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Chairs Discussion WCPFC FAD Management Options Working Group

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WCPFC FAD MANAGEMENT OPTIONS WORKING GROUP

Discussion Paper

Background

There has been much talk in fisheries management and research circles in the Western and Central Pacific around the use of fish aggregating devices (FADs) and their impact on regional fish stocks.

Fishermen have known for some time now that natural floating objects such as logs, dead animals, debris, whale sharks and large cetaceans aggregate schools of tuna and make them relatively more susceptible to fishing gear. These natural objects are now supplemented with more and more man-made FADs. These FADs have become very sophisticated and now allow considerable efficiencies to purse seine fishing operations.

In the WCPO the onset of FAD use began in the early 1990s and saw a rapid expansion in the operation of the tuna purse seine fleets operating in the WCPO continuing on into the next two decades and the surge in catch during that period is representative of that.

The use of the FADs has lead to significant amounts of juvenile yellowfin and bigeye tuna being caught on FAD associated purse seine and ring net sets over many years. Additionally as larger more valuable bigeye tuna and yellowfin tuna being harvested by longline vessels in the western Pacific, we find ourselves literally fishing down the stock from both ends of the reproductive spectrum. This situation has proved unsustainable – with bigeye tuna being especially vulnerable.

Terms of Reference

At WCPFC11, the Commission formed a FAD management option working group to:

1) review reference papers on FADs as well as any relevant information and advice from SC and TCC; and
2) provide recommendations on a variety of FAD-related issues.

These were specifically:

- Collection of additional data on FADs and their use in WCPO fisheries
- FAD marking, and identification, and use of electronic signatures;
- FAD monitoring, tracking and control
- FAD management options; and

- Advise on options for FAD marking and monitoring for WCPO wide application.

Application of the Terms of Reference

Collect additional information on FADs.

Since the inaugural session of the Commission there has been a strong emphasis on the importance of managing the use of floating objects, including FADs to mitigate the catch of juvenile bigeye and yellowfin[1].

In 2008, WCPFC adopted CMM-2008-01which to a large extent was developed to implement compatible management measures for the high seas of the convention area with those developed by the Parties to the Palau Arrangement for their EEZs[2] .One of the elements of that measure was a seasonal closure for FAD fishing.

Complimentary measures were subsequently developed to monitor the implementation of a seasonal closure[3] for FAD fishing. The ROP-IWG3 discussed Observer Minimum Standard Data Fields for use during the FAD closure period. SC5 added four (4) fields and all fields were presented to TCC5 where they were approved. TCC5 recommended to the Commission adoption of 'Minimum Standard Data Fields for Purse Seine FAD monitoring[4]'. These standards were adopted at WCPFC6.

The Minimum Standard Data Fields for Purse Seine FAD monitoring were then applied to the development of the SPC/FFA Observer PS-4 form (now the SPC/FFA GEN-5 form). The information collected is available to WCPFC for ROP data and also from SPC/FFA Regional log sheets.

The first element of the terms of reference of the FAD Management Options Working Group is ambiguous in relation to what specific additional data is to be collected. To address this ambiguity the Chair circulated the following set of questions to initiate discussion on what additional data CCMs and observers may be interested in collecting, for the preparation of an initial discussion document at TCC11.

The intent here was to drill down to a general set of issues the Commission is interested in gathering more information on so as to better inform what specific information needs to be collected in addition to what is already being collected.

1. What is the reason for collecting additional information on FADs?
2. What information would be useful to add value to stock assessments?

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[1] Annex II Paragraph 1(c) WCPFC/Comm 1/01
[2] PNA Requirements Catch Retention and FADs [WCPFC-TCC4-2008/DP-04]
[3] Implementing robust and compatible rules for WCPFC FAD closures and catch retention [WCPFC-TCC5-2009/DP-01]
[4] SC5 outcomes relating to the TCC [WCPFC-TCC5-2009/28]

3. What information would be useful to add value to fisheries management for species caught in association with FADs?
4. Does the WCPFC currently collect information on FADs?
5. What information is collected?
6. How is that information collected?
7. How the FAD information is made available for the Commission use currently?
8. What additional data fields are needed to collect the relevant information?
9. What is the most efficient (cost and timeliness) method of collecting and transmitting the additional data to WCPFC?

Attachment 1 provides a range of responses from a subset of the CCMs and the Science Service Provider to these questions. The table is by no means exhaustive but has been populated to capture various views in order to initiate discussions.

From the information it seems that the need for additional information on the use of FADs is required in order to "frame the issue and have a more objective look at it." It is clear a research plan for FADs needs to be developed for the WCPFC and that shall dictate the additional data collection required.

Recommendation: WCPFC develop a research plan for FADs that incorporates the following elements:

- **Additional data to be collected on FAD construction, FAD deployment, FAD use and FAD loss throughout the WCPFC-CA.**
- **Additional data should be collected on school aggregation times throughout the WCPFC-CA particularly in the sub-equatorial bands as it affects movement rates between different areas in the stock assessment model structure.**
- **WCPFC should task the Science Service Provider to do a characterization of bycatch in the FAD and drifting object fishery in the WCPFC-CA.**

FAD Marking and Tracking

For the second and third elements of the TORs for the WG - FADs can be found in various shapes and sizes ranging from submersed float lines with coconut palm appendages, foam filled steel drums held in place by a concrete anchor, to large flat rafts with structures built on top to house a FAD keeper to ward off poachers. There are also very sophisticated versions made of modern materials and instrumented with very expensive and technologically advanced electronic equipment.

In 2014, SPC conducted a preliminary analysis of the ROP data collected and keypunched to date on FAD design[5]and activities related to FADs in the WCPFC-CA. The previously referred to SPC/FFA GEN-5 form is specifically designed for the collection of information related to the nature of the FAD, the main materials and attachments, the dimensions and information that could allow for the

[5] SC10-ST-IP-09

individual identification of FADs. However, the analysis found that it was difficult to ascertain the fate of the FAD after a set has been made due to the lack of a unique identifier. The main recommendation from that analysis is the development of a unique identifier system to allow for better individual FAD unit tracking.

Review and Recommendations from the WCPFC FAD Management working Group on FAD Marking and Identification

A synthesis of Reference Papers[6]

WCPFC

In 2013, the United States proposed a conservation and management measure (CMM) on FAD data collection and analysis that would have tasked the TCC and Commission to develop a FAD identification scheme. This was considered a first step in any rational FAD management scheme. This FAD identification scheme would have at a minimum considered:

1) A unique identification number with a specific numbering system and format to be adopted by the Commission.
2) Identification that should be easy to apply to the FAD that should be applied in such a manner that it will permit its identification and should not become unreadable or disassociated from the FAD.

Although the proposal was not adopted at WCPFC8, since that time other tuna RFMOs have adopted similar resolutions with FAD marking and identification provisions and these are described in more detail below.

IATTC

In 2013, the IATTC adopted resolution C-13-04 (Appendix 1), which included similar provisions to the above WCPFC measure that tasked its Director to develop an identification scheme[7]. In July 2015, IATTC, replaced this measure with Resolution C-15-03, which includes the following information on FAD identification in a footnote to Annex I

[6] Please note that the Secretariat prepared a paper on FAD management and Monitoring (WCPFC-TCC5-2009/22) in 2009, but as this paper was not included in the reference papers to the FAD management options working group, it is not further described in the summary. The paper should be considered as an additional reference as summarizes guidelines on FAD marking and identification developed by other international bodies as well as describes a proposed marking schemes that was discussed, but not adopted by WCPFC in 2008.

[7] It should be noted that the IATTC measure adopted was proposed by the US and was modeled after the measure that was originally proposed at WCPFC 10.

> "CPCs shall obtain unique alphanumeric codes from the IATTC staff on a periodic basis and distribute those numbers to the vessels in their fleets for FADs that may be deployed or modified, or in the alternative, if there is already a unique FAD identifier associated with the FAD (e.g., the manufacturer identification code for the attached buoy), the vessel owner or operator may instead use that identifier as the unique code for each FAD that may be deployed or modified. The code shall be clearly painted in characters at least 5 cm in height. The characters shall be painted on the upper portion of the attached radio or satellite buoy in a location that does not cover the solar cells used to power the equipment. For FADs without attached radio or satellite buoys, the characters shall be painted on the uppermost or emergent top portion of the FAD. The vessel owner or operator shall ensure the marking is durable (for example, use epoxy-based paint or an equivalent in terms of lasting ability) and visible at all times during daylight. In circumstances where the observer is unable to view the code, the captain or crew shall assist the observer (e.g., share their inventory of FADs to assist in matching each FAD with the identification code), so long as such assistance does not interfere with fishing operations."

IOTC

IOTC adopted Resolution 13/08, which requires CPCs to mark all artificial FADs according to a marking scheme to be developed by the IOTC. IOTC has yet to adopt that marking scheme, but the resolution states that any scheme should include an unique identification number as developed by the Commission, the marking should be easy to read, and easy to apply to the FAD such that it will not become unreadable or disassociated with the FAD.

ICCAT

ICCAT adopted Recommendation 14-01, which requires FADs to be marked, but does not specify a common standard for markings. In a report of an Ad Hoc Working Group on FADs from May 2015 the Working group discussed the merits of marking the FADs and/or beacons and suggested that marking both FADs and beacons using a common format could help ensure all dynamics are captured, and that a common format for identification and marking could be desirable across the RFMOs.

Other input

Several CCMs and Observers submitted papers to the FAD management options working group (see WCPFC website) that refer to FAD marking and identification issues. The PNA submitted a paper describing their plan to track FADs via the satellite buoys attached to the FADs. ISSF noted that FADs "ownership" may be very fluid once a unit has been deployed as they are found or fished upon by other vessels. Additionally FADs effective life is limited when they float out of the area for operation of the vessels and relying on satellite buoys alone for information on FADs could be problematic. ISSF also suggested

that the marking and tracking of FADs and satellite buoys ought to be considered together in order to keep track of a FAD through its lifetime.

As noted above the SPC information paper that analyzed regional observer programme (ROP) data on FAD design (WCPFC-SC10-2014/ST-IP-09), found that it was not possible track the fate of FADs due to the lack of a consistent unique identifier, and recommended the development of a unique identifier system to enable the Commission to generate information on a variety of metrics including the number of FADs, FAD effort levels, etc.

Review of Reference Papers and Recommendations

Three tuna RFMOs, IATTC, IOTC and ICCAT, have adopted resolutions that include FAD marking and identification provisions. IATTC and IOTC tasked their respective secretariats to develop a marking scheme, and IATTC recently adopted a scheme where members can obtain numbers from IATTC for distribution to their vessels for us and/or rely on a unique FAD identifier that is already associated with the FAD. ICCAT's resolution did not establish a common marking standard, and their FAD working group noted that developing a common standard could be helpful.

ICCAT's FAD working group also noted that a common marking format between tuna RFMOs could be desirable. ICCAT and IOTC do not have uniform standards in place yet, but the WCPFC could consider adopting a scheme similar to that used in the IATTC, which could promote consistency in FAD marking and identification across the tuna-RFMOs in the Pacific.

In the ISSF communication to this WG, and the ICCAT working group noted the importance of tracking both FADs and any associated satellite buoys. Tracking FADs or satellite buoys alone may supply an incomplete picture of how FADs are used, but if data are collected on both components, there is a greater likelihood that more information can be generated on FAD usage.

The PNA reported that they have recently conducted a feasibility study on FAD management, and successfully tracked FADs using information from satellite buoys. The report indicated that they plan to track FADs in the future using satellite buoy information. Encouraging the use of electronic signatures where possible could help facilitate data flow for FAD tracking and monitoring.

The marking scheme previously considered by WCPFC as well as those adopted by IATTC and IOTC contain provisions that require markings to be easy to read, and applied in such a manner that they will not become unreadable or disassociated from the FAD.

Recommendation: The Commission should consider developing a marking and identification scheme for FADs and drifting objects that incorporates the following elements:

- **a specific unique identification system and format that would be uniformly used across the convention area.**
- **in developing an identification system for the WCPO the Commission may be guided by systems developed by other RFMOs.**
- **electronic signatures and data from satellite buoys, data standards and data confidentiality.**

Attachment 1

Question	Responses
1. What is the reason for collecting additional information on FADs?	• Put a box around the issue in order to have a better look at it. • Improved understanding of the use of FADs and the impact on the ecosystem, • Better scientific information on the impacts of FAD and fishing on them • Economic data on the value, size and species structures of the FAD catch • Oceanographic data e.g. ➢ Sea surface temperatures ➢ Direction of current ➢ Speed of current • Enhanced compliance and control; and • Development of a broader range of FAD management options, • To better understand other temporal/spatial variables related to how fishers utilise FADs and how these variables could influence success in mitigating juvenile bigeye tuna and yellowfin tuna catch e.g: ➢ Does fishing on FADs before sunrise result in less juvenile catch? ➢ Does the construction of the FAD influence non-fish by-catch aggregation? ➢ Better understanding of the numbers of FADs being deployed and retrieved, and where, and who is fishing on them. • Information on FAD losses is important to assess the overall impact of FAD fishing,
2. What information would be useful to add value to stock assessments?	▪ There is the suggestion that concentrations of FADs may alter the normal migratory patterns of skipjack so spatial and drift information is important (release and recovery and lost yes/no)
3. What information would be useful to add value to fisheries management for species caught in	• Better information on the physical characteristics of FADs to evaluate whether different FAD designs affect catches, especially bycatches • FAD identification information • FAD tracking information

association with FADs?	• FAD design/construction, • FAD set times/location, associated purse seine net design; and, • overall spatial distribution and concentration of FADs
4. Does the WCPFC currently collect information on FADs?	• FAD information is collected on catch log sheets by vessel operators • FAD information is collected on FAD Interaction Forms
5. What information is collected?	• Associated /Unassociated set • Association type • FAD deployment • FAD interaction
6. How is that information collected?	• Vessel catch logs • Observer FAD interaction report
7. 7.How the FAD information is made available for the Commission use currently?	• Daily catch logs for purse seine vessels have fields that indicate whether a set was made on a school that was associated with a FAD or a floating object or whether the set was unassociated. • Fishing trips that occur in the high seas or in another country's waters are required to carry an observer from the ROP. That ROP observer data is then made available to the WCPFC subject t the WCPFC data rules.
8. What additional data fields are needed to collect the relevant information?	SC9 reviewed the outputs from ISG-8 as listed below and agreed that these recommendations be forwarded to the TCC9 for further consideration: • The WCPFC Minimum Standard Data Fields on FADs collected by observers are adequate and no deletions were required; • An observer should try and estimate or measure where possible, the size of mesh used in the construction of the FAD, or any extension hanging under the FAD. It was pointed out that this may be difficult to estimate if the FAD is in the water, but an estimate of size could be measured if the FAD was on deck or was retrieved by the vessel for servicing; • Developing a WCPFC "Vessel FAD Data Reporting Log" to be submitted by "Purse-seine" and "Tender Vessels" was worthwhile. However it was noted that the development of a reporting log on FADs by vessels or reporting format may be facilitated by the development of electronic reporting protocols; • When developing a "Vessel FAD Data Reporting Log" a number of fields were identified that should be included in the Log, such as the type and design of the FAD with highlighted

	identification marks; whether the FAD deployed was drifting or anchored; if the FAD had Electronics associated with it when deployed; and condition of FAD when retrieved;
9. What information would be useful to add value to stock assessments?	There are broadly 3 major methods for collecting additional data on FADs for WCPFC purposes, and all three are likely to play a role: • **Logsheet/operational data** provided by the vessel through its flag state to the WCPFC as well as to coastal states, with increasing opportunities for submission electronically; • **Collection by observers** submitted to WCPFC through the observer programme, with increasing opportunities for electronic submission by observers • **Electronic transmission directly from the FAD buoy** which could be sent to the WCPFC in the same manner as VMS information is transmitted, either directly or forwarded from an existing FAD monitoring system such as that being developed by PNA

Attachment 2

Review and Recommendations from the WCPFC FAD Management working Group on FAD Marking and Identification

At WCPFC11, the Commission formed a FAD management option working group to 1) review reference papers on FADs as well as any relevant information and advice from SC and TCC, and 2) provide recommendations on a variety of FAD-related issues. Although the working group was tasked to consider several FAD-related issues, this paper focuses specifically on options for FAD marking and identification, and use of electronic signatures for FAD identification.

Summary of Reference Papers[8]

WCPFC

In 2013, the United States proposed a conservation and management measure (CMM) on FAD data collection and analysis that would have tasked the TCC and Commission to develop a FAD identification scheme. This was considered a first step in any rational FAD management scheme. This FAD identification scheme would have at a minimum considered:

3) A unique identification number with a specific numbering system and format to be adopted by the Commission
4) Identification that should be easy to apply to the FAD that should be applied in such a manner that it will permit its identification and should not become unreadable or disassociated from the FAD.

Although the proposal was not adopted at WCPFC10, since that time other tuna RFMOs have adopted similar resolutions with FAD marking and identification provisions and these are described in more detail below.

IATTC

The IATTC in 2013 adopted resolution C-13-04 (Appendix 1), which included similar provisions to the above WCPFC measure that tasked its Director to develop an identification scheme. In July 2015, IATTC, replaced this measure with Resolution C-15-03, which includes the following information on FAD identification in a footnote to Annex I

"CPCs shall obtain unique alphanumeric codes from the IATTC staff on a periodic basis and distribute those numbers to the vessels in their fleets for FADs that may be deployed or modified, or in the alternative, if there is already a unique FAD identifier associated with the FAD (e.g., the manufacturer identification code for the attached buoy), the vessel owner or operator may instead use that identifier as the unique code for each FAD that may be deployed or modified. The code shall be clearly painted in characters at least 5 cm in height. The characters shall be painted on the upper portion of the attached radio or satellite buoy in a location that does not cover the solar cells used to power the

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equipment. For FADs without attached radio or satellite buoys, the characters shall be painted on the uppermost or emergent top portion of the FAD. The vessel owner or operator shall ensure the marking is durable (for example, use epoxy-based paint or an equivalent in terms of lasting ability) and visible at all times during daylight. In circumstances where the observer is unable to view the code, the captain or crew shall assist the observer (e.g., share their inventory of FADs to assist in matching each FAD with the identification code), so long as such assistance does not interfere with fishing operations."

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Other input

Several CCMS and Observers submitted papers to the FAD management options working group that refer to FAD marking and identification issues. PNA submitted a paper describing their plan to track FADs via the satellite buoys attached to the FADs. ISSF noted that FADs "ownership" may change as they are found by other vessels, or float out of the area for operation of the vessels and relying on satellite buoys alone for information on FADs could be problematic. ISSF also suggested that the marking and tracking of FADs and satellite buoys ought to be considered together in order to keep track of a FAD through its lifetime.

<u>Review of Reference Papers and Recommendations</u>

Three tuna RFMOs, IATTC, IOTC and ICCAT, have adopted resolutions that include FAD marking and identification provisions. IATTC and IOTC tasked their respective commissions to develop a marking scheme, and IATTC recently adopted a scheme where members can obtain numbers from IATTC for distribution to their vessels for us and/or rely on a unique FAD identifier that is already associated with the FAD. ICCAT's resolution did not establish a common marking standard, and their FAD working group noted that developing a common standard could be helpful. Within the WCPFC, SC10 briefly discussed

an information paper (WCPFC-SC10-2014/ST-IP-09) on regional observer data that recommended the development of a unique identifier system, which was supported through an EU intervention.
Recommendation: The Commision should consider developing a FAD marking and identification scheme with a specific numbering system and format that would be uniformly used across the convention area. Ideally that system would be similar to that adopted by the IATTC - -given the flow of FADs from the ETP into the WCPO.

ICCAT's FAD working group also noted that a common marking format between tuna RFMOs could be desirable. ICCAT and IOTC do not have uniform standards in place yet, but the WCPFC could consider adopting a scheme similar to that used in the IATTC, which could promote consistency in FAD marking and identification across the tuna-RFMOs in the Pacific.
Recommendation: The Commission should consider developing a FAD marking and identification scheme that promotes consistency across tuna RFMOs, and particularly across the Pacific Ocean. Ideally that system would be similar to that adopted by the IATTC - -given the flow of FADs from the ETP into the WCPO.

ISSF communication and the ICCAT working group noted the importance of tracking both FADs and any associated satellite buoys. Tracking FADs or satellite buoys alone would supply an incomplete picture of how FADs are used, but if data are collected on both components, there is a greater likelihood that more information can be generated on FAD usage. PNA conducted a feasibility study on FAD management, were successfully able to track FADs using information from satellite buoys, and plan to track FADs in the future using satellite buoy information. Encouraging the use of electronic signatures where possible could help facilitate data flow for FAD tracking and monitoring.
Recommendation: The Commission should consider developing a FAD marking and identification scheme that applies to FADs as well as any associated satellite buoys and incorporates electronic signatures where possible. As a first step the submission of electronic identification information should be completed in a pilot project to ensure the confidentiality of the data. Result of that project should be reported to the Commission[9].

The marking scheme previously considered by WCPFC as well as those adopted by IATTC and IOTC contain provisions that require markings to be easy to read, and applied in such a manner that they will not become unreadable or disassociated from the FAD.
Recommendation: As proposed by the USA and later adopted by the IATTC, the Commission should consider developing a FAD marking and identification scheme that is easy to apply, will be easy to identify, and should become unreadable or disassociated from the FAD.

[9] For CCMs that have already engaged in establishing FAD marking or tracking measures – such as the PNA their experiences could greatly assist the Commission in developing its protocols for FADs set on the high seas.