



**SCIENTIFIC COMMITTEE
11TH REGULAR SESSION**

POHNPEI, FSM
5th -13th August 2015

**REPORT OF THE PACIFIC TUNA TAGGING PROGRAMME STEERING
COMMITTEE**

WCPFC-SC11-2015/RP-PTTP-01

PTTP Steering Committee

Preliminaries

Background

The Pacific Tuna Tagging Programme (PTTP) is a joint research project being implemented by the Oceanic Fisheries Programme (OFP) of the Secretariat of the Pacific Community (SPC) and the PNG National Fisheries Authority (NFA) with assistance from the Western and Central Pacific Fisheries Commission and the Inter American Tropical Tuna Commission. The goal of the Pacific Tuna Tagging Programme is to improve stock assessment and management of skipjack, yellowfin and bigeye tuna in the Pacific Ocean. The specific objectives are:

1. To obtain data that will contribute to, and reduce uncertainty in, WCPO tuna stock assessments.
2. To obtain information on the age-specific rates of movement and mixing of skipjack, yellowfin and bigeye tuna in the equatorial WCPO, between this region and other adjacent regions of the Pacific basin, and the impact of FADs on movement at all spatial scales.
3. To obtain information on species-specific vertical habitat utilisation by tunas in the tropical WCPO, and the impacts of FADs on vertical behaviour.
4. To obtain information on local exploitation rates and productivity of tuna in various parts of the WCPO.

The PTTP Steering Committee was established by SC2 to provide guidance and oversight in the development of firstly the project document (WCPFC-SC3-GN-WP-10) and subsequently of operational plans, implementation and analytical work. The 9th meeting of the PTTP Steering Committee was held at the 11th Regular Meeting of the WCPFC Scientific Committee, Pohnpei, FSM on 6 August 2015. The current donors to the project are Papua New Guinea, New Zealand, Korea, European Union and the WCPFC.

Review and adoption of agenda

The provisional agenda was adopted.

PTTP Progress Report (SC10-RP-PTTP-02, SC10-RP-PTTP-03, SC10-RP-PTTP-05, SC10-SA-IP-06)

Since the last PTTP Steering Committee meeting, one tagging cruise, CP10, in the tropical central Pacific has been conducted in addition to continued implementation and refinement of tag recovery processes, tag seeding, and data preparation for use in WCPO stock assessments. CP10 was a cruise of 25 days duration conducted in Aug 2014 targeting bigeye tuna aggregations associated with the TAO oceanographic moorings straddling the Equator at 170°W. CP-10 was designed to include data collection on tuna movements, exploitation rates and fish aggregation device (FAD) association dynamics. This work is the result of collaborations between SPC, Tri Marine and ISSF.

The Tonga-based multipurpose vessel Pacific Sunrise was chartered for the cruise. A total of 305 tuna (195 bigeye, 98 yellowfin and 12 skipjack) were tagged. Within these releases, 24 archival tags were deployed on bigeye tuna and 8 on yellowfin tuna. Three drifting FADs were equipped with a satellite communicating acoustic receiver manufactured by Vemco. These types of units utilize Iridium satellite communication and eliminate the need to retrieve the receiver to download information. Sixty-eight fish were implanted with acoustic tags across the 3 equipped dFADs. Half of the fish were tuna (bigeye, skipjack and yellowfin) and the other half were composed of sharks, triggerfish, rainbow runner and wahoo.

CP10 was an unusual cruise amongst the other Central Pacific tagging experiments. The cruise was hampered with the lack of large bigeye aggregations under the TAOs along the 170°W meridian and with the abundance of natural bait in the area resulting in poor bite on our fishing gear. However the first attempt to release tagged fish around drifting FADs was successful.

The total tag releases for the PTPP is 396,894 tuna including 1437 that were tagged with archival tags. Over 70,000 tagged tuna had been recaptured and the data reported to SPC. Tag attrition follows the expected declining pattern with the rate of decline in skipjack tag returns indicating their shorter expected lifespan and higher natural mortality when compared to yellowfin and bigeye tuna. The recovery rates of yellowfin and bigeye tagged with archival tags and conventional tags vary depending on cruise indicating increased tag rejection/fish mortality with archival tagging on some cruises. Tag recoveries have been received from all vessel nationalities involved in the purse seine fishery. The pattern of recoveries is very similar to that reported to the steering committee at SC10 in 2014.

Full-time Tag Recovery Officers continue their duty in Wewak, Madang, Lae, Rabaul, General Santos, Tarawa and Manta. The establishment of these positions has provided greater opportunity for collection of tags during unloading, transshipments and processing in canneries with more complete and reliable capture information.

To aid in the implementation of tag seeding experiments, training is provided as part of the PIRFO Observer training courses. Tag Recovery Officers liaise closely with Observer coordinators, Observer debriefers and observers to implement tag seeding experiments and to recover the tag seeding logs for deployed kits. There have been 6,287 reported tags that have been seeded and 3,613 of these have been returned to SPC. In addition to allowing estimation of tag reporting rates, the tag seeding data also allow the error rate in tag return information to be determined. The accurate reporting of vessel name is particularly important for validation of location and time of recapture using VMS and log book data. The analyses of the tag seeding data indicate that there are often substantial errors in the reported tag recovery dates and positions.

A number of analyses have been undertaken using the PTPP tagging data. Three analyses of bigeye vertical behaviour have been undertaken using archival tag data. The first explores the influence of physical and environmental variables on the catchability and selectivity of bigeye fisheries operating in the Western and Central Pacific. The second has replicated previous work from the EPO by IATTC to classify vertical behaviour and allows for direct comparison with this work. The third has applied multivariate-normal hidden Markov chain modelling to each individual time series to also classify vertical behaviours to describe surfacing behaviour of bigeye and yellowfin. Analyses were undertaken to estimate the

behaviour of skipjack and yellowfin in nearshore habitats and the effect of fish length on horizontal displacements of skipjack, yellowfin and bigeye.

The PTTP also provided an opportunity to collect samples as part of a long-term project to characterize the trophic status of the western and central Pacific pelagic ecosystem. Since the beginning of the PTTP, 5822 stomach samples have been collected, mainly from skipjack, yellowfin, bigeye and albacore tuna. The examination of the stomachs is an ongoing process and is conducted in the laboratory at SPC headquarters.

2015-2016 Work Plan

The proposed PTTP work plan for the period 2015-2016 comprises:

- CP11 (September - November 2014) currently the last cruise without additional funding support
- Tag Recovery
- Further analyses of tag seeding data and reporting rates
- Inclusion of tagging in MFCL and SEAPODYM

Other Regional or Sub-regional Tagging Projects

Japan

Skipjack archival tagging in Japan has been conducting since 2011 between January and July mainly from subtropical area between 20°N-25°N latitude. Since the report provided at SC10 a further 2,263 skipjack were tagged with conventional tags and 500 with archival tags. These tag releases and recoveries will be made available for incorporation into future stock assessments. Collaboration with other organisations and countries will be required to ensure tag recovery is high.

Administrative Matters

The support of all current and past donors was gratefully acknowledged as were the efforts of all contributors and project collaborators.

Discussion

The Steering Committee noted that the field component of the PTTP will finish in 2015 if no further donor funds become available. The results of the analyses on the vertical behaviour of bigeye were discussed in detail. The discussion included the physiological and anatomical capability of bigeye to forage through the deep scattering layer, the greater affinity for bigeye to associate with floating objects and their vulnerability to capture at pre-dawn periods and how this vulnerability may vary spatially in the WCPO. Discussion was also focussed on the influence of bigeye size on tuna vertical behaviour. The steering committee noted that this work has direct management implications, particularly concerning options for mitigation measures to prevent juvenile bigeye catch by purse-seine vessels.

The Steering Committee discussed that that the Japan tagging project has not detected much away from the north west Pacific as yet.