IATTC 2nd Meeting of the Working Group on Fish-Aggregating Devices (FADs)

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Transitioning to Bio-FADs: Ongoing Trials with Jelly-FADs by fleets in the western and eastern Pacific Ocean

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Introduction

WCPFC project 110: Non-entangling and biodegradable FAD trial in the WCPO

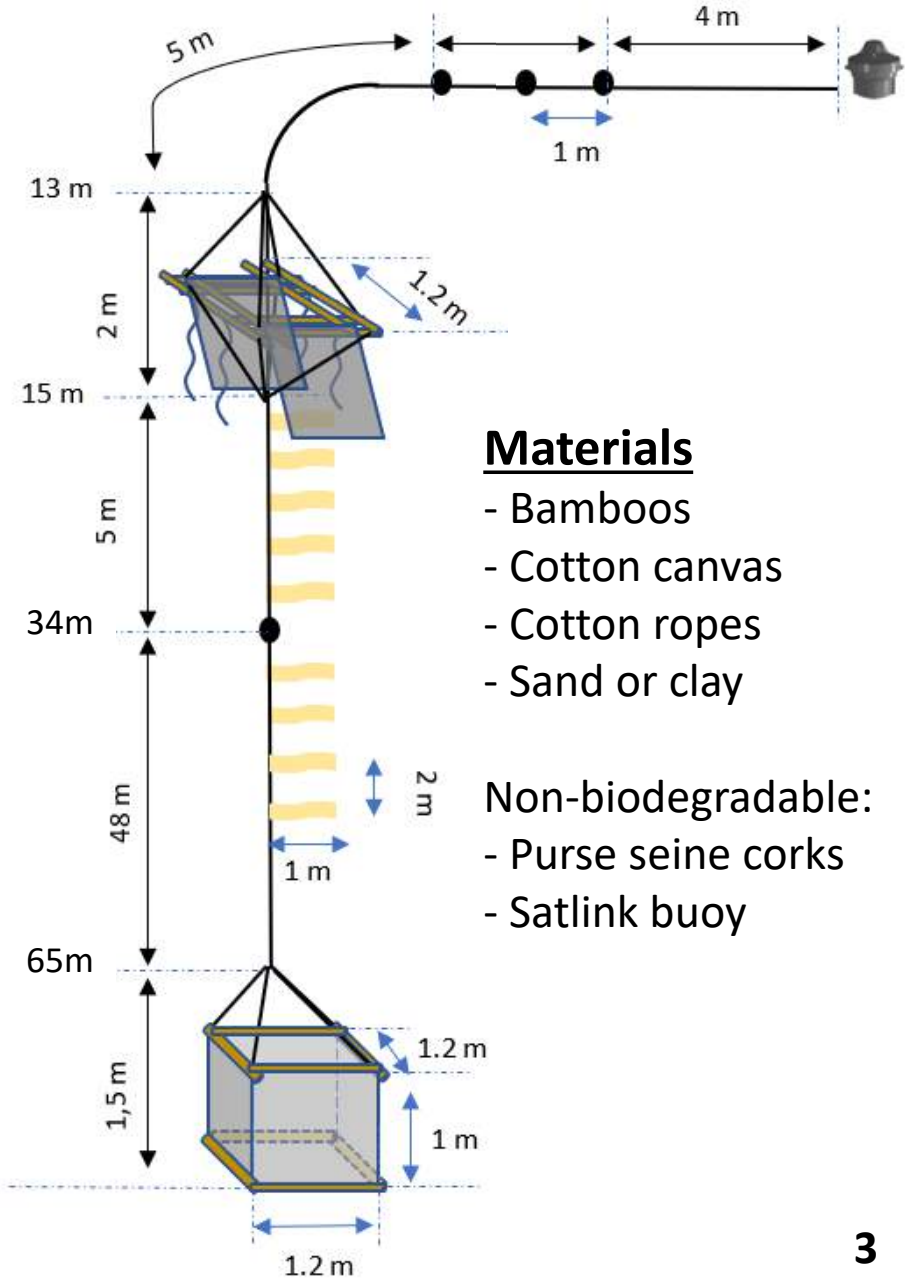
NOAA BREP project: Towards the Use of Biodegradable FADs in the Pacific Ocean

Objectives:

1. Explore design and cost-feasibility of non-entangling and bio-FADs.
2. Train dFAD manufacturers on the construction of bio-FADs.
3. Undertake at-sea experiments to compare the performance/functionality of non-entangling and biodegradable dFADs to conventional dFADs. Deploying them together in pairs.
4. Provide robust scientific advice to industry and national fisheries managers on the performance of non-entangling and biodegradable dFAD designs.
5. Dissemination of the bio-FADs, construction and use through workshops with fishers

The Jelly-FAD

- **Neutral buoyancy:** after 20-25 days, it drift neutrally in the water column just like a jelly-fish.
- **Reduces structural stress:** reduced component at the surface, helping increasing lifetime of biodegradable materials
- **Reduces the size of dFADs:** 3-D shape of the drogue ensures slow drift



Materials

- Bamboos
- Cotton canvas
- Cotton ropes
- Sand or clay

Non-biodegradable:

- Purse seine corks
- Satlink buoy

Method

430 jelly-FADs to be tested

Partners	Vessels	Flag	Construction	No. of BioFADs	
				WCPFC 110	BREP
Caroline Fisheries Corporation	6	FSM	Pohnpei	**50**	
FCF Co. ltd	8	Taiwan	Pohnpei	**50**	
American Tunaboat Association		US			
- **Cape Fisheries**	6		Manta	**30**	**108**
- **Others**	10		Manta and Pago Pago	**50**	**108**
Silla	2	Korea	Pohnpei	**34**	
TOTAL	32			**214**	**216**

Method

Materials & tools

Cotton ropes

Itsaskorda (Spain)
Sea Master (Chinese Taipei)

Bamboos Local

Tools

Clay Local

Purse seine corks Local

Cotton canvas

Soluciones Anmarsaq (Ecuador)
Sea Master (Chinese Taipei)

Satellite echosounder buoy

Satlink SLX+ (Spain)

Materials and construction cost

	Cost for 100 jelly-FADs (US$)	
Type of materials	Pohnpei	Manta
Total Imported materials	32,871	26,640
Total Local materials	3,296	8,396
Net yard use and staff time	18,880	15,000
Total (100 FADs)	55,047	50,036
Cost per FAD (US$)	550	500
Cost per FAD, materials only (US$)	362	350

Method

Construction

Method

Construction update

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At-sea trials – preliminary results

	FM		KR		TW		US fleet	
	Jelly	Conv.	Jelly	Conv.	Jelly	Conv.	Jelly	Conv.
Convention Area	WCPFC		WCPFC		WCPFC		WCPFC & IATTC	
Nb FADs planned	50	50	34	34	50	50	296	296
Deployments	41	18	0	0	42	26	191	167
Deployment period	03/04/23 – 23/10/23		–		02/03/23 – 11/07/23		04/09/22 – 04/05/24	
Sets	1	0	0	0	4	0	7	19
Visit (without set)	2	0	0	0	0	0	0	0
Buoy deactivation	0	0	0	0	9	3	22	19
Stranding events	0	0	0	0	3	0	0	0

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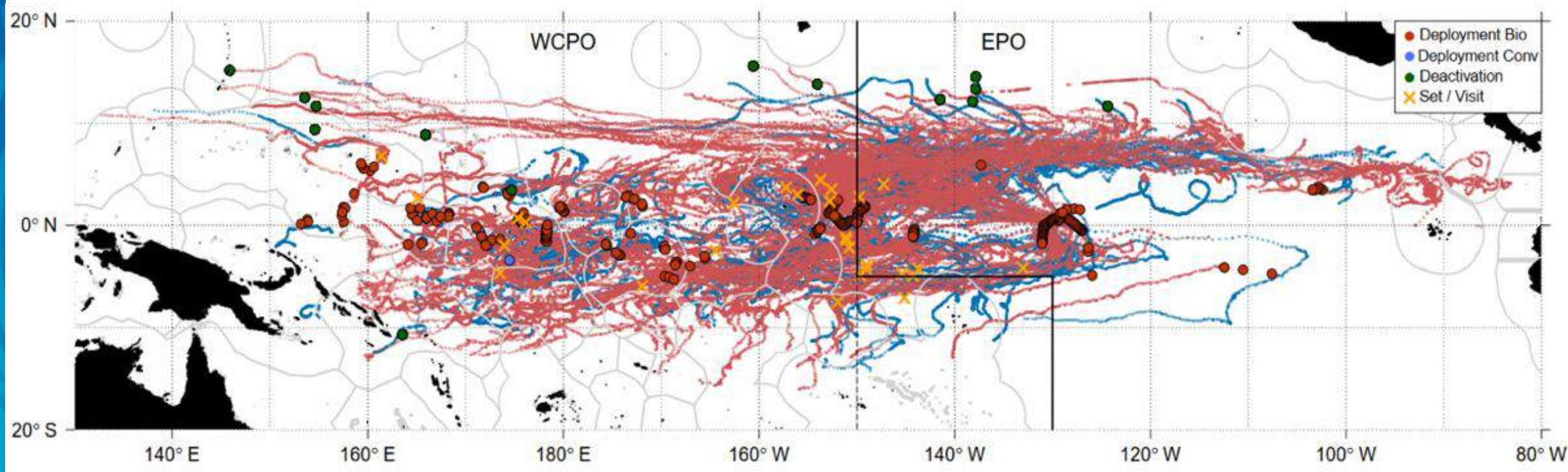
At-sea trials – preliminary results



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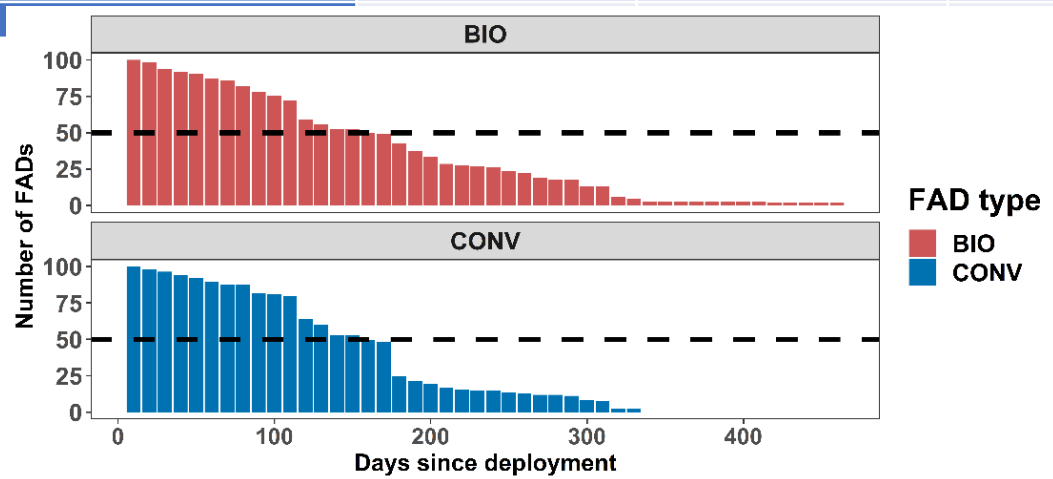
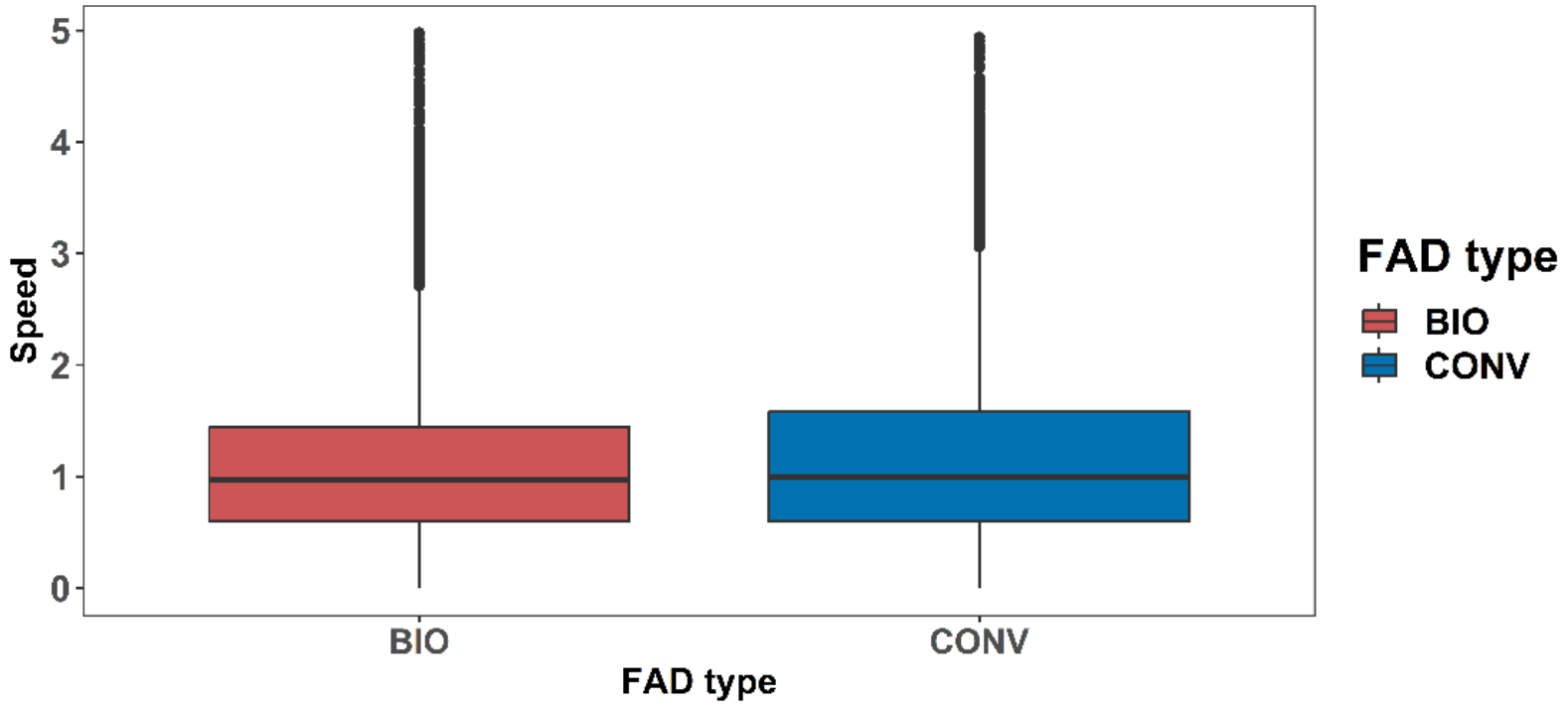
At-sea trials – preliminary results: duration at-sea

	Other fleets		US fleet	
	Jelly-FADs	Conventional	Jelly-FADs	Conventional
Deployments	83	44	132	114
Data available	74	42	129	112
Transmissions (positions or biomass)				
Min	7	5	2	25
Mean	314	274	352	460
Max	1145	1057	2019	2740
Duration (days)				
Min	0	1	1	12
Mean	123	82	160	163
Max	284	248	457	321



At-sea trials – preliminary results: speed



SPEED	Other fleets		US fleet	
	Jelly-FADs	Conventional	Jelly-FADs	Conventional
Min	0.0	0.0	0.0	0.0
Mean	0.9	0.9	1.1	1.2
Max	4.9	4.9	4.9	4.9

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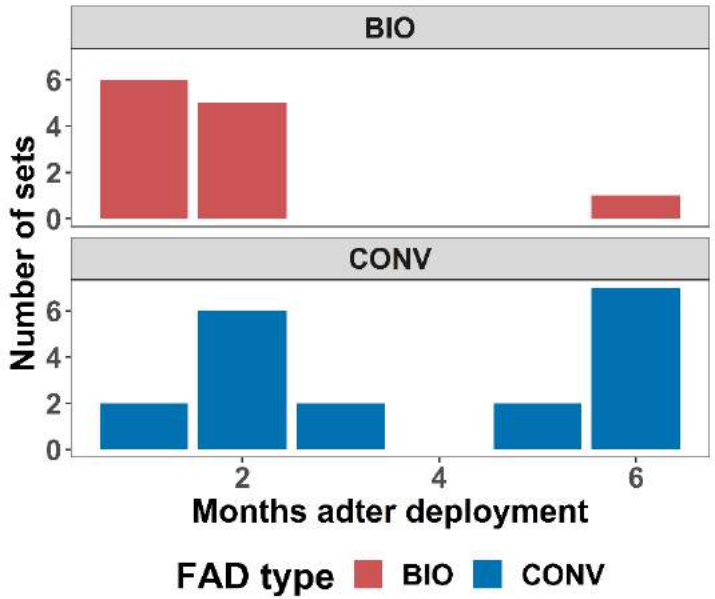
At-sea trials – preliminary results: catch

FAD type	Number of sets	Total tuna catches (mt)			
		Min	Mean	Median	Max
Jelly-FAD	12	0	24.8	30.0	55
Conventional	19	5	54.7	35.0	155
2023 WCPO FADs	11,005	0	46.3	30.0	481



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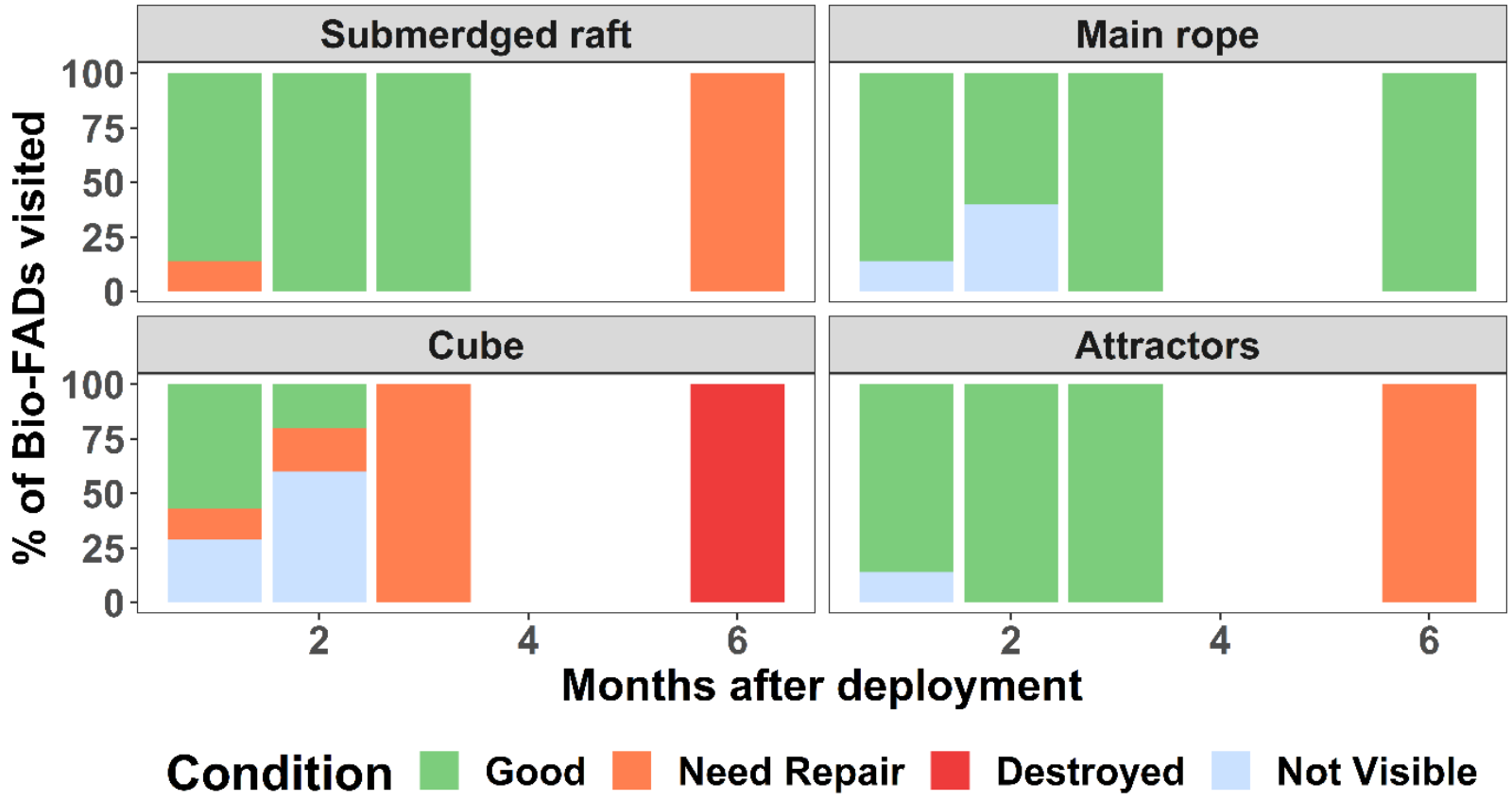
At-sea trials – preliminary results: condition



Conclusion

- Need to deploy a large number of bio-FADs to get meaningful results
- Similar drift speed between conventional and jelly-FAD
- Jelly-FADs were monitored longer than the conventional dFADs
- Conventional FADs showed a higher catch per set compared to jelly-FADs

  Median catch per set on the jelly-FADs for this trial were similar to that of the whole fleet in 2023.
- Bio-FAD condition for the monitored period and limited data shows that the FAD is alive and useful at least, until month 6, there were no observations after that time, both, for conventional and jelly-FADs.

Recommendations:

Given the low amount of FADs that are visited from the total FADs deployed, we recommend fleets start deploying experimental bio-FADs as soon as possible in a systematic manner in order to meet the requirements of the resolution IATTC CM-23-04.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Acknowledgments

Western and Central Pacific Fisheries Commission
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ISSF INTERNATIONAL SEAFOOD SUSTAINABILITY FOUNDATION
NOAA FISHERIES
FCF Co., Ltd. 豐群水產股份有限公司
SILLA
satlink
CAPE FISHERIES MANAGEMENT COMPANY LLC
American Tunaboat Association
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