



**Oceanic Fisheries Programme**  
**Secretariat of the Pacific Community**

**Annual Report 2007**

**and**

**Work Plan 2008**

February, 2008

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## ACRONYMS

CES	Catch and Effort Query System
CLIOTOP	Climatic Impacts on Top Predators Project
CRGA	Committee of Representatives of Governments and Administrations
CROP	Committee of Regional Organisations of the Pacific
EAFM	Ecosystem Approach to Fisheries Management
EC	European Community
EEZ	Exclusive Economic Zone
FAD	Fish Aggregation Device
FFA	Forum Fisheries Agency
FRDC	Fisheries Research and Development Corporation (Australia)
GEF	Global Environment Facility
MULTIFAN-CL	Computer software used for regional stock assessments
NTFSR	National Tuna Fishery Status Report
OFP	Oceanic Fisheries Programme of the SPC
PFRP	Pelagic Fisheries Research Programme of the University of Hawaii
POFM	Pacific Oceanic Fisheries Management Project
PICT	Pacific Islands Countries and Territories
SC	Scientific Committee of the WCPFC
SEAPODYM	Spatial Ecosystem and Population Dynamics Model
SPC	Secretariat of the Pacific Community
SPREP	South Pacific Regional Environment Programme
TMP	Tuna Management Plan
TUFMAN	Tuna Fishery Data Management System
WCPFC	Western and Central Pacific Fisheries Commission
WCPO	Western and Central Pacific Ocean

## 1. Introduction

The Oceanic Fisheries Programme (OFP) is part of the Marine Resources Division of the Secretariat of the Pacific Community (SPC) and is based in Noumea, New Caledonia. It contributes to the Division's aim of helping achieve the vision of the Pacific Islands Regional Ocean Policy: *"A healthy ocean that sustains the livelihoods and aspirations of Pacific Island communities"*. This vision is shared by all of the CROP agencies working towards the achievement of ocean-related objectives in the region.

The OFP is made up of three sections: Stock Assessment & Modelling, Statistics & Monitoring, and Tuna Ecology & Biology. The Programme currently consists of 17 professional staff, 2 research assistants and 11 support staff. In addition, the programme currently employs a number of short-term consultants to carry out specific tasks. In recent years, the OFP has an annual budget in the region of CFP 300 million (approximately AUD 4,000,000).

The OFP provides scientific services relating to oceanic (primarily tuna) fisheries management to its membership. These services include fishery monitoring and data management, ecosystem and biological research relevant to the fisheries, and stock assessment and evaluation of species- and ecosystem-based management options. The most important programme outputs are information (e.g., reports on the status of fisheries, stocks and ecosystems), infrastructure (e.g., databases, monitoring programmes), advice (e.g., regarding appropriate levels of fishing), and national capacity building in Pacific Island Countries and Territories (PICTs).

These services are provided at both the national and regional levels. At the national level, the OFP provides scientific support to national Tuna Management Plans (TMPs) primarily through support of national fishery monitoring and database systems, provision of advice on appropriate levels of catch or effort, and associated human resource development. At the regional level, the OFP provides scientific services (data summaries and analyses, stock assessments and management advice) to the Forum Fisheries Agency (FFA) for its various regional tuna fisheries management initiatives, including the US Tuna Treaty, the Palau Arrangement and coordination of FFA inputs into the Western and Central Pacific Fisheries Commission (WCPFC). The OFP also provides services directly to the WCPFC in the areas of data management and stock assessment. Service provision to both the FFA and WCPFC is governed by inter-organisational memoranda of understanding.

This report contains the annual report of the OFP (including all core- and programme-funded activities and projects being undertaken by the Programme) for the year 2007, the second year of the Strategic Plan for 2006–2008 approved by CRGA 35, and the work plan for 2008.

## 2. Annual Report for 2007

The 2007 Work Plan<sup>1</sup> is guided by the approved Strategic Plan for 2006–2008<sup>2</sup>, which notes that the goal of the OFP is that **fisheries exploiting the region's resources of tuna, billfish and related species are managed for economic and ecological sustainability using the best available scientific information**.

To help Pacific Community members achieve this goal, the OFP will focus on three objectives for the three-year period from 2006 to 2008:

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<sup>1</sup> [http://www.spc.int/oceanfish/Docs/Donors/OFP\\_2006\\_annual\\_report\\_2007\\_work\\_plan.pdf](http://www.spc.int/oceanfish/Docs/Donors/OFP_2006_annual_report_2007_work_plan.pdf)

<sup>2</sup> <http://www.spc.int/mrd/org/ofp-stratplan-2006-8-1.pdf>

- High-quality scientific information and advice for regional and national fisheries management authorities on the status of, and fishery impacts on, stocks targeted or otherwise impacted by regional oceanic fisheries;
- Accurate and comprehensive scientific data for regional and national fisheries management authorities on fisheries targeting the region's resources of tuna, billfish and other oceanic species; and
- Improved understanding of pelagic ecosystems in the western and central Pacific Ocean, with a focus on the western tropical Pacific.

The Strategic Plan foresees a number of outputs associated with these objectives. These are listed below, along with the key performance indicators. The 2007 activities, with performance indicators, are listed comprehensively in matrix form in Tables 1–3, corresponding to the three objectives. In the text below, some of the highlights for 2007 are described in more detail to give the reader a flavour for the work of the Programme.

**Objective 1 – High-quality scientific information and advice for regional and national fisheries management authorities on the status of, and fishery impacts on, stocks targeted or otherwise impacted by regional oceanic fisheries**

This objective is pursued by the OFP's Stock Assessment & Modelling Section. In producing the outputs described below it also draws on the outputs of the other two OFP objectives — the data compiled by the Statistics & Monitoring Section and the understanding of basic ecosystem and biological processes generated by the Tuna Ecology & Biology Section.

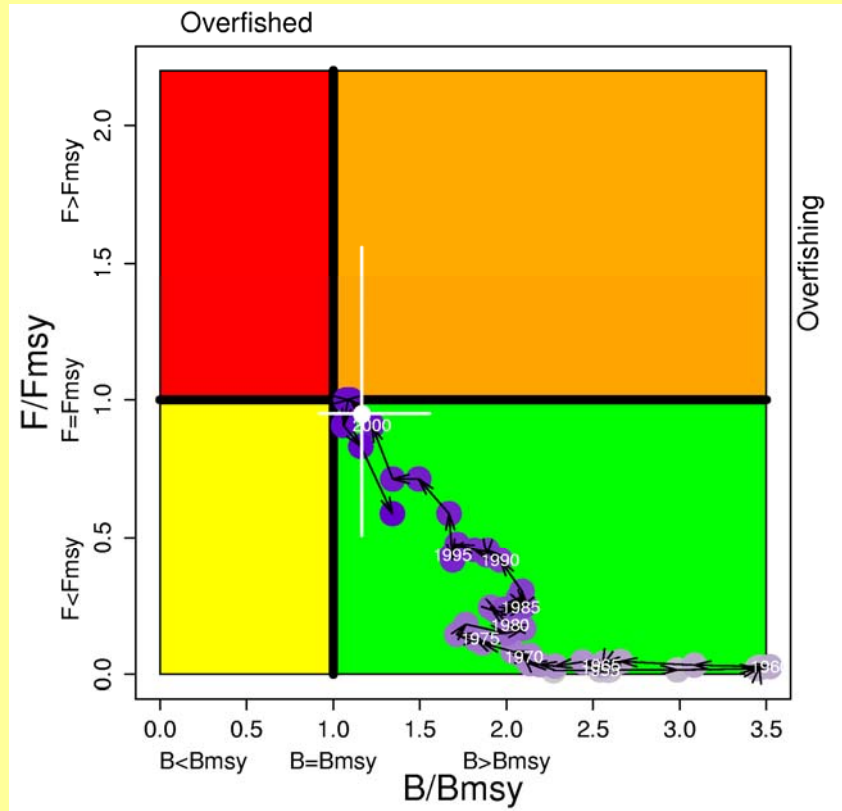
***Output 1.1: Regional stock assessments and associated analyses***

This output is the culmination of a range of activities involving the development of stock assessment methodology and associated computer software, assembling and verifying data used in the assessments, estimating the parameters of the models based on the data and other information and interpreting the model results to provide fishery management advice. The key performance indicator is the production and presentation of stock assessment reports to the WCPFC and its Scientific Committee, various meetings of the FFA, and meetings of the SPC Heads of Fisheries. Since the assessments will be provided as part of a package of services to the WCPFC, their quality will be verified by regular peer review. In 2007, the OFP's work towards this output is focused on the preparation of regional stock assessments and related analyses for presentation to the WCPFC Scientific Committee meeting in Honolulu in August.

**2007 highlight – Updated yellowfin tuna stock assessment**

A detailed stock assessment – for yellowfin tuna – was undertaken for the WCPFC in 2007. The assessment concluded that current exploitation levels are at maximum safe levels, with a significant probability that overfishing is occurring. Further increases in fishing effort would likely result in long-term reduction in catches.

Detailed assessments for skipjack, bigeye and South Pacific albacore are scheduled for 2008. The most recent assessments for these species indicate that overfishing is occurring for bigeye tuna, while skipjack and South Pacific albacore continue to be fished at sustainable levels.



*Temporal trend in annual stock status of yellowfin tuna, relative to biomass (x-axis) and fishing mortality (y-axis) reference points, for the assessment model period (1952–2006). Current fishing mortality is close to the overfishing reference level, and biomass is approaching overfished conditions.*

**Output 1.2: National tuna fishery status reports (NTFSR) and associated analyses**

This output is the principal vehicle by which scientific information and advice is delivered at the national level. NTFSRs are comprehensive reports that describe the fisheries and physical characteristics of the EEZ, and analyse the performance of fisheries in relation to regional stock status, environmental influences and local fishery conditions. The reports are tailored to the requirements of the country concerned, and may, if requested, provide specific advice on appropriate levels of fishing in the EEZ. In 2007 NTFSRs were extended to include some of the OFP's recent work on seamounts, ecological risk assessment and the ecosystem approach to fisheries generally. NTFSRs are typically presented at in-country workshops and briefing sessions to promote local uptake of the findings. The involvement of national counterparts in the production of the reports is also encouraged as a capacity building exercise. The key performance indicator is the production and presentation of NTFSRs. In the past year, NTFSRs for Cook Islands, New Caledonia and Vanuatu were finalised, while reports for

Federated States of Micronesia (FSM), Kiribati, Nauru, Palau and Tonga were progressed. The FSM, Palau, Nauru and Tonga reports are likely to be completed in early 2008. In-country presentations of reports or preliminary information were made in FSM, Nauru and Tonga. In 2008, work is expected to commence on NTFSRs for Marshall Islands, Niue, Samoa, Tuvalu and Wallis and Futuna.

***Output 1.3: Enhanced capacity of PICTs to interpret stock assessment information and advice***

This output, which addresses a long-term need of PICTs, is a result of involvement of national fisheries staff in output 1.2, as well as dedicated activities such as regional workshops on stock assessment methods and interpretation. Performance data will be difficult to compile. However, indicators of success would be that NTFSRs influence national fisheries management decisions and the quality of PICT participation in WCPFC processes is improved. In 2007, the OFP ran the 2<sup>nd</sup> regional stock assessment workshop for PICTs (see below). However, attachments to participate in the preparation of NTFSRs remain difficult to organise primarily because of the now extensive meeting commitments of many PICT fishery department staff. Small departments in particular find it difficult to make staff available for such attachments.

**2007 highlight – 2<sup>nd</sup> Regional Stock Assessment Workshop**

The 2<sup>nd</sup> Regional Stock Assessment Workshop was held for 2 weeks in June–July at SPC headquarters. This year, the workshop was broken into two parts – an introductory and an advanced workshop. Twenty participants from 18 PICTs attended the workshop, which was designed to enhance understanding of regional tuna assessments. Staff from the FFA Secretariat and from the Philippines Bureau of Fisheries and Aquatic Resources also participated. These workshops are a key element of the OFP’s stock assessment capacity building strategy, which seeks to enhance participation of PICTs in WCPFC processes and enable the consideration of regional stock status in national management initiatives. It was pleasing to note that a large number of the workshop participants attended the WCPFC Scientific Committee meeting in Honolulu. SPC members have strongly supported the continuation of these workshops, and it is likely that another will be held in 2008.



***2007 Stock Assessment Workshop***

**Objective 2 – Accurate and comprehensive scientific data for regional and national fisheries management authorities on fisheries targeting the region’s resources of tuna, billfish and other oceanic species**

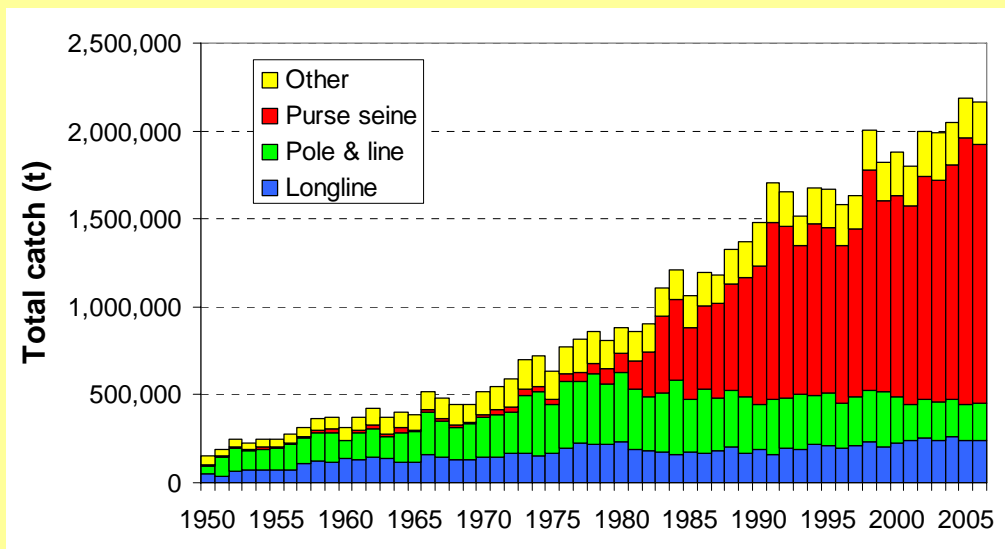
This objective is pursued by the OFP’s Statistics & Monitoring Section. It provides the fundamental basis for the Programme’s assessments of oceanic species, as well as providing direct outputs essential to national and international oceanic fisheries management. The objective incorporates regional data management services provided by the Programme to the WCPFC.

***Output 2.1: Regional oceanic fishery data management services provided to the WCPFC***

The OFP has a long history of compiling and managing regional oceanic fisheries data provided by PICTs and fishing nations. The data include operational level catch and effort data provided on daily logs, sampling data collected in port and by scientific observers at sea, and catch and effort data aggregated by area-time strata. The range of activities supporting this output include data entry, database software development and maintenance, coordination and quality control of data collection, data dissemination at appropriate levels of resolution in accordance with policies on data confidentiality, and the production of statistical bulletins, data summaries and data products. As this output is governed by a WCPFC service agreement, the key performance indicator will be the fulfilment of the terms of reference of that agreement and its annual renewal. In 2007, the OFP worked closely with the WCPFC Secretariat on a range of data issues, including the estimation of total annual catches, compilation of data submitted to the WCPFC, estimation of observer coverage rate requirements and others.

**2007 Highlight – Compilation of scientific data provided to the WCPFC**

The WCPFC’s policy on the provision of scientific data was accepted at its second regular session in December 2005; during 2007, the OFP again compiled these data on behalf of the Commission. The quality of annual catch estimates, stratified catch and effort data, and size composition data continues to improve, although some Commission members did not meet the April 30 deadline. The verification of reported catches with comprehensive unloadings data is gaining increased importance and is likely to be a focus of the future work programme on regional tuna fisheries statistics.



*Total tuna catches in the WCPFC Convention Area, by gear type*



**Output 2.2: Enhanced national fishery monitoring and data management systems**

The development and enhancement of national fishery monitoring and database systems has long been the core business of the OFP. This output encompasses the implementation of customised national fishery monitoring systems covering logsheet data collection, unloadings and vessel activity data collection, observer and port sampling programmes, the development and maintenance of national database systems, data processing assistance and data quality assessment. These activities involve extensive in-country work in systems development, review and maintenance, and training of national staff. As this output is focused on enabling countries to meet both their data provision obligations to the WCPFC and their own domestic fishery management requirements, the key performance indicators are that these obligations and requirements are met. In 2007, initiatives implemented under the GEF-funded Pacific Oceanic Fisheries Management Project, including the support of national tuna data coordinators and the development of national tuna data procedures documents, were continued.

**2007 Highlight – Continuing development and roll-out of TUFMAN**

The Tuna Fisheries Data Management System (TUFMAN) is a comprehensive, integrated database system developed by the OFP that allows PICTs to enter most types of tuna fishery data, perform data quality control and identify gaps in the provision of tuna fishery data. Work on TUFMAN in 2007 included a complete redesign of the reporting module to provide more reports and a more user-friendly interface, the addition of a new Data Registry module and the design of a computer training video facility for TUFMAN. Updates of the latest version of TUFMAN (v4.0) were provided to all existing users (Palau, Marshall Islands, Solomon Islands, Nauru, Fiji, Tuvalu, Tonga, Cook Islands), and new installations were undertaken in FSM and Vanuatu. Work in the latter part of 2007 included investigation into using a new back-end relational database management system to support the large volumes of tuna fishery data in TUFMAN. The main focus of work in 2008 will be the development of a comprehensive observer data module.



***Output 2.3: Enhanced capacity of PICTs to monitor fisheries, manage and use data***

This output is a result of involvement of national staff in output 2.2. The output is achieved by a range of training activities, including regional workshops in fishery monitoring, observer and port sampling training courses, attachment training of national fisheries statistics staff at SPC headquarters, and in-country training in the use of database systems. The achievement of this output will be important for the long-term sustainability of national fishery monitoring systems and its success will ultimately be measured in these terms. In 2007, the OFP continued its programmes of training attachments in fisheries statistics and observer training (courses held in Marshall Islands, Papua New Guinea and Tonga, with Solomon islands scheduled for early 2008). The first regional tuna fishery monitoring workshop for national tuna data coordinators was held in October 2006 at SPC headquarters; a second such workshop is planned for early 2008. The 7<sup>th</sup> Regional Observer Coordinators Workshop and 7<sup>th</sup> meeting of the SPC/FFA Data Collection Committee were held in late 2007. The outcomes of these meetings provide the basis for improved and well-coordinated fishery monitoring the region.

**Objective 3 – Improved understanding of pelagic ecosystems in the western and central Pacific Ocean, with a focus on the western tropical Pacific**

This objective is pursued by the OFP's Tuna Ecology & Biology Section, which undertakes research on the biology of selected tuna and by-catch species, and on the ecosystem in which they live. Information on tuna biology, such as age and growth and vertical habitat utilisation, is incorporated directly into regional tuna stock assessments. As assessments for important by-catch species are developed, similar biological information will also be required for these species. The nature and impacts of ocean climate variability on tuna fisheries are also a focus of the section's work, with modelling techniques used to integrate basin-scale observations and models of physical and biological oceanography with the biology and physiology of tunas. Research is also underway to characterise and model the western tropical Pacific warm pool ecosystem in a holistic way, focusing on defining the trophic relationships among the broad assemblage of pelagic species inhabiting the system. Highlights in 2007 included the conclusion of the field phase of a major tuna tagging project in Papua New Guinea and the examination of the significance of seamounts as a habitat of special importance in the pelagic ecosystem.

***Output 3.1: Data on the biological characteristics of oceanic species and their environment***

This output encompasses a range of research or data-gathering activities that provide information for either single-species assessments or ecosystem monitoring. A particular focus will be on the collection of information on trophic relationships in the pelagic ecosystem. These relationships will, to a large extent, govern the qualitative and quantitative response of the overall ecosystem to the removal by fisheries of target species, which are usually the larger predators, from the upper trophic levels. Our ability to understand and predict such fishery impacts will be critically dependent on an understanding of these trophic relationships and their variability.

Tuna tagging will be critical to the achievement of this output. In recent years, successive regional scientific fora have noted the need for a new large-scale tagging project for tropical tunas in this region. The importance of this work for providing important information on current levels of exploitation, information on stock structure and mixing rates of tropical tunas was reiterated at the 2006 WCPFC Scientific Committee meeting. The OFP has begun to exercise the mandate given by CRGA 35 and CPC 4 in Palau initially through the implementation of the PNG Tuna Tagging Project (see below). The programme is continuing to work with stakeholders to see this work extended to a

full regional tagging programme over the next 3 years – the announcement by the Government of New Zealand of a NZD5,000,000 contribution to the programme, along with other contributions by the European Community, Papua New Guinea and Taiwan – has provided a solid funding base for the regional extension. To this end, a one-month tagging cruise was held in Solomon Islands in late 2007, and additional tagging is planned for the Solomon Islands and elsewhere in 2008 and 2009.

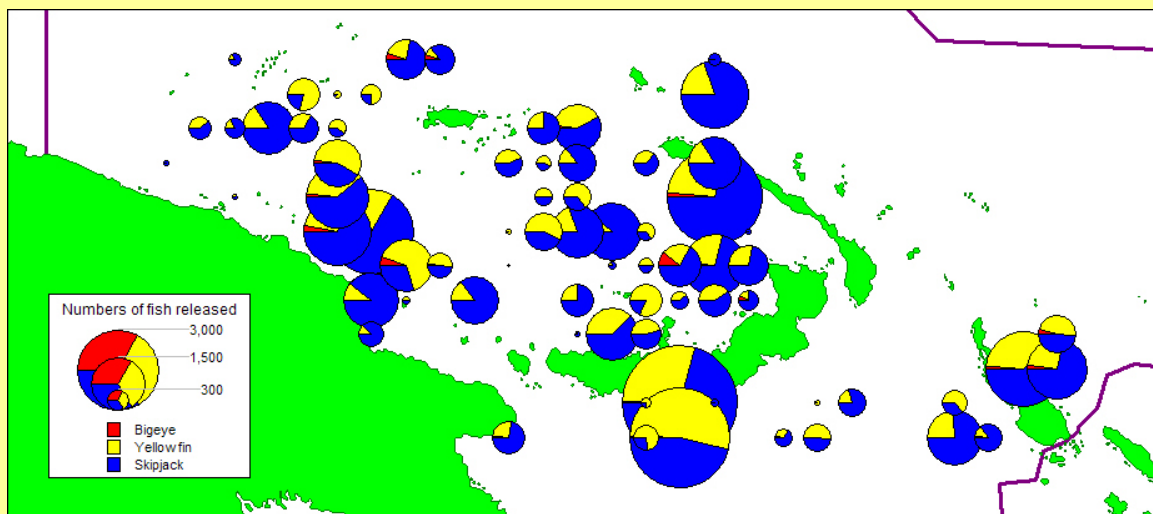
Seamounts are habitats of considerable international interest. They will be investigated in the context of both trophic ecology and tagging activities in order to provide specific management advice as to their ecological significance and impacts on pelagic species and fisheries.

A key performance indicator for this output will be improvement of single-species assessments and ecosystem models resulting from the new data collected. Additionally, the quality of the scientific information produced will be measured by publication of results in the peer-reviewed scientific literature and by the WCPFC Scientific Committee’s review of the work.

As noted above, the OFP, in cooperation with the PNG National Fisheries Authority and a number of donor partners, continued the implementation of the first phase of a new regional tagging programme in PNG. The PNG work is expected to provide new information on local exploitation rates of tunas in PNG, the effects of FADs on tuna movement and catchability, as well as more generally contributing information on movement and exploitation for regional tuna stock assessment (see below). A focus of the 2007 work plan has also been the continuation of trophic sampling in the western tropical Pacific warm pool and planning of seamount research under the POFM Project.

**2007 highlight – PNG Tuna Tagging Project**

The OFP was successful in attracting in excess of USD 1.5 million in donor support to mount a new tuna tagging project in PNG. Two three-month tagging cruises were held in August – November 2006 and February – May 2007 using a pole-and-line vessel, *Soltai 6*, chartered from Soltai Fishing and Processing Ltd of Solomon Islands. A total of 61,751 tuna were tagged (more than twice the operational target) using a combination of conventional dart tags and data archiving electronic tags. To date, 7,459 tag recaptures have been reported to the OFP. The field phase of the project has been an outstanding success. Efforts are now focused on tag recovery and data analysis to realise the ultimate objectives of the project for PNG and the region, and the extension of the work to other areas, initially Solomon Islands.



*Distribution of tag releases, by species, in PNG*

***Output 3.2: Improved ecosystem models that incorporate available data***

Ecosystem models have the potential to enable better understanding of the dynamics of the interaction between large predators such as tuna, their forage, and their biological and physical environment. The main approach taken by the OFP to date has been the development of a Spatial Environmental and Population Dynamics Model (SEAPODYM), which integrates information on Pacific basin-scale oceanography and productivity with data on the fisheries and population dynamics of the target species. The model shows considerable promise for understanding the mechanisms that drive the variability in tuna stocks and fisheries. Ultimately, it is hoped that the model will be useful in addressing a number of important management questions (see output 3.3). This work will be continued as a key activity of the 2006–2008 period and will involve substantial international collaboration through CLIOTOP (Climatic Impacts on Top Predators Programme).

An additional approach to be investigated involves the development of energy-transfer models utilising the trophic information being collected under output 3.1. As a first step, existing models (ECOPATH/ECOSIM) are being trialled; however, it may be desirable to develop a new, more statistically rigorous approach to ecosystem modelling in the longer term. This work will continue to involve substantial international collaboration.

The key performance indicators for this output will be publication of analyses in the peer-reviewed literature and production of working papers for the WCPFC Scientific Committee. In 2007, we continued to participate in the development and analysis of the SEAPODYM model, and hosted a workshop in early 2007 to consider the application of ECOPATH/ECOSIM-type models to data available to the Programme.

***Output 3.3: Scientific advice on ecosystem-based management options using available models and data***

This output represents the packaging of the research data and analyses produced in outputs 3.1 and 3.2 to provide specific advice to PICTs, FFA and the WCPFC on ecosystem-based management options. The types of activities envisaged include advice on fishery impacts on important non-target species or species groups, advice on management options with respect to habitats of special concern such as seamounts, advice on the efficacy of specific ecosystem management measures such as marine protected areas and advice on the possible impacts of long-term climate change on oceanic fish stocks and fisheries.

The key performance indicators for this output will be publication of analyses in the peer-reviewed literature, production of working papers for the WCPFC Scientific Committee and FFA meetings, and the incorporation of advice on ecosystem-based management options in National Fishery Status Reports. In 2007, a key activity was the continuation of the development of ecological risk assessment (ERA) methodology, which included the organisation of a research planning workshop held in association with the 3<sup>rd</sup> session of the WCPFC Scientific Committee in Honolulu in August. Thus far, ERA has had a purely regional focus; however, the OFP is planning to work with members on the application of ERA at the national level, providing PICTs with a solid quantitative basis for the application of the Ecosystem Approach to Fisheries Management.

### 3. Finances

The Oceanic Fisheries Programme received funding (including carry over from 2006 and less project management fees on new funding) of 4,495,072 CFP units for its operations in 2007. The table below gives a breakdown of the funding by donor and work area.

#### Oceanic Fisheries Programme funding for 2007 (CFP units)

Funding source	Stock Assessment & Modelling	Statistics & Monitoring	Biology & Ecology	Programme Management	TOTAL
<i>Core</i>	0	0	0	133,500	142,100
<i>Programme</i>					
AusAID	212,000	318,000	0	0	530,000
France	0	240,656	0	0	280,000
NZAID	0	87,330	0	0	85,000
<i>Sub-total</i>	212,000	645,986	0	0	895,000
<i>Project</i>					
EU	41,728	86,892	61,503	18,319	208,443
GEF	220,502	331,813	899,498	0	1,451,813
PNG tagging					
PNG			0		0
NZAID			0		0
ACIAR			189,927		189,927
France			55,762		55,762
Other			429,406		429,406
<i>Sub-total</i>			675,096		675,096
WCPFC	223,471	223,471	223,471		670,413
PFRP (Univ. of Hawaii)			175,137		175,137
Misc. project funding	92,357	92,357	92,357	0	277,071
<i>Sub-total</i>	578,058	734,533	2,127,062	18,319	3,457,972
<b>TOTAL</b>	<b>790,058</b>	<b>1,380,519</b>	<b>2,127,062</b>	<b>151,819</b>	<b>4,495,072</b>

**TABLE 1/2007.****Objective 1: High-quality scientific information and advice for regional and national fisheries management authorities on the status of, and fishery impacts on, stocks targeted or otherwise impacted by regional oceanic fisheries**

2007 Work Programme Activities	Performance Indicators and/or Means of Verification	2007 Achievements
<b>Output 1.1: Regional stock assessments and associated analyses</b>		
<p>1.1.1 Provision of stock assessment and related analytical services to the WCPFC. In 2007, these services shall include:</p> <ul style="list-style-type: none"> <li>– Undertake analyses of catch and effort data, including where appropriate operational-level data, to improve the standardisation of effort and the construction of indices of stock abundance, principally bigeye, yellowfin, and SP albacore.</li> <li>– Further development of stock assessment models, including the investigation of yellowfin growth parameterisation and recruitment prediction.</li> <li>– Undertake full stock assessment of yellowfin tuna for the Commission.</li> <li>– Undertake evaluations of management options as specified by WCPFC 3</li> </ul>	<ul style="list-style-type: none"> <li>• CPUE workshop hosted and outcomes documented.</li> <li>• SC 3 working papers</li> <li>• Tuna Fishery Assessment Report (TFAR) published following 2007 assessments</li> <li>• WCPFC satisfied with services provided.</li> <li>• Favorable review of OFP scientific services by WCPFC consultant.</li> </ul>	<ul style="list-style-type: none"> <li>• TFAR currently being finalized. This delay was required due to work load considerations of staff involved.</li> <li>• CPUE workshop held and outcomes reported to SC 3: <a href="http://www.wcpfc.int/sc3/pdf/ME-IP-1%20Report%20on%20longline%20CPUE%20meeting.pdf">http://www.wcpfc.int/sc3/pdf/ME-IP-1%20Report%20on%20longline%20CPUE%20meeting.pdf</a></li> <li>• Analysis of operational level data completed and presented to SC 3: <a href="http://www.wcpfc.int/sc3/pdf/WCPFC-SC3-SA-SWG%20WP-6%20CPUE.pdf">http://www.wcpfc.int/sc3/pdf/WCPFC-SC3-SA-SWG%20WP-6%20CPUE.pdf</a></li> <li>• Paper on environmental-based recruitment prediction submitted to scientific journal. Abstract presented to SC 3: <a href="http://www.wcpfc.int/sc3/pdf/WCPFC-SC3-SA-SWG%20WP-5-YFT%20WCPO%20recruitment%20abstract.pdf">http://www.wcpfc.int/sc3/pdf/WCPFC-SC3-SA-SWG%20WP-5-YFT%20WCPO%20recruitment%20abstract.pdf</a></li> <li>• Assessment conducted and presented to SC 3: <a href="http://www.wcpfc.int/sc3/pdf/WCPFC-SC3%20SA-SWG%20WP-01.pdf">http://www.wcpfc.int/sc3/pdf/WCPFC-SC3%20SA-SWG%20WP-01.pdf</a></li> <li>• Following papers prepared and presented to SC 3: <ul style="list-style-type: none"> <li>- <a href="http://www.wcpfc.int/sc3/pdf/WCPFC-SC3%20SA-SWG%20WP-01.pdf">http://www.wcpfc.int/sc3/pdf/WCPFC-SC3%20SA-SWG%20WP-01.pdf</a></li> <li>- <a href="http://www.wcpfc.int/sc3/pdf/WCPFC-SC3-SA-SWG%20WP-04%20spatio-temporal%20pattern.pdf">http://www.wcpfc.int/sc3/pdf/WCPFC-SC3-SA-SWG%20WP-04%20spatio-temporal%20pattern.pdf</a></li> </ul> </li> </ul>
<p>1.1.2 Undertake a stock assessment for South Pacific albacore assessment using SS2 assessment software.</p>	<ul style="list-style-type: none"> <li>• SC 3 working paper.</li> </ul>	<ul style="list-style-type: none"> <li>• Analysis conducted and resented to SC3: <a href="http://www.wcpfc.int/sc3/pdf/ME%20WP-6%20Comparison%20of%20Albacore%20assess%20.pdf">http://www.wcpfc.int/sc3/pdf/ME%20WP-6%20Comparison%20of%20Albacore%20assess%20.pdf</a></li> </ul>

1.1.3	Undertake a stock assessment for WCPO skipjack tuna.	<ul style="list-style-type: none"> <li>• SC 3 working paper.</li> </ul>	<ul style="list-style-type: none"> <li>• Deferred to 2008, but considerable progress made in late 2007.</li> </ul>
1.1.4	Management Strategy Evaluation (MSE) scoping paper outlining methodology and application of approach focusing on one key species, as an example.	<ul style="list-style-type: none"> <li>• SC 3 working paper</li> </ul>	<ul style="list-style-type: none"> <li>• Deferred to 2008, but OFP involvement in this work likely to be limited.</li> </ul>
1.1.5	Improvements to stock assessment and associated visualisation software, including networked processing, testing and documentation of new features.	<ul style="list-style-type: none"> <li>• Improved software and documentation available on <a href="http://www.multifan-cl.org">www.multifan-cl.org</a></li> </ul>	<ul style="list-style-type: none"> <li>• Range of developments and improvements in progress, web site to be updated early 2008</li> <li>• Planning new MULTIFAN-CL code management system using GForce and SVN</li> </ul>
1.1.6	Outputs from stock assessments provided for inclusion in other OFP and regional activities, e.g. ecosystem modeling, management processes, etc.	<ul style="list-style-type: none"> <li>• Participation in relevant meetings, forums, as required</li> </ul>	<ul style="list-style-type: none"> <li>• Stock assessment results reported to US Treaty Consultation, FFC 64, WCPFC SC3, FFA Management Options Workshop, PNG Tuna Forum, WCPFC 4 and several national EAFM consultations</li> </ul>
1.1.7	Undertake preliminary analyses to characterise the recent operation of the WCPO purse-seine fishery.	<ul style="list-style-type: none"> <li>• Scoping paper presented to SC 3.</li> <li>• Collation of data from various sources.</li> </ul>	<ul style="list-style-type: none"> <li>• Deferred pending additional analytical capacity in the OFP.</li> </ul>
<b>Output 1.2: National fishery status reports and associated analyses</b>			
1.2.1	NTFSRs completed for Vanuatu and FSM and commenced for Palau, Samoa, Nauru, and Kiribati.	<ul style="list-style-type: none"> <li>• 6 fishery status/summary reports per year that are used to inform management decision-making at the national level.</li> <li>• Technical Report summarising biology of key species.</li> <li>• Improved integration with FFA in-country work programme.</li> </ul>	<ul style="list-style-type: none"> <li>• Vanuatu report completed, FSM, Nauru, Palau close to completion. Kiribati report commenced.</li> </ul>
1.2.2	Summary report for Tonga.		<ul style="list-style-type: none"> <li>• Tonga report completed</li> </ul>
1.2.3	Hold in-country stakeholder workshops for delivery of NTFSRs.		<ul style="list-style-type: none"> <li>• In-country stakeholder workshops associated with NTFSR and/or EAFM implementation held in FSM (2), Nauru, Tonga.</li> </ul>
1.2.4	Completion of summary of biology of key pelagic species.		<ul style="list-style-type: none"> <li>• First draft completed, finalization expected early 2008.</li> </ul>
<b>Output 1.3: Enhanced capacity of PICTs to interpret stock assessment information and advice</b>			

1.3.1 Summary reports of stock assessment results provided to PICTs at relevant fora, e.g. HoF, FFC, Management Options workshops, etc.	<ul style="list-style-type: none"> <li>• Improved understanding of OFP work at the national level</li> </ul>	<ul style="list-style-type: none"> <li>• Stock assessment results reported to US Treaty Consultation, FFC 64, WCPFC SC3, FFA Management Options Workshop, PNG Tuna Forum, WCPFC 4 and several national EAFM consultations</li> </ul>
1.3.2 Ongoing development of material for a course to provide a general introduction to fisheries stock assessments and their management implications with a focus on WCPO tuna assessments in particular.	<ul style="list-style-type: none"> <li>• Course material published on web site and made available to USP</li> </ul>	<ul style="list-style-type: none"> <li>• Participants issues with course material on CD</li> <li>• Talks with USP continuing regarding incorporation into USP course curricula</li> </ul>
1.3.3 Hold a regional stock assessment workshop at SPC headquarters.	<ul style="list-style-type: none"> <li>• Workshop report</li> <li>• Development of remote learning initiatives.</li> </ul>	<ul style="list-style-type: none"> <li>• 2007 workshop report available at: <a href="http://www.wcpfc.int/sc3/pdf/WCPFC-SC3-GN%20WP14%20SPC%20SA%20Workshop.pdf">http://www.wcpfc.int/sc3/pdf/WCPFC-SC3-GN%20WP14%20SPC%20SA%20Workshop.pdf</a></li> <li>• Online learning facility now implemented at: <a href="http://www.spc.int/oceanfish/Html/SAM/SAW/">http://www.spc.int/oceanfish/Html/SAM/SAW/</a></li> </ul>
1.3.4 Assist in the preparation and presentation of scientific briefs to preparatory meetings of PICTs for the WCPFC.	<ul style="list-style-type: none"> <li>• Improved participation of PICTs in SC and WCPFC meetings</li> </ul>	<ul style="list-style-type: none"> <li>• Assisted FFA in the presentation of briefs to the FFA Science Working Group prior to SC 3 and at FFC 66 prior to WCPFC 4.</li> </ul>
1.3.5 Host attachments of national technical staff to participate in regional stock assessment work and preparation of NTFSRs.	<ul style="list-style-type: none"> <li>• Attachment reports</li> <li>• Improved understanding of regional assessments leading to improved participation in WCPFC and in national management decision making</li> </ul>	<ul style="list-style-type: none"> <li>• One attachment (Nauru) was held in 2007. Attachments are increasingly difficult to schedule because of regional meeting agenda.</li> </ul>



**TABLE 2/2007.****Objective 2: Accurate and comprehensive scientific data for regional and national fisheries management authorities on fisheries targeting the region's resources of tuna, billfish and other oceanic species**

2007 Work Programme Activities	Performance Indicators and/or Means of Verification	2007 Achievements
<b>Output 2.1: Regional oceanic fishery data management services provided to the WCPFC</b>		
2.1.1 Incorporate data provided by Commission members under the Commission's data provision policy (e.g., annual catch estimates, operational-level logsheet data, size data, etc.) into existing databases and facilitate access of Commission secretariat staff to those data as appropriate.	<ul style="list-style-type: none"> <li>Amount of data added to database, as documented in the <i>Tuna Fishery Data Catalogue</i></li> </ul>	<ul style="list-style-type: none"> <li>Data (logsheet, aggregate catch and effort, observer data, size data, and others) were continually incorporated to OFP-managed databases. Database status updated in Tuna Fishery Data Catalog: <a href="http://www.spc.int/oceanfish/Html/Statistics/DataCat/DATACAT.htm">http://www.spc.int/oceanfish/Html/Statistics/DataCat/DATACAT.htm</a></li> <li>Online data coverage query system implemented: <a href="http://www.spc.int/oceanfish/Html/Statistics/Coverage/index.asp">http://www.spc.int/oceanfish/Html/Statistics/Coverage/index.asp</a></li> </ul>
2.1.2 Produce estimates of annual catches by species and gear type.	<ul style="list-style-type: none"> <li>SC 3 working paper</li> </ul>	<ul style="list-style-type: none"> <li>Annual catch estimates reported to SC 3: <a href="http://www.wcpfc.int/sc3/pdf/SC3%20ST%20IP-2.pdf">http://www.wcpfc.int/sc3/pdf/SC3%20ST%20IP-2.pdf</a></li> </ul>
2.1.3 Post public domain catch, effort and size data on the WCPFC and SPC/OFP websites at agreed level of resolution.	<ul style="list-style-type: none"> <li>Web site updated</li> </ul>	<ul style="list-style-type: none"> <li>Public domain data updated and available at <a href="http://www.spc.int/oceanfish/Html/Statistics/index.htm#Public">http://www.spc.int/oceanfish/Html/Statistics/index.htm#Public</a></li> </ul>
2.1.4 Produce and publish on the WCPFC and SPC/OFP websites the Tuna Fishery Yearbook 2006, containing annual catch estimates by gear type, flag and species, and the Tuna Bulletin, containing monthly nominal catch rates for selected fleets.	<ul style="list-style-type: none"> <li>Documents published on web site</li> </ul>	<ul style="list-style-type: none"> <li>Draft 2006 Tuna Fishery Yearbook published: <a href="http://www.wcpfc.int/statistics/pdf/YB_2006%20Draft.pdf">http://www.wcpfc.int/statistics/pdf/YB_2006%20Draft.pdf</a></li> <li>July 2007 issue Tuna Bulletin published: <a href="http://www.wcpfc.int/statistics/pdf/Bulletin_2007_7.pdf">http://www.wcpfc.int/statistics/pdf/Bulletin_2007_7.pdf</a></li> </ul>
2.1.5 Provide estimates of annual catches for 2003–2005 broken down by vessel flag, EEZ, and archipelagic	<ul style="list-style-type: none"> <li>Data provided to WCPFC Secretariat</li> </ul>	<ul style="list-style-type: none"> <li>Data were provided on schedule to WCPFC Secretariat in advance of the WCPFC Annual Session in December 2007.</li> </ul>

waters (for use in determining the catch component of the Commission's assessed contributions).		
2.1.6 Participate in the Indonesia and Philippines Data Collection Project and the compilation of information on the tuna fisheries of Vietnam.	<ul style="list-style-type: none"> <li>• IPDCP activities for 2007 carried out as planned and information compiled on Vietnamese fisheries</li> </ul>	<ul style="list-style-type: none"> <li>• In January 2007, the Fisheries Database Supervisor visited the Philippines to further develop the tuna fisheries statistical system.</li> <li>• A workshop to review the tuna fisheries statistical system in the Pacific Ocean waters of Indonesia and plan port sampling was held in January 2007. The meeting was attended and rapporteured by the Principal Fisheries Scientist (Statistics) and the Fisheries Database Supervisor.</li> <li>• The Principal Fisheries Scientist (Statistics) and the Fisheries Database Supervisor participated in the fourth meeting of the IPDCP Steering Committee, which was held during SC3.</li> </ul>
2.1.7 Develop objectives and priorities for data to be collected by observers for fisheries other than for purse-seine and longline.	<ul style="list-style-type: none"> <li>• SC 3 working paper</li> </ul>	<ul style="list-style-type: none"> <li>• Working Paper presented to SC 3: <a href="http://www.wcpfc.int/sc3/pdf/SC3_ST_WP2.pdf">http://www.wcpfc.int/sc3/pdf/SC3_ST_WP2.pdf</a></li> </ul>
2.1.8 Develop data standards for port sampling and observer programmes.	<ul style="list-style-type: none"> <li>• SC 3 working paper</li> </ul>	<ul style="list-style-type: none"> <li>• Input on this issue provided at SC 3 and at the Inter-Sessional Working Group on the Regional Observer Programme</li> </ul>
2.1.9 Develop rules and procedures for the access to and dissemination of data and an information security policy.	<ul style="list-style-type: none"> <li>• SC 3 working paper</li> </ul>	<ul style="list-style-type: none"> <li>• Contributions made to a paper submitted to SC 3 by the Chair of the Statistics Specialist Working Group</li> </ul>
2.1.10 Further develop the regional database system maintained by the OFP, including components related to archival tag data, catch at size data, catch by EEZ data, observer data, CES catch and effort query system, mapping, stomach contents data, logsheet data entry, meta-databases, oceanographic data, etc.	<ul style="list-style-type: none"> <li>• Development of the regional database documented in staff appraisals</li> </ul>	<ul style="list-style-type: none"> <li>• Significant enhancements were made to the following systems during 2007 <ul style="list-style-type: none"> <li>○ TUFMAN</li> <li>○ CES</li> <li>○ TAGDAGER (Tagging database system)</li> <li>○ Observer data entry system</li> <li>○ ORSE (Observer Query System)</li> <li>○ TUNA DAQUIRI (Data coverage and quality system)</li> <li>○ Logsheets data administration system</li> <li>○ Stomach contents database system</li> </ul> </li> <li>• Enhancements were also made to the following systems : <ul style="list-style-type: none"> <li>○ Port Sampling data entry system</li> <li>○ Port sampling administration system</li> </ul> </li> </ul>

		<ul style="list-style-type: none"> <li>○ Catch-at-size database</li> <li>○ Catch-by-EEZ database</li> <li>○ Length Frequency administration system</li> <li>○ Data Registry system</li> </ul>
<b>Output 2.2: Enhanced national fishery monitoring and data management systems</b>		
2.2.1 Provide regional coordination of national fishery monitoring and data management systems through the provision of a template for integrated national tuna fishery monitoring, data collection forms, computer software, newsletters and other information, and through a meeting of the SPC/FFA Data Collection Committee.	<ul style="list-style-type: none"> <li>• Information provided to National Tuna Data Coordinators. Report of the DCC meeting.</li> </ul>	<ul style="list-style-type: none"> <li>• Regional Tuna Data Template available: <a href="http://www.spc.int/oceanfish/Docs/Statistics/TunaDataTemplateV1.pdf">http://www.spc.int/oceanfish/Docs/Statistics/TunaDataTemplateV1.pdf</a></li> <li>• 7<sup>th</sup> meeting of the SPC/FFA Data Collection Committee held in Brisbane in Nov 2007. Report of this meeting to be posted in early 2008.</li> <li>• A longline logbook was trialed and the results included in the DCC reports.</li> <li>• Observer and port sampling newsletter <i>Fork Length</i> published: <a href="http://www.spc.int/oceanfish/Docs/Statistics/Fork_Length_7.pdf">http://www.spc.int/oceanfish/Docs/Statistics/Fork_Length_7.pdf</a></li> <li>• Paper reviewing of WCPFC Transhipment Declaration Form provided to the WCPFC in September 2007</li> </ul>
2.2.2 Develop or enhance national tuna fishery data management systems, such as TUFMAN, including modules to facilitate the provision of data to SPC and the WCPFC.	<ul style="list-style-type: none"> <li>• TUFMAN installed or updated in member countries and territories</li> </ul>	<ul style="list-style-type: none"> <li>• The TUFMAN System was advanced from version 2.6, at the start of 2007, to version 4.3.2 by the end of 2007. The enhancements to TUFMAN system during 2007 included : <ul style="list-style-type: none"> <li>○ Addition of a Data Registry Module</li> <li>○ Addition of a National Fleet module</li> <li>○ Addition of a specific Mapping module</li> <li>○ Enhancement of the trip log data entry module</li> <li>○ Catering for entry of WCPFC Vessel Record attributes</li> <li>○ Support of TUFMAN in MS SQL SERVER</li> <li>○ Twelve new reports added</li> <li>○ Addition of VESSEL HISTORY database</li> <li>○ Support for the entry of national EEZ activities only in logsheet data entry</li> </ul> </li> <li>• TUFMAN is now installed in 10 member countries, with 3 new installations undertaken in 2007.</li> <li>• A TUFMAN video training tool was designed and development commenced during 2007.</li> </ul>
2.2.3 Develop or enhance national observer programmes.	<ul style="list-style-type: none"> <li>• Staff travel reports</li> <li>• Monitoring system audits</li> </ul>	<ul style="list-style-type: none"> <li>• National observer programmes are now established in 10 of the 15 FFA member countries (Palau, Marshall Islands, Kiribati, FSM, Fiji, PNG, Solomon Islands, Cook Islands, Tonga and Samoa), while four other countries aspire to running observer programmes in the future (Nauru, Vanuatu, Niue and Tokelau).</li> <li>• Duty travel reports document observer programme reviews for Palau,</li> </ul>

		<p>FSM, Fiji and the Marshall Islands during 2007.</p> <ul style="list-style-type: none"> <li>• In the absence of the FFA Observer Manager (the position was under recruitment during 2007) ongoing assistance was also provided to the USMLT and FSMA sub-regional observer programmes.</li> <li>• A paper on the Minimum Data Standards was presented to the WCPFC ISWG for the proposed Regional Observer Programme.</li> <li>• Expert advice on a Regional Observer Programme Strategic Plan was solicited by and provided to the WCPFC informal working group.</li> <li>• Liaison and focused support was given to improve the flow of biological samples from observer programmes.</li> <li>• Fishery monitoring support for Tonga, Samoa, and Fiji were continued.</li> <li>• The number of observer days processed (entered and imported) by OFP in recent years is as follows:</li> </ul> <table border="1"> <thead> <tr> <th>Year</th> <th>Purse seine</th> <th>Longline</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>2001</td> <td>3,018</td> <td>3,945</td> <td>8,964</td> </tr> <tr> <td>2002</td> <td>5,633</td> <td>5,714</td> <td>13,349</td> </tr> <tr> <td>2003</td> <td>6,268</td> <td>5,461</td> <td>13,732</td> </tr> <tr> <td>2004</td> <td>8,362</td> <td>4,446</td> <td>14,812</td> </tr> <tr> <td>2005</td> <td>7,699</td> <td>2,099</td> <td>11,803</td> </tr> <tr> <td>2006</td> <td>6,994</td> <td>2,317</td> <td>11,317</td> </tr> </tbody> </table> <p>The drop in longline observer days since 2004 is primarily due to</p> <ul style="list-style-type: none"> <li>○ Hawaiian longline observer data have not been provided since 2004.</li> <li>○ The Solomon Islands observer programme has not operated since early-2005</li> <li>○ Some trips covering 2006 activities are yet to be received for the US treaty and FSM Arrangement programmes</li> </ul>	Year	Purse seine	Longline	Total	2001	3,018	3,945	8,964	2002	5,633	5,714	13,349	2003	6,268	5,461	13,732	2004	8,362	4,446	14,812	2005	7,699	2,099	11,803	2006	6,994	2,317	11,317
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<p>2.2.4 Develop or enhance national port sampling programmes.</p>	<ul style="list-style-type: none"> <li>• Staff travel reports</li> <li>• Monitoring system audits</li> </ul>	<ul style="list-style-type: none"> <li>• Data collection from 25 port sampling sites in the region is supported by SPC/OFP utilising various project funding. All data received during the year were entered, checked and immediate feedback given to the port sampler supervisors.</li> </ul>																												

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2.2.5 Provide technical assistance for monitoring programmes and database systems related to catches of species of special interest (i.e., marine reptiles, marine mammals, seabirds and sharks).	<ul style="list-style-type: none"> <li>Staff travel reports</li> <li>Monitoring system audits</li> </ul>	<ul style="list-style-type: none"> <li>A specification for a database system storing information on bycatch and bycatch mitigation, and a web-based query system for accessing the information was developed for the WCPFC and presented to SC3.</li> <li>In response to a request from the New Caledonian Government, a review of historical turtle nesting data collected in the Entrecasteaux Reefs was undertaken in addition to designing a sampling protocol for future data collection expeditions. Review document provided to Marine Marchande on 10th April 2007, with subsequent meetings held in May, July and October to present the protocol and discuss logistics for its implementation (in December 2007).</li> </ul>																												
2.2.6 Develop procedures for the auditing of national tuna fishery monitoring.	<ul style="list-style-type: none"> <li>Auditing procedures document drafted</li> </ul>	<ul style="list-style-type: none"> <li>Deferred to 2008</li> </ul>																												
<b>Output 2.3: Enhanced capacity of PICTs to monitor fisheries, manage and use data</b>																														
2.3.1 Provide ongoing support to National Tuna Data Coordinators, including follow-up of issues arising at the Tuna Data Workshop and further development of national tuna data procedures documents.	<ul style="list-style-type: none"> <li>Support documented in staff appraisals</li> </ul>	<ul style="list-style-type: none"> <li>Duty travel reports outlining the support given to NTDCs are available for FSM, RMI and Fiji (two).</li> <li>NTDPDs were updated for Fiji, Tuvalu, Niue, RMI, and Palau.</li> <li>New, revised and draft format MOUs outlining the financial support offered to cover National Tuna Data Coordinators needs were provided to the Marshall Islands, Palau, Solomons, Vanuatu, Cooks and FSM.</li> </ul>																												
2.3.2 Train national tuna fishery data management staff in the use of TUFMAN and other database and sampling programme management software.	<ul style="list-style-type: none"> <li>National staff trained</li> <li>Training documented in staff appraisals</li> </ul>	<p><b><u>Database-related training conducted in offices of member countries and Regional organisations.</u></b></p> <ul style="list-style-type: none"> <li>Philippines (January 2007)</li> <li>Palau (April 2007)</li> <li>FSM (June 2007)</li> </ul>																												

		<ul style="list-style-type: none"> <li>○ WCPFC (June 2007)</li> <li>○ Solomon Islands (October 2007)</li> <li>○ FFA (October 2007)</li> <li>○ Marshall Islands (December 2007)</li> <li>● TUFMAN Video training modules were designed and developed during March/April 2007 (further work expected in 2008)</li> <li>● TUFMAN Tips – a monthly email communication designed to provide specific tips on how to get the best use out of the TUFMAN database system – was introduced in September 2007.</li> </ul>
2.3.3 Hold four national/sub-regional observer training workshops.	<ul style="list-style-type: none"> <li>● Number of certified new observers</li> <li>● Staff travel reports</li> </ul>	<ul style="list-style-type: none"> <li>● Full basic observer training courses were held in: <ul style="list-style-type: none"> <li>– Marshall Islands (9 trainees, 5 certified)</li> <li>– Tonga (8 trainees, 5 certified)</li> </ul> </li> </ul> <p>The Observer and Port Sampler Trainer was seconded to tagging work for a number of months during the year.</p> <ul style="list-style-type: none"> <li>● Other monitoring training conducted included a comprehensive port sampling training course in the Marshall Islands and seed tagging training for observers in PNG and the Marshall Islands.</li> </ul>
2.3.4 Provide observer de-briefing support and training in-country.	<ul style="list-style-type: none"> <li>● Improved quality of observer data</li> <li>● Staff travel reports</li> </ul>	<ul style="list-style-type: none"> <li>● Observer debriefing training was provided to returning observers during in-country support visits for Palau, FSM, Fiji and the Marshall islands.</li> </ul>
2.3.5 Hold a regional observer coordinator’s workshop.	<ul style="list-style-type: none"> <li>● Workshop report</li> </ul>	<ul style="list-style-type: none"> <li>● The Regional Observer Coordinators Workshop was organised by OFP and held in Brisbane, 19<sup>th</sup>- 22<sup>nd</sup> November, 2007.</li> </ul>
2.3.6 Host six training attachments in fisheries statistics at SPC headquarters.	<ul style="list-style-type: none"> <li>● Attachment reports</li> <li>● POFM project quarterly reports</li> </ul>	<p><b><u>SPC Attachment Training conducted for -</u></b></p> <ul style="list-style-type: none"> <li>○ PNG (February 2007)</li> <li>○ Solomon Islands (June 2007)</li> <li>○ Nauru (June 2007)</li> <li>○ Marshall Islands (September 2007)</li> <li>○ FSM (September 2007)</li> <li>○ Solomon Islands (December 2007)</li> <li>○ Fiji (December 2007)</li> </ul>
2.3.7 Develop standards for competency-based training of observers.	<ul style="list-style-type: none"> <li>● Standards for competency-based training of observers drafted</li> </ul>	<ul style="list-style-type: none"> <li>● A consultant was hired and the first part of the report on a CBT curriculum for Regional Observer Training Courses was submitted on time.</li> </ul>

**TABLE 3/2007.****Objective 3: Improved understanding of pelagic ecosystems in the western and central Pacific Ocean, with a focus on the western tropical Pacific**

2007 Work Programme Activities	Performance Indicators and/or Means of Verification	2007 Achievements
<b>Output 3.1: Data on the biological characteristics of oceanic species and their environment</b>		
3.1.1 Provision of quantitative data on the population dynamics of tropical tuna's. In 2007, these services shall include:	<ul style="list-style-type: none"> <li>• 15,000 tuna tagged with conventional tags in PNG waters</li> <li>• 100 tuna tagged with archival tags in PNG waters</li> </ul>	<ul style="list-style-type: none"> <li>• A total of 61,271 tuna tagged in PNG waters with conventional tags and 478 tuna tagged with electronic tags (256 Archival, 195 Sonic and 27 Archival &amp; Sonic). See <a href="http://www.spc.int/oceanfish/">http://www.spc.int/oceanfish/</a> for tagging details.</li> </ul>
a. Implementation of BET, YFT and SKJ research in PNG waters to obtain data on local exploitation rates and the influence of FAD and seamounts on stock fidelity, movement and distribution.	<ul style="list-style-type: none"> <li>• 120 tagged with acoustic tags and monitors deployed within FAD clusters in PNG waters.</li> <li>• Preliminary analysis of 2006 and 2007 PNG data and documentation in 2007 progress report.</li> </ul>	<ul style="list-style-type: none"> <li>• Progress report on Phase 1 of PTTTP presented to the Scientific Committee of the Western and Central Pacific Fisheries Commission. See <a href="http://www.wcpfc.int/sc3/pdf/WCPFC-SC3%20GN%20WP-9%20PNG%20tagging%20project-%20progress%20report.pdf">http://www.wcpfc.int/sc3/pdf/WCPFC-SC3%20GN%20WP-9%20PNG%20tagging%20project-%20progress%20report.pdf</a> for report.</li> </ul>
b. Commencement of BET, YFT and SKJ research in the WCPO to obtain data on exploitation rates, and the influence of bathymetry, oceanographic and geographic drivers on tuna movement and distribution (contingent on SCIFISH application).	<ul style="list-style-type: none"> <li>• Presentation of PNG preliminary analysis at 2 scientific conferences.</li> <li>• 4 Briefing newsletters on progress in PNG.</li> <li>• HoF and WCPFC briefed on PNG progress and interim results.</li> <li>• Submission of SCIFISH funding application for commencement of wider WCPO BET, YFT and SKJ research and Albacore research.</li> </ul>	<ul style="list-style-type: none"> <li>• A proposal for support funding as part of the PTTTP successfully submitted to the Taiwan ROC to undertake tagging cruises in Solomon Islands EEZ.</li> <li>• First Solomon Islands EEZ cruise completed with 11168 tuna tagged with conventional (7,476 skipjack, 3,560 yellowfin, 132 bigeye) and 12 Archival tagged fish. See <a href="http://www.spc.int/oceanfish/">http://www.spc.int/oceanfish/</a> for details.</li> </ul>
c. Commencement of Albacore research in WCPO to obtain data on exploitation rates and the influence of bathymetry, oceanographic and geographic drivers on tuna movement and distribution (contingent on SCIFISH application).	<ul style="list-style-type: none"> <li>• 2008 project plan for BET, YFT &amp; SKJ in wider WCPO prepared</li> <li>• 2008 project plan for Albacore research prepared</li> <li>• Tagging Technician appointed</li> </ul>	<ul style="list-style-type: none"> <li>• Preliminary analysis of 2006 and 2007 PNG vertical behaviour and effects of FAD's presented to the Scientific Committee of the Western and Central Pacific Fisheries Commission. See <a href="http://www.wcpfc.int/sc3/pdf/BI-WP-4_Leroy_AT-SONIC_complete.pdf">http://www.wcpfc.int/sc3/pdf/BI-WP-4_Leroy_AT-SONIC_complete.pdf</a> for report.</li> <li>• Preliminary analysis of 2006 and 2007 PNG vertical behaviour and effects of FAD's presented at the Second International Symposium on the Tagging and Tracking of Marine Fish with Electronic Devices. Proceeding of this conference to be published in the peer-reviewed Reviews in Fish Biology and Fisheries. Preliminary analysis also presented at the 2007 Principal Investigators Meeting for the Pelagic Fisheries Research Program.</li> </ul>

<p>d. Commencement of Albacore research in WCPO to obtain data on age-growth relationships and spawning fidelity (contingent on SCIFISH application).</p>	<ul style="list-style-type: none"> <li>• Albacore Biologist appointed</li> <li>• Peer reviewed publication submitted that compares the modelled recruitment time series of tropical tuna's.</li> </ul>	<ul style="list-style-type: none"> <li>• A proposal for the PTTTP was presented at the August meeting of the Scientific Committee of the Western and Central Pacific Fisheries Commission, and was enthusiastically supported by the scientific representatives of Commission members and cooperating non-members. Since then, a major funding commitment (NZD 5 million) to the PTTTP was announced by the Hon. Helen Clark, Prime Minister of New Zealand at the recent Forum Leaders Meeting in Tonga. See <a href="http://www.wcpfc.int/sc3/pdf/SC3_GN_WP_10%20(tagging%20proposal).pdf">http://www.wcpfc.int/sc3/pdf/SC3_GN_WP_10%20(tagging%20proposal).pdf</a> for project proposal.</li> </ul>
<p>e. Commencement of Albacore research in WCPO to obtain information on longline gear selectivity (contingent on SCIFISH application).</p>	<ul style="list-style-type: none"> <li>• Presentation of recruitment index at 1 scientific conference.</li> </ul>	<ul style="list-style-type: none"> <li>• PTTTP project presented to WCPFC and CRGA.</li> </ul>
<p>f. Development of environmental index of recruitment of tropical tuna's for incorporation in stock assessment.</p>		<ul style="list-style-type: none"> <li>• SCIFISH project confirmed but commencement delayed until 2008. Tagging Technician and Albacore Biology positions advertised only, with selection of preferred applicants to be made in early 2008.</li> <li>• Two publications on recruitment of yellowfin tuna submitted to Canadian Journal of Fish and Aquatic Sciences. Both have received an invitation to resubmit to the journal subject to satisfying suggested revisions by reviewers.</li> <li>• Recruitment index for yellowfin presented at the Scientific Committee of the Western and Central Pacific Fisheries Commission (see <a href="http://www.wcpfc.int/sc3/pdf/WCPFC-SC3-SA-SWG%20WP-5-YFT%20WCPO%20recruitment%20abstract.pdf">http://www.wcpfc.int/sc3/pdf/WCPFC-SC3-SA-SWG%20WP-5-YFT%20WCPO%20recruitment%20abstract.pdf</a>), 2007 Lake Arrowhead Tuna Conference and the 2007 CLIOTOP meeting.</li> </ul>
<p>3.1.2 Provision of quantitative data on the environmental drivers of distribution for tropical tuna's. In 2007, these services shall include:</p>	<ul style="list-style-type: none"> <li>• OFP Technical report documenting methods for identifying seamounts from remote sensed data, methods for correcting false positives in data and bathymetry and oceanographic characteristics of seamounts.</li> </ul>	<ul style="list-style-type: none"> <li>• OFP technical report was replaced by a scientific paper submitted to Deep-sea Research. The submission has been accepted subject to the authors adequately addressing reviewer comments.</li> </ul>
<p>a. Characterising the physical properties of seamounts.</p>	<ul style="list-style-type: none"> <li>• Develop statistical models that test the association between seamounts and tuna distribution (as measured by historical fishing data).</li> </ul>	<ul style="list-style-type: none"> <li>• HoF and WCPFC and SPRFMO briefed on seamount progress. See <a href="http://www.wcpfc.int/sc3/pdf/EB%20IP-9%20document.pdf">http://www.wcpfc.int/sc3/pdf/EB%20IP-9%20document.pdf</a></li> <li>• Valerie Allain presented the seamount analysis to the 2007 GeoHab conference.</li> </ul>
<p>b. Characterising the relationship between seamounts and historical fishing data (this activity contingent on the reallocation of GEF</p>	<ul style="list-style-type: none"> <li>• HoF and WCPFC briefed on seamount</li> </ul>	<ul style="list-style-type: none"> <li>• Discussions initiated with IUCN and GEF Project Management Unit regarding additional staff resources required to complete seamount-oceanography-fisheries statistical analysis.</li> </ul>



resources to OFP from IUCN).	<p>progress and results.</p> <ul style="list-style-type: none"> <li>• Presentation of seamount analysis at 1 scientific conference.</li> </ul>	
3.1.3 Provision of quantitative data on ecosystem and trophic dynamics. In 2007, these services shall include:	<ul style="list-style-type: none"> <li>• Observer sampling of 100 stomachs and tissues &amp; their analysis</li> <li>• Collection of 500 stomachs and tissues &amp; their analysis from tagging cruises.</li> <li>• Maintain prey item reference collection</li> <li>• 1 Submitted manuscript to a peer reviewed journal</li> <li>• Submission of funding proposal to characterise seamounts and their influence on the pelagic ecosystem in the Bismark Sea</li> <li>• 4 Member country newsletters updating results of trophic and diet analysis.</li> <li>• Presentation of trophic and diet analysis at 2 scientific conferences.</li> <li>• HoF and WCPFC briefed on trophic and diet analysis progress and results</li> <li>• Isotope map for WCPO.</li> </ul>	<ul style="list-style-type: none"> <li>• 248 new stomach samples have been collected from observer trips and 1,538 from tagging cruises.</li> <li>• 406 stomach samples have been examined and entered in the database (203 samples from PNG tagging 2006, 132 samples from observers sampling pre-2007 and 44 from observers sampling post-2007.</li> <li>• 14 new prey species have been identified and added to prey items reference collection.</li> <li>• PFRP annual report in July 2007; 4 GEF quarterly reports in Mar. Jun. Sept. Dec. 2007, 4 quarterly Biological Sampling newsletters in Jan. Apr. Jul. Nov. 2007.</li> <li>• Isotope mapping of WCPO completed as part of PhD studies of Brittany Graham at the University of Hawaii. Scientific publication due in 2008.</li> <li>• Presentation of trophic and diet analysis at the 2007 Principal Investigators Meeting for the Pelagic Fisheries Research Program and 2007 Lake Arrowhead Tuna Conference.</li> <li>• 1 article published in PFRP Newsletter Oct-Dec 2007 but no peer review article submitted as yet.</li> <li>• Proposal “Bismarck 2008” to characterise seamounts and their influence on the pelagic ecosystem in the Bismarck Sea submitted in Jan. 2007, but not accepted due to IRD funding constraints.</li> <li>• HoF and WCPFC briefed on trophic and diet analysis progress and results.</li> </ul>
a. Identification of functional groups and influence of latitudinal, bathymetry and oceanographic effects.		
b. Identification of carbon cycles and influence of latitudinal, bathymetry and oceanographic effects.		
c. Identification of natural isotope tags for studying tuna movement.		
3.1.4 Provision of quantitative data on age and reproduction of tropical tuna's. In 2007, these services shall include:	<ul style="list-style-type: none"> <li>• Submit paper on analysis-to-date to a peer-reviewed scientific journal</li> </ul>	<ul style="list-style-type: none"> <li>• 100 otoliths received through PNG Observer program.</li> <li>• Pilot analysis of microchemistry signatures of MFCL regions for yellowfin, Albacore and bigeye.</li> <li>• Scientific paper (Leroy, Lehodey and Hampton) not submitted due to prioritisation of tagging activities.</li> </ul>
a. Continue to receive and archive otoliths for future analysis comparing observed and estimated growth.		
3.1.5 Provision of oceanographic data for OFP activities. In 2007, these	<ul style="list-style-type: none"> <li>• Scoping report on the requirement of OFP for an auto updating oceanographic</li> </ul>	<ul style="list-style-type: none"> <li>• Internal consultant's report on the requirements of an OFP oceanographic database completed including a review of existing extraction tools and</li> </ul>

services shall include:	database and business case for its development.	available data.
a. Develop oceanographic database for OFP.	<ul style="list-style-type: none"> <li>• Provide oceanographic data for NTFSR and stock assessments</li> </ul>	<ul style="list-style-type: none"> <li>• Oceanographic data for NTFSR general introduction provided.</li> <li>• Updated version of ESSIC ocean-model dataset purchased.</li> </ul>
3.1.6 Provision of data on important by-catch species. In 2007, these services shall include:	<ul style="list-style-type: none"> <li>• Develop partnership arrangement with CSIRO for access to their pelagic life history database</li> </ul>	<ul style="list-style-type: none"> <li>• CSIRO dataset provided to OFP as part of joint ERA project.</li> </ul>
a. Develop database of life-history characteristic of by-catch species for use in NTFSR & ERA.	<ul style="list-style-type: none"> <li>• Scope the requirements of OFP for a life-history database</li> </ul>	
<b>Output 3.2: Improved ecosystem models that incorporate available data</b>		
3.2.1 Provision of ecosystem models that describe the pelagic environment and allow the consequences of ecosystem change and fisheries management to be explored. In 2007, these services shall include:	<ul style="list-style-type: none"> <li>• Workshop with trophic modelling experts leading to establishing the candidate ecosystem models for WCPO</li> <li>• Preliminary analysis of trophic structure and the influence of bathymetry, oceanography and geography variation.</li> </ul>	<ul style="list-style-type: none"> <li>• Trophic modeling workshop hosted by SPC in April 2007 to develop Pacific warm-pool ECOPATH with ECOSIM model (Attendees: Bob Olson, Tim Essington, Jeff Dambacher, Tom Okey, David Kirby, Valerie Allain, Simon Nicol). Warm-pool ecosystem model presented to SC3. See <a href="http://www.wcpfc.int/sc3/pdf/SC3_EB_IP8.pdf">http://www.wcpfc.int/sc3/pdf/SC3_EB_IP8.pdf</a></li> <li>• Methods to compare trophic structures between WCPO, EPO and East Australia developed and preliminary analysis completed. Results presented at 2007 Principal Investigators Meeting for the Pelagic Fisheries Research Program.</li> <li>• SEAPODYM related activities deferred until 2008 due to the delayed start of SCIFISH.</li> <li>• SCIFISH project confirmed but commencement delayed until 2008. Fisheries Oceanographer and Ecosystem Modeller positions advertised only, with selection of preferred applicants to be made in 2008.</li> <li>• Member country newsletters deferred until 2008, when SCIFISH commenced and work plan established.</li> <li>• Oceanographic correlates for NTFSR's provided in addition to general introductory description of oceanography in the WCPO.</li> </ul>
a. Identification of trophic uncertainties in WCPO pelagic ecosystem	<ul style="list-style-type: none"> <li>• Validation of diet matrix and prey consumption estimates for SEAPODYM</li> <li>• Completion of SEAPODYM code revisions (contingent on SCIFISH application).</li> </ul>	
b. Identification and inclusion of drivers of spatial heterogeneity in trophic pathways	<ul style="list-style-type: none"> <li>• SEAPODYM Mixed-resolution version is operational and available on website (contingent on SCIFISH application).</li> </ul>	
c. Identification of tropical tuna feedback mechanisms, ecosystem correlates and species at risk from predator removal	<ul style="list-style-type: none"> <li>• SEAPODYM Version with statistical parameter estimation is operational and available on website (contingent on SCIFISH application).</li> </ul>	
d. Develop trophic structure for parameterization of regional SEAPODYM models	<ul style="list-style-type: none"> <li>• SDYMView maintained with any bugs fixed.</li> </ul>	
e. Develop regional version of SEAPODYM	<ul style="list-style-type: none"> <li>• Oceanographic input into New Caledonia trial version of mixed resolution SEAPODYM</li> </ul>	
f. Scenario analysis to forecast the		

<p>impacts of altered management (including closures &amp; MPA's) on oceanic fisheries and its effects on pelagic ecosystems (contingent on SCIFISH application).</p>	<ul style="list-style-type: none"> <li>• Capacity for non-visual multi-conditional queries of SDYM input/output data maintained</li> </ul>	
<p>h. Scenario analysis to evaluate the likelihood of trophic cascades (contingent on SCIFISH application).</p>	<ul style="list-style-type: none"> <li>• Submission of SCIFISH funding application for scenario analysis &amp; SEAPODYM refinement</li> </ul>	
<p>i. Scenario analysis to forecast the impacts of environmental variability (including climate change) on oceanic fisheries and its effects on pelagic ecosystems (contingent on SCIFISH application).</p>	<ul style="list-style-type: none"> <li>• 2008 project plan for scenario analysis prepared.</li> <li>• Fisheries Oceanographer appointed</li> <li>• Ecosystem Modeller appointed</li> <li>• 4 Member country newsletters updating results of ecosystem modelling.</li> <li>• Presentation of ecosystem modeling progress at 2 scientific conferences.</li> <li>• HoF and WCPFC briefed on ecosystem modelling progress and results</li> <li>• Provision of oceanographic correlates for NTFSR.</li> </ul>	
<p>3.2.2 Develop individual/single species population models for exploring management implications and knowledge uncertainty. In 2007, these services shall include:</p>	<ul style="list-style-type: none"> <li>• Continue individual-based modelling</li> <li>• IBM simulations of spatial distributions provided to collaborators for synthesis and display in a GIS</li> </ul>	<ul style="list-style-type: none"> <li>• Pacific leatherbacks and loggerhead turtle models presented at the 2007 CLIOTOP meeting</li> <li>• Scientific paper deferred until 2008.</li> </ul>
<p>a. Pacific leatherbacks and loggerhead turtles</p>	<ul style="list-style-type: none"> <li>• scientific paper submitted to peer reviewed journal</li> <li>• Presentation of Pacific leatherbacks and loggerhead turtle models at 1 scientific conference</li> </ul>	
<p>3.2.3 Incorporate environmental influences for incorporation into stock assessment models. In 2007, these services shall include:</p>	<ul style="list-style-type: none"> <li>• Incorporate environmental index into MULTIFAN-CL</li> <li>• Improved recruitment estimation</li> </ul>	<ul style="list-style-type: none"> <li>• Incorporation of recruitment index deferred until 2009.</li> </ul>
<p>a. Improved estimates of historical and current biomass</p>	<ul style="list-style-type: none"> <li>• A comparison of time series for tropical tuna recruitment predicted from environmental variables to evaluate recruitment influence on stock dynamics</li> </ul>	<ul style="list-style-type: none"> <li>• Two publications on recruitment of yellowfin tuna submitted to Canadian Journal of Fish and Aquatic Sciences. Both have received an invitation to resubmit to the journal subject to satisfying suggested revisions by reviewers.</li> </ul>

	<ul style="list-style-type: none"> <li>• 2007 YFT stock assessment updated with this information.</li> <li>• Peer reviewed publication submitted that compares the modelled recruitment time series of tropical tuna's.</li> <li>• Presentation of recruitment index at 2 scientific conferences.</li> <li>• HoF and WCPFC briefed on recruitment index progress and results</li> </ul>	
3.2.4 Develop descriptions of the pelagic ecosystem for quantitative and qualitative risk assessments. In 2007, these services shall include:	<ul style="list-style-type: none"> <li>• Submission of tender application for ERA with CSIRO.</li> <li>• 2007 level 2 ERA requirements completed.</li> </ul>	<ul style="list-style-type: none"> <li>• WCPFC ERA successfully tendered with CSIRO and project completed.</li> <li>• 3 year work plan for ERA in WCPO accepted and funded by WCPFC.</li> <li>• ACERA submission not progressed due to advice from ACERA administrators that ACERA resources would be insufficient for 2007.</li> </ul>
a. Level 2 ERA for WCPO	<ul style="list-style-type: none"> <li>• Submission of funding submission to ACERA to develop methods for incorporating knowledge uncertainty in ERA.</li> </ul>	<ul style="list-style-type: none"> <li>• ERA progress presented at SC3, see <a href="http://www.wcpfc.int/sc3/pdf/SC3_EB_WP1_kirby_hobday.pdf">http://www.wcpfc.int/sc3/pdf/SC3_EB_WP1_kirby_hobday.pdf</a> and <a href="http://www.wcpfc.int/sc3/pdf/SC3-EB-WP-3.pdf">http://www.wcpfc.int/sc3/pdf/SC3-EB-WP-3.pdf</a></li> </ul>
b. Incorporation of knowledge uncertainty in ERA	<ul style="list-style-type: none"> <li>• Presentation of ERA progress at 2 scientific conferences.</li> <li>• HoF and WCPFC briefed on ERA progress and results.</li> </ul>	<ul style="list-style-type: none"> <li>• HoF and WCPFC briefed as part of OFP briefing.</li> </ul>
<b>Output 3.3: Scientific advice on ecosystem-based management options using available models and data</b>		
3.3.1 Carry out an Ecological Risk Assessment for bycatch species based on updated bycatch estimates and a review of life history characteristics	<ul style="list-style-type: none"> <li>• Presentation of results of ecosystem analysis to wider scientific community and fisheries management organisation.</li> <li>• Presentation of information on national and regional implications of results of ecosystem analysis to Pacific SIDS</li> </ul>	<ul style="list-style-type: none"> <li>• SC3 presentations as follows: <ul style="list-style-type: none"> <li>○ <a href="http://www.wcpfc.int/sc3/pdf/WCPFC-SC3%20GN%20WP-9%20PNG%20tagging%20project-%20progress%20report.pdf">http://www.wcpfc.int/sc3/pdf/WCPFC-SC3%20GN%20WP-9%20PNG%20tagging%20project-%20progress%20report.pdf</a></li> <li>○ <a href="http://www.wcpfc.int/sc3/pdf/SC3_GN_WP_10%20(tagging%20proposal).pdf">http://www.wcpfc.int/sc3/pdf/SC3_GN_WP_10%20(tagging%20proposal).pdf</a></li> <li>○ <a href="http://www.wcpfc.int/sc3/pdf/BI-WP-4_Leroy_AT-SONIC_complete.pdf">http://www.wcpfc.int/sc3/pdf/BI-WP-4_Leroy_AT-SONIC_complete.pdf</a></li> <li>○ <a href="http://www.wcpfc.int/sc3/pdf/SC3_EB_WP1_kirby_hobday.pdf">http://www.wcpfc.int/sc3/pdf/SC3_EB_WP1_kirby_hobday.pdf</a></li> <li>○ <a href="http://www.wcpfc.int/sc3/pdf/SC3_EB_WP1_kirby_hobday.pdf">http://www.wcpfc.int/sc3/pdf/SC3_EB_WP1_kirby_hobday.pdf</a></li> <li>○ <a href="http://www.wcpfc.int/sc3/pdf/WCPFC-SC3-EB%20SWG-WP-2.pdf">http://www.wcpfc.int/sc3/pdf/WCPFC-SC3-EB%20SWG-WP-2.pdf</a></li> <li>○ <a href="http://www.wcpfc.int/sc3/pdf/SC3-EB-WP-3.pdf">http://www.wcpfc.int/sc3/pdf/SC3-EB-WP-3.pdf</a></li> <li>○ <a href="http://www.wcpfc.int/sc3/pdf/SC3_EB_IP8.pdf">http://www.wcpfc.int/sc3/pdf/SC3_EB_IP8.pdf</a></li> <li>○ <a href="http://www.wcpfc.int/sc3/pdf/EB%20IP-9%20document.pdf">http://www.wcpfc.int/sc3/pdf/EB%20IP-9%20document.pdf</a></li> </ul> </li> </ul>
3.3.2 Delivery of scientific advice on tuna population dynamics to industry, management, scientific and executive audiences.	<ul style="list-style-type: none"> <li>• 2 NTFSR</li> <li>• Ecosystem sessions at Stock Assessment Workshops</li> </ul>	
3.3.3 Delivery of scientific advice on	<ul style="list-style-type: none"> <li>• 6 SC3 presentations</li> </ul>	

<p>pelagic ecosystem dynamics to industry, management, scientific and executive audiences</p>	<ul style="list-style-type: none"> <li>• 1 OFP technical reports</li> <li>• 5 Scientific papers</li> <li>• Web-site updates</li> <li>• 4 newsletters</li> <li>• Consultancy to Brian McArdle from the University of Auckland to evaluate levels of by-catch in the WCPO oceanic fishery</li> <li>• Provision of advice to the Southern RMFO on the impacts of managing southern species.</li> </ul>	<ul style="list-style-type: none"> <li>○ <a href="http://www.wcpfc.int/sc3/pdf/WCPFC-SC3-SA-SWG%20WP-5-YFT%20WCPO%20recruitment%20abstract.pdf">http://www.wcpfc.int/sc3/pdf/WCPFC-SC3-SA-SWG%20WP-5-YFT%20WCPO%20recruitment%20abstract.pdf</a></li> <li>• Methods in ERA presented at both 2007 Stock Assessment Workshops.</li> <li>• Evaluation of levels of by-catch completed for WCPO.</li> <li>• SPRFMO provided with summary report and presentation on tuna interactions with SPRFMO species of interest and summary report on seamount distribution provided to SPRFMO Scientific Committee.</li> <li>• Web-site update deferred to 2008.</li> <li>• Four newsletters describing results and progress on ecosystem and trophic interactions in WCPO provided to Pacific SIDS.</li> <li>• Progress on the PTPP updated monthly on external webpage and monthly reports distributed via email to stakeholders.</li> <li>• Scientific papers                         <ul style="list-style-type: none"> <li>○ Langley et al. (submitted – requires revision before resubmission) Canadian Journal of Fish and Aquatic Sciences</li> <li>○ Kirby et al. (submitted – requires revision before resubmission) Canadian Journal of Fish and Aquatic Sciences</li> <li>○ Allain et al. (accepted subject to acceptable revisions) Deep Sea Research</li> </ul> </li> <li>• OFP technical report substituted by peer-reviewed publication (Allain et al.).</li> <li>• PFRP Newsletters                         <ul style="list-style-type: none"> <li>○ Kirby et al. Regime Shifts and Recruitment in the Western and Central Pacific Ocean, PFRP Newsletter 12(3).</li> <li>○ Itano. Papua New Guinea Tuna-Tagging Project. PFRP Newsletter 12(1).</li> </ul> </li> </ul>
<p>3.3.4 Provide regional training in population tuna ecology and ecosystem research.</p>		
<p>3.3.5 Estimates of levels of by-catch in the WCPO oceanic fisheries</p>		

#### 4. Programme Management

A number of significant events impacting upon programme management and programme activities occurred during 2007.

- The European Commission funded PROCFish project (Oceanic Component) terminated on 28 February. Certain critical activities (e.g., observer programme support and training) have been continued at a reduced level using various *ad hoc* funding sources.
- A follow-on project to PROCFish, entitled “Scientific Support for Oceanic Fisheries Management in the Western and Central Pacific Ocean” or SCIFISH, was approved for EC support from additional 9<sup>th</sup> EDF funds made available to the region. The SCIFISH project provides 4 million euros over 4 years from the ACP envelope and 2.6 million euros over 4 years from the OCT envelope. The project will provide further support in the critical areas of national fishery monitoring, tuna tagging, ecosystem modelling and (through a component to be implemented by FFA) fisheries surveillance. The Financing Agreement for the project was signed in late 2007, allowing implementation of the project in early 2008.
- The need for a new regional tuna tagging programme has been identified at regional scientific fora in recent years, notably at the 1<sup>st</sup> and 2<sup>nd</sup> meetings of the WCPFC Scientific Committee. In response, the OFP, in partnership with donor agencies and the PNG National Fisheries Authority, implemented the first phase of a new regional tagging programme in PNG. As noted under section 3.1, this work has been an outstanding success. The OFP has continued to promote regional tuna tagging in the WCPFC. A Regional Tuna Tagging Steering Committee, chaired by the OFP Manager, was established by the WCPFC and has developed a comprehensive proposal for extending the work in PNG throughout the western and central equatorial Pacific. It is hoped that this proposal, which seeks new funding of approximately USD 7 million over five years, will be supported by the WCPFC and the necessary funding secured. A large amount of support was obtained when the Government of New Zealand announced a contribution of NZD 5 million (USD 3.8 million) to the project at the 2007 Pacific Forum Leaders meeting in Tonga.
- The provision of scientific services by the OFP to the WCPFC continued in 2007. A general framework for cooperation between SPC and the WCPFC, as well as the details of provision of services and funding, was agreed in a Memorandum of Understanding signed by the chief executives of both organisations in 2005. Annual service agreements detail the annual work plan conducted by OFP on behalf of WCPFC and the funding support to be provided. The Secretariat views this arrangement positively, and considers that ongoing OFP involvement in scientific service provision to the WCPFC can only enhance the quality or service that it can deliver to SPC members at the national level, or via FFA.
- The FFA is a key OFP client, with OFP providing scientific support to the FFA for most of its tuna fisheries management activities. The scope of FFA activities has expanded greatly in recent years, with a number of new initiatives involving the implementation of the Ecosystem Approach to Fisheries Management, tuna management options analysis, and others. With AusAID support, a new Fisheries Scientist position has been established in the OFP to increase our capacity to support FFA fisheries management activities.

## **5. 2008 Budget**

Core funding to the OFP in 2008 is expected to remain at similar levels to 2007. Programme funding support has been increased, through additional support provided by AusAID, to accommodate the need for increased scientific support to FFA, as outlined in the previous section. In terms of project funding, the GEF-funded POFM project will continue in 2008 at a similar level, as will funding by the WCPFC. The new EDF 9-funded SCIFISH project will begin in early 2008, providing ongoing support in a number of key areas, including capacity building in tuna fishery monitoring, tuna tagging and ecosystem modelling. It is also hoped that additional resources for regional tuna tagging will be made available through the WCPFC to enable a full-scale regional tagging programme to begin in 2008.

## **6. 2008 Work Plan**

The 2008 work plan is summarised in the following tables.

**TABLE 1/2008.****Objective 1: High-quality scientific information and advice for regional and national fisheries management authorities on the status of, and fishery impacts on, stocks targeted or otherwise impacted by regional oceanic fisheries**

2008 Work Programme Activities	Performance Indicators and/or Means of Verification	2008 Achievements
<b>Output 1.1: Regional stock assessments and associated analyses</b>		
<p>1.1.1 Provision of stock assessment and related analytical services to the WCPFC. In 2008, these services shall include:</p> <ul style="list-style-type: none"> <li>– Undertake analyses of longline catch and effort data, including where appropriate operational-level data, to improve the standardisation of effort and the construction of indices of stock abundance for bigeye, yellowfin and South Pacific albacore tuna.</li> <li>– Undertake full stock assessment for target and non-target species as requested by the Commission (bigeye, SP albacore and skipjack in 2008).</li> <li>– Continued exploration of sensitivity of stock assessment outcomes to structural assumptions in models and data issues, including the comparison of various stock assessment models.</li> <li>– A comparison of MFCL and SS-2 stock assessment models for bigeye tuna.</li> <li>– Advice and input, as requested and as time allows, to proposed southwest Pacific swordfish assessment to be undertaken by CCMs.</li> <li>– Development of recruitment indices independent of the MFCL model, including the investigation of recruitment and oceanographic trends.</li> <li>– Development and reporting of stock indicators for</li> </ul>	<ul style="list-style-type: none"> <li>• Stock Assessment preparatory workshop hosted and outcomes documented.</li> <li>• SC 4 working papers</li> <li>• Tuna Fishery Assessment Report (TFAR) published following 2008 assessments.</li> <li>• Input into WCPFC management meetings as required.</li> <li>• WCPFC satisfied with services provided.</li> <li>• Favorable review of OFP scientific services by WCPFC consultant.</li> <li>• Publication of a scientific paper relating yellowfin recruitment to oceanographic conditions (submitted).</li> </ul>	<ul style="list-style-type: none"> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> </ul>



<p>those key species not formally assessed (yellowfin tuna in 2008).</p> <ul style="list-style-type: none"> <li>– Further review of spatio-temporal aspects of catches of juvenile bigeye and yellowfin tuna caught in association with fish aggregating devices (FADs).</li> <li>– Undertake evaluations of management options as specified by WCPFC.</li> </ul>		<ul style="list-style-type: none"> <li>•</li> <li>•</li> </ul>
<p>1.1.2 Management and development of the MULTIFANCL stock assessment software and associated visualisation software, including networked processing, testing and documentation of new features.</p>	<ul style="list-style-type: none"> <li>• Updated stock assessment modeling software and documentation posted on the MULTIFAN-CL website <a href="http://www.multifan-cl.org">www.multifan-cl.org</a>.</li> <li>• SC 4 Working Paper, including any future research plan for the refinement of assessment models.</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
<p>1.1.3 Outputs from stock assessments provided for inclusion in other OFP and regional activities, e.g. FFA Management Options workshops, ecosystem modeling, management processes, etc.</p>	<ul style="list-style-type: none"> <li>• Participation in relevant meetings, forums, as required.</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
<b>Output 1.2: National fishery status reports and associated analyses</b>		
<p>1.2.1 NTFSRs completed for Tonga, Palau, FSM, Nauru, Niue and Kiribati and commenced for Samoa and RMI.</p>	<ul style="list-style-type: none"> <li>• 6 fishery status/summary reports that are used to inform management decision-making at the national level progressed or finalised per year.</li> <li>• Improved integration within the FFA/SPC EAFM work programme.</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
<p>1.2.2 Participate in national stakeholder workshops for delivery of NTFSRs.</p>	<ul style="list-style-type: none"> <li>• Effective participation in the national EAFM and TMP processes and other relevant national meetings.</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
<p>1.2.3 Completion of summary of biology of key pelagic species.</p>	<ul style="list-style-type: none"> <li>• SC 4 paper presenting results for a number of key species.</li> <li>• Completion of report and publication in an appropriate format (e.g. OFP Technical Report).</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
<b>Output 1.3: Enhanced capacity of PICTs to interpret stock assessment information and advice</b>		

1.3.1 Summary reports of stock assessment results provided to PICTs at relevant fora, e.g. HoF, FFC, Management Options workshops, etc.	<ul style="list-style-type: none"> <li>• Improved understanding of OFP work at the national level.</li> <li>• Tuna Fishery Assessment Report published</li> </ul>	•
1.3.2 Ongoing development of material for a course to provide a general introduction to fisheries stock assessments and their management implications with a focus on WCPO tuna assessments in particular.	<ul style="list-style-type: none"> <li>• Liaise with USP staff to evaluate potential collaboration in training of PICT fisheries staff.</li> </ul>	•
1.3.3 Hold a regional stock assessment workshop at SPC headquarters.	<ul style="list-style-type: none"> <li>• Workshop report</li> <li>• Development of remote learning initiatives.</li> </ul>	•
1.3.4 Assist in the preparation and presentation of scientific briefs to preparatory meetings of PICTs for the WCPFC.	<ul style="list-style-type: none"> <li>• Improved participation of PICTs in SC and WCPFC meetings</li> </ul>	•
1.3.5 Host attachments of national technical staff to participate in regional stock assessment work and preparation of NTFSRs.	<ul style="list-style-type: none"> <li>• Attachment reports</li> <li>• Improved understanding of regional assessments leading to improved participation in WCPFC and in national management decision making</li> </ul>	•

**TABLE 2/2008.****Objective 2: Accurate and comprehensive scientific data for regional and national fisheries management authorities on fisheries targeting the region's resources of tuna, billfish and other oceanic species**

2008 Work Programme Activities	Performance Indicators and/or Means of Verification	2008 Achievements
<b>Output 2.1: Regional oceanic fishery data management services provided to the WCPFC</b>		
2.1.1 Incorporate data provided by Commission members under the Commission's data provision policy (e.g., annual catch estimates, operational-level logsheet data, size data, etc.) into existing databases and facilitate access of Commission secretariat staff to those data as appropriate.	<ul style="list-style-type: none"> <li>• Amount of data added to database, as documented in the <i>Tuna Fishery Data Catalogue</i></li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
2.1.2 Compile estimates of catch and effort in support of the functions of the Commission and its subsidiary bodies.	<ul style="list-style-type: none"> <li>• SC4 working paper on estimates of annual catches by species, gear type and flag.</li> <li>• SC4 information paper and report to the Secretariat on estimates of annual catches by vessel flag, EEZ, and archipelagic waters, for use in determining the catch component (for 2005-2007) of the Commission's assessed contributions.</li> <li>• Summary data will be presented in both table and figure at WCPFC5 on estimates of catch and effort in support of Conservation and Management Measures.</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
2.1.3 For catches for which estimates are not otherwise available, conduct statistical analyses to estimate catches, particularly in regard to purse-seine catches of bigeye tuna, discards of target tuna species, and catches of non-target species.	<ul style="list-style-type: none"> <li>• SC4 working paper.</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
2.1.4 Contribute to the development of draft data standards for port sampling and observer programmes in association with WCPFC Secretariat for subsequent consideration by	<ul style="list-style-type: none"> <li>• IWG-ROP and SC4 working paper on justification of SC3 provisional observer data standards.</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>

CCMs.		
2.1.5 Review current unloading data forms used in the region, and the proposed WCPFC transshipment reporting form, to determine their adequacy for scientific purposes.	<ul style="list-style-type: none"> <li>• SC4 working paper.</li> </ul>	•
2.1.6 On request, advise the WCPFC Executive Director regarding the further development of Rules and Procedures for the Protection, Access to and Dissemination of Data and the Information Security Policy.	<ul style="list-style-type: none"> <li>• Advice provided to the Executive Director on request.</li> </ul>	•
2.1.7 Determine the status of the provision of scientific data to the Commission.	<ul style="list-style-type: none"> <li>• Updates on the status of the provision of scientific data on the WCPFC website and a summary report provided to the Secretariat for consideration at TCC4 and WCPFC5.</li> <li>• Continued refinement of the web-based utility to identify data gaps.</li> </ul>	•
2.1.8 Identify known data / information gaps in the current stock assessment, particularly in relation to operational level CPUE data.	<ul style="list-style-type: none"> <li>• SC4 working paper.</li> </ul>	•
2.1.9 Provide support, as requested, to support 'A study on the Causes of Data Gaps'.	<ul style="list-style-type: none"> <li>• Participation in the project.</li> </ul>	•
2.1.10 Participate in the Indonesia and Philippines Data Collection Project and the compilation of information on the tuna fisheries of Vietnam.	<ul style="list-style-type: none"> <li>• Technical support provided and documented in reports of relevant duty travel, meetings of the Steering Committee and IPDCP workshops.</li> <li>• Advice provided to the Secretariat on request.</li> </ul>	•
2.1.11 Produce and publish on the WCPFC website two issues of the Western and Central Pacific Tuna Bulletin, containing estimates of monthly catch rates for WCPO fleets, based on the most recent data available.	<ul style="list-style-type: none"> <li>• Western and Central Pacific Tuna Bulletin posted on the WCPFC website in January and July.</li> </ul>	•
2.1.12 Produce and publish on the Commission's website the Tuna Fishery Yearbook 2007, containing annual catch estimates by gear type, flag and species.	<ul style="list-style-type: none"> <li>• Tuna Fishery Yearbook, 2007, posted on the WCPFC website in late 2008.</li> </ul>	•

2.1.13	Maintain the Commission's website, including the dissemination of public domain catch, effort and size data on the Commission's website at agreed level of resolution.	<ul style="list-style-type: none"> <li>• WCPFC website updated as required.</li> <li>• Public domain data posted on the WCPFC website as data become available.</li> </ul>	•
<b>Output 2.2: Enhanced national fishery monitoring and data management systems</b>			
2.2.1	Provide regional coordination of national fishery monitoring and data management systems through the provision of a template for integrated national tuna fishery monitoring, data collection forms, computer software, newsletters and other information, and through a meeting of the SPC/FFA Data Collection Committee.	<ul style="list-style-type: none"> <li>• Information provided to National Tuna Data Coordinators.</li> <li>• Report of the DCC meeting.</li> </ul>	•
2.2.2	Develop or enhance national tuna fishery data management systems, such as TUFMAN.	<ul style="list-style-type: none"> <li>• TUFMAN installed or updated in member countries and territories</li> </ul>	•
2.2.3	Develop or enhance national observer programmes.	<ul style="list-style-type: none"> <li>• Staff travel reports</li> <li>• Monitoring system audits</li> </ul>	•
2.2.4	Develop or enhance national port sampling programmes.	<ul style="list-style-type: none"> <li>• Staff travel reports</li> <li>• Monitoring system audits</li> </ul>	•
2.2.5	Develop procedures for the auditing of national tuna fishery monitoring.	<ul style="list-style-type: none"> <li>• Auditing procedures document drafted</li> </ul>	
<b>Output 2.3: Enhanced capacity of PICTs to monitor fisheries, manage and use data</b>			
2.3.1	Provide ongoing support to National Tuna Data Coordinators, including follow-up of issues arising at the Tuna Data Workshop and further development of national tuna data procedures documents.	<ul style="list-style-type: none"> <li>• Support documented in staff appraisals</li> </ul>	•
2.3.2	Train national tuna fishery data management staff in the use of TUFMAN and other database and sampling programme management software.	<ul style="list-style-type: none"> <li>• National staff trained</li> <li>• Training documented in staff appraisals</li> </ul>	•
2.3.3	Hold up to eight national and sub-regional observer training workshops.	<ul style="list-style-type: none"> <li>• Number of certified new observers</li> <li>• Staff travel reports</li> </ul>	•
2.3.4	Provide observer de-briefing support and	<ul style="list-style-type: none"> <li>• Improved quality of observer data</li> </ul>	•

training in-country.	<ul style="list-style-type: none"> <li>• Staff travel reports</li> </ul>	
2.3.5 Hold a regional observer coordinator's workshop.	<ul style="list-style-type: none"> <li>• Workshop report</li> </ul>	•
2.3.6 Host six training attachments in fisheries monitoring and statistics at SPC headquarters.	<ul style="list-style-type: none"> <li>• Attachment reports</li> <li>• POFM project quarterly reports</li> </ul>	•
2.3.7 Develop standards for competency-based training of observers.	<ul style="list-style-type: none"> <li>• Standards for competency-based training of observers drafted</li> </ul>	•

**TABLE 3/2008.****Objective 3: Improved understanding of pelagic ecosystems in the western and central Pacific Ocean, with a focus on the western tropical Pacific**

2008 Work Programme Activities	Performance Indicators and/or Means of Verification	2008 Achievements
<b>Output 3.1: Data on the biological characteristics of oceanic species and their environment</b>		
<b>3.1.1 Provision of quantitative data on the population dynamics of tropical tuna's. In 2008, these services shall include:</b>	<ul style="list-style-type: none"> <li>• Completion of 6 week Solomon Islands tagging cruise for deployment of conventional and archival tags</li> <li>• Planning and implementation of a 5 months western Pacific (Solomon Islands, FSM, Indonesia and PNG cruise) for deployment of conventional and archival tags.</li> <li>• PTPP Progress report presented to SC3.</li> <li>• 2008 project plan for Albacore biology and tagging research prepared and presented to SCIFISH Steering Committee.</li> <li>• Tagging Technician appointed</li> <li>• Albacore Biologist appointed</li> <li>• Peer reviewed publication submitted that describes tropical tuna vertical behaviour, including FAD behaviour</li> <li>• Peer reviewed publication submitted that describes tropical tuna horizontal movements as derived from Archival tags</li> <li>• Archival Tag database established</li> <li>• Preliminary analysis of PNG tagging data completed and report drafted</li> <li>• Tag recovery procedures improved (lotteries, measurement equipment provided to strategic agents and recovery points)</li> <li>• Tag recovery analysis and quality control measures implemented to minimise poor reporting</li> <li>• Tag seeding experiments scoped and implemented to estimated reporting rates</li> <li>• Report characterizing the variability and extent of catches of</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
a. Implementation of BET, YFT and SKJ research in WCPO waters to obtain data on local exploitation rates and the influence of FAD and seamounts on stock fidelity, movement and distribution		
b. Commencement of Albacore research in WCPO to obtain information on stock fidelity and movements		
c. Commencement of Albacore research in WCPO to obtain information on exploitation rates.		

	non-target species from purse seine catches in PNG completed	
<b>3.1.2 Provision of quantitative data on the environmental drivers of distribution for tropical tuna's. In 2008, these services shall include:</b>	<ul style="list-style-type: none"> <li>• 2008 project plan for Albacore distribution analysis prepared and presented to SCIFISH Steering Committee.</li> <li>• 2008 project plan for BET, YFT and SKJ distribution analysis presented to SCIFISH Steering Committee.</li> </ul>	
a. Commencement of Albacore research in WCPO to obtain data on the influence of bathymetry, oceanographic and geographic drivers on tuna movement and distribution.	<ul style="list-style-type: none"> <li>• 2008 research plan for characterising the relationship between seamounts and historical fishing data.</li> <li>• Appointment of Spatial Analyst to undertake seamount – historical fishing analysis (contingent on IUCN agreement)</li> </ul>	
b. Commencement of BET, YFT and SKJ research in the WCPO to obtain data on the influence of bathymetry, oceanographic and geographic drivers on tuna movement and distribution		
c. Characterising the relationship between seamounts and historical fishing data (this activity contingent on the reallocation of GEF resources to OFP from IUCN).		
<b>3.1.3 Provision of quantitative data on ecosystem and trophic dynamics. In 2008, these services shall include:</b>	<ul style="list-style-type: none"> <li>• Updated priority list of spatial locations for stomach sampling.</li> <li>• Continued co-ordinations of observer sampling of stomachs and tissues &amp; their analysis</li> </ul>	
a. Identification of functional groups and influence of latitudinal, bathymetry and oceanographic effects	<ul style="list-style-type: none"> <li>• Continued collection of stomachs and tissues &amp; their analysis from tagging cruises.</li> <li>• Maintain prey item reference collection</li> </ul>	
b. Identification of carbon cycles and influence of latitudinal, bathymetry and oceanographic effects.	<ul style="list-style-type: none"> <li>• 4 Member country newsletters updating results of trophic and diet analysis and tagging.</li> <li>• Isotope map for tuna in WCPO submitted for publication in scientific literature.</li> </ul>	
c. Identification of natural isotope tags for studying tuna movement	<ul style="list-style-type: none"> <li>• Influence of latitudinal, bathymetry and oceanographic effects on carbon cycles submitted for publication in scientific literature.</li> <li>• Influence of sampling gear on stomach content and isotope</li> </ul>	



	<p>signature submitted for publication in scientific literature.</p> <ul style="list-style-type: none"> <li>• Analysis of regime shifts in tuna diet completed and scientific manuscript drafted for internal OFP review.</li> <li>• Analysis of FAD impacts on isotope signatures completed and report provided to OFP.</li> </ul>	
<p><b>3.1.4 Provision of quantitative data on age and reproduction of tropical tuna's. In 2008, these services shall include:</b></p>	<ul style="list-style-type: none"> <li>• 2008 project plan for Albacore biology and tagging research prepared and presented to SCIFISH Steering Committee.</li> <li>• Central repository/database for all otoliths data improved to include the meta data for otoliths analysis</li> <li>• Research plan for bigeye reproductive biology</li> <li>• Gap analysis of YFT provided to Stock Assessment</li> </ul>	
<p>a. Continue to receive and archive otoliths for future analysis comparing observed and estimated growth</p>		
<p>b. Develop comprehensive research plan for bigeye reproduction biology for WCPFC (contingent on WCPFC approval of project)</p>		
<p>c. Commencement of Albacore research in WCPO to obtain data on age-growth relationships and spawning fidelity</p>		
<p>d. Gap analysis for reproductive biology for YFT as part of SA structural sensitivity analysis.</p>		
<p><b>3.1.5 Provision of oceanographic data for OFP activities. In 2008, these services shall include:</b></p>	<ul style="list-style-type: none"> <li>• FSM, Nauru, Niue, Kiribati, PNG assistance provided</li> </ul>	
<p>a. Oceanographic assistance for NTFSR's in FSM, Nauru, Niue, Kiribati, PNG</p>		
<p><b>Output 3.2: Improved ecosystem models that incorporate available data</b></p>		
<p><b>3.2.1 Provision of ecosystem models that describe the pelagic environment and allow the consequences of ecosystem change and fisheries management to be explored. In 2008, these services shall include:</b></p>	<ul style="list-style-type: none"> <li>• Scientific manuscript documenting the competing model structures for a WCPO warm-pool ecopath with ecosim model drafted and submitted for OFP internal review.</li> <li>• Completion of SEAPODYM code revisions (consultancy to P. Lehodey).</li> </ul>	

<p>a. Identification of trophic uncertainties in WCPO pelagic ecosystem</p>	<ul style="list-style-type: none"> <li>• SEAPODYM Mixed-resolution version is operational and available on website (consultancy to P. Lehodey).</li> </ul>	
<p>b. Identification and inclusion of drivers of spatial heterogeneity in trophic pathways</p>	<ul style="list-style-type: none"> <li>• SEAPODYM Version with statistical parameter estimation is operational and available on website (consultancy to P. Lehodey).</li> </ul>	
<p>c. Identification of tropical tuna feedback mechanisms, ecosystem correlates and species at risk from predator removal</p>	<ul style="list-style-type: none"> <li>• ZONECO fisheries oceanographer appointed and oceanographic input into New Caledonia trial version of mixed resolution SEAPODYM completed</li> </ul>	
<p>d. Develop regional version of SEAPODYM</p>	<ul style="list-style-type: none"> <li>• 2008 project plan for scenario analysis prepared.</li> <li>• Fisheries Oceanographer appointed</li> </ul>	
<p>e. Scenario analysis to forecast the impacts of altered management (including closures &amp; MPA's) on oceanic fisheries and its effects on pelagic ecosystems</p>	<ul style="list-style-type: none"> <li>• Ecosystem Modeller appointed</li> </ul>	
<p><b>3.2.2 Develop individual/single species population models for exploring management implications and knowledge uncertainty. In 2008, these services shall include:</b></p>	<ul style="list-style-type: none"> <li>• Scientific manuscript submitted.</li> </ul>	
<p>a. Pacific leatherbacks and loggerhead turtles</p>		
<p><b>3.2.4 Develop descriptions of the pelagic ecosystem for quantitative and qualitative risk assessments. In 2008, these services shall include:</b></p>	<ul style="list-style-type: none"> <li>• National-scale analyses and training in ERA for SIDS (FSM, Nauru, Niue, Kiribati, PNG);</li> <li>• Sub-regional analysis of western tropical Pacific;</li> <li>• Assistance to other WCPFC members (USA, NZ) in developing national ERAs;</li> <li>• Implementation report submitted to the Secretariat and Working Paper for EB-SWG and SC4.</li> <li>• Scientific manuscript submitted introducing ERA in the WCPO.</li> </ul>	
<p>a. In association with other qualified organizations or CCM research agencies with a view to securing a broad-based consultation, continue implementation of the multi-year ERA, including PSA, for WCPO tuna fisheries.</p>		
<p>b. Provide additional detailed analysis of high risk spp. from PSA analysis.</p>		
<p><b>Output 3.3: Scientific advice on ecosystem-based management options using available models and data</b></p>		

<p>3.3.1 Delivery of scientific advice on tuna population dynamics to industry, management, scientific and executive audiences</p>	<ul style="list-style-type: none"> <li>• Presentation of results of ecosystem analysis to wider scientific community and fisheries management organisation.</li> <li>• Presentation of information on national and regional implications of results of ecosystem analysis to Pacific SIDS</li> </ul>	
<p>3.3.2 Delivery of scientific advice on pelagic ecosystem dynamics to industry, management, scientific and executive audiences</p>	<ul style="list-style-type: none"> <li>• Ecosystem sessions at Stock Assessment Workshops</li> <li>• 3 SC4 presentations</li> <li>• 2 OFP technical reports</li> </ul>	
<p>3.3.3 Provide regional training in population tuna ecology and ecosystem research</p>	<ul style="list-style-type: none"> <li>• 8 Scientific papers</li> <li>• Web-site updates</li> </ul>	
<p>3.3.4 Estimates of levels of by-catch in the WCPO oceanic fisheries</p>	<ul style="list-style-type: none"> <li>• 4 newsletters</li> <li>• Levels of by-catch in the WCPO oceanic fishery analysis updated.</li> </ul>	

## **7. Acknowledgements**

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