



**SCIENTIFIC COMMITTEE
EIGHTEENTH REGULAR SESSION**

Online
10-18 August 2022

**REPORT OF THE PACIFIC TUNA TAGGING PROGRAMME
STEERING COMMITTEE
(PROJECT 42)**

WCPFC-SC18-2022/RP-PTTP-02

PTTP Steering Committee

1. Preliminaries

The 16th meeting of the PTTP Steering Committee was held via [video conference](#) on [26th July 2022](#) in preparation for the online Eighteenth Regular Session of the WCPFC Scientific Committee.

Background

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 PTTP, originally specified in [WCPFC-SC6-2010/GN-IP-04](#), and revised in 2016 ([SC12-RP-PTTP-01: 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 assessment regions and other adjacent regions of the Pacific basin, species-specific vertical habitat utilisation by tunas, and the impacts of FADs on their behaviour.

The PTTP Steering Committee was established by SC2 to provide guidance and oversight in the development of firstly the project document (WCPFC Regional Tagging Project Steering Committee, 2006) and subsequently of operational plans, implementation and analytical work. The current donors to the project are the WCPFC, the Republic of Korea, the Pacific Community (SPC) and the European Union.

Review and adoption of agenda

The provisional agenda was adopted and is provided in **Annex 1**.

A list of participants is provided in **Annex 2** of this report.

2. PTTP Progress Report

SPC provided a presentation of PTTP Activities as described in [SC18-RP-PTTP-01](#). The presentation followed the draft agenda sub-headers. A summary of their presentation is as follows.

Since SC17, PTTP activities have included one Central Pacific voyage, CP15, in the waters of Kiribati and the surrounding high seas, continued implementation and refinement of tag recovery processes, and associated tagging data analyses. Preparations for WP6 began in early 2022, with the objectives of tagging 10,000 skipjack tuna in the Solomon Island waters in Sep-Oct 2022.

2.1 Tagging Activities

2021 CP15 Cruise

The 39-days cruise was implemented (15 Jul to 22 Aug) during the FAD fishing closure period to utilise drifting FAD positions provided by the purse seine fishing industry and to reduce the probability of recapture of tagged fish immediately after tagging (i.e., to increase the opportunities for tagged fish to disperse and mix with the untagged population). In total, 7,890 fish were tagged including 166 archival tags. The cruise achieved all expectations including a high number and wide distribution of tag releases and the biological sampling for the Pacific Marine Specimen Bank.

2.2 Tag recovery

As at the 13 July 2022, a total of 84,059 tagged tuna had been recaptured and the data reported to SPC.

While a reduced return rate for central Pacific cruise since CP9 continues, last year's CP15 cruise showed much improved numbers of returns, with 12.7% after less than one year. This appears to be the result of higher numbers of releases in a size range of bigeye tuna targeted by purse seine vessels, concentrated fishing pressure east of the tagging cruise area, and improved tag recovery engagement with the purse seine fleet operating in that area. Electronic tag returns have also been high from this cruise, at a rate of almost 20%.

The new tag reward schemes commenced in 2020 have continued, including cannery lotteries, seasonal rewards for tags returned directly from vessels, and the doubling of the standard conventional tag reward.

Initial development with Hallprint on security coded tags has been completed, with an initial batch of 20,000 units now in production. These tags are sequentially numbered as before, but include a three-character, random alphanumeric code. These will help streamline and secure tag recovery and validation in the future.

2.3 Tag Data Analyses

The results of the 2020 longline tagging experiment have now been published in Muir et al. (2020), and have been provided in an abridged format to SC18 ([SC18-SA-IP-12](#)). Skipjack tagging data from the PTPP have informed both analyses of growth and tag mixing for the assessment of this species, and these analyses are detail in [SC18-SA-IP-06](#) and [SC18-SA-WP-04](#), respectively.

Preliminary network analysis of tuna product flow from catch to sale have been completed for a subset of tagging data around PNG and the Solomon Islands, with promising results for automating aspects of tag validation and understand fishery networks in the future.

From February 2007 to July 2022, a total of 604 tag seeding kits (consisting of seeding tags, applicators, guidebooks and data forms) for a total of 15,223 tags have been given to observer coordinators and Tag Recovery Officers (TROs) in Tonga, Ecuador, PNG, Solomon Islands, Fiji, FSM, Marshall Islands, Kiribati, New Zealand and American Samoa for deployment on purse seine vessels by senior observers.

As of the writing of this report, only three seeding have been deployed the PNG observer programme. This continues the trend of few and spatially limited tag seeding experiments during the past five years, still falling well below the 32 experiments per year (1,200 tags) that was recommended to capture any temporal changes in reporting rate (Peatman et al. 2019 WCPFC-SC15-2019/SA-IP-06). The suspension of observer programs in the WCPFC in response to the COVID19 pandemic effectively removed the opportunity for tag seeding deployment in 2021-22. Noting the decisions to lift the suspension from January 2023, SPC has arranged with national and regional observer programs for increased priority for deployment of seeded tags. Arrangements include incentives for encouraging deployment during observer placement and debriefing meetings.

3. WORK PLAN 2022-2025

The proposed 2022-2025 workplan for the PTPP is provided in **Annex 3** of this Steering Committee report. The Steering Committee was reminded that the work-plan recognises the decisions of SC in 2016 to normalise the tagging programme as part of the ongoing work of SC ([Paragraph 848, SC12 Summary Report, 2016](#)), and the decisions of SC13 in 2017 where this rolling medium-term research

work-plan was endorsed and supported the PTTTP as part of the ongoing work of the SC ([Paragraph 630, SC13 Summary Report, 2017](#)). However, restrictions imposed by the ongoing COVID19 pandemic have severely restricted the programme's ability to follow all of these planning measures.

3.1 Tagging Activities

An informal PTTTP Planning Advisory Committee was established during SC16 to assist with PTTTP cruise planning. The Advisory Committee convened twice since SC17 and assisted with the preparation of cruise plans and tag recovery for 2021-22. Dedicated webpage for the Advisory Committee meetings is at <https://meetings.wcpfc.int/meetings/pttp-cpac>.

2022 Cruise options

The existing uncertainties about accessing port facilities or bait-ground area in nearby countries (like FSM) for the remainder of 2022 has restricted this year's WP6 tagging cruise to be implemented only within the Solomon Islands waters. The planned one month is scheduled to depart on the 15th of Sep. from Noro port and the scientific crew will include 5 SPC staff, 1 person for the Solomon Islands National University and 1 observer from the Minister of Fisheries and Marine Resources.

The objective is to tag about 10,000 skipjack to provide data for the scheduled 2025 stock assessment for this species. Some of the tagged skipjack will be injected with Strontium Chloride (SrCl). Tissue biopsy will also be collected from these fish. Recaptures of these SrCl₂ marked SKJ will contribute important data to the ongoing SKJ otolith age validation work. Additionally, taking a genetic sample from these SrCl₂ marked fish at release will provide much-needed samples for validation of the epigenetic ageing model for SKJ. This will be particularly useful if at least some of the WP6 SrCl tagged fish remain at liberty for more than six months (and assuming that otoliths are also able to be extracted and muscle biopsy taken from these recaptured fish).

The Pacific Marine Specimen Bank will be supplemented with different types of biological samples taken from the fish that could not be tagged. This will include testing of potential standard operating procedures (SOP) for tissue collection necessary for Close-Kin-Mark-Recapture applications (see [SC18-SA-IP-10](#)) and SOP for collecting stomach microbiome scapes (see [SC18-EB-IP-05](#)).

2023 Cruise options

Next year it is anticipated to implement a bigeye focus tagging experiment in the Central Pacific area, possibly from Tuvalu as it was originally planned in 2020. Contact have been engaged with French IRD Marine Research Institute to discuss the possibility of implementing a collaborative large scale acoustic study on tuna movements associated with dFADs.

3.2 Tag Recovery Network

The current push for increased engagement with industry will be continued, further promoting new reward schemes and examining where there is potential for increasing the recovery of tags at the point of capture. A strong tag recovery network, with experienced recovery officers and historically well understood flow of tags exists in the Solomon Islands in the area of the upcoming WP6 tagging cruise. Given the planned release of SrCl marked fish during this cruise, additional refresher training for biological sampling is planned immediately following the completion of the cruise, where historically many tagged fish have been found during offloading in the port of Noro.

New security coded tags are also planned for release during this upcoming cruise.

3.3 Data Management

The current PTTTP database, Tagdager, will be migrated to the TUFMAN2 platform, which is already used for observer data. This platform permits a variety of improvements, such as streamlining of the tools used by analyses and TROs, and web-based access. It will also support the integration of future

improvements and tools such as AI-based tag data validation, and improved tag recovery intelligence tools such as Maxitag.

3.4 Tag Data Analyses

Planned analyses include the preparation and provision of tagging data for the bigeye and yellowfin tuna assessments due to be presented at SC19. This may include further development of the Ikamoana tagging simulator.

The incorporation of tagging data into SEAPODYM will also be further developed, possibly prioritising updated versions of the skipjack and bigeye reference models.

4. RELATED TAG ACTIVITIES

No pressing related activities were highlighted by the Steering Committee.

5. OTHER REGIONAL OR SUB-REGIONAL TAGGING

Japanese FRA tagging programme

Japanese colleagues from the National Research Institute of Far Seas Fisheries presented an update on their recent and planned tagging activities.

Two skipjack tagging cruises were successfully undertaken as part of the Japanese tagging programme during 2021-2022. These were the scheduled cruises in the North-eastern area off Japan during October, and an equatorial cruise near the Northern Mariana Islands and the EEZ of the Federated States of Micronesia. Tag return rates have been so far extremely low (<1%) for this most recent cruise, but given the delay in tag reporting this is expected to increase with time.

Two skipjack tagging cruises are planned for the following 12-month period.

1. Oct 2022
 - The North-Eastern area of Japan (40N and 150E)
 - 2,500 conventional tags with 100 Archival tags
2. Dec-Feb 2023
 - Outside the EEZ of Federated States of Micronesia
 - 5,000 conventional tags with 130 Archival tags.

An exchange of conventional tags has continued between SPC and FRA to provide data for potential analyses of variation in reporting rates.

6. ADMINISTRATIVE MATTERS AND RECOMMENDATIONS

No administrative matters or other business were raised.

The Steering Committee endorsed the recommendations of the PTPP report to SC18 (SC18-RP-PTTP-01 as follows:

- Note the successful 2021 CP15 tagging voyage, despite the unfolding Covid19 pandemic.

- Note the critical importance of effective tag seeding to informing stock assessment, and support an urgent increase (when feasible) in deployment and fleet coverage of tag seeding experiments and assist with developing alternative approaches to understand the flow of tags through tuna product networks.
- Note the need for continued member participation and support in tag reporting;
- Support the 2023 tagging programme, and associated budget (Appendix 4);
- Support the 2024-2025 tagging programme, and associated indicative budget; and
- Consider and support the PTPP work-plan for 2022-2025

7. STEERING COMMITTEE DISCUSSION

The Steering Committee asked for clarification on the compatibility of SrCl and Oxytetracycline (OTC) marked otoliths for validating otolith ageing methods (noting that the IATTC uses OTC rather than SrCl). The Scientific Services Provider (SSP) advised that although the wavelength frequencies to illuminate SrCl and OTC marked otoliths differ there should be no other differences in the interpretation of the marks and the data should be compatible. The SSP also noted that it prefers SrCl to avoid any potential food health and safety issues associated with OTC marking. The Steering Committee also noted the importance of promoting the return of whole fish that are SrCl marked to ensure that otoliths are extracted. The SSP noted that for the key locations where WP6 fish are expected to be unloaded they have also scheduled enhanced refresher training for PTPP agents and TROs to collect the whole fish for SrCl recaptures. The training also includes revision of otolith extraction methods and biopsy sampling.

The Steering Committee noted the improved tag recovery rate observed in the last 12 months, particularly for electronic tags released during CP15, and encouraged the SSP to continue with its tag reward schemes. The Steering Committee noted that there will be opportunities to compare the recovery rates between PTPP and JP releases in the coming years which may also assist with obtaining a better understanding of the variability in recovery between fleets and unloading locations. The SSP noted that in general its network of TRO's and PTPP agents was working well, however it noted that due to the COVID19 pandemic restrictions there had been less recovery effort in some distant water fishing nations (e.g., Korea, China, Chinese Taipei) and these would become a priority once travel and other restrictions are lifted.

8. ACKNOWLEDGEMENTS

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 Republic of China;
- Heinz Australia;
- the Global Environment Facility;
- the International Seafood Sustainability Foundation;
- the European Union (through voluntary contributions to WCPFC);
- and the WCPFC itself.

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 PTTTP is gratefully acknowledged. Particular thanks to Jeff Muir for logistics and implementation of the CP15 tagging voyage operating out of Hawaii.

9. ADOPTION OF REPORT

A draft report of the Steering Committee of the PTTTP was provided to members on the 28th July through email. Steering Committee members were invited to make comment until, and provide endorsement by, the 10th of August. These comments were collated into the final report, which was posted to the 18th Scientific Committee website at <https://meetings.wcpfc.int/node/16346>.

**PACIFIC TUNA TAGGING PROJECT
STEERING COMMITTEE**

Electronic Meeting
26 July 2022 (from 11:00-12:00 hours Pohnpei time (UTC+11 hours))

ADOPTED AGENDA

WCPFC-SC18-2022

- 1. PRELIMINARIES**
 - 1.1 Review and Adoption of Agenda**

- 2. PTPP PROGRESS REPORT**
 - 2.1 Tagging**
 - 2.1.1 2020 CP15 Cruise Tag Recovery**

 - 2.2 Tag Data Analyses**

- 3. WORK PLAN 2021-2022**
 - 3.1 Tagging**
 - 3.1.1 2022 WP6 Cruise**
 - 3.1.2 2023 Tagging Cruise Options**

 - 3.2 Tag Recovery Network**
 - 3.3 Data Management**
 - 3.4 Data Analyses**

- 4. RELATED TAG ACTIVITIES**
 - 4.1 EEZ permits and country requirements**

- 5. OTHER REGIONAL OR SUB-REGIONAL TAGGING**
 - 5.1 Japanese FRA Tagging Programme**

- 6. ADMINISTRATIVE MATTERS**
 - 6.1 Administrative Matters**

- 7. ADOPTION OF REPORT**

Annex 2. Registered participation list of the 2022 PTTP Steering Committee

Name	Delegation
Aoki Yoshinori	FRA Japan
Aurelie Guillou	Pacific Community
Aurélien Panizza	Pacific Community
Bruno Leroy	Pacific Community
Dave Itano	The Nature Conservancy
Elaine G. Garvilles	WCPFC Secretariat
Francois Rousard	Pacific Community
Graham Pilling	Pacific Community
Jed Macdonald	Pacific Community
Jessica Farley	CSIRO
Joe Scutt Phillips	Pacific Community
John Annala	New Zealand MPI
John Hampton	Pacific Community
John Morrongiello	Melbourne University
Jon Lopez	IATTC
Juan Wang	Melbourne University
Leanne Fuller	IATTC
Leyla Knittweis	New Zealand MPI
Malo Hosken	Pacific Community
Maturaba Naoto	FRA Japan
Michael Marsik	NOAA
Ren-Fen Wu	Taiwan FA
Shane Griffiths	IATTC
Simon Nicol	Pacific Community
Stephen Newman	DPIRD Australia
SungKwon Soh	WCPFC Secretariat
Valerie Alain	Pacific Community
Vanille Barthelemy	Pacific Community

Annex 3: Proposed PTPP work-plan for the period 2022-2025.

Activity		2022	2023	2024	2025
Tagging	Pole and line tagging research cruise - Skipjack-focused - Yellowfin secondary	Solomon Islands focused WP6 cruise Seek support for regional research vessel		Continued skipjack-focused research cruise	
	Dangler trolling/rod & reel tagging research cruise - Bigeye-focused - Yellowfin secondary		CP16 bigeye-focused cruise with increased electronic tagging		Bigeye-focused central Pacific cruise
	Tag Seeding - Deployment of seeding kits via regional observer programmes	Continued suspension of observer programme causing disruption to seeding kit deployment	Seek a return to ongoing tag seeding		
Tag Recovery	Support and development of tag recovery network - Development of tools to increase tag recovery efficacy	Continued tag recovery intelligence tools development. Review of MRAG performance	Exploration of tuna product flow using network analysis Roll-out of key-coded tags		
	Implementation and revision of tag reward schemes	Further revision of tag reward schemes			
Data management	Tagging data validation using VMS, logbook, and cannery data	Ongoing			
	Maintain and develop PTPP databases and related tools	Continued development of updated PTPP database			
Data Analyses	Provide tagging data for inclusion in stock assessment	Skipjack tagging data for stock assessment	Provision of yellowfin and bigeye tagging data		Skipjack tagging data provision
	Reduce uncertainty in WCPO stock assessments	Ikamoana tag mixing simulations included in skipjack stock assessment	Explore potential for bigeye and yellowfin tag mixing simulations		
	Increase understanding of tuna-fishing gear interactions and interpretation of fisheries data	Exploration and trials of new electronic tagging technologies	Review potential for large-scale acoustic tagging around dFADs		

Annex 4 Summarised PTTP activities and achievements for 2022 and indicative milestones and budget for 2023.

2022 SCOPE OF WORK	ACHIEVEMENT	REFERENCE
Subject to the decision by the PTTP Advisory Committee meeting in 2022, support for the agreed tag-release cruise(s) for conventional and archival tagging and biological sampling in the western and central equatorial Pacific during 2022, targeting the agreed tropical tuna species	CP15 successfully implemented. Tagging Vessel Biological Sampling arrangements implemented Scheduling and planning for WP6 completed.	See Section 2.1 SC18-RP-PTTP-01 See section 3.1 SC18-RP-PTTP-02
Maintain and enhance as appropriate the tag recovery network and pay tag rewards including via cash or t-shirt	Tag Recovery network has been maintained and new tag recovery incentive schemes implemented to encourage tag recovery	See Section 3.1 SC18-RP-PTTP-01 See section 3.2 SC18-RP-PTTP-02
Conduct PTTP data verification with VMS and Logbook, and cannery data;	Tag Validation continued and new methods for validation developed including network analyses to quantify uncertainties.	See Section 3 SC18-RP-PTTP-01
Consolidate web-tagging, recapture and tagging database frameworks	Migration of PTTP information systems to TUFMAN2 platform commenced to allow for web-based data entry and access by registered users	See Table 9 SC18-RP-PTTP-01
Conduct data analyses on tag reporting and seeding, fishing and natural mortality, tagging mortality, movement and tag simulation	PTTP data included in analyses of natural mortality (<i>Fisheries Research</i>). PTTP data included in evaluation of tag mixing assumptions Tag reporting and seeding analyses updated	See SC18-SA-WP-04, SC18-SA-IP-12, SC18-SA-IP-19
Facilitate conduct of quarterly PTTP Cruise Planning Advisory Committee meetings in 2022	Three Advisory Committee meetings held	See Annex A SC18-RP-PTTP-01
Support for the development and implementation of a work plan for 2022 tagging activities as outlined in the 2021 PTTP report to SC17	2023 Workplan and awaiting SC18 approval	See SC18-RP-PTTP-01 See Table below
Preparation of PTTP Steering Committee meeting in conjunction with SC18 and production of the PTTP Progress Report and the 2021 Steering Committee Report.	PTTP Steering Committee held electronically on 26 July 2022	See SC18-RP-PTTP-01 See SC18-RP-PTTP-02
OUTPUTS AND SCHEDULE		
Undertake the agreed tagging cruise(s) aboard a chartered multipurpose fishing vessel	CP15 Completed and reported upon	See SC18-RP-PTTP-01, SC18-RP-PTTP-02
A PTTP progress report for 2022 with a PTTP work plan for 2023	https://meetings.wcpfc.int/node/16209	See SC18-RP-PTTP-01, SC18-RP-PTTP-02
Convene the 2022 PTTP Steering Committee meeting in conjunction with the SC18	https://meetings.wcpfc.int/node/16209	See SC18-RP-PTTP-02
Submission of a Steering Committee report to the WCPFC Secretariat	https://meetings.wcpfc.int/node/16209	See SC18-RP-PTTP-02

Submission of a final project report for 2021 PTTP to the WCPFC Secretariat	Due December 2022	
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2023 SCOPE OF WORK	Indicative WCPFC Budget (USD)	SPC Third Party* contributions (USD)
Administration Services, Project Management (including quarterly PTTP Cruise Planning Advisory Committee meetings)	134,000	50,000
Implement agreed tag-release cruise(s) for conventional and archival tagging and biological sampling in the western and central equatorial Pacific during 2023, targeting the agreed tropical tuna species	500,000	300,000
Deployment of seeding kits via regional observer programmes	12,000	
Support and development of tag recovery network	50,000	150,000
Develop tools to increase tag recovery efficacy	25,000	
Undertake tag recovery validation		60,000
Exploration of tuna product flow using network analysis to assist tag validation	50,000	
Implementation and revision of tag reward schemes	75,000	25,000
Maintain and develop PTTP databases and related tools	50,000	150,000
Prepare tagging data and related parameter estimates for stock assessment		100,000
Undertake tagging simulation for alternative mixing scenarios used in stock assessment and MSE		50,000

*Third-party contributions include SPC programme funds provided by Australia and New Zealand and those of the European Union's Pacific-European-Union-Marine-Partnership project