

Stakeholder perspectives and economic and feasibility analysis of options to mitigate drifting Fish Aggregating Devices (dFAD) loss and abandonment

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The challenge of dFADs in the WCPO

- Drifting Fish Aggregating Devices (dFADs) are critical to tropical tuna purse-seine fisheries, but their widespread use leads to significant loss, abandonment, and stranding.
- In the Western and Central Pacific Ocean (WCPO), only an estimated 9.6% of dFADs are retrieved, 11% stranding, and 40% abandoned.
- Stranded dFADs contribute to marine pollution, navigational hazards, and damage to coral reefs and coastal habitats.
- This study evaluates five mitigation options to address dFAD loss, abandonment and stranding. Assessing their feasibility and economic implications.

Economic and feasibility analysis to decrease dFAD loss and abandonment in the Pacific, including retrieval programs

Options considered :

1. Modifying deployment and retrieval patterns to reduce the likelihood of loss and stranding;
2. Increased purse-seine responsibility for retrieval prior to abandonment, loss or stranding, which could include higher collaboration between fishing companies and fleets;
3. Chartering or purchasing of dedicated “cleaning” vessels to retrieve dFADs in identified hotspots at the edge of the purse-seine fishing grounds;
4. Recovery by existing vessels operating outside the purse-seine fishing grounds (such as longliners); and
5. Shore-based recovery programmes designed to intercept dFADs before stranding events occur.

2.
FINANCIAL REWARD

Assumptions

1.
KNOWING POSITION OF
LOST/ABANDONNED DFADS



ECONOMIC MODELLING and STAKEHOLDER VIEWS

- 1. Modification of the deployment and retrieval patterns to limit loss and stranding**
2. A greater emphasis on owner collection before dFAD loss and abandonment (including collaboration between fishing companies)
3. Dedicated “cleaning” vessel(s) for at-sea collection of lost or abandoned dFADs at the edge of fishing grounds.
4. At-sea collection of vessels (e.g., longliners) already present at-sea.
5. FAD recovery programme from shore ('FAD watch' system) that enables community collection of dFADs prior to stranding events in sensitive areas.

Summary:

- General opinion is that modifying deployment areas could greatly reduce dFAD loss and strandings!
- ~24.2% of deployments occurred within 100 nm of shore.
- 11.5% of dFAD deployments from 2023–2024 also occurred at the edge of the core purse-seine fishing grounds; and 16.1% and 13.9% for dFAD sets and visits.

Challenges / limits:

- Economic impacts on fishing efficiency remain uncertain and difficult to assess.

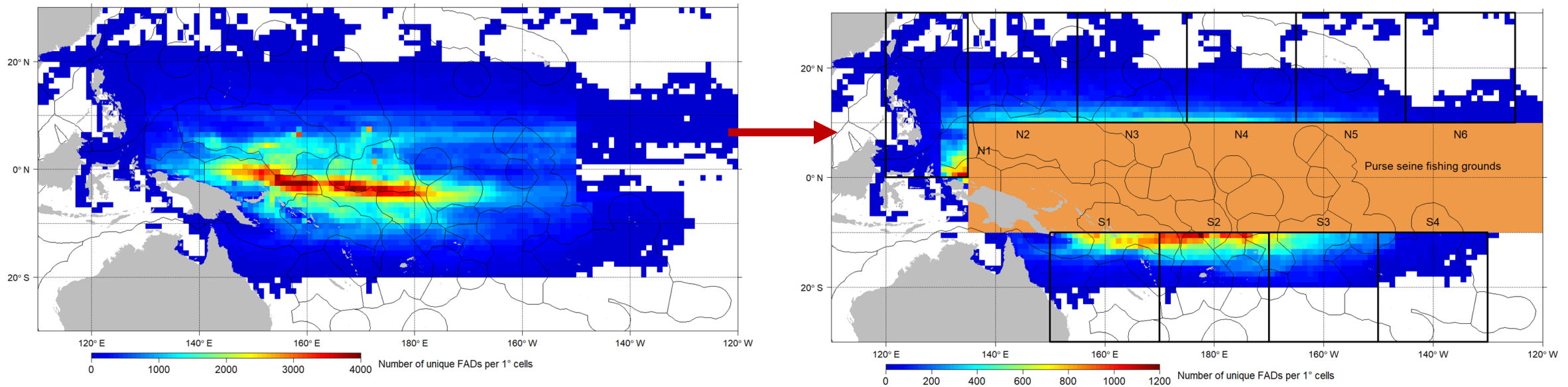
ECONOMIC MODELLING and STAKEHOLDER VIEWS

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2- Higher recoveries by purse seiners

4- Collection from vessels (LL) already present at-sea (outside fishing grounds)

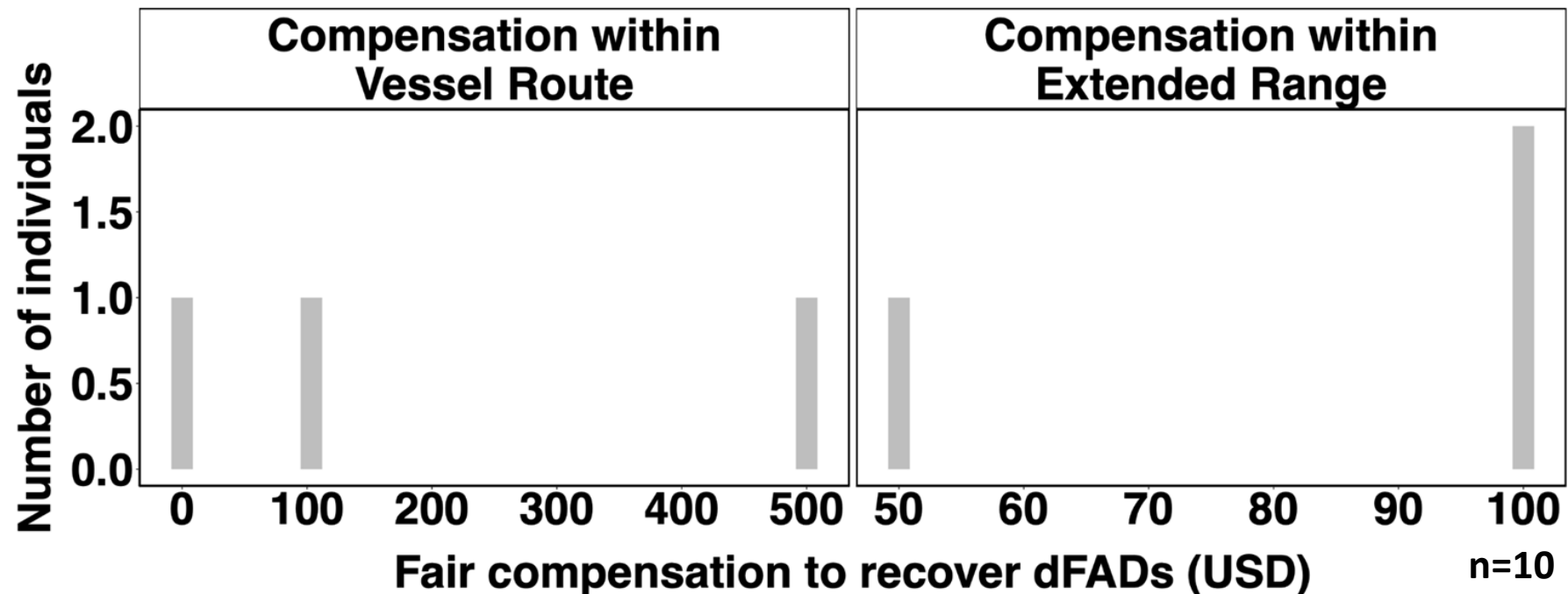
FAD density (any FAD transiting)



Preliminary results

Derived cost per dFAD: **\$668 (low) and \$893 (high)**

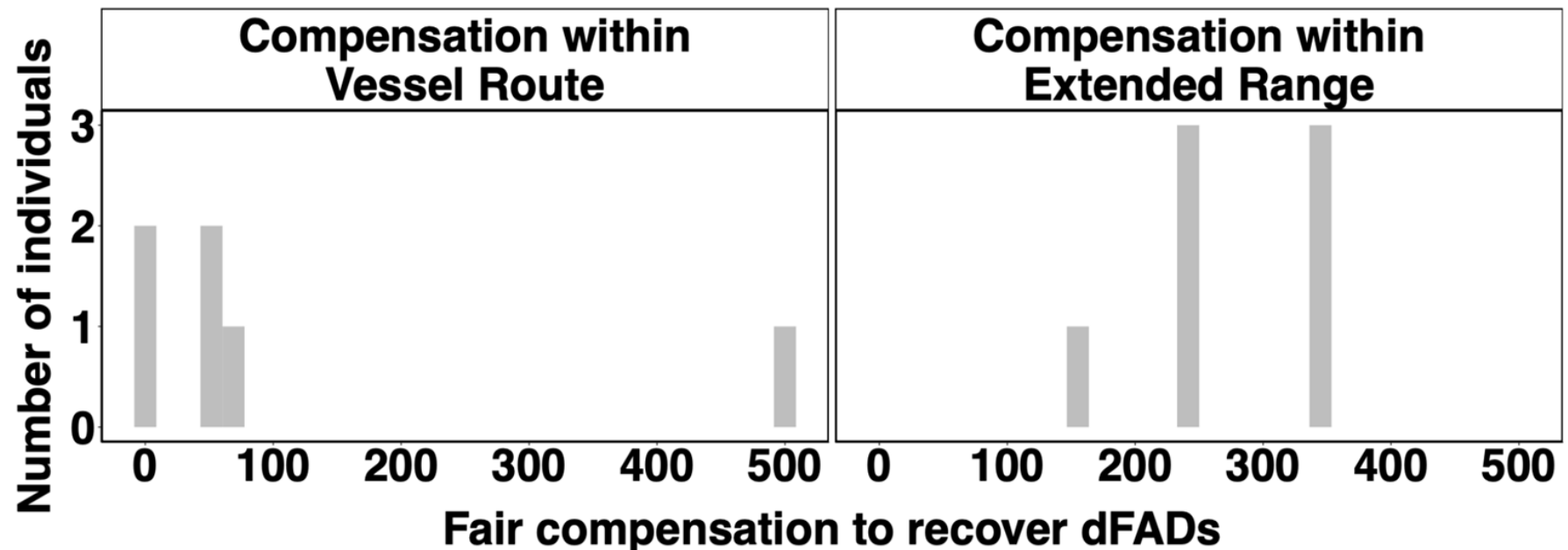
Stakeholder responses:



Preliminary results

Derived cost per dFAD: **\$204 (low) and \$279 (high)**

Stakeholder responses:





Summary:

- Purse-Seiners (Option 2): Estimated cost of 668-893 USD per dFAD.
Stakeholders cited logistical issues and lack of financial incentive as main barriers.
Many stakeholders feel that current regulation limits dFAD recovery by PS.
Financial incentives and regulatory change are thought to be most important to drive change
- Longliners (Option 4): Estimated cost of 204-279 USD per dFAD (due to lower fuel burn).
34% of stakeholders felt this was feasible, though 44% were uncertain (highly dependent on deck space, gear, and handling capabilities)
- Stakeholder estimate fair compensation to be cheaper than “modelled” cost of retrieval

Next steps:

- Re-do analyses with all vessel tracks
- Finer-scale analyses of VMS and FAD tracks: highlight potential recoveries with higher precision

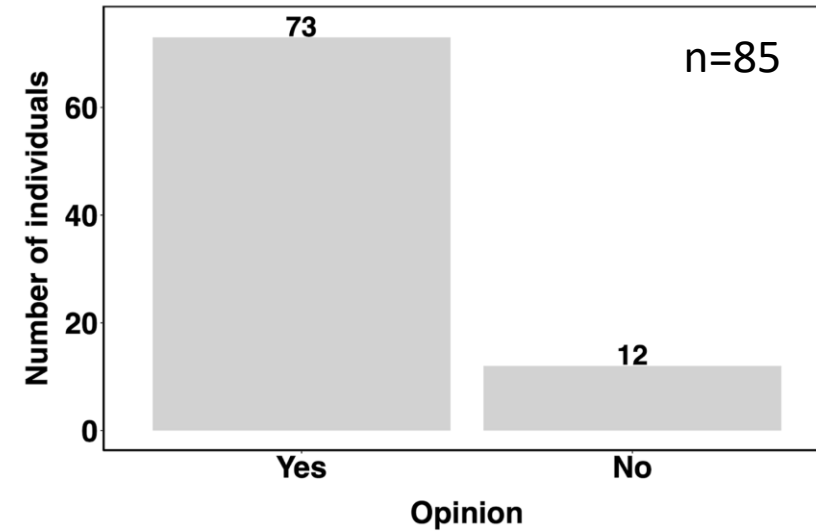
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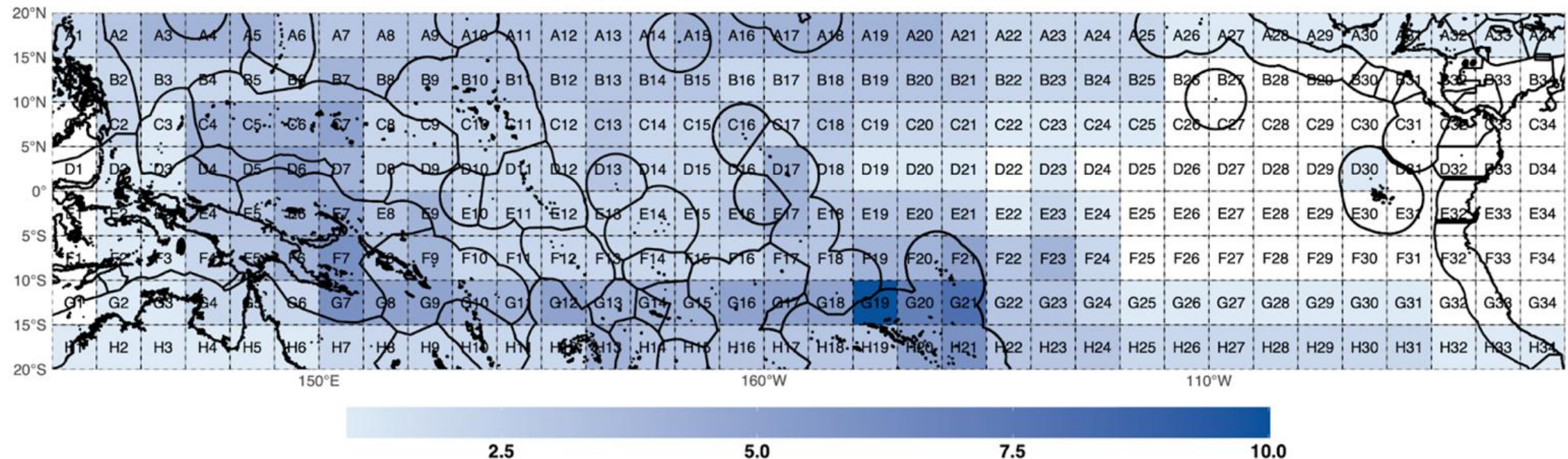
3- Dedicated “cleaning” vessel(s) at the edge of fishing grounds



Should a dedicated cleaning vessel be considered to reduce FAD loss and strandings?



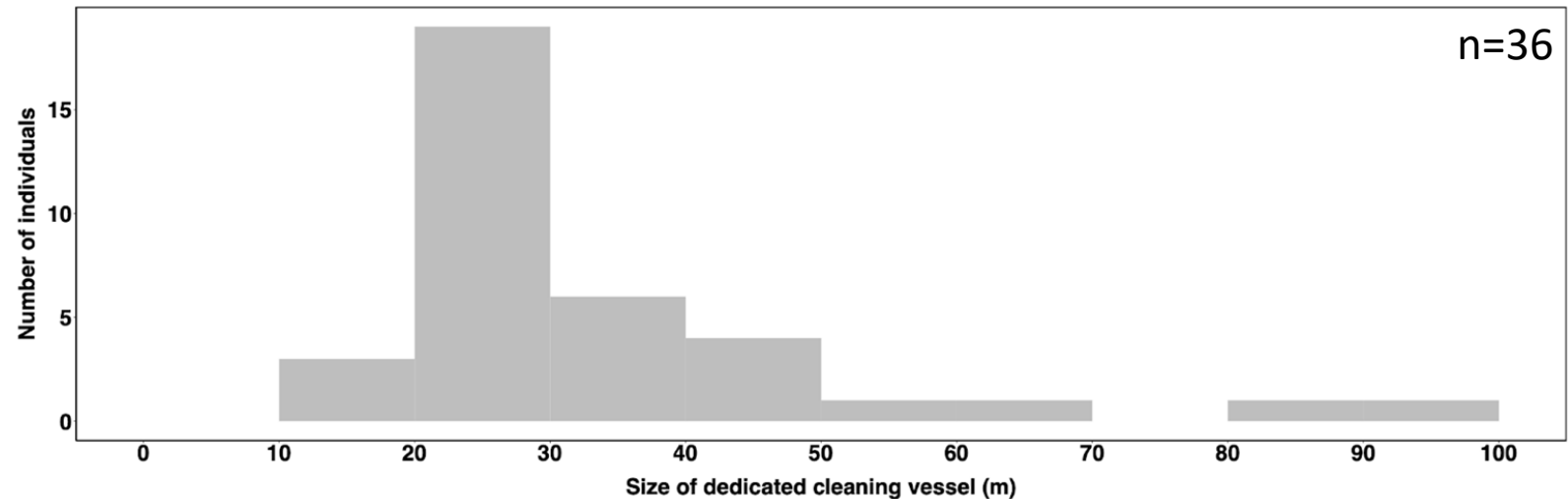
Suggested areas for dedicated cleaner vessel to focus operations:



3- Dedicated “cleaning” vessel(s) at the edge of fishing grounds



Suggested size of a
dedicated cleaning vessel

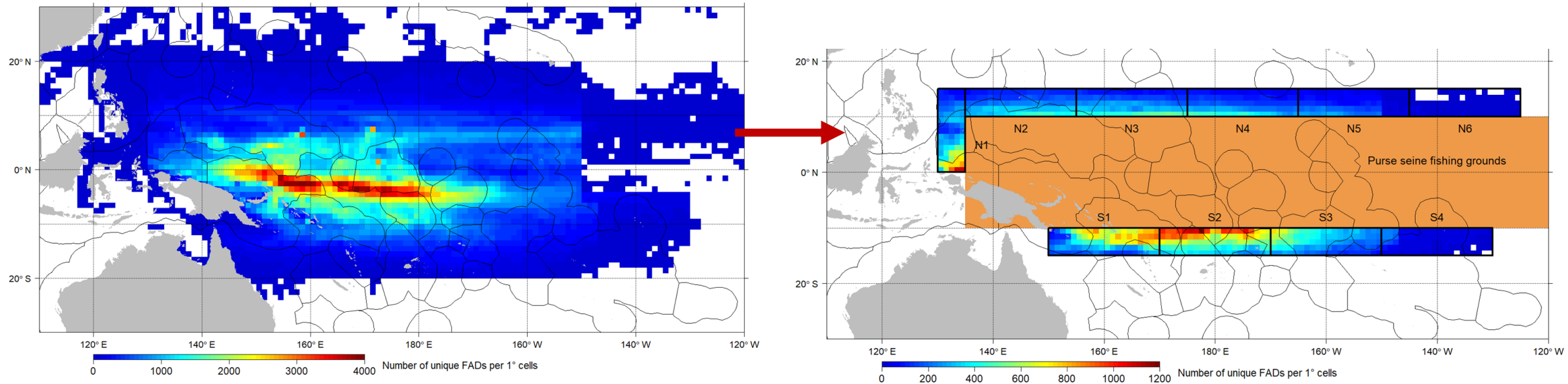


Methods: modelled 3 scenarios of cleaning vessels, based on OPEX from real vessels

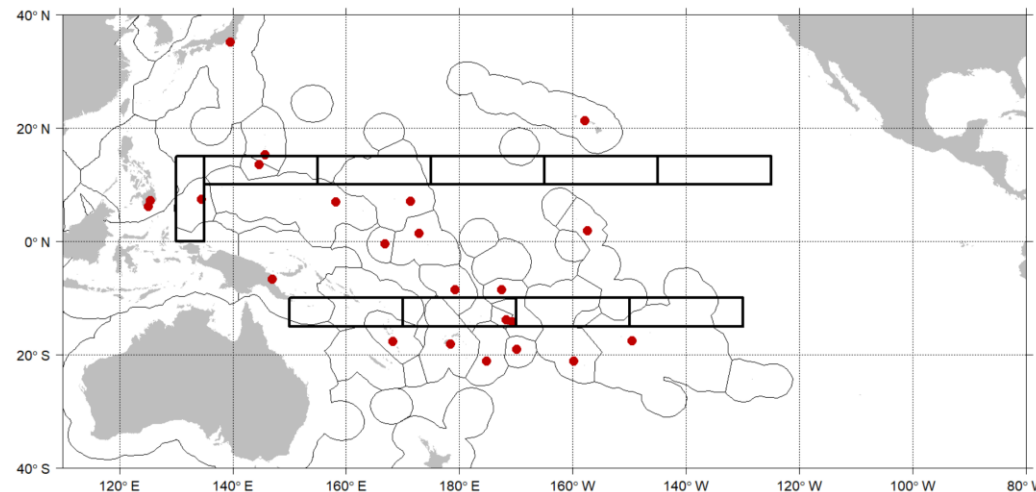
Vessel	FAD storage on vessel		Maximum distance travelled / day (nm)	Fuel burn per day (L/day)
	Minimum	Maximum		
Solomon Island renovated pole and line and now aFAD auxillary vessel and research vessel (37m LOA, 10 knts)	50	200	240	2,000
Atlantic Ocean Tuna Supply Vessel (30m LOA, 8 knts)	70	200	192	2,240
Seychelles renovated supply vessel and now coast guard auxiliary (41m LOA, 13 knts)	150	300	312	3,920

3- Dedicated “cleaning” vessel(s) at the edge of fishing grounds

FAD density (any FAD transiting)

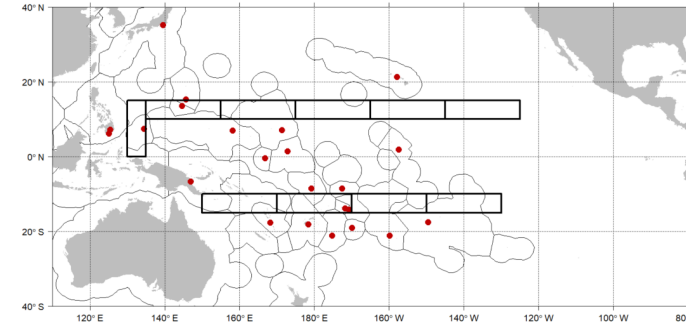


- For each cleaning vessel, scenarios were simulated to assess FAD recovery operations across all hotspots, originating from 26 ports throughout the Pacific.



3- Dedicated “cleaning” vessel(s) at the edge of fishing grounds

Atlantic Ocean Tuna Supply Vessel



Cost per dFAD (USD)

Port		Atlantic Ocean Tuna Supply Vessel									
		2331	1029	1063	925	832	50	1741	4466	2089	460
Northwest	Apra – GU	413	394	584	855	1155	4480	580	699	947	1489
	Davao – PH	333	609	800	1069	1365	4646	680	851	1117	1663
	General Santos – PH	331	603	789	1051	1342	4554	663	832	1094	1628
	Koror – PW	297	555	757	1047	1369	4926	644	818	1103	1693
	Majuro – MH	753	741	481	606	922	4479	526	470	686	1256
	Misaki – JP	608	675	753	974	1244	4649	857	935	1145	1667
	Nanfang'ao – TW	482	665	836	1088	1369	4631	829	967	1210	1738
	Pohnpei – FM	591	587	486	761	1082	4640	488	566	827	1408
	Saipan – MP	461	443	612	900	1218	4772	631	749	1008	1584
	Tarawa – KI	806	808	566	650	954	4621	494	410	652	1252
Northeast	Honolulu – HW	1053	1026	778	614	577	3846	851	660	636	1013
	Kirimati – KI	1255	1241	942	745	702	4525	875	586	480	972
Southwest	Aiwo – NU	803	820	612	792	1130	5142	468	477	778	1442
	Funuaufuti – TV	971	996	760	765	1006	4874	528	278	563	1213
	Lae – PG	508	632	683	923	1221	4658	405	594	879	1454
	Noro – SB	657	734	676	884	1187	4849	317	502	806	1420
	Noumea – NC	830	919	814	916	1146	4656	385	403	670	1250
	Port Vila – VU	814	885	758	855	1093	4612	360	356	640	1228
	Suva – FJ	893	942	770	791	976	4363	459	265	506	1073
	Alofi – NU	1047	1084	873	820	933	4378	606	344	394	966
	Apia – WS	1012	1038	814	757	893	4380	584	303	398	990
	Atafu – TK	979	993	756	686	840	4329	578	305	413	1000
Southeast	Avarua – CK	1212	1246	1012	915	960	4478	755	480	372	891
	Nuku'alofa – TO	1005	1054	863	846	992	4466	555	322	464	1037
	Pago Pago – AS	960	985	775	716	835	4091	560	297	362	915
	Papeete – FP	1282	1300	1052	915	887	4236	851	574	395	736
		n1	n2	n3	n4	n5	n6	s1	s2	s3	s4

Hotspot

Cost per dFAD retrieved (USD)

300 500 1,000 3,000 5,000

Vessel	Minimum dFADs stored	Maximum dFADs stored
Solomon Island renovated P&L (37m LOA, 10 knts)	252 – 3,818	188 – 3,131
AO supply vessel (30m LOA, 8 knts)	345 – 5,254	278 – 4,634
Seychelles renovated LL (41m LOA, 13 knts)	256 – 4,105	223 – 3,912

Summary:

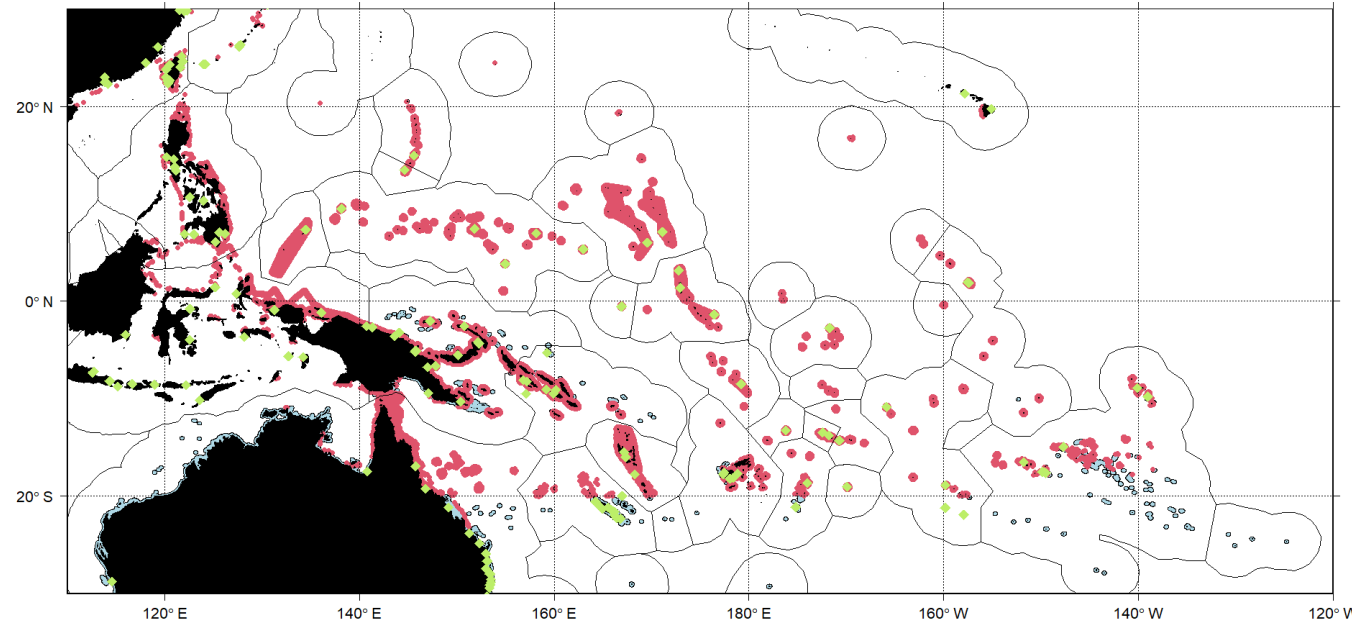
- Stakeholders feel that a dedicated cleaning vessel would be a good idea, with a suggested range of sizes centred around 30-40m LOA.
- Cost Estimates: 178-555 USD per dFAD in high-density hotspots. Retrieving 75% of dFADs in the four main hotspots (~7,175 dFADs) costs 1.4-3.4 million USD/year (plus fixed costs).
- Logistics: A single vessel could clear multiple hotspots.

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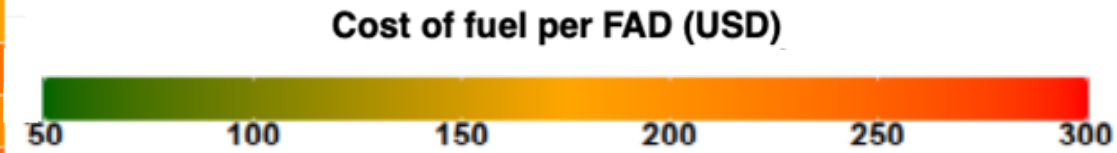
Methods

- Using dFAD tracking data:
 - Number of dFADs for each country
 - within a **6nm and 12nm buffer** around **major ports**
 - within a **6nm and 12nm buffer** of the **entire coastline**
 - dFADs in the PS fishing grounds were not counted in the 12nm scenario

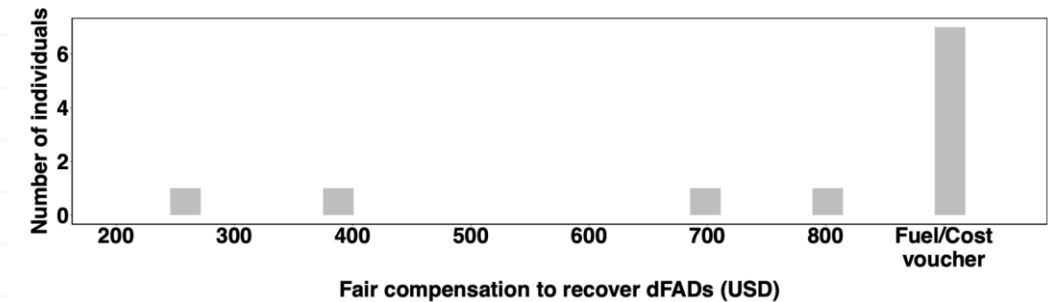


5- FAD recovery programme from shore ('FAD watch' system)

Pacific Island Country or Territory	6 nm		12 nm	
	HP <200	HP >200	HP <200	HP >200
American Samoa	67	101	133	200
Australia	61	92	121	182
Cook Islands	79	119	157	235
Fiji	70	104	138	207
French Polynesia	82	122	162	243
Hawaii	62	94	124	185
Kiribati Gilbert	83	124		
Kiribati Line	83	124	164	246
Kiribati Phoenix	83	124		
Marshall Islands	77	115	152	228
Micronesia	74	112	147	221
Nauru	82	122		
New Caledonia	84	126	166	250
Niue	86	130	171	257
Palau	72	108	143	214
Papua New Guinea	65	97	128	193
Samoa	74	112	147	221
Solomon Islands	72	108	143	214
Tokelau	106	158		
Tonga	77	115	152	228
Tuvalu	89	133	176	264
Vanuatu	77	115	152	228
Wallis and Futuna	86	130	171	257



Stakeholder responses



Summary:

- Cost Estimates: 51-264 USD per dFAD (fuel costs only).
- Total Operations: Recovering 75% of dFADs within 6nm of ports (~5,381 dFADs) would cost ~400,000 USD/year (excluding coordination/transaction costs).
- Priority Areas: Most cost-effective in areas with high stranding rates (e.g., PNG, Solomon Islands, Kiribati) or designated Marine Protected Areas (MPAs).

Next steps:

- Need to consider what comes after recovery: recycling opportunity, burden to PICTs, circular economy, etc.

- **Scale of Retrieval:** The modelled options could retrieve anywhere from under 1,000 to tens of thousands of dFADs annually (up to a third of deployments).
- **No Single Solution:** A combination of mitigation strategies tailored to different operational contexts and regions is required.
- **Financial Requirements:** Meaningful retrieval (>5,000 dFADs via Options 3 or 5) requires between 0.2 and 3.4 million USD annually.
Similar level to a 50 USD tax per dFAD deployed in the WCPO, considering 40,000 deployments per year (2,000,000 USD / year) or a re-selling framework of second-hand buoys picked up by the recovery vessel at 200–300 USD /buoy.
- **Prerequisites:** Success depends on the willingness to share lost dFAD positions and the establishment of clear financial incentives or regulatory mandates.
- **Need to extend the study to the whole of the Pacific Ocean (EPO).** In collaboration with IATTC, to better account for the number of dFAD transiting in all areas considered.

WCPFC-SC22 is invited to:

- Note the Integrated Assessment: Acknowledge this study combining stakeholder input, case studies, dFAD tracking data, and economic modelling to evaluate mitigation options.
- Note the Retrieval Potential: Note that the considered options could retrieve from less than a thousand to several tens of thousands of dFADs per year.
- Note the Cost Variations: Acknowledge the varying estimated costs per dFAD: 51-264 USD (shore-based); 204-279 USD (longliners); 178-555 USD (cleaning vessels); and 668-893 USD (purse-seiners).
- Recommend Further Action: Recommend additional work to refine the analysis and support the implementation of pilot projects in the WCPO.



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Thank you for your attention

We are grateful to all involved in the stakeholder consultation, for taking the time to respond to survey(s), answer emails, or discuss with us!