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PROJECT 42: PACIFIC TUNA TAGGING PROJECT REPORT AND WORK-PLAN FOR 2024-2027

**WCPFC-SC20-2024/RP-PTTP-01 (Rev.01)
26 July 2024**

SPC-OFP

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1. INTRODUCTION

This Pacific Tuna Tagging Programme (PTTP) report provides information on the PTTT to date with a focus on the tagging activities undertaken in 2023-2024 including research voyages, tag recoveries, tag recovery and seeding activities. Issues arising in 2024 for consideration by the PTTT Steering Committee are highlighted and the PTTT work planned for 2024-2027 is outlined.

1.1. Programme objectives

The PTTT is a joint research project, implemented by the Oceanic Fisheries Programme (OFP) of the Pacific Community (SPC). The goal of the Pacific Tuna Tagging Programme is to provide data and knowledge for stock assessment and management of skipjack, yellowfin and bigeye tuna in the Pacific Ocean. The objectives of the PTTT, originally specified in WCPFC-SC6-2010/GN-IP-04, and revised in 2016 (PTTP Steering Committee, 2016), are:

1. To obtain data that will contribute to, and reduce uncertainty in, WCPO tuna stock assessments including estimation of overall and local exploitation rates, extent of mixing and appropriate spatial strata for use in assessments.

2. To obtain information to better understand the interactions between tropical tuna species and major fishing gears to support development of mitigation measures (where appropriate) and better interpret fisheries data (e.g., CPUE).

Under these objectives, information collected includes age-specific rates of movement and mixing, movement between this region and other adjacent regions of the Pacific basin, species-specific vertical habitat utilisation by tunas, and the impacts of FADs on behaviour.

1.2. Programme funding

Since its commencement in 2006, funding support for the PTPP has been provided by the

- PNG National Fisheries Authority;
- New Zealand Aid Agency;
- the Government of the Republic of Korea;
- Australian Centre for International Agricultural Research;
- European Community 8th European Development Fund;
- European Community 9th European Development Fund;
- European Community 10th European Development Fund;
- the French Pacific Fund;
- the Government of Taiwan;
- Heinz Australia;
- the Global Environment Facility;
- the International Seafood Sustainability Foundation;
- the European Union (through voluntary contributions to WCPFC);
- and the WCPFC itself.

In 2011, SPC and the PNG National Fisheries Authority (NFA) also began a three-year tag release programme in the PNG EEZ, funded by NFA. This project, referred to here as the PNG Tagging Project (PNGTP) is considered under the umbrella of the PTPP and where relevant is reported on in this report.

In 2016, the PTPP steering committee recommended that SC normalise the tagging programme as part of the ongoing work of the SC (WCPFC-SC 2016). Ideally this would include research voyages every year alternating between skipjack-focused voyages via pole and line in one year and bigeye-focused voyages via handline and dangler fishing in the next, starting with skipjack in 2017 (noting that yellowfin would be adequately covered by both surveys).

1.4. Operational structure

The overall operational structure of the PTPP to date is given in (Table 1), with the work completed since the last PTPP reported highlighted and the scheduled work for 2024 also shown. The spatial distribution of these research voyages in the Western and Central Pacific Ocean is shown in (Figure 1).

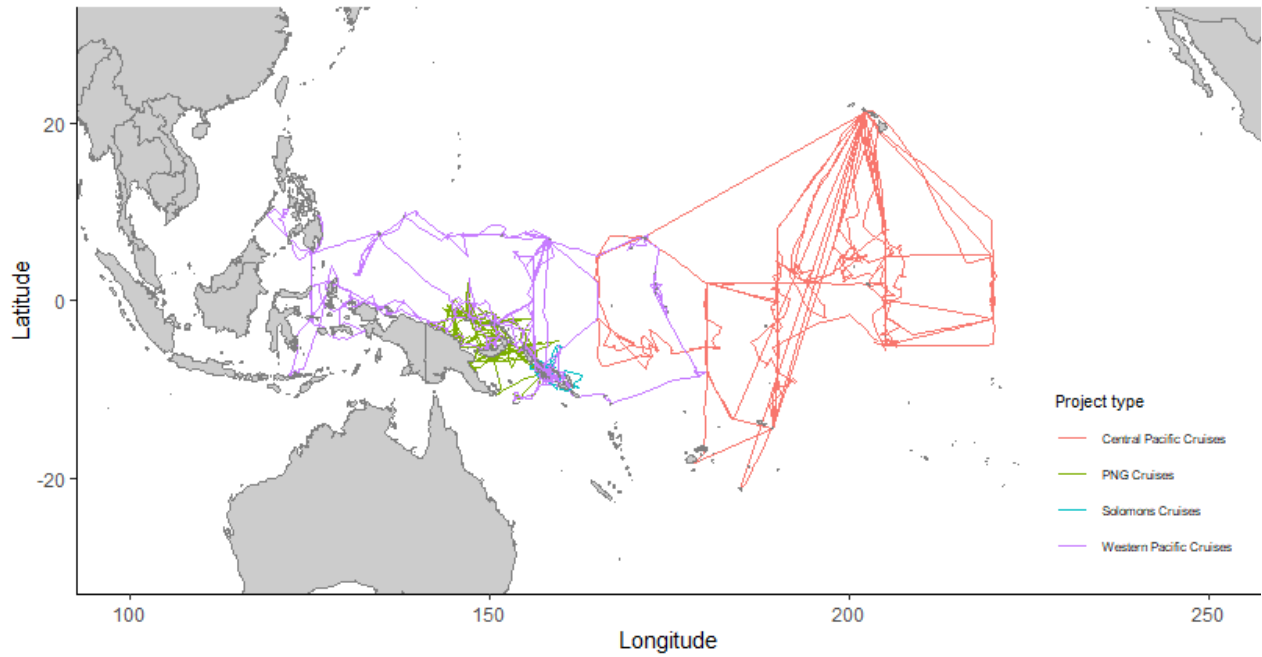


Figure 1: Tagging vessel tracks for all voyages for all PTPP research voyages. Legend relates to the groups of operational areas described in Table 1.

Phase	Time Period	Operational Area	Tagging Vessel
PNGTP	Apr - Jul 2011	New Guinea 2011	SOLTAI 105
	Jan - Mar 2012	New Guinea 2012	SOLTAI 105
	Aug - Aug 2012	PNG TAO 2012	FTV Pokajam
	Apr - Jun 2013	New Guinea 2013	SOLTAI 101
	Jul - Jul 2016	PNG TAO 2016	Pokajam
Phase 1	Aug - Nov 2006	Papua New Guinea	SOLTAI 6
	Feb - May 2007	Papua New Guinea	SOLTAI 6
	Oct - Nov 2007	Solomon Islands	SOLTAI 6
	Feb - Mar 2008	Solomon Islands	SOLTAI 6
	Mar - Apr 2008	Solomon Islands	SOLTAI 105
Phase 2	May - Jun 2008	Central Pacific #1	Double D
	Jun - Nov 2008	Western Pacific #1	SOLTAI 105
	Mar - Jun 2009	Western Pacific #2	SOLTAI 105
	May - Jun 2009	Central Pacific #2	DOUBLE D
	Jul - Oct 2009	Western Pacific #3	SOLTAI 105
	Oct - Nov 2009	Central Pacific #3	AO SHIBI GO
	May - Jun 2010	Central Pacific #4	AO SHIBI GO
	Nov - Dec 2010	Central Pacific #5	PACIFIC SUNRISE
	Oct - Oct 2011	Central Pacific #6	PACIFIC SUNRISE
	Nov - Dec 2011	Central Pacific #7	AO SHIBI GO
	Sep - Oct 2012	Central Pacific #8	PACIFIC SUNRISE
	Nov - Dec 2013	Central Pacific #9	PACIFIC SUNRISE
	Aug - Aug 2014	Central Pacific #10	PACIFIC SUNRISE
	Sep - Nov 2015	Central Pacific #11	GUTSY LADY 4
	Sep - Oct 2016	Central Pacific #12	GUTSY LADY 4
	Sep - Nov 2017	Western Pacific #4	SOLTAI 105
Jul - Aug 2018	Central Pacific #13	GUTSY LADY 4	
Jul - Sep 2019	Western Pacific #5	SOLTAI 105	
Aug - Oct 2020	Central Pacific #14	GUTSY LADY 4	
Jul - Aug 2021	Central Pacific #15	GUTSY LADY 4	
Sep - Oct 2022	Western Pacific #6	SOLTAI 105	
	Aug - Sep 2023	Central Pacific #16	GUTSY LADY 4

Table 1: Period, area and vessel used in PTPP tagging research voyages since the inception of the programme. Work completed since the last PTPP report to SC19 in 2023 in bold.

2. SUMMARY OF PTPP ACTIVITIES IN 2023-2024

2.1. CP16

The sixteenth Central Pacific tagging cruise (CP-16) was implemented in August-September 2023 on the F/V Gutsy Lady 4, originating in Honolulu, Hawaii. The scientific team consisted of 2 SPC staff, 1 IRD staff and 2 contractors. The vessel crew consisted of 5 crew members (all hailing from Indonesia) and Tim Jones, master of the Gutsy Lady 4. This was the 6th such SPC sponsored cruise utilizing this vessel (Table 1). During the 45d cruise, 11,230 conventional tags were deployed (53%BET, 40%YFT, 7%SKJ). A large amount of effort was concentrated around marking fish with SrCl₂ solution to support ageing studies using otoliths of recaptured individuals; 1656 were marked with this method and tagged with white conventional tags. Of these, a live biopsy was taken from 951 in the hope that a sample will be taken at recapture for epigenetic analysis. Biosampling was also conducted; 306 fish were sampled following standard Pacific Marine Specimen Bank protocols. A collaborating scientist from IRD deployed 96 acoustic tags in tuna on an array of 7 drifting Fish Aggregating Devices (dFADs) near Malden Island to explore their behaviour around dFADs.

The nearly 6000nm cruise track visited the Palmyra, Kiribati Line Islands and IW. Of the nearly 1400 industry-shared dFADs, 76 were visited during CP-16. Only one Tropical Atmosphere Ocean mooring, the 2N/155W was visited (on 2 occasions); a small aggregation was detected and a small number of fish were tagged. In contrast to recent CP cruises in the Line Islands, effort was taken to deploy tags in westward drifting dFADs to avoid short-term recaptures from vessels waiting across the 150° meridian in the EPO, and to disperse tagged fish in the WCPO region in hopes of longer term recaptures spread out across a larger geographical area.

A general shift in fishing effort (and dFADs) to the west has been observed during the months after CP16. This is evidenced by recaptured tags from the cruise first appearing in Kiritimati, then Majuro, Tarawa, Tuvalu and Pohnpei. Another factor that has affected recaptures is the dispersion of some of the EPO fleet into different areas, including the WCPO. Generally, (and in contrast to other previous campaigns in the region) fishing was hampered by large numbers of small (<37cm) fish which seemed to be widespread and omnipresent throughout the study area. Despite this, the team managed to deploy more tags than any other CP cruise, due in equal parts to the ever-increasing number of industry provided dFADs, evolving fishing techniques aboard the charter vessel, and a highly adept team aboard her.

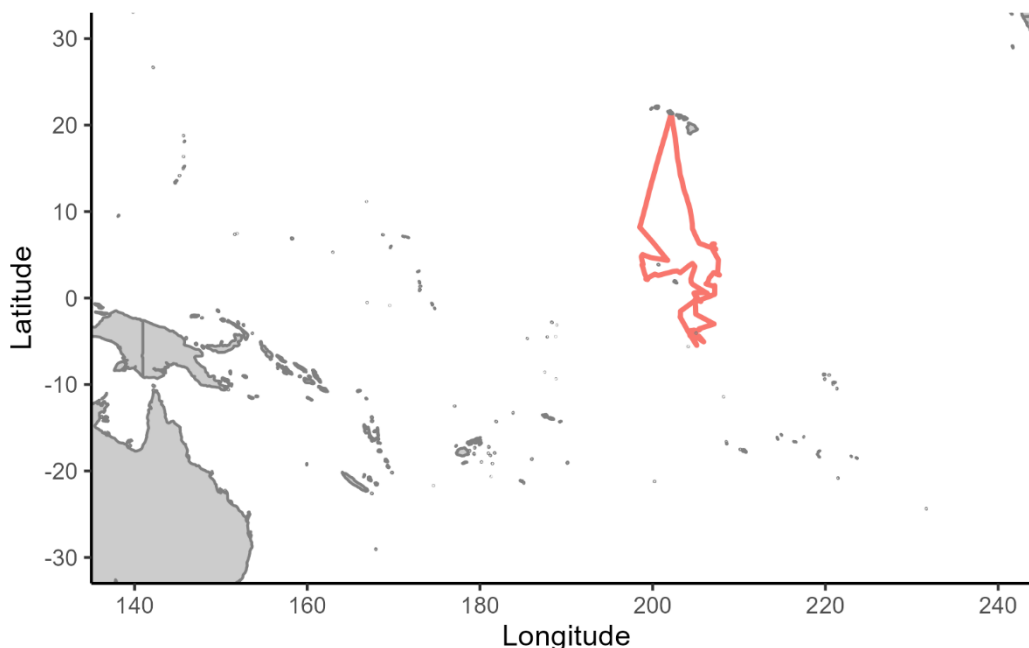


Figure 2: Voyage track during CP16 with daily positions for the vessel.

Of the 45 days of charter during CP16, 37 days were spent fishing in Line Islands/Kiribati, International, and Palmyra/US waters; remaining days were spent steaming to and from the fishing grounds. A total of 11,319 fish were tagged and released during the cruise (Figure 3), comprising 5,999 bigeye (53%), 4,501 yellowfin (40%) and 819 skipjack (7%). Table 2 summarizes the number of fish tagged per species and tag type. The length frequency of tagged tuna is shown in Figure 4.

Tag type	SKJ	YFT	BET	Others	Total
White conventional - 13cm	7	261	1,388	0	1,656
Yellow conventional - 13cm with code	787	4,176	4,611	0	9,574
Vemco V13	25	1	0	0	26
Vemco V13P	0	63	0	0	63
Total fish tagged	819	4,501	5,999	0	11,319

Table 2: Numbers of fish tagged during CP16 by tag type and species.

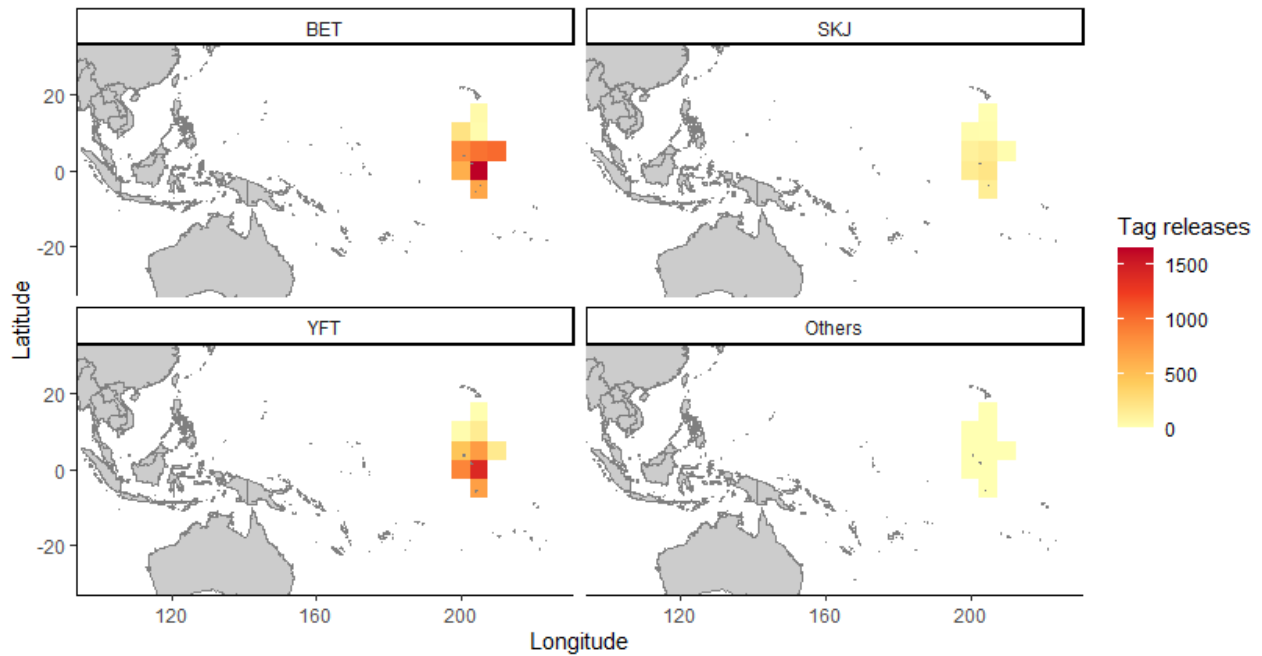


Figure 3: Distribution of tag releases during CP16 aggregated to 5 degree squares

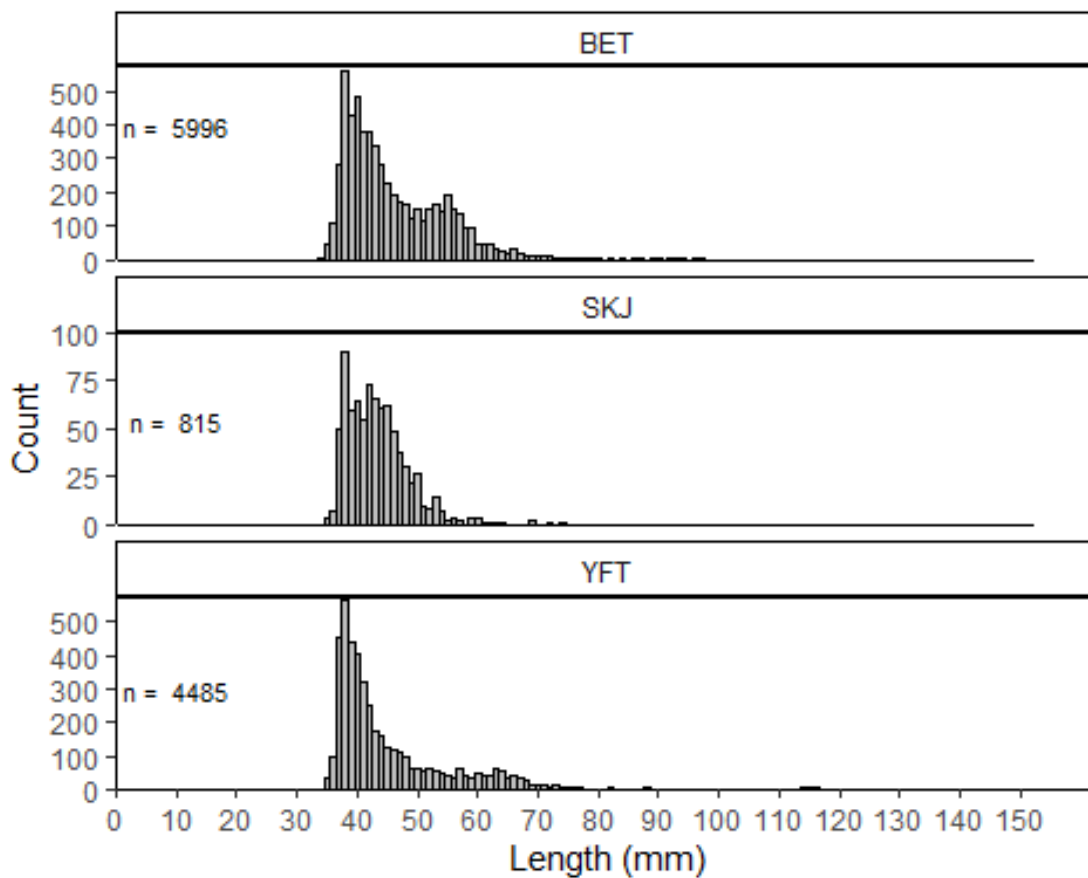


Figure 4: Size distribution (cm) of conventionally tagged tuna during CP16 .

2.2. Upcoming tagging cruises

The preferred and regularly used pole-and-line vessels (FV Soltai 105) available to charter for scientific purposes for skipjack focused tagging cruises in the Western Pacific is scheduled for refurbishment (engine and refrigeration system) in the second half of 2024 (subject to agreements being finalized with the Solomon Islands Government). Once refurbished the previous range capacity of Soltai 105 is expected to be once again available for tagging experiments. Given this option, the scheduling of the tagging cruise in the Western Pacific in 2024 has been earmarked for December 2024-February 2025 to ensure the tagging is undertaken in areas outside of the archipelagic waters of the Solomon Islands. Any delay in the refurbishment completion would result in the cruise commencement being pushed to early 2025 (see 4. *PTTP Research Cruise Platforms*).

Note that other options to undertake the planned skipjack-focused research cruise in 2024 were explored using alternate commercial fishing vessels available to charter from the region, but their condition and availability were such that this was not a viable option. Similarly, the possibility of chartering the multipurpose longline vessel typically used to implement bigeye-focused, central Pacific cruises was explored, using modified gears in the western Pacific to target skipjack more effectively. However, the cost and likelihood of releasing a sufficient number of tagged skipjack tuna under this experiment design were deemed too high risk to be an effective use of PTTP resources

2.3. Tag Seeding

Uncertainty in estimated tag reporting rates continues to be influential in stock assessment of WCPO tuna species. Informative priors placed on these parameters can help constrain model estimation and reduce the occurrence of boundary limits being hit during the likelihood minimisation.

Tag seeding has been a useful tool for evaluating tag recovery rates of wild tagged fish, but numbers of seeding experiments have dropped off considerably in the last 8 years (Figure 5, Table 3). Independent estimates of reporting rate by flag have suggested that a 3-to-4-fold increase in seeding experiments is required to detect any potential change in reporting over time (Peatman et al. 2023). The recent, independent review of the WCPO yellowfin assessment also emphasised the need for more seeding experiments, given the number of reporting rate parameters hitting the upper bounds (Punt et al. 2023).

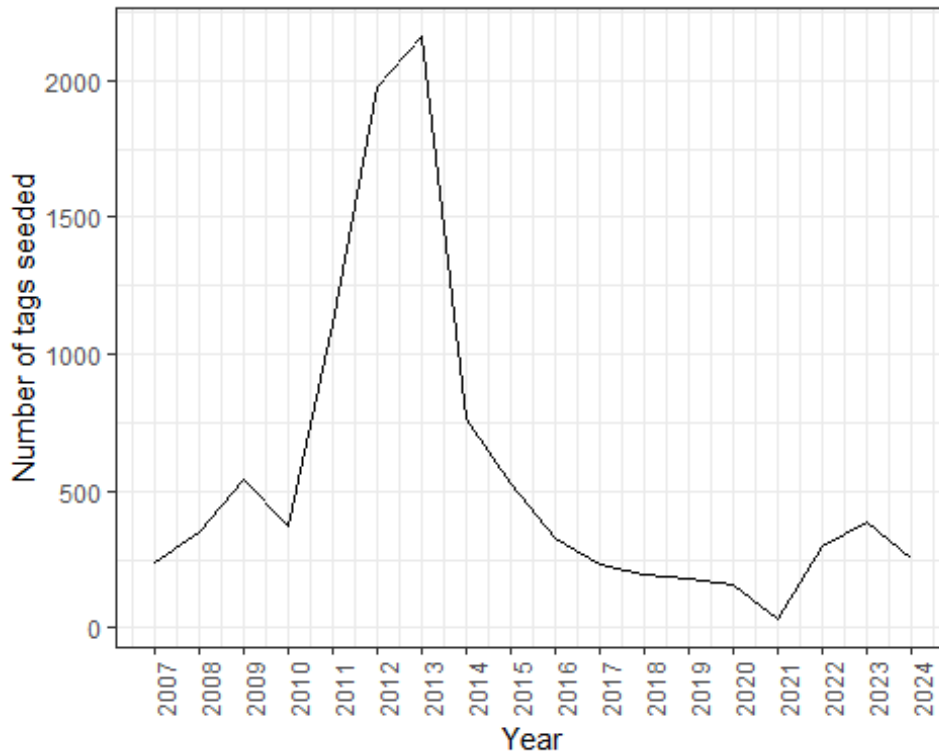


Figure 5 Number of seeded tags deployed per year since the beginning of PTTP.

A large increase in tag seeding has therefor been implemented for 2024, with the aim of arriving at higher and more sustained levels of tag seeding by 2025. Historically, tag seeding has been undertaken ad-hoc, and is coordinated through MRAG and those regional observer programmes who are willing to distribute the necessary kits to trained observers. While these past seeding experiments have been critical to maintained monitoring of reporting rates, it has meant that the coverage of fleets, regions and seasons have been limited. Starting in 2024 the experimental design of deployments has therefor also been modified, to promote more evenly spreading seeded tags across purse seine vessels of differing flags, and who unload or tranship more broadly across the network of ports in the region.

Following feedback from observer coordinators and support staff, the secretive nature of tag seeding experiments will also be revisited. The requirement for observers to undertake certain tasks away from the view of crew has been highlighted as one reason for reluctance by observer programmes to consistently undertake tag seeding. Given that the exact stage of the catch processing into which seeded tags are returned can vary, and that a large proportion of wild tags found and reported at unloading, transhipment or butchering, plain-sight seeding of fish directly into wells will facilitate easier implementation of these important experiments. Approximately 25% of tag seeding will continue to use the secretive protocol, and analyses will be undertaken to compare the effectiveness of the two protocols following the first tranche of increased seeding. Increased training of observers for tag seeding duties is being implemented.

To facilitate this non-secretive tag seeding, a new seeding manual was developed, and 120 seeding kits were produced before the SPC Heads of Fisheries 2024 meeting for distribution to ports across the Pacific. A second production of 200 kits is currently underway to be distributed in the second half of 2024. SPC has also received 300 tags from Japan Fisheries which will be deployed in 10 seeding kits on vessels fishing in areas where Japanese tagging effort has taken place.

The focus will be to distribute seeding kits in the major transshipping and offloading ports in the region, and so far in 2024 110 non-secretive seeding kits have been delivered across the Pacific. These kits were targeted at ports with high levels of fleet activity in the WCPO, and to cover areas where recaptures from wild tagging campaigns have occurred.

Tag seeding training material for observers has been revised to include new protocols and is now hosted in an online platform. Standard Operating Procedures for debriefing tag seeding deployment by observers have been developed, and debriefing forms for tag seeding and tag recovery along with training for debriefers have been revised and further developed.

To increase the pool of observers trained in tag seeding, in addition to the PIRFO biological sampling upgrade training targeting senior observers, tag seeding modules are now delivered during national and regional observers training. Over the past 12 months, 85 observers were trained in tag seeding, 15 trainers were trained in training observers for tag seeding (including 2 additional SPC trainers) and 12 debriefers were trained in debriefing observers for tag seeding. Since the start of the Pacific Tuna Tagging Program, a total of 410 observers were trained in tag seeding deployment.

Year	FAOB	FJOB	FMOB	IATTC	KIOB	MHOB	PGOB	SBOB	TOOB	TTOB
2007	0	0	12	0	0	0	178	0	0	49
2008	0	0	0	0	0	25	274	50	0	0
2009	0	25	0	0	0	51	268	75	0	121
2010	23	20	0	0	0	59	105	48	0	115
2011	0	75	45	0	27	60	225	487	0	194
2012	0	73	145	0	209	49	290	1,095	25	92
2013	0	6	192	0	169	12	940	810	0	30
2014	0	30	0	0	240	0	329	132	30	0
2015	30	30	0	0	140	0	150	120	60	0
2016	0	0	0	126	95	0	60	48	0	0
2017	0	0	0	0	0	24	60	120	30	0
2018	29	0	0	0	0	0	60	50	0	60
2019	30	0	0	0	0	0	154	0	0	0
2020	0	0	0	0	0	0	156	0	0	0
2021	0	0	0	0	0	0	36	0	0	0
2022	0	0	0	0	0	0	298	0	0	0
2023	45	30	0	0	0	0	89	30	0	0
2024	0	30	0	0	0	0	58	60	0	30

Table 3: Number of seeded tags deployed per observer programme since the beginning of the PTTTP.

2.4. Biological sampling

As part of its planned activities, the CP16 voyage provided a significant number of biological samples and data as identified in Table 3. Biological sampling during tagging cruises complements the work conducted by fisheries observers on board tuna fishing vessels, increasing the number of samples collected in the region during the year. This sampling effort contributes significantly to the WCPFC Tuna Tissue Bank by providing biological information and samples that are available to the scientific community to conduct biological and ecological studies of interest to the region (SC18-RP-P35b-01).

Species	Muscle	Liver	Otolith	Stomach	Fin	Spine	Blood	Kidney	Brain	Fatmeter
DOL	12	11	0	12	0	1	0	0	0	0
RRU	1	1	1	1	0	0	0	0	0	0
WAH	4	4	2	4	0	0	0	0	0	0
BET	1,102	74	73	71	0	75	31	0	0	52
BUM	6	5	0	4	0	5	0	0	0	0
YFT	368	83	78	83	0	83	21	0	0	71
FAL	0	0	0	0	13	0	0	0	0	0
KAW	1	1	1	1	0	0	0	0	0	0
SKJ	72	39	29	39	0	39	1	0	0	24
OCS	0	0	0	0	24	0	0	0	0	0

Table 4: Number of samples taken during CP16 per species and sample type.

3. PTTTP RESULTS

The Pacific areas covered by the different tagging voyages implemented since 2006 are shown in Figure 1. While there are noticeable gaps in coverage in the extreme east, west and southern latitudes, these are a direct result of the PTTTP focus on the tropical tunas and undertaking research voyages in areas and with methods allowing maximal catch rates for tagging. The release numbers and recovery percentages to date of conventional and archival tags made during the 16 Central Pacific (CP) voyages, the PNGTP and PTTTP Phase 1 voyages, and the ongoing PTTTP Phase 2 voyages, are detailed in Table 5.

		Release numbers				Recapture rate (%)			
project	Tag type	SKJ	YFT	BET	Total	SKJ	YFT	BET	Total
CP	ARC	32	368	992	1,392	0.0	9.8	19.4	16.4
	CON	2,083	10,768	56,653	69,599	3.2	8.4	24.3	21.2
PTTP Phase 1	ARC	2	328	68	398	50.0	18.0	26.5	19.6
	CON	143,691	65,770	4,173	213,634	17.7	18.1	23.0	17.9
WP Phase 2	ARC	174	91	123	388	3.4	3.3	13.8	6.7
	CON	160,323	42,693	5,515	208,533	20.5	15.5	19.6	19.5
Total PTTP	ARC	208	787	1,183	2,178	3.4	12.5	19.2	15.2
	CON	306,097	119,231	66,341	491,766	19.1	16.3	23.8	19.1

Table 5: Central Pacific, PTTP Phase 1 (PNG and Solomon Islands-based), Phase 2 Western Pacific, and total PTTP (including all other cruises) tag release numbers, and % of recoveries to date of conventional and archival tags.

3.1. Tag recoveries

		Release				Recaptures			
Project	Cruise dates	SKJ	YFT	BET	Total	SKJ	YFT	BET	Totals
CP1	May - Jun 2008	57	116	1,736	1,909	4 (7%)	25 (21.6%)	580 (33.4%)	609 (31.9%)
CP2	May - Jun 2009	169	205	2,309	2,683	5 (3%)	26 (12.7%)	578 (25%)	609 (22.7%)
CP3	Oct - Nov 2009	66	237	4,802	5,105	2 (3%)	64 (27%)	1791 (37.3%)	1857 (36.4%)
CP4	May - Jun 2010	7	120	2,284	2,411	1 (14.3%)	13 (10.8%)	519 (22.7%)	533 (22.1%)
CP5	Nov - Dec 2010	40	228	6,090	6,358	7 (17.5%)	46 (20.2%)	1972 (32.4%)	2025 (31.8%)
CP6	Oct - Oct 2011	2	123	3,804	3,929	0 (0%)	29 (23.6%)	1043 (27.4%)	1072 (27.3%)
CP7	Nov - Dec 2011	52	245	4,212	4,509	1 (1.9%)	21 (8.6%)	1468 (34.9%)	1490 (33%)
CP8	Sep - Oct 2012	20	140	6,014	6,174	2 (10%)	32 (22.9%)	2327 (38.7%)	2361 (38.2%)
CP9	Nov - Dec 2013	29	135	4,296	4,460	2 (6.9%)	11 (8.1%)	637 (14.8%)	650 (14.6%)
CP10	Aug - Aug 2014	12	98	195	339	0 (0%)	6 (6.1%)	4 (2.1%)	10 (2.9%)
CP11	Sep - Nov 2015	231	775	1,966	2,977	6 (2.6%)	33 (4.3%)	218 (11.1%)	257 (8.6%)
CP12	Sep - Oct 2016	109	371	1,575	2,110	3 (2.8%)	84 (22.6%)	273 (17.3%)	360 (17.1%)
CP13	Jul - Aug 2018	79	443	611	1,134	4 (5.1%)	33 (7.4%)	44 (7.2%)	81 (7.1%)
CP14	Aug - Oct 2020	318	1,751	4,318	6,387	8 (2.5%)	100 (5.7%)	509 (11.8%)	617 (9.7%)
CP15	Jul - Aug 2021	98	1,344	6,445	7,887	1 (1%)	133 (9.9%)	1579 (24.5%)	1713 (21.7%)
CP16	Aug - Sep 2023	815	4,485	5,996	11,296	21 (2.6%)	250 (5.6%)	223 (3.7%)	494 (4.4%)
Totals	Totals	2,104	10,816	56,653	69,668	67 (3.2%)	906 (8.4%)	13765 (24.3%)	14738 (21.2%)

Table 6: Tag releases and recaptures for PTPP Central Pacific cruises to date.

		Release				Recaptures			
Project	Cruise dates	SKJ	YFT	BET	Total	SKJ	YFT	BET	Totals
PG1	Aug - Nov 2006	13,948	7,806	562	22,316	2651 (19%)	1810 (23.2%)	230 (40.9%)	4691 (21%)
	Feb - May 2007	26,493	12,845	129	39,467	2513 (9.5%)	1730 (13.5%)	8 (6.2%)	4251 (10.8%)
PG2	Apr - Jul 2011	28,730	11,571	355	40,656	5800 (20.2%)	2496 (21.6%)	60 (16.9%)	8356 (20.6%)
PG3	Jan - Mar 2012	28,312	9,607	2,008	39,927	7346 (25.9%)	1736 (18.1%)	533 (26.5%)	9615 (24.1%)
PG5	Apr - Jun 2013	23,402	5,955	564	29,921	3385 (14.5%)	900 (15.1%)	47 (8.3%)	4332 (14.5%)
SB1	Feb - Apr 2008	15,327	14,405	414	30,146	1800 (11.7%)	2435 (16.9%)	62 (15%)	4297 (14.3%)
	Oct - Nov 2007	7,479	3,565	139	11,183	1981 (26.5%)	786 (22%)	18 (12.9%)	2785 (24.9%)
WP1	Jun - Nov 2008	37,691	17,647	1,467	56,805	6632 (17.6%)	2147 (12.2%)	372 (25.4%)	9151 (16.1%)
WP2	Mar - Jun 2009	34,207	13,919	3,145	51,271	4628 (13.5%)	2361 (17%)	491 (15.6%)	7480 (14.6%)
WP3	Jul - Oct 2009	30,724	7,340	735	38,799	6870 (22.4%)	1452 (19.8%)	199 (27.1%)	8521 (22%)
WP4	Sep - Nov 2017	25,457	2,376	20	27,853	6143 (24.1%)	466 (19.6%)	1 (5%)	6610 (23.7%)
WP5	Jul - Sep 2019	15,595	1,077	146	16,818	1408 (9%)	64 (5.9%)	17 (11.6%)	1489 (8.9%)
WP6	Sep - Oct 2022	16,649	334	2	16,987	7230 (43.4%)	130 (38.9%)	0 (0%)	7360 (43.3%)
Totals	Totals	304,014	108,464	9,688	422,168	58392 (19.2%)	18517 (17.1%)	2038 (21%)	78947 (18.7%)

Table 7: Tag releases and recaptures for PTP Pole & Line cruises to date.

				Recaptures			
Gear	Cruise Type	Tag type	Releases	SKJ	YFT	BET	Total
WP Pole&Line	Archipelagic (Sol+PNG) 2016+	ARC	93	3.8	0.0	0.0	3.2
		CON	61,675	25.6	17.5	10.6	25.1
	Archipelagic (Sol+PNG) pre2016	CON	319,161	17.8	16.9	21.6	17.7
		SON	222	4.3	9.6	38.9	10.4
		ARC	658	4.1	14.9	19.7	14.6
CP Mixed	dFad Access 2013+	ARC	680	0.0	10.6	15.9	14.1
		CON	31,966	2.6	6.9	13.5	11.0
		SON	461	0.0	4.0	5.1	3.7
	Pre-dFad 2008-2013	CON	37,538	5.4	17.2	30.7	29.9
		ARC	712	0.0	8.7	22.4	18.5

Table 8: Recapture rate by gear, tag, and selected cruise-focus types. Equatorial releases consist of tags released in the EEZs of Palau, Fed. States of Micronesia, the Marshall Islands, Nauru, Kiribati and Tuvalu.

3.2. Tag Recovery Network

Since September 2021, a service provider, MRAG, assumed responsibility for centralizing data from the following countries: Palau, Nauru, Tuvalu, Tokelau, Papua New Guinea, Solomon Islands, Vanuatu, American Samoa, Federated States of Micronesia, Marshall Islands, Fiji, Kiribati and Cook Islands. MRAG also makes bonus payments to the Tag Recovery Officer (TRO) and anyone who finds a tag in these countries. To encourage more returns at point of capture, greater effort is being made to develop communications with vessel-level tag finders. For each tag recovered in this way, a letter is generated and sent to the fleet manager with feedback on the migration pattern of the fish and information on its release, to encourage greater engagement and more accurate return information. The special reward scheme for those fleets collaborating in the buoy-sharing programme for PTPP cruises continues. This reward scheme includes rewards at vessel- and fleet-levels as well as for the individual tag finder, including rewards for all crew of the vessel reporting the most tags during a season and a special raffle for all vessels participating in the programme, with two seasons run per year. To encourage observers at sea to support tag recovery, observers are rewarded USD20 to report tags immediately to SPC with a picture of the tagged fish as well as accurate length measurement.

Targeted trips by SPC staff were made to Kiritimati, Kiribati (November 2023), Bangkok, Thailand (May 2024) and Pago Pago, American Samoa (June 2024) to meet with Tag Recovery Officers and others involved in tag recovery, in an attempt to provide training and improve processes for tag recovery in each port. Pago Pago was identified as requiring significant change to the way tag recaptures are currently being handled and processed by the tag recovery officer there. The possibility of hiring a dedicated technician in Pago Pago to handle tag recoveries and other port-related sampling activities is being explored. A follow up trip in the third quarter of 2024 is planned to revisit the Starkist Cannery, meet with stevedoring companies which unload vessels there, the current TRO at Starkist, and to train the new SPC technician to perform tag recovery duties and other sampling activities.

The integration of tagging data, data entry and tag validation tools into the TUFMAN2 platform is now complete, and initial trials for streamlining data entry by giving access to these tools directly to tag recovery officers is planned.

4. PTPP RESEARCH CRUISE PLATFORMS

4.1. Soltai 105 Refurbishment Plan

Since 2006, SPC PTPP has chartered pole-and-line vessels operated by National Fisheries Development Pty Ltd in the Solomon Islands. FV Soltai 105 has been the most valuable vessel due to its long-range capacity which allows for tagging to occur in the high seas and other Pacific Island Exclusive Economic Zones. In the past 10 years, the tuna canning business realities have made it difficult to maintain profitability of pole-and-line fishing in comparison with purse seine fishing gear. Soltai 105 remains the only viable pole and line vessel for chartering as a consequence. Soltai 105 is scheduled for refurbishment of its hull, engine, refrigeration and crew and passenger accommodation. Refurbishment completion is expected before December 2024 if administrative arrangements between NFD and the Solomon Island Government are finalized before September 2024. A refurbished Soltai 105 will provide a suitable vessel for tagging during the period before the Pacific Islands Fisheries Research Vessel is commissioned into operations (see below). Soltai 105 will also complement tagging capacity once this vessel is commissioned.

4.2. Regional Fisheries Research Vessel Project

The design and construction of a regional fisheries research vessel, which will in part be mandated to support PTPP research cruises, continues to progress.

Through a Request for Proposal (RFP) process, a naval architect (NA) has been recruited at the end of April 2023. This allowed a vessel Functionality Study to be developed following involved SPC Divisions (FAME, GEM) and Pacific countries requirement needs. The functionality study provided the Terms of Reference included in a Call of Interest to shipyards that was published in September 2023, concluding in December, with the assistance of the NA. This call of interest resulted in a selection of 5 suitable shipyards that will form part of an RFP to be implemented in the second part of 2024.

Following this, and acknowledging the success of its technical support services, SPC has recruited the NA for the whole project duration. The tasks will cover the vessel basic design, the shipyard selection and vessel construction follow-up work.

In early 2024, the NA began, in consultation with SPC, to work on vessel design, technical documentation and blueprints that will be part of the 2 phase RFP process to select the best boat builder for the project. The 1st phase RFP technical documentation has been completed. Due to ongoing civil unrest and rioting in New Caledonia, a shortage of SPC procurement and legal staff resources has delayed the RFP publication. To assist the NA during the shipyard RFP process and to support decision making in parts of the vessel conception, the project needs to recruit a ship management company. This company will subsequently follow the boat construction and oversee the vessel operation management (mission logistics, vessel and gear maintenance, crew management).

Initial funds to support the design and construction of the vessel have been obtained through The Partners in the Blue Pacific group.

5. PTPP 2024-2027 WORK-PLAN

0		2024	2025	2026	2027	Key	
Tagging	Skipjack-focused cruise	Pole and Line Western Pacific skipjack-focused cruise	Skipjack-focused cruise	Skipjack-focused cruise		Planned activity	
	Bigeye-focused research cruise		Bigeye-focused cruise		Bigeye-focused cruise	Potential activity	
	Tag Seeding through Regional Observer Programmes	Upscale in tag seeding effort and coverage		Continued tag seeding			
Tag Recovery	Support and development of tag recovery network	Training of new TRO for Thailand canneries. Support TROs for Americas ports	Increased engagement from east Asian canneries				
	Support and develop tag recovery and validation	Trial integration of cannery data into tuna product flow network	Development of automatic validation tools				
		Consolidation of historical tag validation					
	Implementation and revision of tag reward schemes	Update and restock of tag rewards					
Data management	Tagging data validation using VMS, logbook, and cannery data	Ongoing					
	Maintain and develop PTPP databases and related tools	Migrate tag release data entry software to TUFMAN2	Trial decentralised TUFMAN2 data entry by TROs				
Data Analyses	Provide tagging data for inclusion in stock assessment and related analyses	Integration of yellowfin tagging data into SEAPODYM	Skipjack tagging data provision	Yellowfin and bigeye data provision			
	Reduce uncertainty in WCPO stock assessments		Updated tagging effects, reporting rates and mixing analyses	Updated tagging effects, reporting rates			
	Increase understanding of tuna-fishing gear interactions and interpretation of fisheries data	Exploration of archival tagging for habitat influenced CPUE indices					

6. RECOMMENDATIONS

SC20 is invited to note the report of ongoing progress in implementation of the PTTP. In particular we recommend that SC:

- Note the critical importance of effective tag seeding for informing stock assessment and support the increased deployment and fleet coverage of tag seeding experiments through regional and national observer programmes.
- Note the need for member participation and support in tag reporting as both wild and seeded tags continue to be found throughout the fishery.
- Note and support the ongoing regional fisheries research vessel project.
- Consider and support the PTTP work-plan for 2024- 2027.

7. ACKNOWLEDGMENTS

We gratefully acknowledge the voluntary contributions from all the entities listed in 1.2 Programme Funding. We acknowledge the support of national fisheries administrations, observer programmes and the tuna fishing industry in assisting with the project, in particular the recovery of recaptured tags. The contribution of both vessel and scientific crew to the successful implementation of the PTTP is gratefully acknowledged.

This report was provided by J. Scutt Phillips, B. Leroy, J. Muir, S. Gislard, C. Sanchez, M. Cunningham, M. Ghergariu and F. Rounsard.

8. REFERENCES

PTTP Steering Committee. 2016. Report of the Pacific Tuna Tagging Programme Steering Committee. WCPFC-SC12-2016/RP-PTTP-01, Bali, Indonesia, 3–11 August 2016.

Punt, A., Maunder, M., and J. Ianelli. (2023) Independent review of recent WCPO yellowfin tuna assessment. WCPFC-SC19-2023/SA-WP-01.

9. APPENDIX A – PLANNING ADVISORY COMMITTEE MEETING REPORT

PTTP 2024 Cruise Planning Advisory Committee Meeting

30th January 2024

11:00-12:00 (UTC+11)

Hybrid Meeting: Nouméa and Microsoft Teams

Adopted agenda provided in Annex 1, participation list in Annex 2.

1. EXECUTIVE SUMMARY

- 2023 CP-16 cruise completed, 11,282 conventional tags released
- Industry participation was at highest level yet, almost doubling the number of drifting FADs shared with the research team
- Recent movement to transfer ownership of the Soltai 105 from SI government to NFD is the next step toward the refurbishment of the vessel, with funding provided by NZ/SPC
- After exploring several options to fulfil the required 2024 Skipjack focussed tagging cruise, it was decided that cruise targeting SKJ will be implemented using the Soltai 105 after the completion of this refurbishment
- Tag recovery efforts continue to produce quality data from the TRO network, as well as with participating fleets with incentives to find tags onboard during fishing
- IATTC TRS network continues to be beneficial to both SPC and IATTC but the funding strategy needs to be addressed
- JPTP tagging efforts in 2023, deployed 1900 conventional and 80 archival tags in SKJ
- The Regional Tagging Vessel planning continues to move forward with more work planned in 2024

1. Welcome and Preliminaries

Joe Scutt Phillips acted as chair, and welcomed all participants, and presented the draft Agenda (Annex 1). No additions or alterations to the agenda were requested, and so was adopted. He provided a brief overview of the PTTP and its mandate.

2. 2023 CP16 cruise summary

Jeff Muir provided a summary of CP-16 which was implemented in August-September 2023 on the F/V Gutsy Lady 4, originating in Honolulu, Hawaii. The scientific team consisted of 2 SPC staff, 1 IRD staff, and 2 contractors.

During the 45-day cruise, 11,282 tags were deployed (53%B, 40%Y, 7%S). A large amount of effort was concentrated around marking fish with SrCl₂ solution; 1656 were marked with this method and tagged with white conventional tags. Of these, a live biopsy was taken from 951 in the hope that a sample would be taken at recapture for epigenetic analysis. Biosampling was also conducted; 306 fish were sampled following standard PMSB protocols. A collaborating scientist from IRD deployed 96 acoustic tags in tuna on an array of 7 dFADs near Malden Island to explore their behaviour around dFADs.

The nearly 6000nm cruise track visited the Palmyra, Kiribati Line Islands, and international waters (IW). Of the nearly 1400 industry-provided dFADs, 76 were visited during CP-16. Only one TAO mooring, the 2N/155W was visited (on 2 occasions); a small aggregation was detected, and a few fish were tagged. Generally, (and in contrast to other previous campaigns in the region) fishing was hampered by large numbers of small (<37cm) fish which seemed to be widespread and omnipresent throughout the study area. Despite this, the team managed to deploy more tags than any other CP cruise, due in equal parts to the ever-increasing number of industry-provided dFADs, evolving fishing techniques aboard the charter vessel, and a highly adept team aboard her.

3. 2024 skipjack-focused tagging cruise: Options, vessel and crew availability

Leading up to the PTPP advisory committee meeting, several alternatives for SKJ-focused cruises were reviewed:

1. Short-distance CP-style cruise aboard F/V Gutsy Lady 4 from Hawaii, targeting the area around the equatorial Line Islands. Utilize industry-provided dFADs to tag on mixed aggregations. Use sport fishing equipment to troll and jig for SKJ with modest release goals for a proof of concept to tag SKJ on a non-pole and line vessel. Use results from this cruise to inform future endeavours where more steaming time is involved (as in option 2 immediately below).
2. Long-distance CP-style cruise aboard F/V Gutsy Lady 4 from Hawaii, targeting Tuvalu, and Gilbert Islands area. Utilize industry-provided dFADs to tag on mixed aggregations. Use sport fishing equipment to troll and jig for SKJ with modest release goals. More transit time to get to target area makes this option the least cost-effective, and higher risk if even modest numbers of SKJ cannot be caught.
3. Contracted range pole and line tagging trip aboard the Soltai 105, based on its last known condition from the 2022 cruise. Tag SKJ around aFADs around New Georgia/Western Province for a short duration.
4. Larger range pole and line cruise on the refurbished Soltai 105 hopefully in the last quarter of 2024 (see Russell Dunham's update about the vessel below).

More than likely, option 4 is the only viable option to tag meaningful numbers of SKJ with an available budget in 2024.

Simon Nicol noted that, unless there were objections, this would be the avenue pursued for the planned skipjack-focused PTTTP cruise.

Other vessels

Solander, a Fiji-based longline company, responded to an informal SPC query for suitable (non-pole and line) vessels to fulfill tagging objectives in the region. They offered the names of 2 of their vessels, but to date, no detailed information has been provided about the specifications of the vessels. Similarly, the Tuvalu-based vessel Manau II was evaluated but has insufficient range to complete CP-style trips.

4. 2024 skipjack-focused tagging cruise: Formalities, permitting, and drifting FAD access

Russell Dunham updated the status of the Soltai 105 transfer and logistics for a refit in 2024. Recently, the SI Government Ministry of Finance sent an MOU for the transfer of the Soltai 105 to NFD/Bolton for their review and signature. NFD/Bolton is now in the process of reviewing the MOU to finalize this process. Once this is complete, a representative will come from Nelson Shipyard (NZ) to evaluate the refurbishment needs of the vessel (hopefully mid-February). SPC staff will be present for this visit to confirm the proposed refurbishment will meet the criteria for future tagging experiments.

Russell Dunham responded to a question from Simon Nicol about the amount of time a refurbishment of this scale would take, and Russell responded that it would likely take 2-3months + 20 days of transit time to and from the shipyard in NZ.

5. Tag Recovery: current and planned activities

Special reward schemes continue with bi-annual seasons with participating fleets. This approach seems to be effective with vessels in the program; many tags have been reported by observers onboard recently. Tagged fish discovered onboard while fishing, where an observer is present, are always the best in terms of data quality.

A contract for a new Thailand Tag Recovery Officer is underway to replace recently retired personnel there.

WP6 (2022) skipjack-focused recoveries extremely high > 40%

CP16 (Aug/Sept 2023) Central Pacific dFAD recaptures (mostly YFT and BET) are beginning to trickle in from ports across the entire region and IATTC. All validated recaptures are west of the 150.

A large-scale tag-seeding effort will be explored by SPC to better understand gaps and deficiencies in the tag recovery network and how to improve data quality for recaptures.

Dan Fuller asked for clarification on how SPC recaptures were validated, noting that IATTC recaptures are validated by on-site Tag Recovery Specialists using well vessel well log sheet data. SPC uses VMS data to validate non-observer recorded recaptures.

Simon Nicol asked Dan Fuller about any news for upcoming IATTC tagging, and if he thought funding for the IATTC TRS network would be available in the coming years. Dan Fuller responded that there would likely be no IATTC tagging cruises until 2026 and that he hopes that SPC and IATTC could come up with a mutually beneficial arrangement to keep IATTC TRSs in place during these years. Current funding for IATTC TRSs, provided by SPC, expires on 31 May 2025.

6. Other regional tagging

Japanese colleagues summarized tagging efforts in 2023, in which approximately 1900 conventional and 80 archival tags were released in SKJ. Low recapture rates continue to hamper the JPTP, with limited explanation for why this is occurring. This, combined with a lack of funding and human resources will limit the chances of tagging cruises moving forward by JPTP. It was noted that Japan will likely find other ways to estimate the exploitation and connectivity of SKJ in the region.

7. Update on Regional Tagging Vessel

2023 activities

- Jan-Mar: RFP process to recruit a Technical Assistant to build the vessel, 6 applicants applied.
- May-Sep: Ship-ST naval architect realised a vessel functionality study. This study was used to write the terms of reference for a call of interest directed to potentially suitable shipyards.
- Sep: Call of Interest sent to shipyards.
- Dec: 5 shipyards selected to be part of the next RFP phase.
- Vessel complete design and building assistance contract signed with Ship-ST for 3 years.
- Country consultation during the WCPFC Rarotonga meeting to present options for vessel governance and naming.

2024 activities

- RFP to recruit a vessel management company.
- Shipyard RFP process with the naval architect; final selection, contract signature with the selected shipyard, and start of the vessel construction.
- Project update report at Heads of Fisheries 2024.
- Country consultation continues to establish a vessel governance scheme.

8. Any other business

Closing statement: There were no other questions or concerns brought up by participants; the content of the meeting and plans moving forward are considered to be adopted by the PTTTP advisory committee.

Next meeting: The next meeting will be the standing PTTTP Steering Committee, to be held prior to the WCPFC Scientific Committee in early august.

Annex 1. Standing Agenda

PACIFIC TUNA TAGGING PROJECT PLANNING ADVISORY COMMITTEE MEETING

30th January 2024 11am to 12am Solomon Islands time (UTC+11)

Virtual Meeting, MS Teams

1. AGENDA

1. Welcome, preliminaries
2. 2023 CP16 cruise summary
3. 2024 skipjack-focused tagging cruise: Options, vessel and crew availability
4. 2024 skipjack-focused tagging cruise: Formalities, permitting, and drifting FAD access
5. Tag Recovery: current and planned activities
6. Other regional tagging
7. Any other business

Annex 2. Participants List

Name	Email	Role
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