aggregating devices (FADs) in the Indian Ocean' (2014) 45 *Marine Policy* 163–170.

12 Based on the five-year average to 2015. The Pacific Community, *Western and Central Pacific Fishery Commission Tuna Fishery Yearbook 2015* (Ocean Fisheries Programme, Secretariat of the Pacific Community, Noumea, 2015).

13 Fonteneau *et al.* (n 11); D Gershman, A Nickson and M O'Toole, *Estimating the Use of FADs Around the World* (The Pew Charitable Trusts, Washington, DC, USA, 2015).

14 A Maufroy, D Kaplan, N Bez, A Delgado de Molina, H Murua, L Floch and E Chassot, 'Massive increase in the use of drifting fish aggregating devices (dFADs) by tropical tuna purse seine fisheries in the Atlantic and Indian Oceans' (2017) 74 *ICES Journal of Marine Science* 215–225.

15 *Ibid.*

16 Gershman *et al.* (n 13).

17 L Escalle, S Brouwer, G Pilling and the PNA Office, 'Estimates of the number of FADs active and FAD deployments per vessel in the WCPO' presented at the Fourteenth

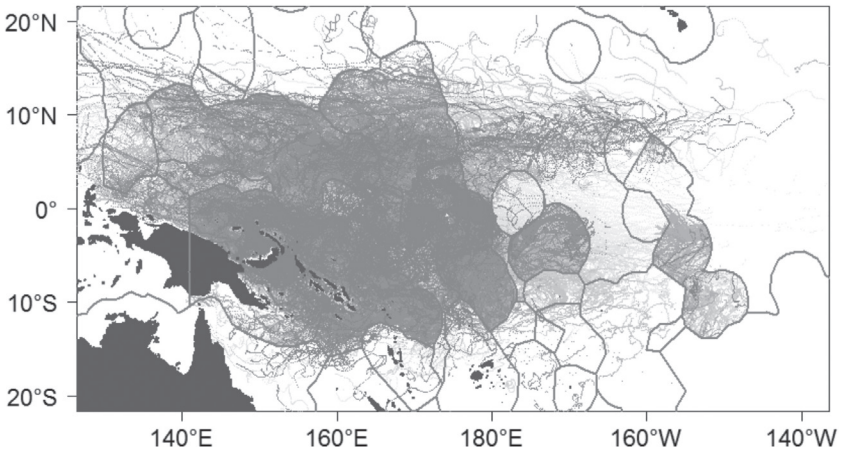

FIGURE 2 WCPO FADs tracked by PNA in 2016–2017[19]

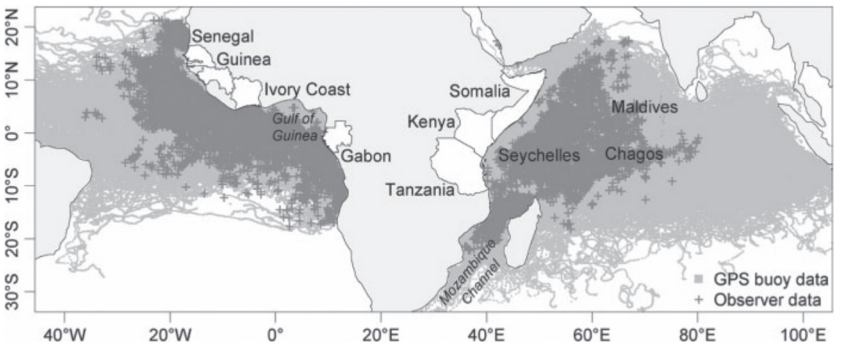

FIGURE 3 FAD buoy data from the French and Spanish fleets in the Indian and Atlantic Oceans 2007–13[20]

Drifting FADs, once deployed, have the ability to drift vast distances and have been observed to drift at sea for up to two years and to drift distances in excess of 10,000 kilometres.[18] This is dramatically demonstrated by the tracks of individual drifting FADs in Figs. 2 and 3 above.

Regular Session of the Scientific Committee to the Western and Central Pacific Fisheries Commission (SC14-MI-WP-10, Busan, Republic of Korea, 8–16 August 2018).

18 *Ibid.*

19 L Escalle, B Muller, S Brouwer, G Pilling and the PNA Office, 'Report on analyses of the 2016/2018 PNA FAD Tracking Programme' presented at the Fourteenth Regular Session of the Scientific Committee to the Western and Central Pacific Fisheries Commission (SCI14-MI-WP-09, Busan, Republic of Korea, 8–16 August 2018).

20 Maufroy *et al.* (n 14).

Impacts of Drifting Fish Aggregating Devices

Proponents for drifting FADs argue that they increase the efficiency of purse seining,[21] while others note that the significant reduction in the size of fish caught undermines the efficiency gains.[22] While they have clearly reduced fuel costs and increased catches of target stocks, they have had significant unintended impacts on target and non-target species, particularly juvenile bigeye and sharks.[23] Purse seine sets on unassociated free swimming schools (i.e., non-FAD sets) will catch larger skipjack and/or yellowfin, and do not impact as significantly on bigeye and sharks.[24] Poorly designed FADs can also entangle turtles, sharks and other sensitive species in the sub-structure or raft of the FAD.[25]

There are also concerns that the use of FADs is introducing further uncertainties into scientific assessments due to their impact on tuna behaviour.[26] Studies in both the eastern[27] and western[28] Pacific have also suggested that the increasing number of FADs is resulting in a decreased catch per unit effort. More theoretically, there is also a concern that the use of FADs may be creating an 'ecological trap' whereby population growth is reduced due to individuals

21 J Morón, J Areso and P Pallarés, 'Statistics and technical information about the Spanish purse-seine fleet in the Pacific' presented at the Fourteenth Meeting of the Standing Committee on Tuna and Billfish (FTWG-11 (14), Noumea, New Caledonia, 9–16 August 2001).

22 A Fonteneau, P Pallares, J Sibert and Z Suzuki, 'The effect of tuna fisheries on tuna resources and offshore pelagic ecosystems' (2002) 16 *Ocean Yearbook* 142–170.

23 B Leroy, J Phillips, S Nicol, G Pilling, S Harley, D Bromhead, S Hoyle, S Caillot, V Allain and J Hampton, 'A critique of the ecosystem impacts of drifting and anchored FADs use by purse-seine tuna fisheries in the western and central Pacific Ocean' (2013) 26(1) *Aquatic Living Resources* 49–61, doi:10.1051/alr/2012033.

24 A Langley, A Wright, G. Hurry, J. Hampton, T. Aqorua and L. Rodwell, 'Slow steps towards management of the world's largest tuna fishery' (2009) 33(2) *Marine Policy* 271–279.

25 J Murua, G Moreno, M Hall, L Dagorn, D Itano and V Restrepo, *Towards Global Non-Entangling Fish Aggregating Device* (*FAD*) *Use in Tropical Tuna Purse Seine Fisheries through a Participatory Approach* (ISSF Technical Report 2017–07, International Seafood Sustainability Foundation, Washington, DC, USA, 2017).

26 M Maunder, 'Updated indicators of stock status for skipjack tuna in the eastern Pacific Ocean' presented at the Ninth Scientific Advisory Committee to the Inter-American Tropical Tuna Commission (SAC-09-07 REV, La Jolla, California, USA, 14–18 May 2018).

27 M Hall and MH Román, 'The fishery on fish-aggregating devices (FADs) in the eastern Pacific Ocean – update' presented at the Eighth Meeting of the Scientific Advisory Committee of the Inter-American Tropical Tuna Commission (SAC-08-03e, La Jolla, California, USA, 8–12 May 2017).

28 Escalle *et al.* (n 17).

making poor habitat choice.[29] Studies have also suggested that tuna associated with FADs are less healthy than those in free swimming schools.[30]

Abandoned, lost and discarded FADs can also cause ghost fishing as they continue to aggregate fish schools, and ultimately damage coastal habitats and produce marine litter.[31] In 2018, it was estimated that only around 10 per cent of deployed FADs were recovered by a vessel.[32]

Drifting FADs in the Western and Central Pacific Ocean

Skipjack, bigeye, and yellowfin are the most productive and valuable tuna in the WCPO fisheries. In the most recent data for 2017, fisheries for these three species caught 2,424,000 metric tonnes, worth approximately US$5.3 billion in landed value.[33] Purse seiners[34] are used to target skipjack and yellowfin, principally to supply canneries. Bycatch of bigeye accounts for a very small percentage of total purse seine catch but nevertheless has a significant impact due to the sheer size of the catch in the context of total bigeye catches.[35] Despite comprising approximately almost 75 per cent of all WCPO catch, purse seine fisheries comprise less than 60 per cent of the total value of WCPO tuna fisheries due to the lower value of tuna for canning.[36] In effect, purse seine fisheries are valuable in terms of their quantity, rather than their quality.

All three species are distributed throughout the tropical and subtropical waters of the WCPO and are listed in the LOSC as highly migratory.[37] However, unlike tuna fisheries in the Atlantic, eastern Pacific and Indian Oceans, the WCPO tuna fisheries are overwhelmingly fished in tropical waters under the national jurisdiction of eight Pacific small island developing States that are a party to

29 R Gillett and D Bromhead, *Tuna for Tomorrow? Some of the Science Behind an Important Fishery in the Pacific Islands* (Asian Development Bank, Manila, 2008); Fonteneau *et al.* (n 22); JP Hallier and D Gaertner, 'Drifting fish aggregation devices could act as an ecological trap for tropical tuna species' (2008) 353 *Marine Ecology Progress Series* 255–264.

30 Hallier and Gaertner (n 29).

31 E Gilman, B Bigler, B Muller, G Moreno, E Largacha, M Hall, F Poisson, W Chiang, J Toole and P He, *Stakeholders' Views on Methods to Identify the Ownership and Track the Position of Drifting Fish Aggregating Devices Used by Tuna Purse Seine Fisheries with Reference to the FAO Draft Guidelines on the Marking of Fishing Gear* (Fisheries and Aquaculture Technical Paper No. T631, United Nations Food and Agriculture Organization, Rome, 2018).

32 Escalle *et al.* (n 19).

33 Pacific Islands Forum Fisheries Agency (FFA), 'Value of WCPO Tuna Fisheries 2017' (Excel database) (Honiara, 2018).

34 Cochrane (n 6).

35 FFA (n 33).

36 *Ibid.*

37 LOSC (n 4), Annex 1.

the Nauru Agreement.[38] A recent report by the Pacific Community and the Office of the Parties to the Nauru Agreement (PNA) analysed data from the PNA FAD Tracking Programme and studied the movement of drifting FADs.[39] The study was limited to the jurisdiction of the PNA and excluded most data from the high seas, and noted that fishing companies only forwarded 30–40 per cent of satellite buoy transmissions. Nevertheless, within these limitations, the analysis identified hotspots for FAD deployment and identified numerous tracks of drifting FADs drifting through multiple PNA EEZs and beyond for up to two years. The average drift time was approximately three months, with an average drifting distance of just over 1,000 kilometres.

The study uncovered a high density of FADs drifting through Kiribati's Phoenix Islands Protected Area (PIPA). This 408,250 square kilometre marine protected area is closed to fishing and is inscribed on the UNESCO World Heritage List. PIPA protects one of the world's largest oceanic coral archipelago ecosystems and includes 14 underwater seamounts and other deep-sea habitats. Scientific surveys have so far identified over 800 diverse species of fauna.[40] The waters are highly productive for tuna, and recent studies have begun to investigate its potential significance for tuna spawning. The Government of Kiribati has implemented the highest level of protections for PIPA,[41] including prohibiting fishing, and has previously arrested purse seine vessels for fishing inside the protected area, consistent with its rights under the LOSC.[42]

While the FAD tracking analysis did not identify any fishing sets within PIPA, it did identify a high density of drifting FADs drifting through PIPA. This activity is in conflict with PIPA's conservation goals and its management arrangements, and raises an important question that has regional ramifications: is a drifting FAD 'fishing' when it is drifting? This is not just a concern for PIPA; ultimately it is a concern for all coastal States and for the flag States that register the vessels responsible for deploying the drifting FADs. If drifting FADs are

38 Q Hanich, 'Distributing the bigeye conservation burden in the Western and Central Pacific fisheries' (2012) 36 *Marine Policy* 327–332.

39 Escalle *et al.* (n 19); L Escalle, S Brouwer, J Scutt Phillips, G Pilling and PNA Office, 'Preliminary analyses of PNA FAD tracking data from 2016 and 2017' presented at the Thirteenth Regular Session of the Scientific Committee to the Western and Central Pacific Fisheries Commission (SC13-MI-WP-05, Rarotonga, Cook Islands, 9–17 August 2017).

40 R Rotjan, R Jamieson, B Carr, L Kaufman, S Mangubhai, D Obura, R Pierce, B Rimon, B Ris, S Sandin, P Shelley, UR Sumaila, S Taei, H Tausig, T Teroroko, S Thorrold, B Wikgren, T Toatu and G Stone, 'Establishment, management, and maintenance of the Phoenix Islands protected area' in ML Johnson and J Sandell (eds), *Advances in Marine Biology*, Vol. 69 (Academic Press, Oxford, 2014) 289–324.

41 Phoenix Island Protected Area Regulations 2008 (Kiribati), s 6(5).

42 LOSC (n 4), Part V.

considered to be 'fishing', then a coastal State's sovereign rights apply to FADs that drift through waters under national jurisdiction, and flag States have specific responsibilities to ensure that their vessels do not engage in unauthorised fishing within foreign EEZs. If they are not considered to be 'fishing' then this has obvious implications for the development of legally-binding fisheries management responsibilities for coastal and flag States, which could in turn affect how international fisheries law and policy is negotiated going forward.

In the Pacific, consistent with their sovereign rights over fisheries within their EEZs, the PNA began a FAD tracking programme in 2016 and have begun to implement their own scheme for managing drifting FADs within their EEZs[43] which will

- improve reporting of the current FAD tracking trial through the Fisheries Information Management System;
- integrate FAD log sheets with electronic reporting by fisheries observers;
- develop a PNA FAD buoy tracking and registration measure; and
- address ecological issues associated with FADs, including FAD retrieval and liability for beaching of FADs.

The PNA held a technical workshop in February 2019 to develop their plans and began processes to develop a FAD registration and tracking measure that will provide the foundation for their initiative. This is expected to come into force at the start of 2020.[44]

Management – What Next?

The proliferation in the use of drifting FADs across the global tuna fishing industry creates a unique set of regulatory and management challenges for two key reasons. First, drifting FADs differ from other types of fishing gear. They do not capture or restrict the free movement of fish; instead, they rely on attraction to situate the fish in one identifiable place for subsequent capture by a fishing vessel. Unlike other forms of oceanic fishing gears that 'fish' while attached, or in close proximity, to their host vessel, drifting FADs may aggregate fish thousands of kilometres from any associated vessel. Given their drifting nature, drifting FADs are everywhere and they go everywhere. They may be set by a vessel in one location and drift hundreds or thousands of kilometres, aggregating highly migratory tuna as they go, within and across multiple maritime boundaries.

43 Parties to the Nauru Agreement (PNA), 'PNA to Strengthen FAD Management' available at https://www.pnatuna.com/content/pna-strengthen-fad-management.

44 PNA, 'PNA officials prepare for big agenda in Palau' available at https://www.pnatuna.com/content/pna-officials-prepare-big-agenda-palau.

Second, as noted above, many drifting FADs are lost at sea or abandoned to save fuel costs. In such circumstances, the vast majority of drifting FADs ultimately become a form of marine pollution that includes synthetic materials; cause damage to coastal ecosystems when washed up in sensitive areas such as coral reefs and seagrass beds; and potentially reduce the catch per unit of effort through school fragmentation. These characteristics raise significant unanswered questions around the management responsibility for drifting FADs, the extent to which they can be considered 'fishing', and the extent to which existing international law creates obligations for coastal and flag States, as well as RFMOs, to monitor, control and report drifting FAD activities.

Existing international law provides a broad framework within which issues generated by the use of drifting FADs can be examined. LOSC establishes the key rights and obligations of coastal States and flag States in relation to fisheries and defines the scope of their responsibility. UNFSA elaborates on these requirements as they apply to the management of highly migratory and straddling stocks, including the tuna stocks that are often the target of drifting FADs. Underneath the broad umbrella of these global agreements, RFMOs seek to manage particular stocks or the stocks within a particular geographic region through regional measures (summarized below in Table 1).

Obligations to Monitor, Control and Report 'Fishing'

The LOSC provides the overarching framework of international law regarding the conservation and management of oceanic fisheries. This section will identify the obligations relevant for drifting FADs under the LOSC and UNFSA and consider how those obligations are to be implemented practically by coastal and flag States through the exercise of due diligence. It will also identify aspects of the Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean (WCPF Convention),[45] the Convention establishing the WCPFC to manage tuna stocks in the WCPO, that are important for drifting FAD regulation.

Both flag and coastal States have significant international obligations to control fishing in the EEZ, the maritime area adjacent to a coastal state's territorial sea and extending out to a maximum distance of 200 nm from baselines. Under the LOSC, the coastal State is given significant rights and jurisdiction to support its fisheries management activities. The coastal State has 'sovereign rights [in the EEZ] for the purpose of exploring and exploiting, conserving

45 Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean (WCPF Convention) (Honolulu, 5 September 2000, in force 19 June 2004), 2275 *UNTS* 43.

and managing the natural resources'.[46] In addition, the coastal State has 'jurisdiction … with regard to … the protection and preservation of the marine environment'.[47]

Alongside those rights and jurisdiction, the coastal State has obligations to conserve the living resources of the EEZ. It must determine a total allowable catch for the living resources in its EEZ.[48] Further, it must, 'taking into account the best scientific evidence available to it, … ensure through proper conservation and management measures that the maintenance of the living resources in the exclusive economic zone is not endangered by over-exploitation'.[49]

Significant obligations also fall upon the flag State of vessels fishing within the EEZ of a coastal State. The flag State is under an overarching duty to 'effectively exercise its jurisdiction and control in administrative, technical and social matters over ships flying its flag'.[50] When its vessels are operating in the EEZ of another State, the flag State must have 'due regard to the rights and duties of the coastal State and shall comply with the laws and regulations adopted by the coastal State'.[51]

Article 62(4) of the LOSC deals specifically with the harvesting of living resources and requires nationals of other States fishing in the EEZ to comply with the coastal State's conservation measures, as well as other applicable laws and regulations. More broadly, the LOSC contains obligations that apply to States and to all maritime areas, such as the obligation under Article 192 to 'protect and preserve the marine environment' and the obligation under Article 194(1) to take 'all measures consistent with this Convention that are necessary to prevent, reduce and control pollution of the marine environment from any source'.

These LOSC obligations are clarified and expanded upon in the 1995 UNFSA. The duty of States to cooperate in relation to the management and conservation of straddling fish stocks and highly migratory fish stocks, in order to ensure the effective implementation of relevant provisions of the LOSC, is a key feature of UNFSA. States are obliged, *inter alia*, to 'adopt measures to ensure long-term sustainability of … fish stocks', 'apply the precautionary approach', 'minimize pollution … [and] catch by lost or abandoned gear', 'take measures to prevent or eliminate overfishing and excess fishing capacity', 'collect and share … complete and accurate data concerning fishing activities', and

46 LOSC (n 4), Article 56(1)(a).
47 *Ibid.*, Article 56(1)(b)(iii).
48 *Ibid.*, Article 61(1).
49 *Ibid.*, Article 61(2).
50 *Ibid.*, Article 94(1).
51 *Ibid.*, Article 58(3).

TABLE 1 Conservation measures across tuna RFMOs

RFMO[a]	FAD Management Plans	Conservation Measures	Data Collection/Reporting/Control
IATTC[b]	None	FAD retrieval or reporting lost FADs: CPCs shall require the owners and operators of all purse seine vessels flying their flag, when fishing on **FAD**s in the IATTC Convention Area, to collect and report types of activity including retrieval or lost FADs (Res. C-18-05) Limited number of FADs: None Closure Period: All purse seine vessels covered by these measures must stop fishing in the Convention Area for a period of 72 days each year during one of the designated timeframes and within the designated locations (Res. C-18-05) Non-entangling FADs: As of 1 January 2019, CPCs shall ensure that the design and deployment of FADs are based on the principles set out in Annex II (Res. C-18-05)	Yes, measures for data collection/reporting CPCs shall require the owners and operators of all purse-seine vessels flying their flag, when fishing on FADs in the IATTC Convention Area to collect and report requested information (Res. C-18-05)

List of Acronyms: BET = Bigeye Tuna; SKJ = Skipjack Tuna; YFT = Yellowfin Tuna; Res = Resolution; Rec = Recommendation; CMM = Conservation and Management Measures; CCM = Commission Members, Cooperating Non-members and Participating Territories; CPC = Contracting and Participating Countries

a Although the Commission for the Conservation of Bluefin Tuna is considered a tuna RFMO, due to limited measures on FADs, it is not included in Table 1.

b Inter-American Tropical Tuna Commission (IATTC), 'Conservation Measures for Tropical Tunas in the Eastern Pacific Ocean During 2018–2020 and Amendment to Resolution C-17-01' (Mexico City, Mexico, 24–28 July 2017) Resolution C-17-02, para 3; IATTC, 'Amendment of Resolution C-16-01 on the Collection and Analyses of Data on Fish-Aggregating Devices' (San Diego, California, 24, 27–30 August 2018) Resolution C-18-05, paras 2–3 and 10.

TABLE 1 Conservation measures across tuna RFMOs (*cont.*)

RFMO	FAD Management Plans	Conservation Measures	Data Collection/Reporting/Control
ICCAT[c]	Yes, for management plans CPCs fishing for BET, YFT and SKJ in association with objects that could affect fish aggregation, including FADs, shall submit management plans to the Executive Secretary (Rec. 16-01)	FAD retrieval or reporting lost FADs: CPCs shall ensure that all purse seine and baitboat fishing vessels and all support vessels shall collect and report each visit on a FAD and each loss of a FAD (Rec. 16-01) Limited number of FADs: CPCs shall ensure that no more than 500 FADs with or without instrumental buoys are active per vessel (Rec. 16-01) Closure Period: Fi shing for, or supported activities to fish for BET, YFT and SKJ tunas in association with objects that could affect fish aggregation, including FADs, shall be prohibited during the period 1 January to 28 February in the designated area (Rec. 16-01) Non-entangling FADs: CPCs shall replace, by 2016, existing FADs with non-entangling FADs (Rec. 16-01)	Yes, measures for data collection/ reporting CPCs shall ensure that all purse seine and baitboat fishing vessels and all support vessels shall collect and report the requisite information for each deployment of a **FAD**, each visit on a FAD, whether followed or not by a set, and each loss of a FAD (Rec. 16-01)

c International Commission for the Conservation of Atlantic Tunas (ICCAT), 'Recommendation by ICCAT on a Multi-Annual Conservation and Management Programme for Tropical Tunas' (entered into force 12 June 2017) Recommendation 16-01, paras 13–14, 16, 18–21 and 23.

TABLE 1 Conservation measures across tuna RFMOs (*cont.*)

RFMO	FAD Management Plans	Conservation Measures	Data Collection/Reporting/Control
IOTC[d]	Yes, for management plans CPCs having vessels fishing on FADs shall submit management plans for the use of FADs by their purse seiners and baitboat vessels; there is a specific guideline for the preparation of management plans for drifting FADs (Annex I, Res. 18/08)	FAD retrieval or reporting lost FADs: CPCs shall submit management plans that include plans for monitoring and retrieval of lost FADs (Res. 18/08) Limited number of FADs: CPCs and flag States must limit instrumented buoys to 350 per vessel and no more than 700 per annum (Res. 18/08) Closure Period: None Non-entangling FADs: Starting in 2014, gradually, CPCs will ensure the design and deployment of FADs is based on the principles set out in Annex III for non-entanglement FADs (Res. 18/08)	Yes, measures for data collection/ reporting CPCs shall submit the data elements prescribed in Annex I and Annex II to the Commission (Res. 18/08)

d Indian Ocean Tuna Commission (IOTC), 'Procedures on a Fish Aggregating Devices (FADs) Management Plan, Including a Limitation on the Number of FADs, More Detailed Specification of Catch Reporting from FAD Sets, and the Development of Improved FAD Designs to Reduce the Incidence of Entanglement of Non-Target Species' Resolution 18/08, paras 3, 7, and 11–14.

TABLE 1 Conservation measures across tuna RFMOs (*cont.*)

RFMO	FAD Management Plans	Conservation Measures	Data Collection/Reporting/Control
WCPFC[e]	Yes[f]	FAD retrieval or reporting lost FADs: CCMs shall encourage their fishing vessels to retrieve abandoned, lost or discarded fishing gear and dispose at port facilities or alternatively report same (CMM 2017-04) Limited number of FADs: Flag CCMs shall ensure that no more than 350 drifting FADs with activated instrumented buoys per vessel are active at one time (CMM 2018-01) Closure Period: Three month FAD closure inside EEZs, plus additional two months on the high seas, including prohibition of deploying, servicing or setting on FADs (CMM 2018-01) Non-entangling FADs: CCMs shall ensure that the design and construction of any FAD to be deployed in, or that drifts into, the WCPFC Convention Area shall comply with specifications (CMM 2018-01)	Yes, measures for data collection/reporting Each CCM shall ensure that the master of each vessel completes an accurate written or electronic log every day, including for days with no fishing operations but where any other fishing effort occurred, as well as the relevant activities (e.g., 'searching', 'deploy/retrieve FAD') (CMM 2013-05)

e Western and Central Pacific Fisheries Commission (WCPFC), 'Conservation and Management Measure for Marine Pollution' (14th Regular Session, Manila, Philippines, 3–7 December 2017) Conservation and Management Measure 2017-04, para 14; WCPFC, 'Conservation and Management Measure for Bigeye, Yellowfin, and Skipjack Tuna in the Western and Central Pacific Ocean' (15th Regular Session, Honolulu, Hawaii, USA, 10–14 December 2018) Conservation and Management Measure 2018-01, paras 16–17, 19–20 and 23; WCPFC 'Conservation and Management Measure on Daily Catch and Effort Reporting' (10th Regular Session, Cairns, Australia, 2–10 December 2013) Conservation and Management Measure 2013-05, para 1.

f WCPFC Resolution 2013-01 para 37 required CCMs fishing on the high seas to submit management plans to the Commission for the use of FADs by their vessels on the high seas by 1 July 2014. All CCMs complied and the plans remain in effect, but are not an annual requirement.

'implement and enforce conservation and management measures through effective monitoring, control and surveillance'.[52] Cooperation between coastal States and fishing States is to take place through the mechanism of RFMOs.[53] States which do not participate in the relevant RFMO are not permitted to authorise their vessels to fish on stocks managed by that RFMO.[54] Flag States must ensure that vessels flying its flag and fishing on the high seas 'comply with … regional conservation and management measures and … do not engage in any activity which undermines the effectiveness of such measures',[55] and also 'ensure that vessels flying its flag do not conduct unauthorised fishing within areas under national jurisdiction of other States'.[56]

Exercising Due Diligence under the LOSC

The coastal and flag State obligations under the LOSC and UNFSA are important when considering their responsibilities in relation to drifting FADs. The content of the obligations was considered in 2015 by the International Tribunal for the Law of the Sea (ITLOS) in the *Request for an Advisory Opinion Submitted by the Sub-Regional Fisheries Commission* (*SRFC*).[57] The SRFC, a regional fishing organisation established to support cooperation and coordination in fisheries management amongst seven West African nations, sought advice on the obligations of flag States, and the extent of flag State liability, in relation to illegal, unreported and unregulated (IUU) fishing activities conducted by vessels sailing under their flag within the EEZ of another State. According to the Tribunal, the obligation for the flag State to comply with coastal State laws and regulations in the EEZ[58] generates a 'responsibility to ensure' compliance with those laws and regulations by all vessels flying its flag.[59] As part of this responsibility 'the flag State … must adopt the necessary administrative measures to ensure that fishing vessels flying its flag are not involved in activities which will undermine the flag State's responsibilities under the Convention in respect of the conservation and management of marine living resources'.[60]

52 UNFSA (n 5), Article 5.
53 *Ibid*., Article 8.
54 *Ibid*., Article 17(2).
55 *Ibid*., Article 17(1).
56 *Ibid*., Article 17(3)(b)(iv).
57 Advisory Opinion, 2 April 2015, *ITLOS Reports 2015*, p. 4.
58 LOSC (n 4), Articles 58(3) and 62(4).
59 Advisory Opinion (n 57), paras 126–127.
60 *Ibid*., para 119.

The Tribunal was careful to clarify that in carrying out these requirements the flag State is not obliged to achieve a particular result; rather, the obligation is one of due diligence. The focus of the obligation is on the processes put in place by the flag State to try and prevent illegal fishing, to detect illegal fishing if it occurs nonetheless, and to respond appropriately if illegal fishing is detected. The content of a due diligence obligation will depend upon a variety of factors, including the size and scope of the risk, level of understanding of the risk, and accepted methods for managing the risk. The content of the obligation may also change over time as understanding of a risk improves, or new technology to deal with a risk becomes available.

Due Diligence by Coastal and Flag States under the WCPF Convention

Clues as to how the due diligence obligation might operate in the context of drifting FADs in the WCPF Convention Area come from the text of the WCPF Convention and the commitments made by parties to that Convention. The objective of the WCPF Convention is 'to ensure, through effective management, the long-term conservation and sustainable use of highly migratory fish stocks in the western and central Pacific Ocean'.[61]

Parties commit to adopt measures to ensure long-term sustainability of fish stocks and to promote optimum utilisation; take a precautionary approach; assess the impacts of fishing on target and non-target species; adopt measures to minimize pollution originating from fishing vessels; protect marine biodiversity; take measures to prevent overfishing; and collect and share timely and accurate data concerning fishing activities.[62] Coastal States are required to apply these measures in areas within their national jurisdiction 'in the exercise of their sovereign rights for the purpose of exploring and exploiting, conserving and managing highly migratory fish stocks'.[63]

Flag States are required to take measures to ensure that its fishing vessels comply with the Convention and all conservation and management measures.[64] They must ensure that their vessels 'do not engage in any activity which undermine the effectiveness of such measures', and 'do not conduct unauthorized

61 WCPF Convention (n 45), Article 2.
62 *Ibid.*, Article 5.
63 *Ibid.*, Article 7(1).
64 *Ibid.*, Article 1(a).

fishing within areas under the national jurisdiction of any Contracting Party'.[65] In addition, flag States must ensure that vessels fish for highly migratory species in high seas areas only if they have been specifically authorised by the flag State to do so. Such authorisation is only granted where the flag State 'is able to exercise effectively its responsibilities in respect of such vessels under the 1982 Convention, the [1995 Fish Stocks] Agreement and this Convention'.[66]

Definition of Fishing

The ability of a coastal State to effectively and sustainably manage fish stocks within its EEZ is clearly impacted by the potential operation of drifting FADs. Drifting FADs also raise specific issues for the flag State of vessels fishing both in high seas areas and in areas under national jurisdiction. Vessels setting or fishing on drifting FADs in high seas areas may be operating in a manner that undermines the effectiveness of conservation measures in adjacent areas under national jurisdiction. Even more significantly, such vessels may be shown to be conducting unauthorized fishing within areas of national jurisdiction, despite actually harvesting fish on the high seas, as the drifting phase of the operation of FADs falls within the broad definition of 'fishing' under the WCPF Convention. The WCPF Convention defines fishing very broadly to include:

i. searching for, catching, taking or harvesting fish;
ii. attempting to search for, catch, take or harvest fish;
iii. engaging in any other activity which can reasonably be expected to result in the locating, catching, taking or harvesting of fish for any purpose;
iv. placing, searching for or recovering fish aggregating devices or associated electronic equipment such as radio beacons;
v. any operations at sea directly in support of, or in preparation for, any activity described in subparagraphs (i) to (iv), including transhipment; and
vi. use of any other vessel, vehicle, aircraft or hovercraft, for any activity described in subparagraphs (i) to (v) except for emergencies involving the health and safety of the crew or the safety of a vessel.[67]

While the setting, monitoring and recovery of FADs is covered by paragraph (iv), the drifting phase of their operation is also clearly an activity 'which can reasonably be expected to result in the locating, catching, taking or harvesting of fish' under paragraph (iii). A vessel that has intentionally deployed a drifting

65 *Ibid.*, Article 1(a)–(b).
66 *Ibid.*
67 *Ibid.*, Article 1.

FAD, or that has located and is tracking a drifting FAD, is engaged in the activity of locating fish during the time that the FAD is permitted to drift. Paragraph (iii) does not require the activity to actually result in the capture or harvest of fish by the vessel engaged in the activity. The requirement is only that it be reasonable to expect that the activity will lead to that result. Given that the express purpose of using a FAD is to gather schools of fish and thereby increase a vessel's ability to locate and capture fish, it is reasonable to expect that the drifting period will yield a result.[68] Finally, it need not be demonstrated that the activity was engaged in by a vessel specifically for the purpose of locating or harvesting fish; the subjective intention on the part of the fishing vessel is not relevant to the definition and the activity can be engaged in 'for any purpose'.

In summary, the use of drifting FADs falls within the WCPF Convention definition of 'fishing' at all stages of use, from deployment to recovery, including the drifting stage when the FAD is 'soaking' and remotely aggregating fish.

Obligations to Avoid Pollution and Ghost Gear

Drifting FADs in the WCPF Convention Area also raise significant issues with respect to marine pollution. The FAD tracking study estimated that at least 26 per cent of the associated satellite buoys were lost, thereby resulting in marine pollution, with approximately 20 per cent of these subsequently beaching on Pacific island coastlines. Between 4 and 5 August 2018, the Sea Education Association expedition vessel, *Robert C. Seamans*, visited the island of Nikumaroro in the Phoenix Islands and expedition members recovered 13 FAD transponders that were found beached. Of these, at least one was still active and blinking and transmitting data, and several looked very new.[69]

The International Convention for the Prevention of Pollution from Ships 1973/78 (MARPOL) remains the pre-eminent international instrument addressing marine pollution originating from ships.[70] Annex V, Prevention of Pollution by Garbage from Ships, covers the provisions related to fishing operations.[71] MARPOL excludes 'fishing gear released into the water with the intention for

68 It is noteworthy that this subparagraph does not require the successful catch of fish, just that it is a reasonable expectation that the activity result in at least one of the five activities.

69 J Witting, 'Report of FAD transponder float collection on Nikumaroro Island, Phoenix Islands Protected Area, during SEA Cruise S-281, 4–5 August 2018' submitted to PIPA Implementation Office and PIPA Conservation Trust (2018).

70 International Convention for the Prevention of Pollution from Ships 1973 (MARPOL) as amended by the Protocol (London, 1 June 1978, in force 2 October 1983) 1340 *UNTS* 61.

71 *Ibid.*, Annex V.

later retrieval' from its provisions concerning garbage or accidental loss.[72] The 2017 Guidelines for the Implementation of MARPOL note that fishing gear, once discharged, becomes a harmful substance.[73] These new MARPOL guidelines require members to take action to minimise the probability of loss, to record and report losses, and to maximise recovery of lost gear. They encourage vessel operators, organisations and governments to undertake research and to develop technology and regulations as necessary.

Governments are also required to regulate the reporting of accidentally lost, discharged, or abandoned fishing gear that poses a significant risk to the marine environment or navigation. Both vessel owners and governments are required to report information on lost, discharged or abandoned fishing gear and share it with coastal States, under certain circumstances. Lastly, governments are required to create communication frameworks to facilitate the reporting and sharing of information with coastal States. These provisions clearly obligate flag States to regulate the fishing gear of their vessels, including monitoring and collecting information on the use, deployment, drifting, and retrieval phases of a drifting FAD to minimize marine pollution due to their loss.

The WCPF Convention requires members to adopt measures to minimise catch by lost or abandoned gear as well as pollution originating from fishing vessels.[74] On 1 January 2019, WCPFC Conservation and Management Measure (CMM) 2017–04 on Marine Pollution entered into force, requiring and encouraging members to implement new controls and research new methods to prohibit and minimise marine pollution. Among other things, the measure obligates members to encourage their fishing vessels to retrieve abandoned, lost or discarded fishing gear. Where retrieval is not possible or does not occur, members shall encourage their fishing vessels to report the location, type, size and age of abandoned, lost or discarded fishing gear. Members are also encouraged to develop communication frameworks to enable the recording and sharing of information on fishing gear loss in order to reduce loss and facilitate recovery of fishing gear, and to develop frameworks or systems to assist fishing vessels to report the loss of gear to their flag State, relevant coastal States, and the Commission.

72 *Ibid.*, Annex V, para 1.7.8.

73 International Maritime Organization (IMO), '2017 Guidelines for the Implementation of MARPOL Annex V', IMO Resolution MEPC.295(71) (adopted on 7 July 2017).

74 WCPF Convention (n 45), Article 5(e).

Discussion

This article explores some of the significant governance questions relating to drifting FADs. Under the LOSC, coastal States are obliged to conserve the living resources of the EEZ and to ensure that those resources are not endangered through overexploitation. Flag States are responsible for ensuring that their vessels are not fishing without authorization in a coastal State's EEZ. They are also responsible for ensuring that their vessels are not engaged in any activities which undermine the effectiveness of conservation and management measures. The operation of drifting FADs therefore raises significant questions of both coastal and flag State responsibility. As part of their due diligence obligations under the LOSC, flag States must be able to demonstrate the measures they are taking to prevent, detect and respond to the issues raised by the use of drifting FADs by their vessels.

While analysis establishes a clear legal requirement for all State parties to exercise due diligence over the management of drifting FADs through a number of international regulatory instruments, it also reveals a lack of clarity around the attribution of responsibility. Who is responsible for the management, recovery and damage remediation of drifting FADs in tuna fisheries around the world? What happens when a FAD is licensed by one coastal State, but not its neighbour (FADs currently pay little attention to maritime boundaries)? What happens in a management scheme where FADs are leased and traded, who owns them in such circumstances, and who is responsible at each stage?

It is clear that deploying a FAD or recovering a FAD are both 'fishing' within the scope of the LOSC and UNFSA, and generate legal obligations for UNFSA parties and RFMOs to monitor, control and report on these activities. But what are the thresholds for the performance of due diligence in this regard? Given the current weak state of management of drifting FADs by RFMOs around the world, this lack of clarity indicates that the current regulatory framework does not yet adequately support the responsible management of drifting FADs, and the proper conservation and management of tuna fisheries that use drifting FADs. However, in the WCPO where the WCPF Convention clearly defines drifting FADs as a type of fishing, regardless of its stage of use (i.e., deploying, soaking or setting), it is clearer that the WCPFC and its members have an obligation to cooperatively monitor and control the deployment, drift and recovery of FADs, and to follow the lead of the PNA for fisheries within their EEZs.

While MARPOL excludes 'fishing gear released into the water with the intention for later retrieval' from its provisions concerning garbage or accidental loss, the recent PNA study found that 90 per cent of drifting FADs are never

retrieved.[75] The sheer numbers of drifting FADs that are not retrieved raises obvious questions regarding intent, yet the WCPFC provides no mechanism to determine if the fishing gear was ever intended to be retrieved. In this context, it is reasonable to question whether the deployment of drifting FADs breaches MARPOL.

In response, this article proposes three actions that the WCPFC could consider taking to strengthen the regulatory framework for drifting FADs management in the Convention Area and to implement its obligations. This could be accomplished by building on PNA sub-regional initiatives that are currently in development, and implementing them through the adoption of WCPFC conservation and management measures:

First, the Commission could establish a centralised drifting FAD monitoring system consistent with the vessel monitoring system (VMS) established under Article 24. This system should be compatible with coastal State systems and could geofence EEZ and protected area boundaries and send alerts to the relevant flag and coastal State each time a drifting FAD drifts across such a boundary. Consistent with the WCPFC VMS, this FAD monitoring system should be tamper-proof and prohibit vessels from switching beacons off when they are drifting. This system should also support implementation of CMM 2017–04.

Second, the Commission could establish controls on the deployment of drifting FADs so as to minimize lost or abandoned gear and ensure that all deployed FADs are recovered consistent with Article 5(e). These controls could require drifting FAD beacons to be operational and reporting to the WCPFC system when drifting so as to be able to locate them at all times. The Commission could also prescribe measures to be taken against vessels that deploy FADs without a beacon, or switch off beacons on unretrieved FADs, thereby effectively abandoning the FAD and causing marine pollution.

Third, the Commission could clearly define appropriate member and Commission responses for FADs that drift into an EEZ without a license, into a closed area, or into a closed season consistent with the sovereign rights of coastal States and flag State responsibilities. The Commission could potentially expand the application of the IUU Vessel List to support coastal State actions against a vessel that intentionally deploys a FAD in a location where it will then drift through an EEZ or protected area, or subsequently set on such FADs without a license after they have drifted back out of an EEZ or protected area, whether it be the original vessel that placed the FAD, or a second vessel that may have purchased the beacon data.

75 Escalle *et al.* (n 19).

Conclusion

These proposed actions are not without their operational and political challenges. They would all need to be adopted by the Commission, and would require significant international cooperation and information sharing. But the technology is now available to track drifting FADs while simultaneously protecting confidentiality concerns, and global communities are increasingly demanding action on marine pollution and unregulated fishing. Without action, fisheries that depend on drifting FADs may rapidly lose their social license if drifting FADs continue to increase in number with unsustainable impacts and drift into closed waters, while flotsam from abandoned and lost FADs washes up on beaches and contributes to marine litter.