

**SKIPPERS WORKSHOPS:** ISSF Skippers Workshops bring tuna fishers together with marine scientists for participatory sessions — at key fishing ports worldwide — to share ideas and information on best practices to reduce bycatch.

Skippers workshops are an important component of ISSF’s mission. Held throughout the year at major ports in the Atlantic, Pacific, and Indian Oceans, ISSF workshops have welcomed crew members from vessels fishing under more than 25 national flags. In 2018, we have embarked on our 8<sup>th</sup> round of Skipper Workshops. The information below summarizes results obtained during the noted Round 8 workshop.

**Workshop location and date:**

**Pohnpei (Federated States of Micronesia) April 17<sup>th</sup> 2018**

**N° Participants: 28 (Appendix II)**

**Presenting Scientists: JEFFERSON MURUA, assisted by Cheng Xu Li**

**SKIPPERS WORKSHOPS COMMENTS + NEW IDEAS**

**COLOR CODES FOR MEASURE ACCEPTANCE LEVEL**

<b>HIGH</b>	<b>MID-HIGH</b>	<b>MID</b>	<b>MID-LOW</b>	<b>LOW</b>
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**SHARKS**

<b>3. Fishing shark in the net</b>	<ul style="list-style-type: none"> <li>- Fishers had doubts about the efficiency of this activity. They also questioned how they would know if there were sharks in the net to make it worth conducting the shark fishing.</li> <li>- Most sharks they find in FADs are silky sharks of small sizes, which would probably make fishing the sharks and moving them outside a bit easier.</li> </ul>
<b>4. Release practices</b>	<ul style="list-style-type: none"> <li>- Many skippers liked the ideas presented to release medium and large sharks and manta rays, such as such as cargo nets, ramps or the home-made bamboo grid. Still none of them have tried them yet, and most manual releases are made by hand. Fishers pointed out how difficult it can be to handle large mantas.</li> <li>- All fishers visited during boat visits at port took a copy of PFD files with posters for best practices and other informative materials (e.g. PS guidebook, BET/YFT identification guide, NEFAD guide, etc.)</li> <li>- Some fishers pointed out that the top deck in many of the Asian fleet vessels are not as large as those of European purse seiners for example, which makes it more difficult to apply some of these practices, such as the use of the cargo net. Still, captains pointed out that they could figure out one way or another how to make these practices work in their boat.</li> <li>- None of the American or Asian fleet (Chinese, Taiwanese, Korean, etc.) purse seiners use hoppers anymore. Brailing is directly into the lower deck or</li> </ul>

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wells. Most boats did not have a conveyor belt, instead having chutes, through which fish pass very fast and there is no chance of removing mixed up bycatches.

- An experienced US captain said he had never encountered a manta rays, but yes devil stingrays.
- Although bycatches like sharks and others are often released, the priority remains to load the wells rapidly to maintain tuna quality, so sometimes bycatches are left of a side and not released immediately.
- Whale sharks are released over the corkline. Captains commented that often it is difficult to spot the whale shark until it is already circled in the net.
- A skipper commented he had read about a study in New Zealand on the low survival rates of bycaught manta rays in other fisheries. The workshop presenter commented that scientists from ISSF had used satellite tagging in sharks and whale sharks to investigate survival rates after release, but not on manta rays. Perhaps scientists are assuming that manta rays survive if using best release practices (e.g. cargo net) as they swim away quite rapidly. However, this should be checked using satellite tagging as mantas and rays may have sustained internal injuries or high stress levels during net sacking and hauling operations., that affect their longer-term survival

### 5.Non-entangling DFADs

- Many skippers were aware of the ISSF non-entangling guidelines, but only the US skippers at the workshops seemed to know about ISSF measure 3.5. on transactions only with vessels using non-entangling FADs which came into effect in April 2018.
- Some participants asked about the additional price required to build non-entangling FADs (referring to Lower Entanglement Risk FADs as well). It was pointed out that tying up in coils the net is inexpensive, and even if having to buy small mesh netting from small pelagic fisheries in Asia, the price increase would be low compared for example to the price of buoys.
- Skippers from the US fleet said they are now all using Lower Risk Entanglement FADs which are constructed by tying large 4-5 inch mesh into coils or sausages. Fishers used different “sausage” type models some with 4 coils (i.e. one in each corner) or one central bundle. However, the FAD float made in a “burrito-style” (i.e. a line of 7 corks wrapped in netting) still uses large mesh size netting. Turtle entanglement in these rafts is thought to be low due to the narrow surface area to climb up and because the netting is very tightly wrapped around the corks. However, technically speaking this larger mesh use would render the FAD in the “high risk entanglement” category. To solve this, the float should be either uncovered, wrapped in small mesh size netting and/or covered with a canvas material.
- Asian fleet skippers consulted still use high entanglement risk “Korean-style” FADs with a burrito-style raft and open panels of PS netting hanging

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below down to 50-80 m. Numerous attractors such as colored plastic stripes, palm leaves, etc. are added to the FAD's net tail.

- To a larger or smaller degree all fishers had seen at some point sharks entangled in FADs. They said that turtle entanglements are even rarer but can happen.

## MARINE POLLUTION

### 1. Non-entangling biodegradable FADs and FAD retrieval

- Fishers acknowledged that an important cumulative number of FADs end up beaching and this could be a problem. Participants welcomed information about NE biodegradable FADs and said they would like to learn about what happens in the next year with trials taking place in the Indian Ocean with Biofad, Atlantic Ocean with the Ghanaian fleet and Eastern Pacific with Tunacons.
- Having dedicated vessels for FAD retrieval was seen as a viable option. Captains said that often they lose FADs when these drift into international waters where they have no licenses. Companies with several purse seiners are now starting to share more FADs to maximize fishing efficiency but also to cover more ground being able to exploit or retrieve FADs from other company vessels which are far away.
- According to some fishers, when another vessel's FAD is intercepted the original buoy is removed and normally destroyed or left to drift (without the FAD). Buoys are not returned to original owners at port as is done in other oceans (e.g. Indian Ocean, Atlantic Ocean). The intercepted FAD if not used, is abandoned and will end up eventually sinking or beaching.
- Fishers try to check a FAD at least every three months and will often do maintenance repairs to extend the lifetime of the floating object. Many thought that a year is the maximum lifetime of their traditional non-degradable FADs.
- Despite the existence of some FAD "factories" or yards in Pago Pago or Pohnpei where companies can order FADs to be built on land (like most FADs are nowadays built in Manta, Abidjan or Port Victoria), in the WCPO most boats still construct their own FADs onboard.

## SMALL TUNA

### 1. Echo-sounder buoy selectivity

- Several vessels were using more than one brand of buoy. For echo-sounder buoys, Zunibal was one of the most common brands, however among Asian fishers, in particular Taiwanese, the brand Kato was widely used (see photo in Appendix II). Based on the opinion of some fishers the Kato brand was more reliable than Zunibal, but Zunibal had a better price (e.g. 800-900 US\$) compared to the Taiwanese make (e.g. 1200-1300 US\$). This is why ship-

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	<p>owners were still buying Zunibal despite the better performance of other brands.</p> <ul style="list-style-type: none"> <li>- Skippers using Kato liked better the software interface compared to Zunibal, because it is easier to interpret, showing percentage of fish abundance at different depths (photo Appendix II).</li> <li>- Unlike in other fleets like the European, most captains commented that most of the buoys they use are with no echo-sounder. According to questionnaires, about one third are with echo-sounder only. Some skippers said they seed one echo-sounder buoy with several GPS-only buoys, while others tended to use the echo-sounder buoys in the better fishing areas, as they thought it was a waste to use valuable echo-sounder buoys in fish-poor zones.</li> <li>- When asked about the percent of FADs that get stolen, sunk and beached, some US captains say that up to 50% of the FADs they work with belong to others. Some Taiwanese fishers estimated they lose most their FADs (80%) to other vessels. Fishers also thought that few FADs sink, as the cork floats do not lose buoyancy as a bamboo raft would. Participants mention they have seen some submerged raft FADs before (e.g. raft below sea surface to prevent location by other vessels) but they do not use this design. Probably belonging to boats from the Spanish fleet who are known to utilize frequently submerged FADs in other oceans.</li> <li>- FADs may accumulate in rip tides but otherwise are quite sparsely distributed.</li> </ul>
<p><b>Short tail FADs and YFT/BET identification</b></p>	<ul style="list-style-type: none"> <li>- The abundance of small BET in FADs is not related to FAD depth based on fishers' comments. Some thought that water temperature drives BET distribution.</li> <li>- A skipper commented that they see very few BET in general, especially around the 180° region.</li> <li>- When fishers were quizzed about BET and YFT identification, very few responded correctly. Electronic copies of Itano's identification guides for BET/YFT were distributed during boat visits and fishers were pointed towards the ISSF web address where they could download species ID guides.</li> <li>- When checking some FAA/SPC regional logsheets on Taiwanese boat visits it was apparent that most had recorded certain amounts of YFT for the FAD sets but there was no mention of BET. It is unknown if this was because there was really no BET in those sets or because they misidentify small BET as YFT. Some captains enter their fishing data in their own fishing diary first (see photo Appendix II) and from there they transcribe the information into SPC formularies.</li> </ul>

<b>4. FAD numbers</b>	<ul style="list-style-type: none"> <li>- According to a helicopter pilot who had worked in Korean and Taiwanese boats, the Korean skippers focused more on free school fishing, while the Taiwanese vessels he had worked in were almost exclusively working on FAD sets and little free-school was done. However, interviewing a Korean captain, he said that this is changing and that the Korean fleet is increasingly relying more of FAD fishing and the use of echo-sounder buoys.</li> <li>- Some skippers thought that the number of FADs is increasing too much and that they would prefer to go back to less FADs and more free school fishing.</li> <li>- When asked what management measure would be adequate to reduce catches of small bigeye tuna, the most frequent answer was to continue with the temporal FAD closure. Many fishers saw this conservation management measure as a positive one.</li> </ul>
<b>BONY FISH AND OTHERS</b>	
<b>1.Utilization</b>	<ul style="list-style-type: none"> <li>- All target tuna species are retained due to regulations. However, for bycatch species some companies have a no-retention policy, meaning that even fishers cannot take home fish like wahoo, mahi-mahi for their own personal consumption.</li> </ul>
<b>LONG TERM (FUNDAMENTAL RESEARCH) ACTIONS</b>	
<b>1.Ecosystem functions</b>	<ul style="list-style-type: none"> <li>- Older fishers said that due to the high number of FADs it is more difficult to fish on free school, as most schools now remain aggregated under FADs.</li> </ul>
<b>CPUE AND FISHING EFICIENCY</b>	
<b>1.Fishing technology, observers and FADs</b>	<ul style="list-style-type: none"> <li>- None of the participants consulted had electronic monitoring systems (EMS) onboard. However, they mentioned that there are about 25 vessels in the WCPO which carry a one-camera system used to verify skipjack free-school sets for MSC certification purposes. The hard-drive with the images is collected by CFC, but how they process or revise these images was unknown.</li> <li>- Some skippers pointed out that the information collection standard of the observers is low, many being poorly trained for these tasks and some degree of corruption might also be happening.</li> <li>- Most Taiwanese, Chinese and US vessels seen at port carried a helicopter. The helicopter is used both for free school and FAD fishing. According to a helicopter pilot he was averaging 3-4 hours of flight per day. To locate FADs the helicopter had to fly closer to the sea surface as they are more difficult to detect. The helicopter driver is accompanied by a “spotter”.</li> </ul>

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- Many of the PS vessels visited were in 1000-1200 GT range, and most nets were close to 2000 m long. Fishers did point out that they are moving towards nets with wider mesh size (8 inch mesh), as they sink faster. Some thought that small fish can escape better through this larger netting.
- Several of the Taiwanese vessels inspected at port were of recent construction (e.g. 2015 or later), mostly made at the ship-yard of Kaohsiung and carried modern electronic equipment (sonar, sounder, etc.) onboard.
- In several boats sets of clumped small LED-lights were spotted (see photo in Appendix II). Consulted fishers pointed out these are hung from the FAD several hours before the pre-dawn set to attract the fish. They said they can use between 20 to 50 of these lights in a FAD.
- Many of the WCPO PS companies own several vessels and fishers said that there is an increasing tendency to share FADs between company vessels. This behavior increases fishing efficiency as FADs that are too far away to fish on by the owner vessel are exploited by other company boats. Often FADs of the same company are distributed in different fishing grounds or EEZs. This may also prevent FAD loss, as floating objects that would otherwise ended abandoned if drifting to far out or moving into other EEZs may be retrieved and relocated by other company vessels.

#### NEXT SKIPPERS WORKSHOP: INDONESIA

### Appendix I – ISSF Skipper Workshops Agenda

Agenda ISSF Skippers Workshop Pohnpei (Federated States of Micronesia) 2018

**Date:** April 17 2018

**Venue:** WCPFC Annex, Pohnpei

#### Agenda

**09:00-10:30**

- 1- Opening remarks and welcoming
- 2 – ISSF Bycatch project and Skippers Workshop background
- 3 – Discussion on:
  - Small bigeye and yellowfin tuna options (echo-sounder buoys, short tail FADs)

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- Best on deck bycatch release practices
- Bycatch utilization

10:30-11:00

Coffee break

11:00-13:00

4- Discussion on:

- Non-entangling and biodegradable FADs
- Shark fishing in the net
- Proactive Vessel Register

5 – Final questions and answers

## Appendix II – Participant Lists ISSF Skipper Workshops

### Pohnpei (Federated States of Micronesia) 14<sup>th</sup> April 2018

Name	Profession	PS vessel	Company
Chia Pin Wu	Skipper	Jih Yu 168	Jih Yu Fishery Co.
Hsu Yu Yung	Skipper	Jih Yu 968	Jih Yu Fishery Co.
Kim Soo Seong	Skipper	Fu kuan 808	Yuh Yon Fishery Co.
Jang Byung Kug	Skipper	Fu kuan 808	Yuh Yon Fishery Co.
Song Sin Yuan	Crew	Fu kuan 808	Yuh Yon Fishery Co.
Chen Ming Kuei	Skipper	Fong Kuo 188	Fong Kuo Co.
Liu Te Cheng	Crew	Fong Kuo 188	Fong Kuo Co.
Irak Aguilar	Skipper	Yap Seagull	Diving Seagull
Liu Lhi Bao	Skipper	Fu Kuan	Yuh Yon Fishery Co.
Isami Kimura	Skipper	Ta Ching 666	Everglory Fishing Co.
Masayosh Kou	Skipper	Ta Ching 666	Everglory Fishing Co.
Cheng Xu Li	Fleet Manager		Pan Pacific Fishing
Hung Yu Shen	Manager Assistant		Pan Pacific Fishing
Yu Yirong	Agent		Pan Pacific Fishing
Paul Balistrieri	Skipper	Sea Fox	SPTC
William Armstrong	Skipper	Sea Honor	SPTC
Yao Li Hao	Crew	Sea Honor	SPTC

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Lu Kuo-Yang	Skipper	Win Far 666	Gong Fu Fishery
Lin Chao-Chien	Skipper	Win Far 666	Gong Fu Fishery
Lo Sen	Crew	Win Far 666	Gong Fu Fishery
Yen Meng Heng	Skipper	Micronesia 103	Kasar Fishing Co.
Hsu Tien Wen	Skipper	Micronesia 103	Kasar Fishing Co.
Francisco Varga	Helicopter Pilot	Micronesia 103	Kasar Fishing Co.
Yen Tia Chen	Crew	Micronesia 103	Kasar Fishing Co.
Marko Kamber	Ship-owner		Carolines Fishing Corp.
Lee Hae Jon	Skipper	Sajo Posedonia	Oyang Corp.
Oh Taeung	Skipper	Queen Isabella 88	City Pro Management
Park Woo Youb	Skipper	Queen Isabella 88	City Pro Management
Park Min Gyu	Chief Engineer	Queen Isabella 88	City Pro Management

## VESSEL PORT VISITS

port	PS vessel	Company	Flag
Micronesia	Win Far 666	Gong Fu Fishery	Taiwan
	Micronesia 103	Kasar Fishing Co.	FSM (Taiwanese owned)
	Sajo Posedonia	Oyang Corp.	Republic of Korea
	Queen Isabella	City Pro Management	FSM (Taiwanese owned)

## Appendix Iii – ISSF Skipper Workshop Pohnpei (Federated States of Micronesia) 2018 photos

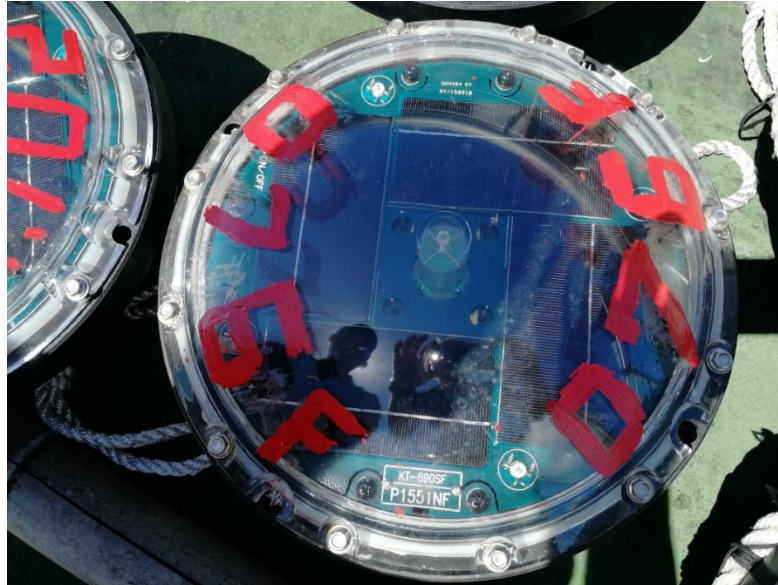


Fig. 1. Small cluster of LED lights used to hang under FAD before sets

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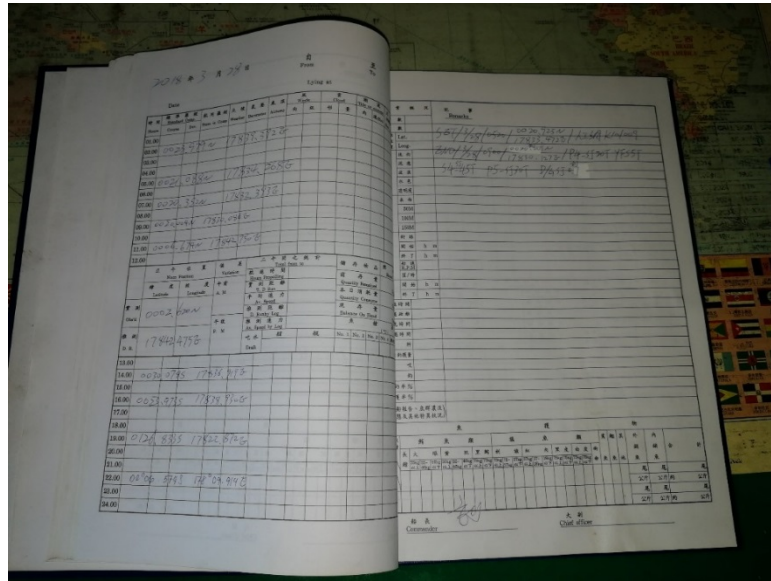
**Fig. 2. Taiwanese brand Kato echo-sounder buoy**



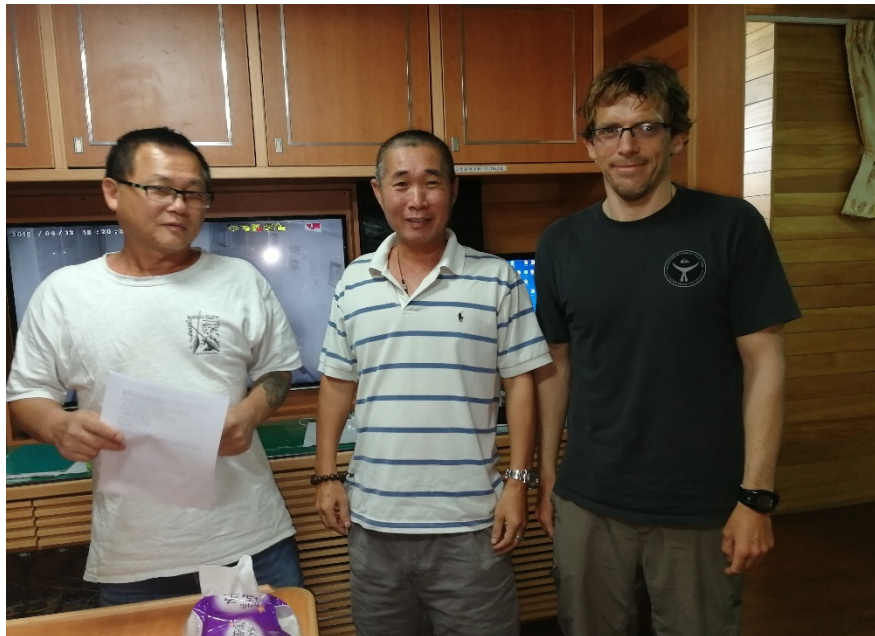
**Fig. 3. Screen display of Kato echo-sounder buoys**

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**Fig. 4. Taiwanese fishing log book**



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**Fig. 5. Boat visit with fishing masters and crew of Micronesia 103 and Queen Isabella 88 in Pohnpei (Federated States of Micronesia)**

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