

Non-entangling FADs: research to support management

ISSF Research and Management Outcomes

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WFCPFC – FAD Design

Focus: reducing the entanglement of non-target animals and impact of FADs on ecosystem

Results:

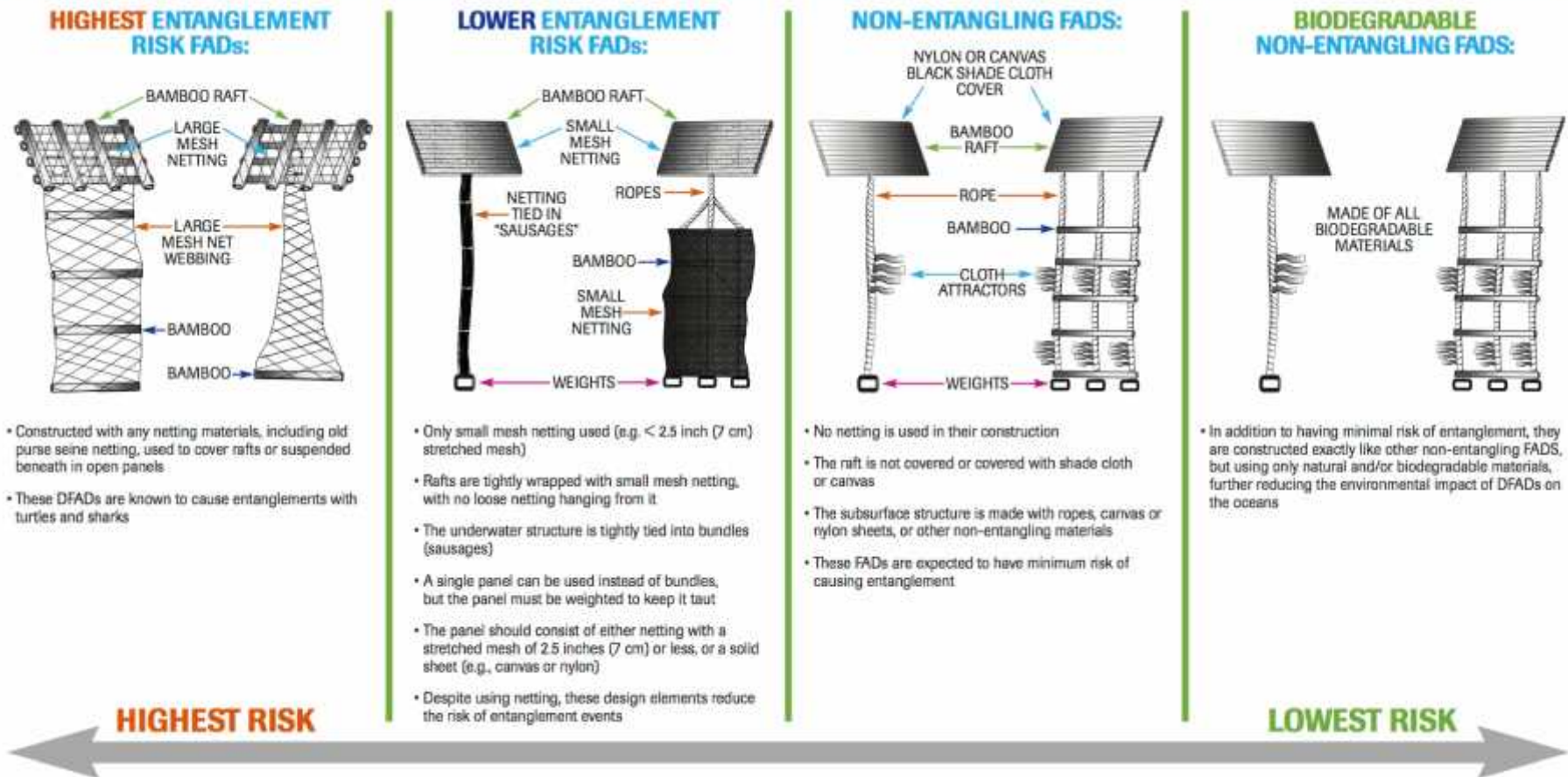
- Biodegradable FADs – research ongoing
 - Hawaii – coconut husk large diameter rope and small square mesh
 - Maldives – cotton, cotton+sisal, cotton+linen+ sisal
- Other mitigation strategies
 - Handling practices on deck
- Live release of non-target catch from the net with satellite tagging to assess post-release survival rates



WFCPFC – FAD Design

Results continued:

- Design and test options to develop risk based FAD designs



WFCPFC – FAD Research

Observations:

- FAD DESIGNS
 - Non-entangling and biodegradable = precautionary



ISSF is investigating ways to lessen the **impact on non-target species**

ISSF Recommendations

	Do not cover FAD surfaces with mesh			reduces turtle entanglement
	Use non-meshed materials such as ropes or canvas sheets for hanging components			reduces shark entanglement
	Use natural or biodegradable materials such as bamboo, palm leaves and brush			reduces ocean debris
	Avoid setting on small schools			can reduce bycatch with little impact on total target catch



WFCPFC – Tuna Behaviour

Focus: Residence times and vertical migration on dFADs

Results:

- Tuna, sharks & bycatch near-continuous association with dFADs for weeks/months
 - BET & YFT relatively long residence times
 - SKJ & silky sharks shorter residence times
 - Rainbow runner and oceanic trigger fish intermediate residence times



WFCPFC – Tuna Behaviour

Results continued:

- Distinct 24hr patterns (diel) with FAD associations; differences observed:
 - Between ocean areas and for target and non-target species
- Tuna and silky shark same pattern:
 - day time presence, depart early evening, returning ~3am
 - BET less presence in early evening, but coincides with departure of SKJ and YFT
- Difficult to mitigate BET, silky sharks or finfish based on diel behaviour



WFCPFC – Tuna Behaviour

Results continued:

- Acoustic tagging shows changes in vertical migration on dFADs
 - All species are at shallower depths during the night (deeper depths during the day)
 - Particularly evident pre-dawn hours - all species were at their shallowest depths
 - Suggests that shallowing the PS net depth is not likely to be a viable/practical solution for BET mortality on FADs



WFCPFC – Tuna Behaviour

Focus: Behaviour of SKJ, BET and YFT in multispecies aggregations associated with dFADs

Results:

- Spatial and temporal differences in schooling behaviour
 - Differences not sufficient such that modifications to PS fishing practices would mitigate capture of juvenile BET and YFT

WFCPFC – FAD Research

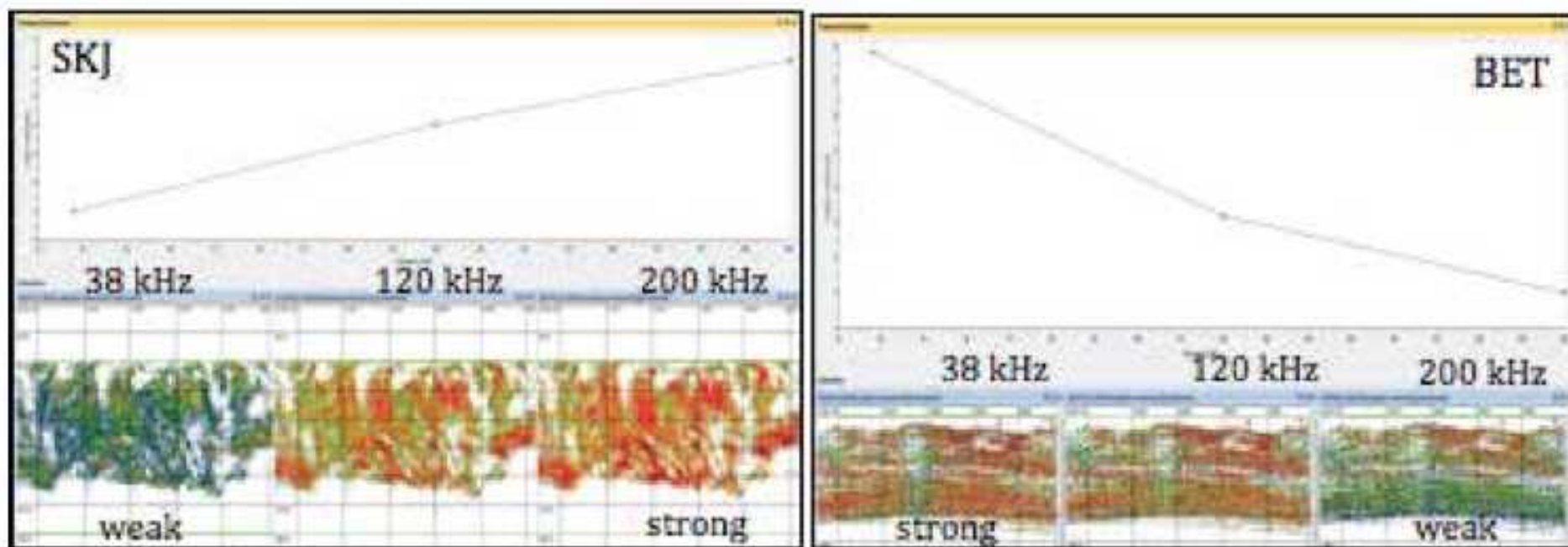
Observations:

- TUNA BEHAVIOUR
 - Expand the focus on acoustic tagging research as a priority for skipjack, yellowfin and bigeye tuna, in addition to include non-target species.

WFCPFC – Acoustic FADs

Focus: Differentiate tuna from non-target species by identifying the size and species under FADs

Results:



WFCPFC – FAD Research

Observations:

- ACOUSTIC FADs
 - Differentiate YFT from BET
 - Target strength frequency measurement required for YFT
 - Need single species schools = difficult for YFT
 - Determine how fishing technology and increases in FAD-related effort creep influence PS CPUE and fleet dynamics



ISSF FAD Research

Ongoing FAD Research

Technical methods to reduce catch of small bigeye tuna and impacts to sharks and other fish by purse seine vessels, include:

Echo-sounder buoys to remotely assess the amount of small bigeye tuna around FADs



potential reduction of under-sized tuna caught

Acoustic & visual means to assess the species composition and behavior of fish aggregations around FADs and in the net



potential reduction of bycatch through avoidance or selective release; i.e. escape panels, backdown procedure

Acoustic tagging and tracking of bigeye and non-target species around FADs



potential avoidance of small bigeye and non-target species

Comparison of shallow vs deep hanging components on bigeye catch



potential avoidance of small bigeye

Double FAD experiments to examine potential to separate bycatch from tuna on adjacent FADs



potential avoidance of small tuna and non-target species

WFCPFC – FAD Research

Summary of Observations:

- FAD DESIGNS
 - Precautionary approach is the adoption of non-engagement and biodegradable FAD designs to minimise the impact on bycatch and the ecosystem.
- TUNA BEHAVIOUR
 - Expand the focus on acoustic tagging research as a priority for skipjack, yellowfin and bigeye tuna, in addition to include non-target species.



WFCPFC – FAD Research

Summary of Observations:

- ACOUSTIC FADs
 - Differentiate YFT from BET
 - Target strength frequency measurement required for YFT
 - Need single species schools = difficult for YFT
 - Impact of fishing technology on effort creep influence PS CPUE and fleet dynamics plus treatment of supply/tender vessels of PS efficiency

